

***RCRA Facility Investigation
Work Plan***

Volume VII

**General Motors Corporation
NAO Flint Operations Site
Flint, Michigan**

March 30, 2001

BBL[®]
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Consultants with focus

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Appendix C Field Sampling Plan/Quality Assurance Project Plan (FSP/QAPP)

Volume VI

Appendix D Data Management Plan (DMP)

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Volume VII

Appendix E Health and Safety Plan (HASP)

- Attachment H (Material Safety Data Sheets)

Volume VIII

Appendix F Community Relations Plan (CRP)

Appendix G Historical Analytical Results

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engineers & scientists

Attachment H – Material Safety Data Sheets

HOME OIL -- ACETONE - ACETONE, TECHNICAL
MATERIAL SAFETY DATA SHEET
NSN: 6810002811864
Manufacturer's CAGE: 0A9L8
Part No. Indicator: A
Part Number/Trade Name: ACETONE

General Information

Item Name: ACETONE, TECHNICAL
Company's Name: HOME OIL CO
Company's Street: 3511 N OHIO
Company's P. O. Box: 2609
Company's City: WICHITA
Company's State: KS
Company's Country: US
Company's Zip Code: 67201
Company's Emerg Ph #: 316-838-4663
Company's Info Ph #: 316-838-4663 FAX:316-832-1211
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 010
Status: SE
Date MSDS Prepared: 16MAR90
Safety Data Review Date: 22APR93
Supply Item Manager: CX
MSDS Serial Number: BQMBF
Specification Number: O-A-51G
Hazard Characteristic Code: F2
Unit Of Issue: DR
Unit Of Issue Container Qty: 55 GAL
Type Of Container: DRUM
Net Unit Weight: 361.8 LBS

Ingredients/Identity Information

Proprietary: NO
Ingredient: ACETONE (SARA III)
Ingredient Sequence Number: 01
Percent: 100
NIOSH (RTECS) Number: AL3150000
CAS Number: 67-64-1
OSHA PEL: 1000PPM
ACGIH TLV: 750PPM/1000STEL;9293
Other Recommended Limit: NONE SPECIFIED

Physical/Chemical Characteristics

Appearance And Odor: CLEAR COLORLESS LIQUID
Boiling Point: 134F,57C
Vapor Pressure (MM Hg/70 F): 157
Vapor Density (Air=1): 2.0
Specific Gravity: 0.791
Decomposition Temperature: UNKNOWN
Evaporation Rate And Ref: 5.7 (NONE SPECIFIED)
Solubility In Water: SOLUBLE
Percent Volatiles By Volume: 100
Corrosion Rate (IPY): UNKNOWN

Fire and Explosion Hazard Data

Flash Point: -4F,-20C
Lower Explosive Limit: 2.6
Upper Explosive Limit: 12.8

Extinguishing Media: USE CARBON DIOXIDE, FOAM, OR DRY CHEMICAL.
Special Fire Fighting Proc: FIRE FIGHTERS SHOULD USE NIOSH APPROVED SCBA & FULL PROTECTIVE EQUIPMENT WHEN FIGHTING CHEMICAL FIRE. USE WATER SPRAY TO COOL NEARBY CONTAINERS EXPOSED TO FIRE.
Unusual Fire And Expl Hazrds: FIRE OR EXCESSIVE HEAT MAY CAUSE PRODUCTION OF HAZARDOUS DECOMPOSITION PRODUCTS. EXPLOSIVE AIR-VAPOR MIXTURES MAY FORM.

Reactivity Data

Stability: YES
Cond To Avoid (Stability): HIGH TEMPERATURES, SPARKS, AND OPEN FLAMES
Materials To Avoid: STRONG OXIDIZING AGENTS
Hazardous Decomp Products: CARBON MONOXIDE AND CARBON DIOXIDE.
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NOT APPLICABLE

Health Hazard Data

LD50-LC50 Mixture: (ORAL-RAT)8.5-10.7 G/KG;ALMOST NON-TOXIC
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: NO
SLIGHTLY IRRITATING. INHALATION:CENTRAL NERVOUS SYSTEM DEPRESSION.
DERMATITIS. INHALATION:CNS DEPRESSION. INGESTION:NOT A LIKELY ROUTE OF ENTRY.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: THIS MATERIAL IS NOT CONSIDERED TO BE A CARCINOGEN BY NTP, IARC, OR OSHA.
Signs/Symptoms Of Overexp: EYES:IRRITATION. SKIN:REDDNESS, EDEMA OR DRYING OF THE SKIN. INHALATION:DROWSINESS, NARCOSIS, AND UNCONSCIOUSNESS.
INGESTION:NOT A LIKELY ROUTE OF ENTRY.
Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER.
Emergency/First Aid Proc: EYES:FLUSH WITH WATER FOR AT LEAST 15 MIN. GET MEDICAL ATTENTION. SKIN:WASH EXPOSED AREA WITH SOAP AND WATER.
INHALATION:REMOVE TO FRESH AIR. APPLY ARTIFICIAL RESPIRATION IF NECESSARY.
INGESTION:DO NOT INDUCE VOMITING. ASPIRATION MAY CAUSE CHEMICAL PNEUMONIA.

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: ELIMINATE ALL IGNITION SOURCES. VENTILATE AREA. AVOID BREATHING VAPORS. USE SCBA OR SUPPLIED-AIR MASK FOR LARGE SPILLS OR IN CONFINED AREAS. CONTAIN SPILL. REMOVE WITH INERT ABSORBANT.
Neutralizing Agent: NONE
Waste Disposal Method: RE-EVALUATION OF THE PRODUCT MAY BE REQUIRED BY THE USER AT THE TIME OF DISPOSAL, SINCE THE PRODUCT USES, TRANSFORMATIONS, MIXTURES, AND PROCESSES MAY CHANGE CLASSIFICATION TO NON-HAZARDOUS. DISPOSE IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL LAWS.
Precautions-Handling/Storing: KEEP CONTAINERS TIGHTLY CLOSED AND IN A COOL, DRY AREA.
Other Precautions: NONE

Control Measures

Respiratory Protection: SUPPLIED AIR RESPIRATORY PROTECTION FOR CLEANING LARGE SPILLS OR UPON ENTRY INTO TANKS, VESSELS, OR OTHER CONFINED SPACES.
Ventilation: LOCAL EXHAUST VENTILATION RECOMMENDED.
Protective Gloves: RUBBER GLOVES
Eye Protection: CHEMICAL GOGGLES OR GLASSES
Other Protective Equipment: EYE WASH AND SHOWER
Work Hygienic Practices: EXERCISE REASONABLE PERSONNEL CLEANLINESS.
Suppl. Safety & Health Data: NONE

Transportation Data

```
=====
Trans Data Review Date: 93112
DOT PSN Code: ABF
DOT Proper Shipping Name: ACETONE
DOT Class: 3
DOT ID Number: UN1090
DOT Pack Group: II
DOT Label: FLAMMABLE LIQUID
IMO PSN Code: ADF
IMO Proper Shipping Name: ACETONE
IMO Regulations Page Number: 3102
IMO UN Number: 1090
IMO UN Class: 3.1
IMO Subsidiary Risk Label: -
IATA PSN Code: ACM
IATA UN ID Number: 1090
IATA Proper Shipping Name: ACETONE
IATA UN Class: 3
IATA Label: FLAMMABLE LIQUID
AFI PSN Code: ACM
AFI Prop. Shipping Name: ACETONE
AFI Class: 3
AFI ID Number: UN1090
AFI Pack Group: II
AFI Label: FLAMMABLE LIQUID
AFI Basic Pac Ref: 7-7
MMAC Code: NR
=====
```

Disposal Data

Label Data

```
=====
Label Required: YES
Technical Review Date: 22APR93
MFR Label Number: UNKNOWN
Label Status: F
Common Name: ACETONE
Chronic Hazard: NO
Signal Word: DANGER!
Acute Health Hazard-Slight: X
Contact Hazard-Slight: X
Fire Hazard-Severe: X
Reactivity Hazard-None: X
Special Hazard Precautions: MAY BE POISONOUS IF INHALED OR ABSORBED
THROUGH SKIN. VAPORS MAY CAUSE DIZZINESS OR SUFFOCATION. CONTACT MAY
IRRITATE OR BURN SKIN AND EYES. FIRE MAY PRODUCE IRRITATING OR POISONOUS
GASES. RUNOFF FROM FIRE CONTROL OR DILUTION WATER MAY CAUSE POLLUTION.
CENTRAL NERVOUS SYSTEM DEPRESSION. INGESTION:NOT A LIKELY ROUTE OF ENTRY.
CHRONIC-EYES:IRRITATION. SKIN:DERMATITIS. INHALATION:CNS DEPRESSION.
INGESTION:NOT A LIKELY ROUTE OF ENTRY. ELIMINATE ALL I
=====
```

POLYSCIENCE -- BENZENE, PRODUCT #: 251C-1 - BENZENE, ACS.
MATERIAL SAFETY DATA SHEET
NSN: 6810002815266
Manufacturer's CAGE: 58378
Part No. Indicator: A
Part Number/Trade Name: BENZENE, PRODUCT #: 251C-1

=====
General Information
=====

Item Name: BENZENE, ACS.
Company's Name: POLYSCIENCE
Company's Street: 7800 MERRIMAC AVE
Company's City: NILES
Company's State: IL
Company's Country: US
Company's Zip Code: 60648
Record No. For Safety Entry: 003
Tot Safety Entries This Stk#: 006
Status: SE
Date MSDS Prepared: 01MAR92
Safety Data Review Date: 05AUG94
Supply Item Manager: CX
MSDS Serial Number: BTSWC
Specification Number: 0-C-265C (RED SPEC)
Hazard Characteristic Code: F3
Unit Of Issue: CN
Unit Of Issue Container Qty: 20 LITERS
Type Of Container: METAL/PLASTIC
Net Unit Weight: 36.4 LBS

=====
Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: BENZENE (SARA III)
Ingredient Sequence Number: 01
Percent: 100
NIOSH (RTECS) Number: CY1400000
CAS Number: 71-43-2
OSHA PEL: SEE 1910.1028
ACGIH TLV: 10 PPM; A2; 9394
Other Recommended Limit: NONE RECOMMENDED

=====
Physical/Chemical Characteristics
=====

Appearance And Odor: COLORLESS LIQUID.
Boiling Point: 176F, 80C
Vapor Pressure (MM Hg/70 F): 7403 @20C
Vapor Density (Air=1): 2.77
Specific Gravity: 0.874
Autoignition Temperature: 928F

=====
Fire and Explosion Hazard Data
=====

Flash Point: 12F, -11C
Lower Explosive Limit: 1.3
Upper Explosive Limit: 7.1
Extinguishing Media: CARBON DIOXIDE, DRY CHEM POWDER OR APPROPRIATE FOAM.
WATER MAY BE EFFECTIVE FOR COOLING BUT MAY NOT EFFECT EXTINGUISHMENT
Special Fire Fighting Proc: WEAR SELF-CONTAINED BREATHING APPARATUS AND
PROTECTIVE CLOTHING TO PREVENT CONTACT W/SKIN & EYES. USE WATER SPRAY TO
COOL FIRE-EXPOSED CONTAINERS.
Unusual Fire And Expl Hazrds: EXTREMELY FLAMMABLE. VAPOR MAY TRAVEL
CONSIDERABLE DISTANCE TO SOURCE OF IGNITION AND FLASHBACK. CONTAINER

EXPLOSION MAY OCCUR UNDER FIRE CONDITIONS.

=====
Reactivity Data
=====

Cond To Avoid (Stability): HIGHT TEMPERATURES. SOURCES OF IGNITION.
Materials To Avoid: OXIDIZING AGENTS.
Hazardous Decomp Products: TOXIC FUMES OF CARBON MONOXIDE AND CARBON
DIOXIDE.

=====
Health Hazard Data
=====

LD50-LC50 Mixture: LD50 (ORAL,RAT)=930 MG/KG
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: NO
Health Haz Acute And Chronic: ACUTE:HARMFUL IF SWALLOWED, INHALED, ABSORBED
THRU SKIN. IRRIT TO MUC MEM & UPPER RESP TRACT. CAUSES SKIN & SEVERE EYE
IRRIT. CHRONIC: CARCINOGEN. MAY ALTER GENETIC MATERIAL. BLOOD EFFECTS.
Carcinogenicity - NTP: YES
Carcinogenicity - IARC: YES
Carcinogenicity - OSHA: YES
Explanation Carcinogenicity: CONTAINS Benzene [71-43-2] WHICH IS LISTED BY
NTP AND IARC AND REGULATED BY OSHA AS A CARCINOGEN.
Signs/Symptoms Of Overexp: NAUSEA, DIZZ, HEAD, NARCOTIC EFFECT. CANCER.
EXHILARATION, NERVOUS EXCITATION &/OR GIDD, DEPRESS, DROWSINESS, FATIGUE.
TIGHTNESS IN CHEST, BREATHLESSNESS, LOSS OF CONSC, TREMORS, CONVULS, DEATH DUE
TO RESP PARA OR CIRCULATORY COLLAPSE. DRYING, SCALING DERM, 2NSD SKIN
INFECTIONS. BLEEDING FROM NOSE/GUMS/MUC MEM, SMALL BLISTERS, LEUKOPENIA.
Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER.
Emergency/First Aid Proc: IMMED FLUSH EYES OR SKIN W/COPIOUS AMTS OF WATER
FOR @ LEAST 15MINS WHILE REMOVING CONTAMINATED CLOTHING/SHOES. IF INHALED,
REMOVE TO FRESH AIR. IF NOT BREAHTING GIVE ARTIFICIAL RESPIRATION. IF
BREATHING IS DIFFICULT GIVE OXYGEN. IF SWALLOWED WASH OUT MOUTH W/WATER
PROVIDED PERSON IS CONSCIOUS. CALL A PHYSICIAN.

=====
Precautions for Safe Handling and Use
=====

Steps If Matl Released/Spill: EVACUATE AREA. SHUT OFF ALL IGNITION SOURCES.
WEAR SCBA, RUBBER BOOTS & HEAVY RUBBER GLOVES. COVER W/ACTIVATED CARBON
ADSORBENT. TAKE UP & PLACE IN CLOSED CONTAINERS. TRANSPORT OUTDOORS.
VENITLATE AREA & WASH SITE AFTER MATL PICKUP IS COMPLETE.
Neutralizing Agent: NOT RELEVANT.
Waste Disposal Method: BURN IN A CHEMICAL INCINERATOR EQUIPPED W/AN
AFTERBURNER & SCRUBBER BUT EXERT EXTRA CARE IN IGNITING AS THIS MATERIAL IS
HIGHLY FLAMMABLE. OBSERVE ALL LOCAL, STATE AND FEDERAL LAWS.
Precautions-Handling/Storing: WEAR APPROPRIATE NIOSH/MSHA APPROVED RESP,
CHEM-RESIST GLOVES, SAFTY GOGGLES, OTHER PROTECTIVE CLOTH. USE ONLY IN
CHEMICAL FUME HOOD. USE NONSPARKING TOOLS
Other Precautions: DON'T BREATHE VAPOR. DON'T GET IN EYES, ON SKIN, ON
CLOTHING. AVOID PROLONG/REPEAT EXPOSURE. KEEP TIGHTLY CLOSED. KEEP AWAY FROM
HEAT, SPARKS, OPEN FLAME. STORE IN COOL DRY PLACE. IF FEEL UNWELL SEEK MED
ADVICE (SHOW LABEL WHERE POSSIBLE).

=====
Control Measures
=====

Respiratory Protection: WEAR APPROPRIATE NIOSH/MSHA-APPROVED RESPIRATOR.
Ventilation: CHEMICAL FUME HOOD WHICH IS EXPLOSION PROOF.
Protective Gloves: CHEMICAL RESISTANT GLOVES.
Eye Protection: SAFETY GOGGLES.
Other Protective Equipment: PROTECTIVE SUITABLE CLOTHING TO MINIMIZE SKIN
CONTACT. SAFETY SHOWER & EYE BATH.
Work Hygienic Practices: WASH CONTAMINATED CLOTHING PROMPTLY. WASH
THOROUGHLY AFTER HANDLING.

Transportation Data

=====
Trans Data Review Date: 94217
DOT PSN Code: BRS
DOT Proper Shipping Name: BENZENE
DOT Class: 3
DOT ID Number: UN1114
DOT Pack Group: II
DOT Label: FLAMMABLE LIQUID
IMO PSN Code: BXB
IMO Proper Shipping Name: BENZENE
IMO Regulations Page Number: 3185
IMO UN Number: 1114
IMO UN Class: 3.2
IMO Subsidiary Risk Label: -
IATA PSN Code: DBA
IATA UN ID Number: 1114
IATA Proper Shipping Name: BENZENE
IATA UN Class: 3
IATA Label: FLAMMABLE LIQUID
AFI PSN Code: DBA
AFI Symbols: 0
AFI Prop. Shipping Name: BENZENE
AFI Class: 3
AFI ID Number: UN1114
AFI Pack Group: II
AFI Basic Pac Ref: 7-7
N.O.S. Shipping Name: BENZENE.
Additional Trans Data: PER CTDf SHIPPING NAME: BENZENE, UNIT CAN CONTAINS
20 LITERS. FOR PALLETIZATION REQMTS: METAL OR PLASTIC 5 GALLON CONTAINER.
=====

Disposal Data

Label Data

=====
Label Required: YES
Technical Review Date: 05AUG94
Label Status: F
Common Name: BENZENE, PRODUCT #: 251C-1
Chronic Hazard: YES
Signal Word: DANGER!
Acute Health Hazard-Severe: X
Contact Hazard-Moderate: X
Fire Hazard-Severe: X
Reactivity Hazard-None: X
Special Hazard Precautions: HARMFUL IF SWALLOWED, INHALED, ABSORBED THRU
SKIN. IRRIT TO MUC MEM & UPPER RESP TRACT. CAUSES SKIN & SEVERE EYE IRRIT.
CHRONIC: CARCINOGEN. MAY ALTER GENETIC MATERIAL (MUTAGEN). BLOOD EFFECTS.
TARGET ORGANS: BLOOD/BLOOD MARROW/CNS. FIRST AID: IMMEDIATELY FLUSH EYES OR SKIN W/
COPIOUS AMTS OF WATER FOR @ LEAST 15MINS WHILE REMOVING CONTAMINATED
CLOTHING/SHOES. IF INHALED, REMOVE TO FRESH AIR. IF NOT BREATHING GIVE
ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT GIVE OXYGEN. IF SWALLOWED
WASH OUT MOUTH W/WATER PROVIDED PERSON IS CONSCIOUS. CALL A PHYSICIAN.
Protect Eye: Y
Protect Skin: Y
Protect Respiratory: Y
Label Name: POLYSCIENCE
Label Street: 7800 MERRIMAC AVE
Label City: NILES
Label State: IL
Label Zip Code: 60648
Label Country: US
=====

SUPELCO -- BIS(2-ETHYLHEXYL)PHTHALATE, R430660
MATERIAL SAFETY DATA SHEET
NSN: 663000N056536
Manufacturer's CAGE: 54968
Part No. Indicator: A
Part Number/Trade Name: BIS(2-ETHYLHEXYL)PHTHALATE, R430660

=====
General Information
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Company's Name: SUPELCO INC
Company's Street: SUPELCO PARK
Company's City: BELLFONTE
Company's State: PA
Company's Country: US
Company's Zip Code: 16823-0048
Company's Emerg Ph #: 814-359-3441
Company's Info Ph #: 814-359-3441
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SMJ
Date MSDS Prepared: 04JAN90
Safety Data Review Date: 21DEC94
MSDS Serial Number: BWNHX
Hazard Characteristic Code: NK

=====
Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: PHTHALIC ACID, BIS(2-ETHYL(HEXYL)ESTER; (1,2-
BENZENEDICARBOXYLIC ACID, BIS(2-ETHYLHEXYL)ESTER) (SARA III)
Ingredient Sequence Number: 01
NIOSH (RTECS) Number: TI0350000
CAS Number: 117-81-7
OSHA PEL: 5 MG/M3
ACGIH TLV: 5 MG/M3; 10 STEL

=====
Physical/Chemical Characteristics
=====

Appearance And Odor: CLEAR COLORLESS LIQUID.
Boiling Point: 723F, 384C
Melting Point: -58F, -50C
Vapor Pressure (MM Hg/70 F): N/A
Vapor Density (Air=1): N/A
Specific Gravity: 0.981
Evaporation Rate And Ref: N/A
Percent Volatiles By Volume: N/A

=====
Fire and Explosion Hazard Data
=====

Flash Point: 405F, 207C
Lower Explosive Limit: N/A
Upper Explosive Limit: N/A
Extinguishing Media: WATER, CO*2, DRY CHEMICAL, ALCOHOL FOAM.
Special Fire Fighting Proc: WEAR NIOSH/MSHA APPROVED SCBA & FULL
PROTECTIVE EQUIPMENT(FP N).
Unusual Fire And Expl Hazrds: NONE SPECIFIED BY MANUFACTURER.

=====
Reactivity Data
=====

Stability: YES
Cond To Avoid (Stability): NONE SPECIFIED BY MANUFACTURER.
Materials To Avoid: OXIDIZING AGENTS.
Hazardous Decomp Products: NONE SPECIFIED BY MANUFACTURER.

Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NOT RELEVANT.

=====
Health Hazard Data
=====

LD50-LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: NO
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: MAY IRRITATE EYES &/SKIN. HARMFUL IF SWALLOWED. CONTAINS MATERIAL(S) KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER. GASTROINTESTINAL DISTURBANCES. REPORTED ANIMAL CARCINOGEN. POSSIBLE TERATOGEN.
Carcinogenicity - NTP: YES
Carcinogenicity - IARC: YES
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: PHTHALIC ACID, BIS(2-ETHYLHEXYL)ESTER: IARC MONOGRAPHS, SUPPLEMENT, VOL 7, PG 322, 1987: GROUP 2A. NTP 7TH (SUPP DATA)
Signs/Symptoms Of Overexp: SEE HEALTH HAZARDS.
Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER.
Emergency/First Aid Proc: EYES: FLUSH EYES W/WATER FOR AT LEAST 15 MINUTES. SKIN: PROMPLTY WASH SKIN W/MILD SOAP & LARGE VOLUMES OF WATER. REMOVE CONTAMD CLTHG. INHAL: IMMED MOVE TO FRESH AIR. GIVE OXYGEN IF BREATHING IS LABORED. IF BREATHING STOPS, GIVE ARTIFICIAL RESPIRATION.
CONTACT MD. INGEST: CALL MD IMMEDIATELY(FP N).

=====
Precautions for Safe Handling and Use
=====

Steps If Matl Released/Spill: TAKE UP WITH ABSORBENT MATERIAL. VENTILATE AREA. FLUSH AREA WITH WATER.
Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.
Waste Disposal Method: COMPLY WITH ALL APPLICABLE LOCAL, STATE & FEDERAL REGULATIONS.
Precautions-Handling/Storing: STORE IN SEALED CONTAINER IN COOL, DRY LOCATION.
Other Precautions: REPORTED CANCER HAZARD.

=====
Control Measures
=====

Respiratory Protection: WEAR NIOSH/MSHA APPROVED RESPIRATORY PROTECTION.
Ventilation: USE ONLY IN EXHAUST HOOD.
Protective Gloves: IMPERVIOUS GLOVES (FP N).
Eye Protection: ANSI APPRVD CHEM WORKERS GOGGLES(FP N).
Other Protective Equipment: NONE SPECIFIED BY MANUFACTURER.
Work Hygienic Practices: NONE SPECIFIED BY MANUFACTURER.
Suppl. Safety & Health Data: EXPLAN OF CARCIN: ANNUAL REPORT ON CARCINOGENS, 1994: ANTICIPATED TO BE CARCINOGEN. ANIMAL: LIVER, TESTES.

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Transportation Data
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Disposal Data
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Label Data
=====

Label Required: YES
Technical Review Date: 21DEC94
Label Date: 21DEC94
Label Status: G
Common Name: BIS(2-ETHYLHEXYL)PHTHALATE, R430660
Chronic Hazard: YES
Signal Word: CAUTION!
Acute Health Hazard-Slight: X

Contact Hazard-Slight: X
Fire Hazard-Slight: X
Reactivity Hazard-None: X
Special Hazard Precautions: COMBUSTIBLE. ACUTE: MAY IRRITATE EYES &/SKIN.
HARMFUL IF SWALLOWED. GASTROINTESTINAL DISTURBANCES. CHRONIC: CANCER
HAZARD. CONTAINS PHTHALIC ACID, BIS(2-ETHYLHEXYL)ESTER) WHICH IS LISTED AS
A LIVER CARCINOGEN TO ANIMALS(FP N). POSSIBLE TERATOGEN.
Protect Eye: Y
Protect Skin: Y
Protect Respiratory: Y
Label Name: SUPELCO INC
Label Street: SUPELCO PARK
Label City: BELLFONTE
Label State: PA
Label Zip Code: 16823-0048
Label Country: US
Label Emergency Number: 814-359-3441

ULTRA SCIENTIFIC -- HC-030, BROMOMETHANE SOLUTION AT 100 UG-ML
MATERIAL SAFETY DATA SHEET
NSN: 684000N058057
Manufacturer's CAGE: OMU35
Part No. Indicator: A
Part Number/Trade Name: HC-030, BROMOMETHANE SOLUTION AT 100 UG/ML
IN(SUPDAT)

=====
General Information
=====

Company's Name: ULTRA SCIENTIFIC
Company's Street: 250 SMITH ST
Company's City: N KINGSTOWN
Company's State: RI
Company's Country: US
Company's Zip Code: 02852
Company's Emerg Ph #: 401-294-9400
Company's Info Ph #: 401-294-9400
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SMJ
Date MSDS Prepared: 20SEP93
Safety Data Review Date: 09MAR95
MSDS Serial Number: BWZFM

=====
Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: METHYL ALCOHOL; (METHANOL) (SARA 313) (CERCLA). LD50:(ORAL,
RAT) 12,900 MG/KG.
Ingredient Sequence Number: 01
Percent: 99.99
NIOSH (RTECS) Number: PC1400000
CAS Number: 67-56-1
OSHA PEL: 200 PPM, S
ACGIH TLV: 200 PPM;250 STEL, S

Proprietary: NO
Ingredient: METHANE, BROMO-; (BROMOMETHANE) (SARA 302/313) (CERCLA).
LD50:(ORAL,RAT) <100 MG/KG.
Ingredient Sequence Number: 02
Percent: 0.013
NIOSH (RTECS) Number: PA4900000
CAS Number: 74-83-9
OSHA PEL: 20 PPM, S, C
ACGIH TLV: 5 PPM, S

=====
Physical/Chemical Characteristics
=====

Appearance And Odor: LIQUID.

=====
Fire and Explosion Hazard Data
=====

Flash Point: NOT APPLICABLE
Extinguishing Media: CARBON DIOXIDE, DRY CHEMICAL POWDER OR WATER SPRAY.
Special Fire Fighting Proc: USE NIOSH/MSHA APPROVED SCBA & FULL PROTECTIVE
EQUIPMENT (FP N).
Unusual Fire And Expl Hazrds: COMBUSTIBLE.

=====
Reactivity Data
=====

Stability: YES
Cond To Avoid (Stability): LOW REACTIVITY

Materials To Avoid: NONE SPECIFIED BY MANUFACTURER.
Hazardous Decomp Products: NONE SPECIFIED BY MANUFACTURER.
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NOT RELEVANT

=====
Health Hazard Data
=====

LD50-LC50 Mixture: SEE INGREDIENTS.
Route Of Entry - Inhalation: NO
Route Of Entry - Skin: NO
Route Of Entry - Ingestion: NO
Health Haz Acute And Chronic: TOXIC; IRRITANT. ALL CHEMICALS SHOULD BE
CONSIDERED HAZARDOUS - DIRECT PHYSICAL CONTACT SHOULD BE AVOIDED.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NOT RELEVANT
Signs/Symptoms Of Overexp: SEE HEALTH HAZARDS.
Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER.
Emergency/First Aid Proc: INGEST:CALL MD IMMEDIATELY (FP N)..SKIN: FLUSH
W/COPIOUS AMOUNTS OF WATER. EYES:FLUSH W/COPIOUS AMOUNTS OF WATER FOR AT
LEAST 15 MINUTES. INHAL:REMOVE TO FRESH AIR - GIVE OXYGEN, IF NECESSARY.
CONTACT MD.

=====
Precautions for Safe Handling and Use
=====

Steps If Matl Released/Spill: DUE TO THE SMALL QUANTITY INVOLVED, SPILLS
OR LEAKS SHOULD NOT POSE A SIGNIFICANT PROBLEM. A LEAKING BOTTLE MAY BE
PLACED IN A PLASTIC BAG & NORMAL DISPOSAL PROCEDURES FOLLOWED. LIQUID
SAMPLES MAY BE ABSORBED ON VERMICULITE OR SAND.
Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.
Waste Disposal Method: BURN IN A CHEMICAL INCINERATOR EQUIPPED W/
AFTERBURNER & SCRUBBER. OBSERVE ALL FEDERAL, STATE & LOCAL LAWS CONCERNING
DISPOSAL.
Precautions-Handling/Storing: KEEP TIGHTLY CLOSED & STORE IN A COOL, DRY
PLACE.
Other Precautions: THIS MATERIAL SHOULD ONLY BE USED BY THOSE PERSONS
TRAINED IN THE SAFE HANDLING OF HAZARDOUS CHEMICALS.

=====
Control Measures
=====

Respiratory Protection: NIOSH/MSHA APPROVED RESPIRATOR APPROPRIATE FOR
EXPOSURE OF CONCERN (FP N).
Ventilation: NONE SPECIFIED BY MANUFACTURER.
Protective Gloves: IMPERVIOUS GLOVES (FP N).
Eye Protection: ANSI APPROVED CHEM WORKERS GOGGS (SUPDAT)
Other Protective Equipment: EYE WASH FOUNTAIN & DELUGE SHOWER WHICH MEET
ANSI DESIGN CRITERIA (FP N). USE APPROP NIOSH/MSHA APPRVD SAFETY (SUPDAT)
Work Hygienic Practices: NONE SPECIFIED BY MANUFACTURER.
& FULL LENGTH FACESHIELD (FP N). OTHER PROT EQUIP:EQUIPMENT. WEAR CHEMICAL
RESISTANT CLOTHING SUCH AS LAB COAT &/OR RUBBER APRON TO PREVENT CONTACT W/
EYES, SKIN & CLOTHING.

=====
Transportation Data
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=====
Disposal Data
=====

=====
Label Data
=====

Label Required: NO
Label Status: X
Common Name: LABEL COVERED UNDER EPA REGS - HAZCOM LABEL NOT

AUTHORIZED

CHEM SERVICE -- 2-BUTANONE, 0-810
MATERIAL SAFETY DATA SHEET
NSN: 681000N043709
Manufacturer's CAGE: 8Y898
Part No. Indicator: A
Part Number/Trade Name: 2-BUTANONE, 0-810

=====
General Information
=====

Company's Name: CHEM SERVICE INC
Company's P. O. Box: 3108
Company's City: WEST CHESTER
Company's State: PA
Company's Country: US
Company's Zip Code: 19381
Company's Emerg Ph #: 215-692-3026
Company's Info Ph #: 215-692-3026
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SMJ
Date MSDS Prepared: 31MAR93
Safety Data Review Date: 04OCT95
MSDS Serial Number: BTGWJ
Hazard Characteristic Code: F3

=====
Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: 2-BUTANONE; (METHYL ETHYL KETONE) (MEK) (SARA III)
Ingredient Sequence Number: 01
NIOSH (RTECS) Number: EL6475000
CAS Number: 78-93-3
OSHA PEL: 200 PPM;300 STEL
ACGIH TLV: 200 PPM;300 STEL

=====
Physical/Chemical Characteristics
=====

Appearance And Odor: COLORLESS LIQUID, FRUITY PLEASANT ODOR.
Boiling Point: 176F,80C
Melting Point: -125F,-87C
Vapor Pressure (MM Hg/70 F): 70 @ 20C
Vapor Density (Air=1): 2.5
Solubility In Water: SLIGHTLY SOLUBLE

=====
Fire and Explosion Hazard Data
=====

Flash Point: 15.8F,-9C
Lower Explosive Limit: 1.8%
Upper Explosive Limit: 10%
Extinguishing Media: CARBON DIOXIDE, DRY CHEMICAL POWDER OR SPRAY.
Special Fire Fighting Proc: WEAR NIOSH/MSHA APPROVED SCBA AND FULL
PROTECTIVE EQUIPMENT (FP N).
Unusual Fire And Expl Hazrds: NONE SPECIFIED BY MANUFACTURER.

=====
Reactivity Data
=====

Stability: YES
Cond To Avoid (Stability): NONE SPECIFIED BY MANUFACTURER.
Materials To Avoid: STRONG OXIDIZING AGENTS, STRONG BASES, STRONG REDUCING
AGENTS, AMINES, AMMONIA &/OR AMMONIUM HYDROXIDE, (SUPP DATA)
Hazardous Decomp Products: DECOMPOSITION LIBERATES TOXIC FUMES.
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NOT RELEVANT

=====
Health Hazard Data
=====

LD50-LC50 Mixture: LD50: (ORAL,RAT) 2737 MG/KG
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: CONTACT LENSES SHOULD NOT BE WORN IN LAB.
ALL CHEMS SHOULD BE CONSIDERED HAZ. AVOID DIRECT PHYSICAL CONTACT. MAY BE
HARMFUL IF ABSORBED THROUGH SKIN. MAY BE HARMFUL IF INHALED. MAY BE HARMFUL
IF SWALLOWED. SEVERE IRRIT. DEPENDING ON INTENSITY & DURATION OF EXPOSURE,
EFTS MAY VARY FROM MILD IRRIT TO (EFTS OF OVEREXP)
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NOT RELEVANT
Signs/Symptoms Of Overexp: HLTH HAZ: SEVERE DESTRUCTION OF TISSUE. CAN
CAUSE SKIN IRRIT. VAPORS OR MIST IS IRRITATING TO EYES, MUCOUS MEMBRANES
AND UPPER RESPIRATORY TRACT. EXPOSURE CAN CAUSE GASTRO-INTESTINAL
DISTURBANCES. EXPOSURE CAN CAUSE DERMATITIS. NARCOTIC AT HIGH CONCS. TARGET
ORGANS: CNS & LUNGS.
Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER.
Emergency/First Aid Proc: AN ANTIDOTE IS A SUBSTANCE INTENDED TO
COUNTERACT THE EFT OF A POISON. IT SHOULD BE ADMIN ONLY BY A MD OR TRAINED
EMERGENCY PERSONNEL. MED ADVICE CAN BE OBTAINED FROM A POISON CONTROL CTR.
EYE: FLUSH CONTINUOUSLY W/WATER FOR AT LEAST 15 MIN. SKIN: FLUSH W/WATER
FOR 15-20 MIN. IF NO BURNS HAVE OCCURED-USE SOAP & WATER TO CLEANSE SKIN.
INHAL: REMOVE PATIENT TO FRESH AIR. ADMIN O2 IF (SUPP DATA)

=====
Precautions for Safe Handling and Use
=====

Steps If Matl Released/Spill: EVAC AREA. WEAR APPROPRIATE OSHA REGULATED
EQUIPMENT. VENTILATE AREA. ABSORB ON VERMICULITE OR SIMILAR MATERIAL. SWEEP
UP AND PLACE IN AN APPROPRIATE CONTAINER. HOLD FOR DISPOSAL. WASH
CONTAMINATED SURFACES TO REMOVE ANY RESIDUES.
Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.
Waste Disposal Method: BURN IN A CHEMICAL INCINERATOR EQUIPPED WITH AN
AFTERBURNER AND SCRUBBER. DISPOSAL MUST BE IN ACCORDANCE WITH FEDERAL,
STATE AND LOCAL REGULATION (FP N).
Precautions-Handling/Storing: THIS CHEM SHLD BE HANDLED ONLY IN A HOOD.
EYE SHIELDS SHOULD BE WORN. USE APPROPRIATE NIOSH/MSHA APPROVED SAFETY
EQUIPMENT.
Other Precautions: AVOID CONTACT WITH SKIN, EYES & CLOTHING. KEEP TIGHTLY
CLOSED IN A COOL DRY PLACE. STORE ONLY WITH COMPATIBLE CHEMICALS.

=====
Control Measures
=====

Respiratory Protection: NIOSH/MSHA APPROVED RESPIRATOR APPROPRIATE FOR
EXPOSURE OF CONCERN (FP N).
Ventilation: THIS CHEMICAL SHOULD BE HANDLED ONLY IN A HOOD.
Protective Gloves: IMPERVIOUS GLOVES (FP N).
Eye Protection: ANSI APVD CHEMICAL SAFETY GOGGLES (FP N)
Other Protective Equipment: NONE SPECIFIED BY MANUFACTURER.
Work Hygienic Practices: NONE SPECIFIED BY MANUFACTURER.
Suppl. Safety & Health Data: MATLS TO AVOID:INORGANIC ACIDS, CAUSTICS,
COPPER & COPPER ALLOYS, ISOCYANATES, PYRIDINES. FIRST AID PROC:PATIENT IS
HAVING DFCLTY BRTHG. IF PATIENT HAS STOPPED BRTHG ADMIN ARTF RESP. IF
PATIENT IS IN CARDIAC ARREST ADMIN CPR. CONTINUE LIFE SUPPORTING MEASURES
UNTIL MED ASSISTANCE HAS ARRIVED. INGEST:GET MD IMMED (FPN).

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Transportation Data
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Disposal Data
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Label Data
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Label Required: YES
Technical Review Date: 05OCT93
Label Date: 20SEP93
Label Status: G
Common Name: 2-BUTANONE, 0-810
Chronic Hazard: NO
Signal Word: DANGER!
Acute Health Hazard-Severe: X
Contact Hazard-Severe: X
Fire Hazard-Severe: X
Reactivity Hazard-Slight: X
Special Hazard Precautions: EXTREMELY FLAMMABLE LIQUID! DECOMPOSITION
LIBERATES TOXIC FUMES. AVOID CONTACT. KEEP TIGHTLY CLOSED IN COOL, DRY
PLACE. ACUTE: MAY BE HARMFUL IF ABSORBED THROUGH SKIN, INHALED, OR
SWALLOWED. CAN CAUSE SEVERE TISSUE DAMAGE & SKIN/EYE IRRITATION. IRRITATING
TO MUCOUS MEMBRANES & UPPER RESPIRATORY TRACT. CAN CAUSE GASTROINTESTINAL
DISTURBANCES. INHALATION AT HIGH CONCENTRATIONS MAY CAUSE NARCOTIC EFFECTS.
EXPOSURE CAN CAUSE DERMATITIS. CHRONIC: NONE SPECIFIED BY MANUFACTURER.
Protect Eye: Y
Protect Skin: Y
Protect Respiratory: Y
Label Name: CHEM SERVICE INC
Label P.O. Box: 3108
Label City: WEST CHESTER
Label State: PA
Label Zip Code: 19381
Label Country: US
Label Emergency Number: 215-692-3026

ULTRA SCIENTIFIC -- EPA-1012, CARBON DISULFIDE SOLUTION AT (SUPP DATA)
MATERIAL SAFETY DATA SHEET
NSN: 684000N058060
Manufacturer's CAGE: 0MU35
Part No. Indicator: A
Part Number/Trade Name: EPA-1012, CARBON DISULFIDE SOLUTION AT (SUPP DATA)

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General Information
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Company's Name: ULTRA SCIENTIFIC
Company's Street: 250 SMITH ST
Company's City: N KINGSTOWN
Company's State: RI
Company's Country: US
Company's Zip Code: 02852
Company's Emerg Ph #: 401-294-9400
Company's Info Ph #: 401-294-9400
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SMJ
Date MSDS Prepared: 13SEP93
Safety Data Review Date: 09MAR95
MSDS Serial Number: BWZFQ

=====
Ingredients/Identity Information
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Proprietary: NO
Ingredient: METHYL ALCOHOL; (METHANOL) (SARA 313) (CERCLA). LD50:(ORAL, RAT) 12,900 MG/KG.
Ingredient Sequence Number: 01
Percent: 99.37
NIOSH (RTECS) Number: PC1400000
CAS Number: 67-56-1
OSHA PEL: 200 PPM, S
ACGIH TLV: 200 PPM;250 STEL, S

Proprietary: NO
Ingredient: CARBON DISULFIDE (SARA 302/313) (CERCLA)
Ingredient Sequence Number: 02
Percent: 0.63
NIOSH (RTECS) Number: FF6650000
CAS Number: 75-15-0
OSHA PEL: 20 PPM
ACGIH TLV: 10 PPM, S

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Physical/Chemical Characteristics
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Appearance And Odor: LIQUID.
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Fire and Explosion Hazard Data
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Flash Point: NOT APPLICABLE
Extinguishing Media: CARBON DIOXIDE, DRY CHEMICAL POWDER OR WATER SPRAY.
Special Fire Fighting Proc: USE NIOSH/MSHA APPROVED SCBA & FULL PROTECTIVE EQUIPMENT (FP N).
Unusual Fire And Expl Hazrds: COMBUSTIBLE.
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=====
Reactivity Data
=====

Stability: YES
Cond To Avoid (Stability): NONE SPECIFIED BY MANUFACTURER.
Materials To Avoid: STRONG OXIDIZERS.
Hazardous Decomp Products: NOT APPLICABLE

Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NOT RELEVANT

=====
Health Hazard Data
=====

LD50-LC50 Mixture: SEE INGREDIENT 1.
Route Of Entry - Inhalation: NO
Route Of Entry - Skin: NO
Route Of Entry - Ingestion: NO
Health Haz Acute And Chronic: TOXIC; IRRITANT. ALL CHEMICALS SHOULD BE CONSIDERED HAZARDOUS - DIRECT PHYSICAL CONTACT SHOULD BE AVOIDED.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NOT RELEVANT
Signs/Symptoms Of Overexp: SEE HEALTH HAZARDS.
Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER.
Emergency/First Aid Proc: INGEST:CALL MD IMMEDIATELY (FP N). SKIN: FLUSH W/COPIOUS AMOUNTS OF WATER. EYES:FLUSH W/COPIOUS AMOUNTS OF WATER FOR AT LEAST 15 MINUTES. INHAL:REMOVE TO FRESH AIR - GIVE OXYGEN, IF NECESSARY. CONTACT MD.

=====
Precautions for Safe Handling and Use
=====

Steps If Matl Released/Spill: DUE TO THE SMALL QUANTITY INVOLVED, SPILLS OR LEAKS SHOULD NOT POSE A SIGNIFICANT PROBLEM. A LEAKING BOTTLE MAY BE PLACED IN A PLASTIC BAG & NORMAL DISPOSAL PROCEDURES FOLLOWED. LIQUID SAMPLES MAY BE ABSORBED ON VERMICULITE OR SAND.
Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.
Waste Disposal Method: BURN IN A CHEMICAL INCINERATOR EQUIPPED W/AFTERBURNER & SCRUBBER. OBSERVE ALL FEDERAL, STATE & LOCAL LAWS CONCERNING DISPOSAL.
Precautions-Handling/Storing: KEEP TIGHTLY CLOSED & STORE IN A COOL, DRY PLACE.
Other Precautions: THIS MATERIAL SHOULD ONLY BE USED BY THOSE PERSONS TRAINED IN THE SAFE HANDLING OF HAZARDOUS CHEMICALS.

=====
Control Measures
=====

Respiratory Protection: NIOSH/MSHA APPROVED RESPIRATOR APPROPRIATE FOR EXPOSURE OF CONCERN (FP N).
Ventilation: NONE SPECIFIED BY MANUFACTURER.
Protective Gloves: IMPERVIOUS GLOVES (FP N).
Eye Protection: ANSI APPROVED CHEM WORKERS GOGGS (SUPDAT)
Other Protective Equipment: EYE WASH FOUNTAIN & DELUGE SHOWER WHICH MEET ANSI DESIGN CRITERIA (FP N). USE APPROP NIOSH/MSHA APPRVD SAFETY (SUPDAT)
Work Hygienic Practices: NONE SPECIFIED BY MANUFACTURER.
Suppl. Safety & Health Data: MFR'S TRADE NAME/PART NO:5000 UG/ML IN EQUIPMENT. WEAR CHEMICAL RESISTANT CLOTHING SUCH AS LAB COAT &/OR RUBBER APRON TO PREVENT CONTACT W/EYES, SKIN & CLOTHING.

=====
Transportation Data
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=====
Disposal Data
=====

=====
Label Data
=====

Label Required: NO
Label Status: X
Common Name: LABEL COVERED UNDER EPA REGS - HAZCOM LABEL NOT AUTHORIZED

ALDRICH CHEMICAL -- CARBON TETRACHLORIDE 99.9+% HPLC GRADE, 27065-2
MATERIAL SAFETY DATA SHEET
NSN: 681000N014236
Manufacturer's CAGE: 60928
Part No. Indicator: A
Part Number/Trade Name: CARBON TETRACHLORIDE 99.9+% HPLC GRADE, 27065-2

=====
General Information
=====

Company's Name: ALDRICH CHEMICAL CO INC
Company's P. O. Box: 355
Company's City: MILWAUKEE
Company's State: WI
Company's Country: US
Company's Zip Code: 53201
Company's Emerg Ph #: 414-273-3850
Company's Info Ph #: 414-273-3850
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SMJ
Date MSDS Prepared: 13DEC91
Safety Data Review Date: 16JUN95
MSDS Serial Number: BKKWC
Hazard Characteristic Code: NK

=====
Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: CARBON TETRACHLORIDE (SARA 313) (CERCLA)
Ingredient Sequence Number: 01
Percent: 99.9+
NIOSH (RTECS) Number: FG4900000
CAS Number: 56-23-5
OSHA PEL: 10 PPM Z-2
ACGIH TLV: S,5 PPM/10 STEL, A3

Proprietary: NO
Ingredient: SUPDAT:IF SWALLOWED. IRRITATING TO EYES, RESP SYS & SKIN. THIS
PROD IS SUBJECT TO SARA SECTION 313 RPTG REQUIREMENTS.
Ingredient Sequence Number: 02
NIOSH (RTECS) Number: 9999999ZZ
OSHA PEL: NOT APPLICABLE
ACGIH TLV: NOT APPLICABLE

Proprietary: NO
Ingredient: EXPLAN OF CARCIN:CARCINOGEN. ANIMAL:LIVER, KIDNEY, LUNG.
Ingredient Sequence Number: 03
NIOSH (RTECS) Number: 9999999ZZ
OSHA PEL: NOT APPLICABLE
ACGIH TLV: NOT APPLICABLE

=====
Physical/Chemical Characteristics
=====

Appearance And Odor: COLORLESS LIQUID
Boiling Point: 171F,77C
Melting Point: -9F,-23C
Vapor Pressure (MM Hg/70 F): SUPDAT
Vapor Density (Air=1): 5.32
Specific Gravity: 1.594
Evaporation Rate And Ref: NOT KNOWN
Solubility In Water: NOT KNOWN

=====
Fire and Explosion Hazard Data

Flash Point: NONE
Extinguishing Media: NONCOMBUSTIBLE. USE EXTINGUISHING MEDIA APPROPRIATE TO SURROUNDING FIRE CONDITIONS.
Special Fire Fighting Proc: WEAR NIOSH/MSHA APPROVED PRESSURE DEMAND SCBA & FULL PROTECTIVE EQUIPMENT (FP N).
Unusual Fire And Expl Hazrds: THERMAL DECOMPOSITION PRODUCTS MAY INCLUDE HCL & PHOSGENE (FP N). EMITS TOXIC FUMES UNDER FIRE CONDITIONS.

Reactivity Data

Stability: YES
Cond To Avoid (Stability): NONE SPECIFIED BY MANUFACTURER.
Materials To Avoid: ALKALI METALS, FINELY POWDERED METALS, OXIDIZING AGENTS. REACTS VIOLENTLY W/DIMETHYL FORMAMIDE (DMF) ABOVE 65C.
Hazardous Decomp Products: TOXIC FUMES OF:PHOSGENE GAS, CARBON MONOXIDE, CARBON DIOXIDE.
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NOT RELEVANT.

Health Hazard Data

LD50-LC50 Mixture: LD50:(ORAL,RAT) 2350 MG/KG
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: CHLOROCARBON MATLS HAVE PRDCED SENSIT OF MYOCARDIUM TO EPINEPHRINE IN LAB ANIMALS & COULD HAVE A SIMILAR EFT IN HUMANS. ADRENOMIMETICS (E.G. EPINEPHRINE) MAY BE CONTRAINDICATED EXCEPT FOR LIFE-SUSTAINING USES IN HUMANS ACUTELY OR CHRONICALLY EXPOSED TO CHLOROCARBONS (FP N). ACUTE:HARMFUL IF SWALLOWED, (EFTS OF OVEREXP)
Carcinogenicity - NTP: YES
Carcinogenicity - IARC: YES
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: CARBON TETRACHLORIDE:IARC MONO, SUPP VOL 7, PG 143, 1987:GROUP 2B. NTP 7TH ANN RPT ON CARCINS, 1994:ANTIC TO BE (ING 3)
Signs/Symptoms Of Overexp: HLTH HAZ:INHALED, OR ABSORBED THRU SKIN. VAP/MIST IS IRRITATING TO EYES, MUC MEMB & UPPER RESP TRACT. CAUSES SKIN IRRIT. EXPOSURE CAN CAUSE:STOMACH PAINS, VOMIT, DIARR. NAUS, DIZZ & HDCH, DMG TO EYE, LIVER & KIDNEYS. EXPOS TO AND/OR CONSUMPTION OF ALCOHOL MAY INCREASE TOX EFTS. CHRONIC:MAY ALTER GENETIC MATL. (SUPDAT)
Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER.
Emergency/First Aid Proc: EYES OR SKIN:IMMED FLUSH W/COPIOUS AMTS OF WATER FOR @ LEAST 15 MINS WHILE REMOVING CONTAMD CLTHG & SHOES. CONTAM OF EYES SHOULD BE TREATED BY IMMED & PRLNGD IRRIGATION W/COPIOUS AMOUNTS OF WATER. ASSURE ADEQ FLUSH OF EYES BY SEPARATING EYELIDS W/FINGERS. INHAL: REMOVE TO FRESH AIR. IF NOT BRTHG GIVE ARTF RESP. IF BRTHG IS DFCLT, GIVE OXYG. INGEST:WASH OUT MOUTH W/WATER PROVIDED PERSON IS (SUPDAT)

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: EVACUATE AREA. COVER W/ACTIVATED CARBON ABSORB, TAKE UP & PLACE IN CLSD CNTNRS. TRANSPORT OUTDOORS.
Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.
Waste Disposal Method: DISSOLVE OR MIX MATL W/COMBUST SOLV & BURN IN CHEM INCIN EQUIPPED W/AN AFTERBURNER & SCRUBBER. DISPOSAL MUST BE IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS (FP N).
Precautions-Handling/Storing: DO NOT BREATHE VAP. DO NOT GET IN EYES, ON SKIN, ON CLTHG. AVOID PRLNGD/RPTD EXPOS. READILY ABSORB THRU SKIN. KEEP TIGHTLY CLSD. STORE IN COOL(SUPDAT)
Other Precautions: NO SMOKING IN AREA OF USE. DO NOT USE IN GEN VICINITY OF ARC WELDING, OPEN FLAMES OR HOT SURFACES. HEAT &/OR UV RADIA MAY CAUSE FORMATION OF HCL &/OR PHOSGENE (FP N).

Control Measures

Respiratory Protection: NIOSH/MSHA APPROVED RESPIRATOR APPROPRIATE FOR EXPOSURE OF CONCERN (FP N).
 Ventilation: CHEMICAL FUME HOOD.
 Protective Gloves: CHEMICAL-RESISTANT GLOVES.
 Eye Protection: ANSI APPRVD CHEM WORKERS GOGGLES (FP N).
 Other Protective Equipment: RUBBER BOOTS. EYE WASH FOUNTAIN AND DELUGE SHOWER MEETING ANSI DESIGN CRITERIA (FP N).
 Work Hygienic Practices: WASH THOROUGHLY AFTER HANDLING.
 OVEREXP MAY CAUSE REPROD DISORDER(S) BASED ON TESTS W/LAB ANIMALS. TARGET ORGANS:LIVER, KIDNEYS, NERVES, HEART. FIRST AID PROC:CONSCIOUS. CALL PHYS. REMOVE & WASH CONTAMD CLTHG PROMPTLY. HNDLG/STOR:DRY PLACE. MAY CAUSE HERITABLE GENETIC DMG. TOX BY INHAL, CONT W/SKIN & (ING 2)

Transportation Data

Trans Data Review Date: 91214
 DOT PSN Code: CVY
 DOT Proper Shipping Name: CARBON TETRACHLORIDE
 DOT Class: 6.1
 DOT ID Number: UN1846
 DOT Pack Group: II
 DOT Label: POISON
 IMO PSN Code: DPR
 IMO Proper Shipping Name: CARBON TETRACHLORIDE
 IMO Regulations Page Number: 6096
 IMO UN Number: 1846
 IMO UN Class: 6.1
 IMO Subsidiary Risk Label: -
 IATA PSN Code: FKO
 IATA UN ID Number: 1846
 IATA Proper Shipping Name: CARBON TETRACHLORIDE
 IATA UN Class: 6.1
 IATA Label: TOXIC
 AFI PSN Code: FKO
 AFI Prop. Shipping Name: CARBON TETRACHLORIDE
 AFI Class: 6.1
 AFI ID Number: UN1846
 AFI Pack Group: II
 AFI Special Prov: N36
 AFI Basic Pac Ref: 10-9

Disposal Data

Label Data

Label Required: YES
 Technical Review Date: 16JUN95
 Label Date: 22JUN95
 Label Status: G
 Common Name: CARBON TETRACHLORIDE 99.9+% HPLC GRADE, 27065-2
 Chronic Hazard: YES
 Signal Word: WARNING!
 Acute Health Hazard-Moderate: X
 Contact Hazard-Moderate: X
 Fire Hazard-None: X
 Reactivity Hazard-None: X
 Special Hazard Precautions: TOXIC. IRRITANT. ACUTE:HARMFUL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN. INHALATION OF MIST/VAPOR MAY CONTRIBUTE TO THE OCURRENCE OF IRREGULAR HEARTBEAT (FP N). VAPOR OR MIST IS IRRITATING TO EYES, MUCOUS MEMBRANES AND UPPER RESPIRATORY TRACT. CAUSES SKIN IRRITATION. EXPOSURE CAN CAUSE STOMACH PAINS, VOMITING AND DIARRHEA,

NAUSEA, DIZZINESS AND HEADACHE, DAMAGE TO EYE, LIVER AND KIDNEYS. ALCOHOL EXPOS/CONSUMPTION MAY INCREASE TOXIC EFFECTS. CHRONIC: CARBON TETRACHLORIDE IS LISTED AS AN ANIMAL LUNG, LIVER, KIDNEY CARCINOGEN (FP N). MAY ALTER GENETIC MATERIAL.

Protect Eye: Y

Protect Skin: Y

Protect Respiratory: Y

Label Name: ALDRICH CHEMICAL CO INC

Label P.O. Box: 355

Label City: MILWAUKEE

Label State: WI

Label Zip Code: 53201

Label Country: US

Label Emergency Number: .414-273-3850

ALDRICH CHEMICAL -- CHLOROBENZENE, 99.9+% 27064-4
MATERIAL SAFETY DATA SHEET
NSN: 681000N014224
Manufacturer's CAGE: 60928
Part No. Indicator: A
Part Number/Trade Name: CHLOROBENZENE, 99.9+% 27064-4

=====
General Information
=====

Company's Name: ALDRICH CHEMICAL CO
Company's P. O. Box: 355
Company's City: MILWAUKEE
Company's State: WI
Company's Country: US
Company's Zip Code: 53201
Company's Info Ph #: 414-273-3850
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SMJ
Date MSDS Prepared: 07MAR90
Safety Data Review Date: 06MAR91
MSDS Serial Number: BKKVN
Hazard Characteristic Code: F4

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Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: CHLOROBENZENE (SARA III)
Ingredient Sequence Number: 01
Percent: 99.9+
NIOSH (RTECS) Number: CZ0175000
CAS Number: 108-90-7
OSHA PEL: 75 PPM
ACGIH TLV: 10 PPM; 9192

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Physical/Chemical Characteristics
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Appearance And Odor: CLEAR, COLORLESS, VOLATILE LIQUID WITH ALMOND-LIKE
ODOR (FP N).
Boiling Point: 270F, 132C
Melting Point: -49F, -45C
Vapor Pressure (MM Hg/70 F): 11.8 @ 25C
Vapor Density (Air=1): 3.86
Specific Gravity: 1.107
Evaporation Rate And Ref: 1 (BUAC=1) (FP N)
Solubility In Water: INSOLUBLE

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Fire and Explosion Hazard Data
=====

Flash Point: 75.0F, 23.9C
Flash Point Method: CC
Lower Explosive Limit: 1.3%
Upper Explosive Limit: 7.1%
Extinguishing Media: WATER SPRAY, CO2, DRY CHEMICAL POWDER, ALCOHOL OR
POLYMER FOAM
Special Fire Fighting Proc: WEAR NIOSH/MSHA APPROVED PRESSURE DEMAND SCBA
AND FULL PROTECTIVE EQUIPMENT TO PREVENT CONTACT WITH SKIN AND EYES.
FLAMMABLE LIQUID.
Unusual Fire And Expl Hazrds: EMITS TOXIC FUMES UNDER FIRE CNDTNS. VAP MAY
TRAVEL CONSIDERABLE DISTANCE TO IGNIT SOURCE & FLASH BACK. THERMAL DECOMP
PRODS MAY INCLUDE HCL & PHOSGENE (FP N).

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Reactivity Data
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Stability: YES
Cond To Avoid (Stability): NONE SPECIFIED BY MANUFACTURER.
Materials To Avoid: OXIDIZING AGENTS.
Hazardous Decomp Products: TOXIC FUMES OF: HCL GAS, CO, CO2. PHOSGENE (FP N).
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NOT RELEVANT
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Health Hazard Data
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LD50-LC50 Mixture: SEE SUPP DATA
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: NO
Route Of Entry - Ingestion: NO
Health Haz Acute And Chronic: ACUTE: HARMFUL IF SWALLOWED OR INHALED. VAPOR OR MIST IS IRRITATING TO THE EYES, MUCOUS MEMBRANES AND UPPER RESPIRATORY TRACT. CAUSES SKIN IRRITATION. EXPOSURE CAN CAUSE: NAUSEA, DIZZINESS AND HEADACHE, DAMAGE TO LIVER AND KIDNEYS. CHRONIC: POSSIBLE CARCINOGEN (MFR).
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NOT RELEVANT
Signs/Symptoms Of Overexp: SEE HEALTH HAZARDS
Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER.
Emergency/First Aid Proc: EYES: IMMEDIATELY FLUSH WITH COPIOUS AMOUNTS OF WATER FOR AT LEAST 15 MINUTES. CONTAMINATION OF THE EYES SHOULD BE TREATED BY REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN. CALL MD. WASH CONTAMINATED CLOTHING BEFORE REUSE. INGEST: DO NOT INDUCE VOMIT. CALL MD IMMEDIATELY (FP N).
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Precautions for Safe Handling and Use
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Steps If Matl Released/Spill: EVACUATE AREA. SHUT OFF ALL SOURCES OF IGNITION. WEAR NIOSH/MSHA APPROVED SCBA, RUBBER BOOTS & HEAVY RUBBER GLOVES. ABSORB ON SAND OR VERMICULITE & PLACE IN CLOSED CONTAINERS FOR DISPOSAL. VENTILATE AREA & WASH SPILL SITE AFTER MATERIAL PICKUP IS COMPLETE.
Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.
Waste Disposal Method: BURN IN A CHEMICAL INCINERATOR EQUIPPED WITH AN AFTERBURNER AND SCRUBBER BUT EXERT EXTRA CARE IN IGNITING AS THIS MATERIAL IS HIGHLY FLAMMABLE. OBSERVE ALL FEDERAL, STATE AND LOCAL LAWS.
Precautions-Handling/Storing: POSSIBLE CARCINOGEN. DO NOT BREATHE VAPOR. KEEP TIGHTLY CLOSED. HANDLE AND STORE UNDER NITROGEN. STORE IN A COOL, DRY PLACE.
Other Precautions: IRRITANT. HARMFUL LIQUID. DO NOT GET IN EYES, ON SKIN OR CLOTHING. KEEP AWAY FROM HEAT, SPARKS & OPEN FLAME. NO SMOKING IN AREA OF USE. DO NOT USE IN THE GENERAL VICINITY OF ARC WELDING, OPEN FLAMES OR HOT SURFACES. HEAT (SEE SUPP DATA)
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Control Measures
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Respiratory Protection: WEAR APPROPRIATE NIOSH/MSHA APPROVED RESPIRATOR.
Ventilation: USE ONLY IN A CHEMICAL FUME HOOD.
Protective Gloves: CHEMICAL-RESISTANT GLOVES
Eye Protection: CHEMICAL WORKERS GOGGLES (FP N)
Other Protective Equipment: RUBBER BOOTS AND OTHER PROTECTIVE EQUIPMENT, SAFETY SHOWER AND EYE BATH
Work Hygienic Practices: WASH HANDS THOROUGHLY AFTER USE AND BEFORE EATING, DRINKING, SMOKING OR USING SANITARY FACILITIES (FP N).
Suppl. Safety & Health Data: LD50-LC50 MIX: LD50: (ORAL/RAT)=2290 MG/KG, (ORAL/MUS)=2300 MG/KG, (IPR/MUS)=515 MG/KG, (ORAL/RBT)=2250 MG/KG, (ORAL/GPG)=2250 MG/KG, (UNR/MAM)=2300 MG/KG. OTHER PREC: AND/OR UV RADIATION MAY CAUSE THE FORMATION OF HCL AND/OR PHOSGENE (FP N).
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Transportation Data
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Trans Data Review Date: 91214
DOT PSN Code: DGJ
DOT Proper Shipping Name: CHLOROBENZENE
DOT Class: 3
DOT ID Number: UN1134
DOT Pack Group: III
DOT Label: FLAMMABLE LIQUID
IMO PSN Code: EBV
IMO Proper Shipping Name: CHLOROBENZENE
IMO Regulations Page Number: 3318
IMO UN Number: 1134
IMO UN Class: 3.3
IMO Subsidiary Risk Label: -
IATA PSN Code: GEY
IATA UN ID Number: 1134
IATA Proper Shipping Name: CHLOROBENZENE
IATA UN Class: 3
IATA Label: FLMMABLE LIQUID
AFI PSN Code: GEY
AFI Prop. Shipping Name: CHLOROBENZENE
AFI Class: 3
AFI ID Number: UN1134
AFI Pack Group: III
AFI Basic Pac Ref: 7-7

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Disposal Data
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Label Data
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Label Required: YES
Technical Review Date: 23JUL91
Label Status: F
Common Name: CHLOROBENZENE, 99.9+% 27064-4
Chronic Hazard: YES
Signal Word: DANGER!
Acute Health Hazard-Slight: X
Contact Hazard-Slight: X
Fire Hazard-Severe: X
Reactivity Hazard-None: X
Special Hazard Precautions: ACUTE: EXTREMELY FLAMMABLE LIQUID AND VAPOR.
VAPOR MAY CAUSE FLASH FIRE. KEEP AWAY FROM HEAT, SPARKS AND FLAME. KEEP
CONTAINER CLOSED. USE WITH ADEQUATE VENTILATION. HARMFUL IF SWALLOWED,
INHALED, OR ABSORBED THROUGH SKIN. AVOID BREATHING VAPOR. AVOID CONTACT WITH
EYES, SKIN AND CLOTHING. WASH THOROUGHLY AFTER HANDLING. CAUSES EYE, SKIN,
MUCOUS MEMBRANE AND UPPER RESPIRATORY TRACT IRRITATION. CHRONIC: POSSIBLE
CARCINOGEN (MFR). TARGET ORGANS: LIVER, KIDNEYS.
Protect Eye: Y
Protect Skin: Y
Protect Respiratory: Y
Label Name: ALDRICH CHEMICAL CO.
Label P.O. Box: 355
Label City: MILWAUKEE
Label State: WI
Label Zip Code: 53201
Label Country: US
Label Emergency Number: 414-273-3850

CHEM SERVICE -- F16 CHLOROETHANE
MATERIAL SAFETY DATA SHEET
NSN: 655000F037543
Manufacturer's CAGE: 8Y898
Part No. Indicator: A
Part Number/Trade Name: F16 CHLOROETHANE

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General Information
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Company's Name: CHEM SERVICE INC
Company's Street: 660 TOWER LN
Company's P. O. Box: 3108
Company's City: WEST CHESTER
Company's State: PA
Company's Country: US
Company's Zip Code: 19381-3108
Company's Emerg Ph #: 215-692-3026/800-452-9994
Company's Info Ph #: 215-692-3026/800-452-9994
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SE
Date MSDS Prepared: 27AUG92
Safety Data Review Date: 15DEC94
Preparer's Company: CHEM SERVICE INC
Preparer's St Or P. O. Box: 660 TOWER LN
Preparer's City: WEST CHESTER
Preparer's State: PA
Preparer's Zip Code: 19381-3108
MSDS Serial Number: BWJHR

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Ingredients/Identity Information
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Proprietary: NO
Ingredient: ETHYL CHLORIDE, CHLOROETHANE
Ingredient Sequence Number: 01
NIOSH (RTECS) Number: KH7525000
CAS Number: 75-00-3
OSHA PEL: 1000 PPM
ACGIH TLV: 1000 PPM
Other Recommended Limit: 2600 MG/CUM

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Physical/Chemical Characteristics
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Appearance And Odor: COLORLESS CONDENSED GAS W/ETHER LIKE ODOR.
Boiling Point: 54.14F
Melting Point: -217.66F
Vapor Pressure (MM Hg/70 F): 1000
Vapor Density (Air=1): 2.23
Solubility In Water: SLIGHT

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Fire and Explosion Hazard Data
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Flash Point: -58F
Lower Explosive Limit: 3.8
Upper Explosive Limit: 15.4
Extinguishing Media: CO2, DRY CHEMICAL POWDER. DON'T USE WATER.
Unusual Fire And Expl Hazrds: FLAMMABLE CHEMICAL.

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Reactivity Data
=====

Stability: YES
Cond To Avoid (Stability): SENSITIVE TO HEAT & LIGHT.
Materials To Avoid: ACTIVE METALS, SODIUM, POWDERED METALS, MAGNESIUM,

ALUMINUM, STRONG OXIDIZING AGENTS.

Hazardous Decomp Products: TOXIC FUMES. DECOMPOSITION PRODUCTS ARE CORROSIVE.

Hazardous Poly Occur: NO

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Health Hazard Data
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Route Of Entry - Inhalation: YES

Route Of Entry - Skin: YES

Route Of Entry - Ingestion: YES

Health Haz Acute And Chronic: SKIN: RAPIDLY ABSORBED/FATAL/ADVERSE HEALTH EFFECTS/FROSTBITE. INHALTION: HARMFUL/FATAL/RESPIRATORY TRACT IRRITATION/DAMAGE. EXPOSURE CAN CAUSE NERVOUS/CARDIOVASCULAR SYSTEM INJURY, DELAYED ADVERSE HEALTH EFFECTS, LIVER & KIDNEY DAMAGE.

Carcinogenicity - NTP: NO

Carcinogenicity - IARC: NO

Carcinogenicity - OSHA: NO

Explanation Carcinogenicity: NONE

Signs/Symptoms Of Overexp: IRRITATION, GI DISTURBANCES, NAUSEA, HEADACHE, DIZZINESS, DISORIENTATION.

Emergency/First Aid Proc: EYES: FLUSH W/WATER FOR 15-20 MINS. SKIN: FLUSH REMOVE TO FRESH AIR. GIVE CPR/OXYGEN IF NEEDED. IF IN SHOCK, KEEP WARM & QUIET. INGESTION: DON'T GIVE LIQUIDS/INDUCE VOMITING IF UNCONSCIOUS/CONVULSIVE. IF VOMITING OCCURS, WATCH CLOSELY FOR ANY AIRWAY OBSTRUCTION. OBTAIN MEDICAL ATTENTION IN ALL CASES.

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Precautions for Safe Handling and Use
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Steps If Matl Released/Spill: EVACUATE AREA. WEAR APPROPRIATE OSHA REGULATED EQUIPMENT. VENTILATE AREA. WASH CONTAMINATED SURFACES TO REMOVE ANY RESIDUES.

Waste Disposal Method: BURN IN A CHEMICAL INCINERATOR EQUIPPED W/AN AFTERBURNER & SCRUBBER IAW/FEDERAL, STATE & LOCAL REGULATIONS.

Precautions-Handling/Storing: STORE IN A COOL DRY PLACE ONLY W/COMPATIBLE CHEMICALS. KEEP TIGHTLY CLOSED. DON'T USE MAGNESIUM/ALUMINUM/THEIR ALLOYS AS CONTAINERS. (SEE SUPP)

Other Precautions: AVOID CONTACT W/SKIN, EYES & CLOTHING. DON'T BREATHE VAPORS. CONTACT LENSES SHOULDN'T BE WORN IN THE LABORATORY. FOR LABORATORY USE ONLY. ALL CHEMICALS SHOULD BE CONSIDERED HAZARDOUS. AVOID DIRECT PHYSICAL CONTACT.

=====
Control Measures
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Respiratory Protection: WEAR APPROPRIATE OSHA/MSHA APPROVED SAFETY EQUIPMENT.

Ventilation: CHEMICAL SHOULD BE HANDLED ONLY IN A HOOD.

Eye Protection: EYE SHIELDS

Work Hygienic Practices: REMOVE/LAUNDER CONTAMINATED CLOTHING BEFORE REUSE.

Suppl. Safety & Health Data: STORAGE & HANDLING CONT'D: DARK COLORS DON'T AFFECT PURITY.

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Transportation Data
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Disposal Data
=====

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Label Data
=====

Label Required: YES

Label Status: G

Common Name: F16 CHLOROETHANE

Special Hazard Precautions: SKIN: RAPIDLY ABSORBED/FATAL/ADVERSE HEALTH

EFFECTS/FROSTBITE. INHALTION: HARMFUL/FATAL/RESPIRATORY TRACT IRRITATION/
DAMAGE. EXPOSURE CAN CAUSE NERVOUS/CARDIOVASCULAR SYSTEM INJURY, DELAYED
ADVERSE HEALTH EFFECTS, LIVER & KIDNEY DAMAGE. IRRITATION, GI DISTURBANCES,
NAUSEA, HEADACHE, DIZZINESS, DISORIENTATION.

Label Name: CHEM SERVICE INC

Label Street: 660 TOWER LN

Label P.O. Box: 3108

Label City: WEST CHESTER

Label State: PA

Label Zip Code: 19381-3108

Label Country: US

Label Emergency Number: 215-692-3026/800-452-9994

HACH -- CHLOROFORM 14458-17 - CHLOROFORM, ACS
MATERIAL SAFETY DATA SHEET
NSN: 681000N021908
Manufacturer's CAGE: 4T252
Part No. Indicator: A
Part Number/Trade Name: CHLOROFORM 14458-17

=====
General Information
=====

Item Name: CHLOROFORM, ACS
Company's Name: HACH CO.
Company's Street: 100 DAYTON RD.
Company's P. O. Box: 907
Company's City: AMES
Company's State: IA
Company's Country: US
Company's Zip Code: 50010-6402
Company's Emerg Ph #: 515-232-2533
Company's Info Ph #: 800-227-4224
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 002
Status: SE
Date MSDS Prepared: 16DEC91
Safety Data Review Date: 07JUL92
Supply Item Manager: CX
MSDS Preparer's Name: UNKNOWN
MSDS Serial Number: BNBXS
Specification Number: 0-C-265
Spec Type, Grade, Class: ACS
Hazard Characteristic Code: T7
Unit Of Issue: BT
Unit Of Issue Container Qty: 4 LITERS
Type Of Container: STD COML BT
Net Unit Weight: 13.2 LBS

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Ingredients/Identity Information
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Proprietary: NO
Ingredient: CHLOROFORM
Ingredient Sequence Number: 01
Percent: 100
NIOSH (RTECS) Number: FS9100000
CAS Number: 67-66-3
OSHA PEL: (C) 50 PPM
ACGIH TLV: 10 PPM; A2; 9293
Other Recommended Limit: NOT ESTABLISHED

=====
Physical/Chemical Characteristics
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Appearance And Odor: HEAVY, VOLATILE, COLORLESS LIQUID; ETHEREAL ODOR.
Boiling Point: 142F, 61C
Melting Point: -83F, -64C
Vapor Pressure (MM Hg/70 F): 160
Vapor Density (Air=1): 4.1
Specific Gravity: 1.474
Decomposition Temperature: >2000F, >109
Evaporation Rate And Ref: 11.6 (N-BUTYL ACETATE=1)
Solubility In Water: SLIGHT
Percent Volatiles By Volume: 100
Viscosity: UNKNOWN
Corrosion Rate (IPY): UNKNOWN
Autoignition Temperature: NONE

Fire and Explosion Hazard Data

Flash Point: NONCOMBUSTIBLE
Lower Explosive Limit: NONE
Upper Explosive Limit: NONE
Extinguishing Media: DRY CHEMICAL, ALCOHOL FOAM OR CARBON DIOXIDE.
Special Fire Fighting Proc: WEAR FIRE FIGHTING PROTECTIVE EQUIPMENT AND FULL FACE-PIECE SELF-CONTAINED BREATHING APPARATUS.
Unusual Fire And Expl Hazrds: WHEN INVOLVED IN FIRE, CHLOROFORM EMITS HIGHLY TOXIC AND IRRITATING FUMES.

Reactivity Data

Stability: YES
Cond To Avoid (Stability): EXPOSURE TO LIGHT AND AIR.
Materials To Avoid: STRONG ALKALIES OR ACTIVE METALS SUCH AS ALUMINUM, MAGNESIUM, SODIUM OR POTASSIUM, LITHIUM, DISILANE (ACETONE+CAUSTICS).
Hazardous Decomp Products: MAY EMIT TOXIC FUMES OF CHLORIDES, CARBON MONOXIDE AND PHOSGENE IN FIRE.
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NOT APPLICABLE

Health Hazard Data

LD50-LC50 Mixture: LD50: (ORAL RAT) 800 MG/KG
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: NO
Route Of Entry - Ingestion: NO
Health Haz Acute And Chronic: MAY BE IRRITATING TO EYES, SKIN AND RESPIRATORY TRACT. MODERATELY TOXIC. TARGET ORGANS: CENTRAL NERVOUS SYSTEM, LIVER AND KIDNEYS.
Carcinogenicity - NTP: YES
Carcinogenicity - IARC: YES
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: CHLOROFORM: GROUP 2B (IARC), GROUP 2 (NTP). ANIMAL DATA INDICATES BIRTH DEFECT HAZARD.
Signs/Symptoms Of Overexp: MAY CAUSE IRRITATION, HEADACHE, DROWSINESS, VOMITING, DIZZINESS, PAIN, UNCONSCIOUSNESS, IRREGULAR HEARTBEAT, LIVER AND KIDNEY DAMAGE, DEATH.
Med Cond Aggravated By Exp: DISEASES OF THE LIVER, KIDNEYS AND CENTRAL NERVOUS SYSTEM; SIMULTANEOUS EXPOSURE TO CHLOROFORM AND ALCOHOL CAN INCREASE THE TOXIC HAZARDS OF CHLOROFORM.
Emergency/First Aid Proc: EYES: FLUSH WITH RUNNING WATER FOR 15 MINUTES, HOLDING EYELIDS OPEN. GET IMMEDIATE MEDICAL ATTENTION. SKIN: REMOVE CONTAMINATED CLOTHING. WASH SKIN WITH SOAP AND WATER. GET MEDICAL ADVICE. INHALATION: REMOVE TO FRESH AIR. PROVIDE OXYGEN IF BREATHING IS DIFFICULT. GIVE ARTIFICIAL RESPIRATION IF NOT BREATHING. GET MEDICAL ATTENTION. INGESTION: DO NOT INDUCE VOMITING. GET IMMEDIATE MEDICAL ATTENTION.

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: STOP MATERIAL FROM GOING TO DRAIN OR ENVIRONMENT. COLLECT ALL SPILLED MATERIAL AND DECONTAMINATE SPILL AREA. DISPOSE OF MATERIAL IN AN EPA APPROVED HAZARDOUS WASTE FACILITY.
Neutralizing Agent: NONE
Waste Disposal Method: DISPOSE OF IN ACCORDANCE WITH ALL FEDERAL, STATE & LOCAL REGULATIONS.
Precautions-Handling/Storing: STORE IN TIGHTLY CLOSED CONTAINER. CAUTION. PROTECT FROM LIGHT. AVOID CONTACT WITH EYES, SKIN AND CLOTHING. DO NOT BREATHE VAPOR.
Other Precautions: DO NOT SMOKE IN WORK AREA. DO NOT EXPOSE TO OPEN FLAMES OR HOT SURFACES. HEAT AND/OR UV RADIATION MAY CAUSE THE FORMATION OF HCL AND/OR PHOSGENE FUMES.

Control Measures

Respiratory Protection: THE SELECTION OF A NIOSH/MSHA APPROVED ORGANIC VAPOR RESPIRATOR SHOULD BE BASED UPON THE CONTAMINATION LEVELS FOUND IN THE WORK PLACE. THE WORKING LIMITS OF THE RESPIRATOR MUST NOT BE EXCEEDED. SCBA OR AIR-SUPPLIED RESPIRATOR RECOMMENDED.
Ventilation: LOCAL EXHAUST RECOMMENDED.
Protective Gloves: NITRILE OR PVA RUBBER GLOVES RECOMMENDED
Eye Protection: CHEMICAL SPLASH GOGGLES
Other Protective Equipment: APRON OR LABORATORY COAT
Work Hygienic Practices: WASH THOROUGHLY AFTER HANDLING.
Suppl. Safety & Health Data: NONE

Transportation Data

Trans Data Review Date: 92189
DOT PSN Code: DHF
DOT Proper Shipping Name: CHLOROFORM
DOT Class: 6.1
DOT ID Number: UN1888
DOT Pack Group: II
DOT Label: 6.1
IMO PSN Code: EEH
IMO Proper Shipping Name: CHLOROFORM
IMO Regulations Page Number: 6103
IMO UN Number: 1888
IMO UN Class: 6.1
IMO Subsidiary Risk Label: -
IATA PSN Code: GJO
IATA UN ID Number: 1888
IATA Proper Shipping Name: CHLOROFORM
IATA UN Class: 6.1
IATA Label: TOXIC
AFI PSN Code: GJO
AFI Prop. Shipping Name: CHLOROFORM
AFI Class: 6.1
AFI ID Number: UN1888
AFI Pack Group: II
AFI Special Prov: N36
AFI Basic Pac Ref: 10-9
Additional Trans Data: NONE

Disposal Data

Label Data

Label Required: YES
Technical Review Date: 07JUL92
MFR Label Number: NOT APPLICABLE
Label Status: F
Common Name: CHLOROFORM
Chronic Hazard: YES
Signal Word: WARNING!
Acute Health Hazard-Moderate: X
Contact Hazard-Moderate: X
Fire Hazard-None: X
Reactivity Hazard-None: X
Special Hazard Precautions: MAY BE IRRITATING TO EYES, SKIN AND
RETAIN MATERIAL WITH DIKE. PUMP/VACUUM FREE MATERIAL AND ABSORB RESIDUE.
PLACE WASTE IN CLOSED CONTAINER. STORE IN TIGHTLY CLOSED CONTAINER.
CAUTION. PROTECT FROM LIGHT. FIRST AID: EYES: FLUSH WITH RUNNING WATER FOR
15 MINUTES. GET IMMEDIATE MEDICAL ATTENTION. SKIN: REMOVE CONTAMINATED
CLOTHING. WASH SKIN WITH SOAP AND WATER. INHALATION: REMOVE TO FRESH AIR.

SUPELCO -- PURGEABLE HALOCARBON KIT 601-S, CHLOROMETHA - ENVIRONMENTAL ANALYTICAL
MATERIAL SAFETY DATA SHEET
NSN: 6630013155335
Manufacturer's CAGE: 54968
Part No. Indicator: D
Part Number/Trade Name: PURGEABLE HALOCARBON KIT 601-S, CHLOROMETHA

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General Information
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Item Name: ENVIRONMENTAL ANALYTICAL STANDARD, WASTEWATER
Company's Name: SUPELCO INC
Company's Street: SUPELCO PARK
Company's City: BELLEFONTE
Company's State: PA
Company's Country: US
Company's Zip Code: 16823-0048
Company's Emerg Ph #: 814-359-3441
Company's Info Ph #: 814-359-3441
Record No. For Safety Entry: 004
Tot Safety Entries This Stk#: 005
Status: KE
Date MSDS Prepared: 27MAY92
Safety Data Review Date: 23APR93
Supply Item Manager: KX
MSDS Serial Number: BQMLW
Hazard Characteristic Code: J1
Unit Of Issue: EA
Unit Of Issue Container Qty: 1
Type Of Container: AMPOULE
Net Unit Weight: 1.0 ML

=====
Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: METHYL CHLORIDE (CHLOROMETHANE) (SARA III)
Ingredient Sequence Number: 01
Percent: 0.02
NIOSH (RTECS) Number: PA6300000
CAS Number: 74-87-3
OSHA PEL: 100 PPM
ACGIH TLV: S,50 PPM/100 STEL 94
Other Recommended Limit: NONE SPECIFIED

Proprietary: NO
Ingredient: METHYL ALCOHOL (METHANOL) (SARA III)
Ingredient Sequence Number: 02
Percent: 99.98
NIOSH (RTECS) Number: PC1400000
CAS Number: 67-56-1
OSHA PEL: S,200PPM/250STEL
ACGIH TLV: S,200PPM/250STEL; 93
Other Recommended Limit: NONE SPECIFIED

=====
Physical/Chemical Characteristics
=====

Appearance And Odor: COLORLESS LIQUID.
Boiling Point: 149F,65C
Melting Point: -144F,-98C
Vapor Pressure (MM Hg/70 F): 100
Vapor Density (Air=1): 1.10
Specific Gravity: 0.790
Decomposition Temperature: UNKNOWN
Evaporation Rate And Ref: >1 (ETHER=1)

Solubility In Water: COMPLETE
Percent Volatiles By Volume: 100%
Corrosion Rate (IPY): UNKNOWN
Autoignition Temperature: UNKNON

=====
Fire and Explosion Hazard Data
=====

Flash Point: 50.0F,10.0C
Lower Explosive Limit: 6.0
Upper Explosive Limit: 36.5
Extinguishing Media: CARBON DIOXIDE, ALCOHOL FOAM, OR DRY CHEMICAL.
Special Fire Fighting Proc: WEAR SELF CONTAINED BREATHING APPARATUS WHEN FIGHTING A CHEMICAL FIRE.
Unusual Fire And Expl Hazrds: NOT APPLICABLE.

=====
Reactivity Data
=====

Stability: YES
Cond To Avoid (Stability): NOT APPLICABLE
Materials To Avoid: OXIDIZING AGENTS, CHROMIC ANHYDRIDE, LEAD PERCHLORATE, PERCHLORIC ACIDS.
Hazardous Decomp Products: TOXIC HYDROGEN CHLORIDE, CHLORINE GAS, OXIDES OF CARBON.
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NOT APPLICABLE

=====
Health Hazard Data
=====

LD50-LC50 Mixture: LD50 (ORAL RAT) IS UNKNOWN
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: HARMFUL IF INHALED. MAY BE FATAL IF SWALLOWED. MAY CAUSE BLINDNESS. MAY CAUSE IRRITATION OF EYES AND SKIN.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: THIS COMPOUND CONTAINS NO INGREDIENTS AT CONCENTRATIONS OF 0.1% OR GREATER THAT ARE CARCINOGENS OR SUSPECT CARCINOGENS.
Signs/Symptoms Of Overexp: HEADACHE, NAUSEA, GASTROINTESTINAL DISTURBANCES AND BLINDNESS.
Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER.
Emergency/First Aid Proc: EYES:FLUSH WITH WATER FOR 15 MINUTES. SEE PHYSICIAN. SKIN:WASH WITH SOAP AND WATER. INHALATION:REMOVE TO FRESH AIR. IF BREATHING STOPS, GIVE CPR. CONTACT PHYSICIAN. INGESTION:GIVE 2 TABLESPOONS OF BAKING SODA IN A GLASS OF WATER. PRESS FINGER TO BACK OF TONGUE TO INDUCE VOMITING. IMMEDIATELY CONTACT PHYSICIAN. DO NOT GIVE ANYTHING IF UNCONSCIOUS.

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Precautions for Safe Handling and Use
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Steps If Matl Released/Spill: TAKE UP WITH ABSORBENT MATERIAL. VENTILATE AREA. ELIMINATE IGNITION SOURCES.
Waste Disposal Method: DISPOSE OF IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.
Precautions-Handling/Storing: STORE IN A SEALED CONTAINER IN COOL, DRY, WELL VENTILATED AREA. KEEP AWAY FROM IGNITION SOURCES. KEEP AWAY FROM OXIDIZERS.
Other Precautions: AVOID EYE OR SKIN CONTACT. AVOID BREATHING VAPORS.

=====
Control Measures
=====

Respiratory Protection: WEAR FACE MASK WITH ORGANIC VAPOR CANISTER.

Ventilation: USE ONLY IN WELL VENTILATED AREA.
Protective Gloves: WEAR RUBBER GLOVES.
Eye Protection: WEAR PROTECTIVE GLASSES.
Other Protective Equipment: NOT APPLICABLE
Work Hygienic Practices: WASH THOROUGHLY AFTER HANDLING AND BEFORE EATING, DRINKING OR SMOKING.
Suppl. Safety & Health Data: KIT (CATALOGUE #48769) HAS 31 AMPOULES: 28 AMPOULES CONTAIN SINGLE CHEMICAL IN METHANOL (SUCH AS PART B,C,D,E,...), AND THREE AMPOULES CONTAIN MIXTURE OF CHEMICALS IN METHANOL(SUCH AS PART A OF THIS KIT, SAME NSN).

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Transportation Data
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Trans Data Review Date: 93113
DOT PSN Code: GJJ
DOT Proper Shipping Name: FLAMMABLE LIQUIDS, N.O.S.
DOT Class: 3
DOT ID Number: UN1993
DOT Pack Group: II
DOT Label: FLAMMABLE LIQUID
IMO PSN Code: HIN
IMO Proper Shipping Name: FLAMMABLE LIQUID, N.O.S. o
IMO Regulations Page Number: 3230
IMO UN Number: 1993
IMO UN Class: 3.2
IMO Subsidiary Risk Label: -
IATA PSN Code: MBV
IATA UN ID Number: 1993
IATA Proper Shipping Name: FLAMMABLE LIQUID, N.O.S. *
IATA UN Class: 3
IATA Label: FLAMMABLE LIQUID
AFI PSN Code: MBV
AFI Prop. Shipping Name: FLAMMABLE LIQUIDS, N.O.S.
AFI Class: 3
AFI ID Number: UN1993
AFI Pack Group: II
AFI Basic Pac Ref: 7-7
MMAC Code: NR
N.O.S. Shipping Name: 99.98% METHANOL,0.02% CHLOROMETHANE.

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Disposal Data
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Label Data
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Label Required: YES
Technical Review Date: 23APR93
MFR Label Number: UNKNOWN
Label Status: F
Common Name: PURGEABLE HALOCARBON KIT 601-S, CHLOROMETHANE
Chronic Hazard: YES
Signal Word: DANGER!
Acute Health Hazard-Severe: X
Contact Hazard-Slight: X
Fire Hazard-Severe: X
Reactivity Hazard-None: X
Special Hazard Precautions: HARMFUL IF INHALED. MAY BE FATAL IF SWALLOWED. MAY CAUSE BLINDNESS. MAY CAUSE IRRITATION OF EYES AND SKIN. STORE IN A SEALED CONTAINER IN COOL, DRY, WELL VENTILATED AREA. KEEP AWAY FROM IGNITION SOURCES. KEEP AWAY FROM OXIDIZERS. FIRST AID: EYES:FLUSH WITH WATER FOR 15 MINUTES. SEE PHYSICIAN. SKIN:WASH WITH SOAP AND WATER. INHALATION:REMOVE TO FRESH AIR. IF BREATHING STOPS, GIVE CPR. CONTACT PHYSICIAN. INGESTION:GIVE 2 TABLESPOONS OF BAKING SODA IN A GLASS OF WATER. PRESS FINGER TO BACK OF TONGUE TO INDUCE VOMITING. IMMEDIATELY CONTACT

PHYSICIAN. DO NOT GIVE ANYTHING IF UNCONSCIOUS.

Protect Eye: Y

Protect Skin: Y

Protect Respiratory: Y

Label Name: SUPELCO INC

Label Street: SUPELCO PARK

Label City: BELLEFONTE

Label State: PA

Label Zip Code: 16823-0048

Label Country: US

Label Emergency Number: 814-359-3441

CHEM SERVICE -- 0-659 CIS 1,2-DICHLOROETHENE - LABORATORY STANDARD
MATERIAL SAFETY DATA SHEET
NSN: 655000F037480
Manufacturer's CAGE: 8Y898
Part No. Indicator: A
Part Number/Trade Name: 0-659 CIS 1,2-DICHLOROETHENE

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General Information
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Item Name: LABORATORY STANDARD
Company's Name: CHEM SERVICE INC
Company's Street: 660 TOWER LN
Company's P. O. Box: 3108
Company's City: WEST CHESTER
Company's State: PA
Company's Country: US
Company's Zip Code: 19381-3108
Company's Emerg Ph #: 215-692-3026/800-452-9994
Company's Info Ph #: 215-692-3026/800-452-9994
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SE
Date MSDS Prepared: 02JUN92
Safety Data Review Date: 06DEC94
Preparer's Company: CHEM SERVICE INC
Preparer's St Or P. O. Box: 660 TOWER LN
Preparer's City: WEST CHESTER
Preparer's State: PA
Preparer's Zip Code: 19381-3108
MSDS Serial Number: BWJDT

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Ingredients/Identity Information
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Proprietary: NO
Ingredient: DICHLOROETHENE
Ingredient Sequence Number: 01
NIOSH (RTECS) Number: KV9420000
CAS Number: 156-59-2

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Physical/Chemical Characteristics
=====

Appearance And Odor: COLORLESS LIQUID
Boiling Point: 140F
Melting Point: -112F
Solubility In Water: INSOLUBLE

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Fire and Explosion Hazard Data
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Flash Point: 42.8F
Extinguishing Media: CO2, DRY CHEMICAL POWDER/SPRAY.
Unusual Fire And Expl Hazrds: FLAMMABLE CHEMICAL. VAPORS MAY TRAVEL
CONSIDERABLE DISTANCE TO IGNITION SOURCE & FLASH BACK. DECOMPOSITION
PRODUCTS ARE CORROSIVE.

=====
Reactivity Data
=====

Stability: YES
Cond To Avoid (Stability): MOISTURE, AIR, LIGHT, HEAT & OTHER IGNITION
SOURCES.
Materials To Avoid: STRONG OXIDIZING AGENTS, MAGNESIUM, ALUMINUM.
Hazardous Decomp Products: TOXIC FUMES
Hazardous Poly Occur: NO

Health Hazard Data

=====
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: SKIN: MAY BE HARMFUL IF ABSORBED. CAN CAUSE IRRITATION. INHALATION: MAY BE HARMFUL. DUST &/VAPORS CAN CAUSE RESPIRATORY TRACT IRRITATION. CAN BE IRRITATING TO MUCOUS MEMBRANCES. INGESTION: MAY BE HARMFUL. EYES: IRRITATION. EXPOSURE CAN CAUSE LIVER DAMAGE. NARCOTIC AT HIGH CONCENTRATIONS.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NONE
Signs/Symptoms Of Overexp: IRRITATION, NARCOTIC.
Emergency/First Aid Proc: EYES: FLUSH CONTINUOUSLY W/WATER FOR 15-20 MINS. SKIN: FLUSH W/WATER FOR 15-20 MINS. IF NOT BURNED, WASH W/SOAP & WATER TO CLEANSE. INHALATION: REMOVE TO FRESH AIR. GIVE CPR/OXYGEN IF NEEDED & CONTINUE LIFE SUPPORT UNTIL MEDICAL ASSISTANCE ARRIVES. INGESTION: RINSE MOUTH OUT W/WATER, IF CONSCIOUS. OBTAIN MEDICAL ATTENTION IN ALL CASES.
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Precautions for Safe Handling and Use

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Steps If Matl Released/Spill: EVACUATE AREA. WEAR APPROPRIATE OSHA REGULATED EQUIPMENT. VENTILATE AREA. ABSORB ON VERMICULITE/SIMILAR MATERIAL. SWEEP UP & PLACE IN APPROPRIATE CONTAINER/HOLD FOR DISPOSAL. WASH CONTAMINATED SURFACES TO REMOVE ANY RESIDUES.
Waste Disposal Method: BURN IN A CHEMICAL INCINERATOR EQUIPPED W/AN AFTERBURNER & SCRUBBER IAW/FEDERAL, STATE & LOCAL REGULATIONS.
Precautions-Handling/Storing: STORE IN A COOL DRY PLACE ONLY W/COMPATIBLE CHEMICALS. KEEP TIGHTLY CLOSED. STORE UNDER REFRIGERATION.
Other Precautions: AVOID CONTACT W/SKIN, EYES & CLOTHING. DON'T BREATHE VAPORS. CONTACT LENSES SHOULDN'T BE WORN IN THE LABORATORY. ALL CHEMICALS SHOULD BE CONSIDERED HAZARDOUS. AVOID DIRECT PHYSICAL CONTACT.
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Control Measures

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Respiratory Protection: WEAR APPROPRIATE OSHA/MSHA APPROVED SAFETY EQUIPMENT.
Ventilation: CHEMICAL SHOULD BE HANDLED ONLY IN A HOOD.
Eye Protection: EYE SHIELDS
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Transportation Data

Disposal Data

Label Data

=====
Label Required: YES
Label Status: G
Common Name: 0-659 CIS 1,2-DICHLOROETHENE
Special Hazard Precautions: SKIN: MAY BE HARMFUL IF ABSORBED. CAN CAUSE IRRITATION. INHALATION: MAY BE HARMFUL. DUST &/VAPORS CAN CAUSE RESPIRATORY TRACT IRRITATION. CAN BE IRRITATING TO MUCOUS MEMBRANCES. INGESTION: MAY BE HARMFUL. EYES: IRRITATION. EXPOSURE CAN CAUSE LIVER DAMAGE. NARCOTIC AT HIGH CONCENTRATIONS. IRRITATION, NARCOTIC.
Label Name: CHEM SERVICE INC
Label Street: 660 TOWER LN
Label P.O. Box: 3108
Label City: WEST CHESTER
Label State: PA
Label Zip Code: 19381-3108
=====

Label State: PA
Label Zip Code: 19381-3108
Label Country: US
Label Emergency Number: 215-692-3026/800-452-9994

LD50-LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: ACUTE: HARMFUL IF SWALLOWED, INHALED, OR ABSORBED THRU SKIN. MATERIAL IS EXTREMELY DESTRUCTIVE TO TISSUE OF THE MUCOUS MEMBRANES AND UPPER RESPIRATORY TRACT, EYES AND SKIN. SYMPS OF EXPOS MAY INCLUDE BURNING SENSATION, COUGHING, WHEEZING, LARYNGITIS, SHORTNESS OF BREATH, HDCH, NAUS & VOMIT. INHAL (EFTS OF OVEREXP)
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NOT RELEVANT
Signs/Symptoms Of Overexp: HLTH HAZ: MAY BE FATAL AS A RESULT OF SPASM, INFLAMMATION AND EDEMA OF THE LARYNX & BRONCHI, CHEMICAL PNEUMONITIS & PULM EDEMA. CHRONIC: POSS CARCINOGEN. TO THE BEST OF OUR KNOWLEDGE, THE CHEMICAL, PHYSICAL, AND TOXICOLOGICAL PROPERTIES HAVE NOT BEEN THOROUGHLY INVESTIGATED.
Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER.
Emergency/First Aid Proc: EYES: IMMED FLUSH WITH COPIOUS AMOUNTS OF WATER FOR AT LEAST 15 MIN. SKIN: IMMED FLUSH WITH COPIOUS AMOUNTS OF WATER WHILE REMOVING CONTAMINATED CLTHG & SHOES. WASH CONTAMINATED CLOTHING BEFORE REUSE. INHAL: REMOVE TO FRESH AIR. IF NOT BREATHING GIVE ARTF RESP. IF BREATHING IS DFCLT, GIVE OXYGEN. INGEST: WASH OUT MOUTH WITH WATER PROVIDED PERSON IS CONSCIOUS. CALL PHYSICIAN.

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: EVACUATE AREA. WEAR NIOSH/MSHA APPRVD SCBA, RUBBER BOOTS & HEAVY RUBBER GLOVES. ABSORB ON SAND/VERMICULITE AND PLACE IN CLOSED CONTAINERS FOR DISPOSAL. VENTILATE AREA AND WASH SPILL SITE AFTER MATERIAL PICKUP IS COMPLETE.
Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.
Waste Disposal Method: THIS COMBUSTIBLE MATERIAL MAY BE BURNED IN A CHEMICAL INCINERATOR EQUIPPED WITH AN AFTERBURNER AND SCRUBBER. OBSERVE ALL FEDERAL, STATE AND LOCAL ENVIRONMENTAL REGULATIONS.
Precautions-Handling/Storing: DO NOT BREATHE VAP. DO NOT GET IN EYES, ON SKIN/CLTHG. AVOID PRLNGD/RPTD EXPOS. CORR. KEEP TIGHTLY CLSD. KEEP AWAY FROM HEAT AND OPEN FLAME.
Other Precautions: LIGHT AND MOISTURE SENSITIVE. REFERIGERATE. CORROSIVE. TOXIC. LACHRYMATOR.

Control Measures

Respiratory Protection: WEAR NIOSH/MSHA APPROVED RESPIRATOR.
Ventilation: USE ONLY IN A CHEMICAL FUME HOOD.
Protective Gloves: CHEMICAL-RESISTANT GLOVES.
Eye Protection: CHEM WORK GOG & FULL LENGTH (SUPP DATA)
Other Protective Equipment: SAFETY SHOWER AND EYE BATH.
Work Hygienic Practices: WASH THOROUGHLY AFTER HANDLING.
Suppl. Safety & Health Data: EYE PROT: FSHLD(FP N). (8-INCH MINIMUM).

Transportation Data

Trans Data Review Date: 93104
DOT PSN Code: DWE
DOT Proper Shipping Name: CORROSIVE LIQUIDS, N.O.S.
DOT Class: 8
DOT ID Number: UN1760
DOT Pack Group: II
DOT Label: CORROSIVE
IMO PSN Code: ESH
IMO Proper Shipping Name: CORROSIVE LIQUID, N.O.S. o

IMO Regulations Page Number: 8147
IMO UN Number: 1760
IMO UN Class: 8
IMO Subsidiary Risk Label: -
IATA PSN Code: HKR
IATA UN ID Number: 1760
IATA Proper Shipping Name: CORROSIVE LIQUID, N.O.S. *
IATA UN Class: 8
IATA Label: CORROSIVE
AFI PSN Code: HKR
AFI Prop. Shipping Name: CORROSIVE LIQUID, N.O.S.
AFI Class: 8
AFI ID Number: UN1760
AFI Pack Group: II
AFI Basic Pac Ref: 12-5

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Disposal Data
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Label Data
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Label Required: YES
Technical Review Date: 01OCT92
Label Date: 01OCT92
Label Status: G
Common Name: TRANS-1, 4-DICHLORO-2-BUTENE, 98%, 32451-5
Chronic Hazard: YES
Signal Word: DANGER!
Acute Health Hazard-Moderate: X
Contact Hazard-Severe: X
Fire Hazard-Moderate: X
Reactivity Hazard-Slight: X
Special Hazard Precautions: CORROSIVE! KEEP TIGHTLY CLOSED. KEEP AWAY FROM HEAT & OPEN FLAME. LIGHT & MOISTURE SENSITIVE. REFERIGERATE. ACUTE: HARMFUL IF SWALLOWED, INHALED, OR ABSORBED THRU SKIN. MATERIAL IS EXTREMELY DESTRUCTIVE TO TISSUE OF THE MUCOUS MEMBRANE & UPPER RESPIRATORY TRACT, EYES & SKIN. SYMPTOMS OF EXPOSURE MAY INCLUDE BURNING SENSATION, COUGHING, WHEEZING, LARYNGITIS, SHORTNESS OF BREATH, HDCH, NAUS & VOMIT. INHAL MAY BE FATAL AS A RESULT OF SPASM, INFLAMMATION & EDEMA OF THE LARYNX & BRONCHI, CHEMICAL PNEUMONITIS & PULMONARY EDEMA. CHRONIC: POSSIBLE CARCINOGEN.
Protect Eye: Y
Protect Skin: Y
Protect Respiratory: Y
Label Name: ALDRICH CHEMICAL CO
Label P.O. Box: 355
Label City: MILWAUKEE
Label State: WI
Label Zip Code: 53201
Label Country: US
Label Emergency Number: 414-273-3850

CHEM SERVICE -- F25 1,2-DICHLOROBENZENE
MATERIAL SAFETY DATA SHEET
NSN: 655000F037531
Manufacturer's CAGE: 8Y898
Part No. Indicator: A
Part Number/Trade Name: F25 1,2-DICHLOROBENZENE

=====
General Information
=====

Company's Name: CHEM SERVICE INC
Company's Street: 660 TOWER LN
Company's P. O. Box: 3108
Company's City: WEST CHESTER
Company's State: PA
Company's Country: US
Company's Zip Code: 19381-3108
Company's Emerg Ph #: 215-692-3026/800-452-9994
Company's Info Ph #: 215-692-3026/800-452-9994
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SE
Date MSDS Prepared: 24MAR92
Safety Data Review Date: 15DEC94
Preparer's Company: CHEM SERVICE INC
Preparer's St Or P. O. Box: 660 TOWER LN
Preparer's City: WEST CHESTER
Preparer's State: PA
Preparer's Zip Code: 19381-3108
MSDS Serial Number: BWJHC

=====
Ingredients/Identity Information
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Proprietary: NO
Ingredient: O-DICHLOROBENZENE, 1,2-DICHLOROBENZENE (ORTHO) (IARC - GROUP
3) *94-4*
Ingredient Sequence Number: 01
NIOSH (RTECS) Number: CZ4500000
CAS Number: 95-50-1
OSHA PEL: 300 MG/CUM
ACGIH TLV: 25 PPM
Other Recommended Limit: 50 PPM

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Physical/Chemical Characteristics
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Appearance And Odor: COLORLESS-PALE YELLOW LIQUID W/AROMATIC ODOR.
Boiling Point: 356F
Melting Point: 5F
Vapor Pressure (MM Hg/70 F): 1.2
Vapor Density (Air=1): 5.1
Solubility In Water: INSOLUBLE

=====
Fire and Explosion Hazard Data
=====

Flash Point: 150.8F
Lower Explosive Limit: 2.2
Upper Explosive Limit: 9.2
Extinguishing Media: CO2, DRY CHEMICAL POWDER/SPRAY.
Unusual Fire And Expl Hazrds: COMBUSTIBLE COMPOUND.

=====
Reactivity Data
=====

Stability: YES
Cond To Avoid (Stability): LIGHT.

Materials To Avoid: STRONG OXIDIZING AGENTS, MAGNESIUM, ALUMINUM.

Hazardous Decomp Products: TOXIC FUMES.

Hazardous Poly Occur: NO

=====
Health Hazard Data
=====

LD50-LC50 Mixture: ORAL LD50 (RAT/MOUSE): 500 MG/KG

Route Of Entry - Inhalation: YES

Route Of Entry - Skin: YES

Route Of Entry - Ingestion: YES

Health Haz Acute And Chronic: SKIN: HARMFUL/FATAL IF ABSORBED, ALLERGIC REACTION, IRRITATION. INHALATION: HARMFUL/FATAL, MUCOUS MEMBRANE IRRITATION. INGESTION: FATAL, MAY CAUSE LIVER & KIDNEY DAMAGE, SEVERE CORROSION OF MOUTH. EYES: SEVERE BURNS.

Carcinogenicity - NTP: NO

Carcinogenicity - IARC: NO

Carcinogenicity - OSHA: NO

Explanation Carcinogenicity: NONE

Signs/Symptoms Of Overexp: IRRITATION, BURNS.

Emergency/First Aid Proc: EYES: FLUSH W/WATER FOR 15-20 MINS. SKIN: FLUSH W/WATER FOR 15-20 MINS. IF NOT BURNED, WASH W/SOAP & WATER TO CLEANSE.

INHALATION: REMOVE TO FRESH AIR. GIVE CPR/OXYGEN IF NEEDED. KEEP WARM & QUIET. INGESTION: INDUCE VOMITING. DON'T GIVE LIQUIDS/INDUCE VOMITING IF UNCONSCIOUS/CONVULSIVE. IF VOMITING OCCURS, WATCH CLOSELY TO AVOID AIRWAY OBSTRUCTION. OBTAIN MEDICAL ATTENTION IN ALL CASES.

=====
Precautions for Safe Handling and Use
=====

Steps If Matl Released/Spill: EVACUATE AREA. WEAR APPROPRIATE OSHA REGULATED EQUIPMENT. VENTILATE AREA. ABSORB ON VERMICULITE/SIMILAR MATERIAL. SWEEP UP & PLACE IN APPROPRIATE CONTAINER/HOLD FOR DISPOSAL. WASH CONTAMINATED SURFACES TO REMOVE ANY RESIDUES.

Waste Disposal Method: BURN IN A CHEMICAL INCINERATOR EQUIPPED W/AN AFTERBURNER & SCRUBBER IAW/FEDERAL, STATE & LOCAL REGULATIONS.

Precautions-Handling/Storing: STORE IN A COOL DRY PLACE ONLY W/COMPATIBLE CHEMICALS. KEEP TIGHTLY CLOSED. DON'T USE MAGNESIUM/ALUMINUM/THEIR ALLOYS AS CONTAINERS.

Other Precautions: AVOID CONTACT W/SKIN, EYES & CLOTHING. DON'T BREATHE VAPORS. CONTACT LENSES SHOULDN'T BE WORN IN THE LABORATORY. ALL CHEMICALS SHOULD BE CONSIDERED HAZARDOUS. AVOID DIRECT PHYSICAL CONTACT. DARK COLORS DON'T AFFECT PURITY.

=====
Control Measures
=====

Respiratory Protection: WEAR APPROPRIATE OSHA/MSHA APPROVED SAFETY EQUIPMENT.

Ventilation: CHEMICAL SHOULD BE HANDLED ONLY IN A HOOD.

Eye Protection: EYE SHIELDS

Work Hygienic Practices: REMOVE/LAUNDRER CONTAMINATED CLOTHING BEFORE REUSE. READILY ABSORBED & RETAINED ON CLOTHING & SHOES.

Suppl. Safety & Health Data: FOR LABORATORY USE ONLY.

=====
Transportation Data
=====

=====
Disposal Data
=====

=====
Label Data
=====

Label Required: YES

Label Status: G

Common Name: F25 1,2-DICHLOROBENZENE

Special Hazard Precautions: SKIN: HARMFUL/FATAL IF ABSORBED, ALLERGIC

REACTION, IRRITATION. INHALATION: HARMFUL/FATAL, MUCOUS MEMBRANE
IRRITATION. INGESTION: FATAL, MAY CAUSE LIVER & KIDNEY DAMAGE, SEVERE
CORROSION OF MOUTH. EYES: SEVERE BURNS. IRRITATION, BURNS.

Label Name: CHEM SERVICE INC

Label Street: 660 TOWER LN

Label P.O. Box: 3108

Label City: WEST CHESTER

Label State: PA

Label Zip Code: 19381-3108

Label Country: US

Label Emergency Number: 215-692-3026/800-452-9994

EM SCIENCE -- 1,1-DICHLOROETHANE SOLUTION, EPM50113
MATERIAL SAFETY DATA SHEET
NSN: 681000N064965
Manufacturer's CAGE: 63612
Part No. Indicator: A
Part Number/Trade Name: 1,1-DICHLOROETHANE SOLUTION, EPM50113

=====
General Information
=====

Company's Name: EM SCIENCE
Company's Street: 480 DEMOCRAT RD
Company's P. O. Box: 70
Company's City: GIBBSTOWN
Company's State: NJ
Company's Country: US
Company's Zip Code: 08027
Company's Emerg Ph #: 800-424-9300 (CHEMTREC)
Company's Info Ph #: 609-354-9200
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SMJ
Date MSDS Prepared: 05AUG94
Safety Data Review Date: 13OCT95
MSDS Serial Number: CBVZY

=====
Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: ETHANE, 1,1-DICHLORO-; (1,1-DICHLOROETHANE) (SARA 313)
(CERCLA)
Ingredient Sequence Number: 01
Percent: 0.02
NIOSH (RTECS) Number: KI0175000
CAS Number: 75-34-3
OSHA PEL: 100 PPM
ACGIH TLV: 100 PPM

Proprietary: NO
Ingredient: METHYL ALCOHOL (METHANOL) (SARA 313) (CERCLA)
Ingredient Sequence Number: 02
Percent: 99.98
NIOSH (RTECS) Number: PC1400000
CAS Number: 67-56-1
OSHA PEL: S, 200 PPM
ACGIH TLV: S,200PPM/250STEL

=====
Physical/Chemical Characteristics
=====

Appearance And Odor: CLEAR LIQUID.
Boiling Point: 149F, 65C
Melting Point: -144F, -98C
Vapor Pressure (MM Hg/70 F): 97 @ 20C
Vapor Density (Air=1): 1.1
Specific Gravity: 0.791 (H*20=1)
Evaporation Rate And Ref: 5.9 (BUAC=1)
Solubility In Water: SOLUBLE
Percent Volatiles By Volume: 99.9 +

=====
Fire and Explosion Hazard Data
=====

Flash Point: 52.0F, 11.1C
Flash Point Method: TCC
Lower Explosive Limit: 6.7%

Upper Explosive Limit: 36.5%
Extinguishing Media: USE WATER SPRAY, FOAM, DRY CHEMICAL, OR CO*2.
Special Fire Fighting Proc: WEAR NIOSH/MSHA APPROVED SCBA & FULL PROTECTIVE EQUIPMENT (FP N).
Unusual Fire And Expl Hazrds: DANGEROUS FIRE AND EXPLOSIVE HAZARD. CLOSED CONTAINERS MAY EXPLODE UPON HEATING. VAPOR CAN TRAVEL DISTANCES TO IGNITION SOURCE AND FLASH BACK.

Reactivity Data

Stability: YES
Cond To Avoid (Stability): HEAT; CONTACT WITH IGNITION SOURCES.
Materials To Avoid: ACIDS, OXIDIZERS, REACTIVE METALS.
Hazardous Decomp Products: CO*X, FORMALDEHYDE.
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NOT RELEVANT

Health Hazard Data

LD50-LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: TOXIC BY INGESTION AND INHALATION. CAN BE TOXIC BY SKIN ABSORPTION. AFTER INGESTION OR INHALATION, INITIAL SYMPTOMS MAY BE ONLY THAT OF MILD INTOXICATION, BUT MAY BECOME SEVERE AFTER 1-18 HRS. AFFECTS CNS, ESP OPTIC NERVE. CHRONIC: MARKED IMPAIRMENT OF VISION & ENLARGEMENT OF LIVER HAS BEEN REPORTED W/ (EFTS OF OVEREXP)
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NOT RELEVANT
Signs/Symptoms Of Overexp: HLTH HAZS: CHRONIC EXPOS. CHRONIC EXPOS MAY ALSO CAUSE DMG TO KIDNEYS & CNS. CAUSES DIZZ, NAUS, MUSCLE WEAK, NARCOSIS, RESP FAILURE. INGEST CAN PRDCE BLINDNESS (AS LITTLE AS 30 ML)/DEATH (AS LITTLE AS 100 ML). PRLNGD/RPTD SKIN CONT MAY CAUSE IRRIT. FETAL DEVELOPMENT ABNORMS & EFTS ON EMBRYO/FETUS HAVE BEEN (SUPP DATA)
Med Cond Aggravated By Exp: SKIN CONDITIONS, EYE PROBLEMS, IMPAIRED LIVER OR KIDNEY FUNCTION.
Emergency/First Aid Proc: GET MED ASSISTANCE FOR ALL CASES OF OVEREXP. SKIN: IMMED FLUSH THORO W/LG AMTS OF WATER. REMOVE CONTAM CLOTHES AND WASH BEFORE REUSE. EYES: IMMED FLUSH THORO W/WATER FOR @ LST 15 MIN. INHAL: REMOVE TO FRESH AIR; GIVE ARTF RESP IF BRTHG HAS STOPPED. INGEST: IF CONSCIOUS, DRINK WATER & INDUCE VOMIT IMMED AS DIRECTED BY MED PERS. NEVER GIVE ANYTHING BY MOUTH TO AN UNCON PERSON.

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: WEAR SUITABLE PROT EQUIP LISTED IN CTL MEASURES. ELIM ANY IGNIT SOURCES UNTIL AREA IS DETERM TO BE FREE FROM EXPLO/FIRE HAZS. CNTN RELS & ELIM IT SOURCE, IF THIS CAN BE DONE W/OUT RISK. DISP AS HAZ WASTE. COMPLY W/FED, STATE & LOC REGS.
Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.
Waste Disposal Method: DISPOSE AS HAZARDOUS WASTE. COMPLY WITH FEDERAL, STATE AND LOCAL REGULATIONS.
Precautions-Handling/Storing: KEEP CONTAINER CLOSED. STORE IN A COOL AREA AWAY FROM IGNITION SOURCES AND OXIDIZERS. DO NOT BREATHE VAPOR OR MIST. DO NOT GET IN EYES, ON SKIN/CLTHG.
Other Precautions: NONE SPECIFIED BY MANUFACTURER.

Control Measures

Respiratory Protection: IF WORKPLACE EXPOS LIM(S) OF PROD/ANY COMPONENT IS EXCEEDED (SEE TLV/PEL), NIOSH/MSHA APPRVD AIR SUPPLIED RESP IS ADVISED IN

ABSENCE OF PROPER ENVIRONMENTAL ENGINEERING &/OR ADMIN CONTROLS SHOULD BE IMPLEMENTED TO REDUCE EXPOSURE.

Ventilation: MATERIAL SHOULD BE HANDLED OR TRANSFERRED IN AN APPROVED FUME HOOD OR WITH ADEQUATE VENTILATION.

Protective Gloves: BUTYL RUBBER, VITON OR EQUIVALENT.

Eye Protection: ANSI APPROVED CHEM WORKERS GOGGLES (FP N).

Other Protective Equipment: ANSI APPROVED EMERGENCY EYE WASH AND DELUGE SHOWER (FP N).

Work Hygienic Practices: WASH THOROUGHLY AFTER HANDLING. DO NOT TAKE INTERNALLY.

Suppl. Safety & Health Data: EFFECTS OF OVEREXPOSURE REPORTED FROM PROLONGED EXPOSURE TO METHYL ALCOHOL IN LABORATORY TESTS INVOLVING PREGNANT RATS.

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Transportation Data
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=====
Disposal Data
=====

=====
Label Data
=====

Label Required: YES

Technical Review Date: 13OCT95

Label Status: G

Common Name: 1,1-DICHLOROETHANE SOLUTION, EPM50113

Chronic Hazard: YES

Signal Word: DANGER!

Acute Health Hazard-Severe: X

Contact Hazard-Moderate: X

Fire Hazard-Severe: X

Reactivity Hazard-None: X

TOXIC BY INGESTION AND INHALATION. CAN BE TOXIC BY SKIN ABSORPTION. AFTER INGESTION OR INHALATION, INITIAL SYMPTOMS MAY BE ONLY THAT OF MILD INTOXICATION, BUT MAY BECOME SEVERE AFTER 1-18 HRS. AFFECTS CENTRAL NERVOUS SYSTEM, ESPECIALLY OPTIC NERVE. CHRONIC: MARKED IMPAIRMENT OF VISION AND ENLARGEMENT OF LIVER HAS BEEN REPORTED. CHRONIC EXPOSURE MAY ALSO CAUSE DAMAGE TO KIDNEYS AND CENTRAL NERVOUS SYSTEM. CAUSES DIZZINESS, NAUSEA, MUSCLE WEAKNESS, NARCOSIS, RESPIRATORY FAILURE. INGESTION CAN PRODUCE BLINDNESS (AS LITTLE AS 30 ML) OR DEATH (AS LITTLE AS 100 ML). Prolonged/repeated skin contact may cause irritation.

Protect Eye: Y

Protect Skin: Y

Protect Respiratory: Y

Label Name: EM SCIENCE

Label Street: 480 DEMOCRAT RD

Label P.O. Box: 70

Label City: GIBBSTOWN

Label State: NJ

Label Zip Code: 08027

Label Country: US

Label Emergency Number: 800-424-9300 (CHEMTREC)

SIGMA CHEMICAL -- 270057-1 1,2-DICHLOROETHANE
MATERIAL SAFETY DATA SHEET
NSN: 681000F048549
Manufacturer's CAGE: 21076
Part No. Indicator: A
Part Number/Trade Name: 270057-1 1,2-DICHLOROETHANE

=====
General Information
=====

Company's Name: SIGMA CHEMICAL COMPANY
Company's Street: 3050 SPRUCE ST
Company's P. O. Box: 14508
Company's City: SAINT LOUIS
Company's State: MO
Company's Country: US
Company's Zip Code: 63178-5000
Company's Emerg Ph #: 314-771-5765/800-325-3010
Company's Info Ph #: 314-771-5765/800-325-3010
Distributor/Vendor # 1: ALDRICH CHEMICAL CO
Distributor/Vendor # 1 Cage: 60928
Distributor/Vendor # 2: FLUKA CHEMICAL CORP
Distributor/Vendor # 2 Cage: 63181
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SE
Date MSDS Prepared: 01APR95
Safety Data Review Date: 24JUN96
Preparer's Company: SIGMA CHEMICAL COMPANY
Preparer's St Or P. O. Box: 3050 SPRUCE ST
Preparer's City: SAINT LOUIS
Preparer's State: MO
Preparer's Zip Code: 63178-5000
MSDS Serial Number: BZFPP

=====
Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: 1,2-DICHLOROETHANE, ETHYLENE DICHLORIDE (SUSPECTED ANIMAL
CARCINOGEN BY IARC-GROUP 2B, CARCINOGEN BY NTP) *96-2*
Ingredient Sequence Number: 01
NIOSH (RTECS) Number: KI0525000
CAS Number: 107-06-2
ACGIH TLV: 10 PPM
Other Recommended Limit: 40 MG/CUM

=====
Physical/Chemical Characteristics
=====

Appearance And Odor: COLORLESS LIQUID
Boiling Point: 181.4F
Melting Point: -31F
Vapor Pressure (MM Hg/70 F): 87
Vapor Density (Air=1): 3.4
Specific Gravity: 1.256

=====
Fire and Explosion Hazard Data
=====

Flash Point: 60F
Lower Explosive Limit: 6.2
Upper Explosive Limit: 15.6
Extinguishing Media: CO2, DRY CHEMICAL POWDER/APPROPRIATE FOAM. USE WATER
TO COOL EXPOSED CONTAINERS.
Special Fire Fighting Proc: WEAR SCBA & PROTECTIVE CLOTHING.
Unusual Fire And Expl Hazrds: VAPOR MAY TRAVEL LONG DISTANCE TO IGNITION &

FLASH BACK.

=====
Reactivity Data
=====

Stability: YES

Materials To Avoid: OXIDIZING AGENTS & ALUMINUM

Hazardous Decomp Products: TOXIC FUMES OF CO, CO2, HYDROGEN CHLORIDE GAS & PHOSGENE.

Hazardous Poly Occur: NO
==========
Health Hazard Data
=====

LD50-LC50 Mixture: ORAL LD50 (RAT): 670 MG/KG

Route Of Entry - Inhalation: YES

Route Of Entry - Skin: NO

Route Of Entry - Ingestion: YES

Health Haz Acute And Chronic: MAY CAUSE CANCER & HERITABLE GENETIC DAMAGE. TOXIC BY INHALATION, IN CONTACT W/SKIN & IF SWALLOWED. IRRITATING TO EYES, RESPIRATORY SYSTEM & SKIN.

Carcinogenicity - NTP: YES

Carcinogenicity - IARC: YES

Carcinogenicity - OSHA: NO

Explanation Carcinogenicity: SEE INGREDIENTS

Signs/Symptoms Of Overexp: IRRITATION

REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE CPR. IF BREATHING IS DIFFICULT, GIVE OXYGEN. INGESTION: RUNSE W/WATER IF CONSCIOUS. OBTAIN MEDICAL ATTENTION IN ALL CASES.
==========
Precautions for Safe Handling and Use
=====

Steps If Matl Released/Spill: EVACUATE AREA. SHUT OFF ALL SOURCES OF IGNITION. WEAR SCBA & PROTECTIVE EQUIPMENT. VENTILATE AREA & WASH AERA.

Waste Disposal Method: DISPOSE OF IAW/FEDERAL, STATE & LOCAL REGULATIONS.

Precautions-Handling/Storing: KEEP TIGHTLY CLOSED. STORE UNDER NITROGEN.
==========
Control Measures
=====

Respiratory Protection: WEAR APPROPRIATE NIOSH/MSHA APPROVED RESPIRATOR.

Protective Gloves: CHEMICAL RESISTANT

Eye Protection: SAFETY GOGGLES

Other Protective Equipment: CHEMICAL FUME HOOD, SAFETY SHOWER & EYE BATH.
==========
Transportation Data
==========
Disposal Data
==========
Label Data
=====

Label Required: YES

Label Status: G

Common Name: 270057-1 1,2-DICHLOROETHANE

Special Hazard Precautions: MAY CAUSE CANCER & HERITABLE GENETIC DAMAGE. TOXIC BY INHALATION, IN CONTACT W/SKIN & IF SWALLOWED. IRRITATING TO EYES, RESPIRATORY SYSTEM & SKIN. IRRITATION

Label Name: SIGMA CHEMICAL COMPANY

Label Street: 3050 SPRUCE ST

Label P.O. Box: 14508

Label City: SAINT LOUIS

Label State: MO

Label Zip Code: 63178-5000

Label Country: US

Label Emergency Number: 314-771-5765/800-325-3010

CHEM SERVICE -- F29 1,1-DICHLOROETHENE
MATERIAL SAFETY DATA SHEET
NSN: 655000F037520
Manufacturer's CAGE: 8Y898
Part No. Indicator: A
Part Number/Trade Name: F29 1,1-DICHLOROETHENE

=====
General Information
=====

Company's Name: CHEM SERVICE INC
Company's Street: 660 TOWER LN
Company's P. O. Box: 3108
Company's City: WEST CHESTER
Company's State: PA
Company's Country: US
Company's Zip Code: 19381-3108
Company's Emerg Ph #: 215-692-3026/800-452-9994
Company's Info Ph #: 215-692-3026/800-452-9994
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 002
Status: SE
Date MSDS Prepared: 13OCT92
Safety Data Review Date: 14DEC94
Preparer's Company: CHEM SERVICE INC
Preparer's St Or P. O. Box: 660 TOWER LN
Preparer's City: WEST CHESTER
Preparer's State: PA
Preparer's Zip Code: 19381-3108
MSDS Serial Number: BWJGQ

=====
Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: VINYLIDENE CHLORIDE, 1,1-DICHLOROETHENE, 1,1-DICHLOROETHYLENE,
VDC
Ingredient Sequence Number: 01
NIOSH (RTECS) Number: KV9275000
CAS Number: 75-35-4
OSHA PEL: 1 PPM
ACGIH TLV: 5 PPM
Other Recommended Limit: 5 PPM

=====
Physical/Chemical Characteristics
=====

Appearance And Odor: COLORLESS LIQUID W/FRUITY/PLEASANT ODOR.
Boiling Point: 87.06F
Melting Point: -188.5F
Solubility In Water: INSOLUBLE

=====
Fire and Explosion Hazard Data
=====

Flash Point: 5F
Extinguishing Media: CO2, DRY CHEMICAL POWDER. DON'T USE WATER.
Unusual Fire And Expl Hazrds: FLAMMABLE CHEMICAL. EXPLOSIVE. TENDS TO
DEVELOP PRESSURE ON STANDING. SENSITIVE TO HEAT & AIR. MAY POLYMERIZE UPON
STANDING.

=====
Reactivity Data
=====

Stability: NO
Cond To Avoid (Stability): HEAT, AIR, UPON STANDING.
Hazardous Poly Occur: YES
Conditions To Avoid (Poly): UPON STANDING.

=====
Health Hazard Data
=====

LD50-LC50 Mixture: ORAL LD50 (RAT/MOUSE): 200 MG/KG
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: NO
Route Of Entry - Ingestion: YES
IRRITATION/ALLERGIC REACTIION/SENSITIZATION. INHALATION: MUCOUS MEMBRANE IRRITATION. EXPOSURE CAN CAUSE LIVER & KIDNEY DAMAGE/NERVOUS & CARDIOVASCULAR SYSTEM INJURY/DELAYED ADVERS HEALTH EFFECTS. NARCOTIC AT HIGH CONCENTRATIONS.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NONE
Signs/Symptoms Of Overexp: IRRITATION.
Emergency/First Aid Proc: EYES: FLUSH CONTINUOUSLY W/WATER FOR 15-20 MINS. SKIN: FLUSH W/WATER FOR 15-20 MINS. IF NOT BURNED, WASH W/SOAP & WATER. INHALATION: REMOVE TO FRESH AIR. GIVE CPR/OXYGEN IF NEEDED. KEEP WARM & QUIET. INGESTION: DON'T INDUCE VOMITING/GIVE LIQUIDS IF UNCONSCIOUS/ CONVULSING. IF VOMITING OCCURS, WATCH CLOSELY FOR ANY AIRWAY OBSTRUCTION. OBTAIN MEDICAL ATTENTION IN ALL CASES.

=====
Precautions for Safe Handling and Use
=====

Steps If Matl Released/Spill: EVACUATE AREA. WEAR APPROPRIATE OSHA REGULATED EQUIPMENT. VENTILATE AREA. ABSORB ON VERMICULITE/SIMILAR MATERIAL. SWEEP UP & PLACE IN APPROPRIATE CONTAINER/HOLD FOR DISPOSAL. WASH CONTAMINATED SURFACES TO REMOVE ANY RESIDUES.
Waste Disposal Method: BURN IN A CHEMICAL INCINERATOR EQUIPPED W/AN AFTERBURNER & SCRUBBER IAW/FEDERAL, STATE & LOCAL REGULATIONS.
Precautions-Handling/Storing: STORE IN A COOL DRY PLACE ONLY W/COMPATIBLE CHEMICALS. KEEP TIGHTLY CLOSED. STORE UNDER NITROGEN & REFRIGERATION. FOR LABORATORY USE ONLY.
Other Precautions: AVOID CONTACT W/SKIN, EYES & CLOTHING. DON'T BREATH VAPORS. CONTACT LENSES SHOULDN'T BE WORN IN THE LABORATORY. ALL CHEMICALS SHOULD BE CONSIDERED HAZARDOUS. AVOID DIRECT PHYSICAL CONTACT.

=====
Control Measures
=====

Respiratory Protection: WEAR APPROPRIATE OSHA/MSHA APPROVED SAFETY EQUIPMENT.
Ventilation: CHEMICAL SHOULD BE HANDLED ONLY IN A HOOD.
Eye Protection: EYE SHIELDS
Work Hygienic Practices: REMOVE/LAUNDER CONTAMINATED CLOTHING BEFORE REUSE.

=====
Transportation Data
==========
Disposal Data
==========
Label Data
=====

Label Required: YES
Label Status: G
Common Name: F29 1,1-DICHLOROETHENE
IRRITATION/ALLERGIC REACTIION/SENSITIZATION. INHALATION: MUCOUS MEMBRANE IRRITATION. EXPOSURE CAN CAUSE LIVER & KIDNEY DAMAGE/NERVOUS & CARDIOVASCULAR SYSTEM INJURY/DELAYED ADVERS HEALTH EFFECTS. NARCOTIC AT HIGH CONCENTRATIONS. IRRITATION.
Label Name: CHEM SERVICE INC
Label Street: 660 TOWER LN

Label P.O. Box: 3108
Label City: WEST CHESTER
Label State: PA
Label Zip Code: 19381-3108
Label Country: US
Label Emergency Number: 215-692-3026/800-452-9994

ALLIED SIGNAL; ENGINEERED MATERIALS SECTION -- GENETRON 12 DICHLORODIFLUOROMETHANE
MATERIAL SAFETY DATA SHEET
NSN: 6830002920133
Manufacturer's CAGE: 1L164
Part No. Indicator: A
Part Number/Trade Name: GENETRON 12 DICHLORODIFLUOROMETHANE

=====
General Information
=====

Item Name: DICHLORODIFLUOROMETHANE, TECHNICAL
Company's Name: ALLIED SIGNAL INC; ENGINEERED MATERIALS SECTION
Company's Street: COLUMBIA RD & PARK AVE
Company's P. O. Box: 1087R
Company's City: MORRISTOWN
Company's State: NJ
Company's Country: US
Company's Zip Code: 07960
Company's Emerg Ph #: 201-455-4117
Company's Info Ph #: 800-522-8001
Distributor/Vendor # 1: CFC RECOVERY SYSTEMS INC (770-984-2292)
Distributor/Vendor # 1 Cage: 0UJL7
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 003
Status: SE
Date MSDS Prepared: 01AUG95
Safety Data Review Date: 17MAR98
Supply Item Manager: CX
MSDS Serial Number: BDVNR
Specification Number: BB-F-1421
Spec Type, Grade, Class: TYPE 12
Hazard Characteristic Code: G3
Unit Of Issue: CY
Unit Of Issue Container Qty: 150 LBS
Type Of Container: CYLINDER
Net Unit Weight: 150 LBS

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Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: DICHLORODIFLUOROMETHANE (SARA III)
Ingredient Sequence Number: 01
Percent: 100
NIOSH (RTECS) Number: PA8200000
CAS Number: 75-71-8
OSHA PEL: 1000 PPM
ACGIH TLV: 1000 PPM; 9192

=====
Physical/Chemical Characteristics
=====

Appearance And Odor: COLORLESS LIQUEFIED GAS WITH FAINT ETHERAL ODOR.
Boiling Point: -22F,-30C
Melting Point: -252F,-158C
Vapor Pressure (MM Hg/70 F): 85 PSIA
Vapor Density (Air=1): 4.26
Specific Gravity: 1.325
Evaporation Rate And Ref: N/A(GAS)
Solubility In Water: 0.028 @ 77F

=====
Fire and Explosion Hazard Data
=====

Flash Point: NONE
Lower Explosive Limit: N/A
Upper Explosive Limit: N/A

Extinguishing Media: ANY STANDARD AGENT-CHOOSE THE ONE THAT IS APPROPRIATE FOR TYPE OF FIRE. MATERIAL ITSELF IS NON-FLAMMABLE.
 Special Fire Fighting Proc: SELF-CNTND BRTHG APP.H*20 TO DISPERSE VAPORS/COOL EXPOS CONT
 Unusual Fire And Expl Hazrds: CONTACT W.REACTV METALS (MOLTEN AL;BA/LI FINES)WILL PRODUCE RAPID EXOTHERMIC REACTIONS.

=====
 Reactivity Data
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Stability: YES
 Cond To Avoid (Stability): DECOMPOSE AT GAS FLAME TEMPERATURE GIVE HALOGENS,HALO-ACIDS
 Materials To Avoid: POWDERED AL,MG.ATTACKS MG AND ITS ALLOYS
 Hazardous Decomp Products: TOXIC SUBSTANCES BY HIGH HEAT,E.G.FLUORIDES, CARBONYL HALIDES
 Hazardous Poly Occur: NO

=====
 Health Hazard Data
 =====

LD50-LC50 Mixture: ACGIH/TLV:1000 PPM (AIR)
 Route Of Entry - Inhalation: YES
 Route Of Entry - Skin: YES
 Route Of Entry - Ingestion: NO
 Health Haz Acute And Chronic: INHALATION:LOW TOXICITY AT CONCENTRATIONS AS HIGH AS 4%. SKIN ANS EYES:LIQUID MAY CAUSE FROSTBITE.
 Carcinogenicity - NTP: NO
 Carcinogenicity - IARC: NO
 Carcinogenicity - OSHA: NO
 Explanation Carcinogenicity: NOT APPLICABLE
 Signs/Symptoms Of Overexp: INHALATION:SYMPTOMS OF ASPHYXIATION; LOSS OF COORDINATION, INCREASED PULSE RATE, CARDIAC SENSITIZATION, AND DEEPER RESPIRATION. SKIN:REDNESS, LOSS OF SENSATION AND SWELLING.
 Emergency/First Aid Proc: EYES:FLUSH WITH WATER 15 MIN.SKIN:WASH WITH SOAP & WATER.INHALED:REMOVE TO FRESH AIR.GIVE CPR/OXYGEN IF NEED.DO NOT GIVE ADRENALIN NOR ANY STIMULANT.INGESTION:ITEM IS GAS AT AMBIENT TEMPERATURE:N/A

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 Precautions for Safe Handling and Use
 =====

Steps If Matl Released/Spill: IF LARGE QUANTITY IS RELEASED,VACATE PREMISES AND ALLOW TO DISSIPATE.NOTE TLV
 Waste Disposal Method: CONSULT WITH APPROPRIATE AGENCIES BEFORE DISCHARGING OR DISPOSING OF WASTE MATERIAL. DISPOSAL BY A LICENSED WASTE DISPOSAL COMPANY MAY BE NECESSARY.
 Precautions-Handling/Storing: AVOID CONTACT WITH EYES, SKIN OR CLOTHING. DO NOT PUNCTURE OR DROP CYLINDERS OR EXPOSE THEM TO OPEN FLAME OR EXCESSIVE HEAT. STORE IN A COOL DRY AREA.
 Other Precautions: PROTECT CYLINDER AND THEIR FITTINGS FROM PHYSICAL DAMAGE.

=====
 Control Measures
 =====

Respiratory Protection: USE SELF-CONTAINED BREATHING APPARATUS IF NOT IN WELL VENTILATED SPO
 Ventilation: MECHANICAL VENTILATION AS NEEDED
 Protective Gloves: RUBBER
 Eye Protection: SAFETY GLASSES
 Suppl. Safety & Health Data: ITEM MEETS REQUIREMENTS FOR TYPE 12 UNDER FED SPEC BB-F-1421

=====
 Transportation Data
 =====

Trans Data Review Date: 98140
 DOT PSN Code: ETJ

DOT Proper Shipping Name: DICHLORODIFLUOROMETHANE OR REFRIGERANT GAS R 12
DOT Class: 2.2
DOT ID Number: UN1028
DOT Label: NONFLAMMABLE GAS
IMO PSN Code: FKB
IMO Proper Shipping Name: DICHLORODIFLUOROMETHANE
IMO Regulations Page Number: 2129
IMO UN Number: 1028
IMO UN Class: 2(2.2)
IMO Subsidiary Risk Label: -
IATA PSN Code: IWJ
IATA UN ID Number: 1028
IATA Proper Shipping Name: DICHLORODIFLUOROMETHANE
IATA UN Class: 2.2
IATA Label: NON-FLAMMABLE GAS
AFI PSN Code: IWJ
AFI Prop. Shipping Name: DICHLORODIFLUOROMETHANE
AFI Class: 2.2
AFI ID Number: UN1028
AFI Basic Pac Ref: 6-6,6-8

=====
Disposal Data
=====

Disposal Data Review Date: 88074
Rec # For This Disp Entry: 01
Tot Disp Entries Per NSN: 002
Landfill Ban Item: YES
Disposal Supplemental Data: ITEM MEETS REQUIREMENTS FOR TYPE 12 UNDER FED SPEC BB-F-1421 IN CASE OF ACCIDENTAL EXPOSURE OR DISCHARGE, CONSULT HEALTH AND SAFETY FILE FOR PRECAUTIONS.
1st EPA Haz Wst Code New: U075
1st EPA Haz Wst Name New: DICHLORODIFLUOROMETHANE
1st EPA Haz Wst Char New: TOXIC (T)
1st EPA Acute Hazard New: NO

=====
Label Data
=====

Label Required: YES
Technical Review Date: 30MAR91
Label Date: 30MAR91
Label Status: G
Common Name: GENETRON 12 DICHLORODIFLUOROMETHANE
Chronic Hazard: NO
Signal Word: CAUTION!
Acute Health Hazard-Slight: X
Contact Hazard-Slight: X
Fire Hazard-None: X
Reactivity Hazard-Slight: X
Special Hazard Precautions: INHALATION:LOW TOXICITY AT CONCENTRATIONS AS HIGH AS 4%. SKIN ANS EYES:LIQUID MAY CAUSE FROSTBITE. AVOID CONTACT WITH EYES, SKIN OR CLOTHING. DO NOT PUNCTURE OR DROP CYLINDERS OR EXPOSE THEM TO OPEN FLAME OR EXCESSIVE HEAT. STORE IN A COOL DRY AREA.
Protect Eye: Y
Protect Skin: Y
Protect Respiratory: Y
Label Name: ALLIED CORP., ALLIED CHEMICAL,CSS DEPT.
Label Street: COLUMBIA RD & PARK AVE
Label P.O. Box: 1087R
Label City: MORRISTOWN
Label State: NJ
Label Zip Code: 07960
Label Country: US
Label Emergency Number: 201-455-2000

CHEM SERVICE -- F32 1,2-DICHLOROPROPANE
MATERIAL SAFETY DATA SHEET
NSN: 655000F037526
Manufacturer's CAGE: 8Y898
Part No. Indicator: A
Part Number/Trade Name: F32 1,2-DICHLOROPROPANE

=====
General Information
=====

Company's Name: CHEM SERVICE INC
Company's Street: 660 TOWER LN
Company's P. O. Box: 3108
Company's City: WEST CHESTER
Company's State: PA
Company's Country: US
Company's Zip Code: 19381-3108
Company's Emerg Ph #: 215-692-3026/800-452-9994
Company's Info Ph #: 215-692-3026/800-452-9994
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SE
Date MSDS Prepared: 13AUG92
Safety Data Review Date: 14DEC94
Preparer's Company: CHEM SERVICE INC
Preparer's St Or P. O. Box: 660 TOWER LN
Preparer's City: WEST CHESTER
Preparer's State: PA
Preparer's Zip Code: 19381-3108
MSDS Serial Number: BWJGW

=====
Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: 1,2-DICHLOROPROPANE
Ingredient Sequence Number: 01
NIOSH (RTECS) Number: TX9625000
CAS Number: 78-87-5
OSHA PEL: 75 PPM
ACGIH TLV: 75 PPM
Other Recommended Limit: 75 PPM

=====
Physical/Chemical Characteristics
=====

Appearance And Odor: COLORLESS LIQUID W/FRUITY/PLEASANT ODOR.
Boiling Point: 203-204.8F
Melting Point: -148F
Vapor Pressure (MM Hg/70 F): 40
Solubility In Water: SLIGHT

=====
Fire and Explosion Hazard Data
=====

Flash Point: 69.8F
Lower Explosive Limit: 3.4
Upper Explosive Limit: 14.5
Extinguishing Media: CO2, DRY CHEMICAL POWDER. DON'T USE WATER.
Unusual Fire And Expl Hazrds: FLAMMABLE CHEMICAL. SENSITIVE TO HEAT.

=====
Reactivity Data
=====

Stability: YES
Cond To Avoid (Stability): HEAT.
Materials To Avoid: STRONG OXIDIZING AGENTS/BASES/ACID, MAGNESIUM,
ALUMINUM.

Hazardous Decomp Products: TOXIC FUMES.

Hazardous Poly Occur: NO

=====
Health Hazard Data
=====

LD50-LC50 Mixture: ORAL LD50 (RAT/MOUSE): 2196 MG/KG

Route Of Entry - Inhalation: YES

Route Of Entry - Skin: YES

Route Of Entry - Ingestion: YES

Health Haz Acute And Chronic: SKIN: MAY BE RAPIDLY ABSORBED/HARMFUL/
IRRITATION/ALLERGIC REACTION/SENSITIZATION. INHALATION: HARMFUL/RESPIRATORY
TRACT IRRITATION/MUCOUS MEMBRANE IRRITATION/ALLERGIC RESPIRATORY REACTION.
INGESTION: HARMFUL/LIVER & KIDNEY DAMAGE. EYES: IRRITATION/DAMAGE/SEVERE
BURNS. (SEE SUPP)

Carcinogenicity - NTP: NO

Carcinogenicity - IARC: NO

Carcinogenicity - OSHA: NO

Explanation Carcinogenicity: NONE

Signs/Symptoms Of Overexp: IRRITATION, BURNS, GI DISTURBANCES, NAUSEA,
HEADACHE, DIZZINESS.

Emergency/First Aid Proc: EYES: FLUSH CONTINUOUSLY W/WATER FOR 15-20 MINS.

SKIN: FLUSH W/WATER FOR 15-20 MINS. IF NOT BURNED, WASH W/SOAP & WATER.

INHALATION: REMOVE TO FRESH AIR. GIVE CPR/OXYGEN IF NEEDED. KEEP WARM &

QUIET. INGESTION: DON'T INDUCE VOMITING/GIVE LIQUIDS IF UNCONSCIOUS/

CONVULSIVE. IF VOMITING, WATCH CLOSELY FOR ANY AIRWAY OBSTRUCTION. OBTAIN

MEDICAL ATTENTION IN ALL CASES.

=====
Precautions for Safe Handling and Use
=====

Steps If Matl Released/Spill: EVACUATE AREA. WEAR APPROPRIATE OSHA
REGULATED EQUIPMENT. VENTILATE AREA. ABSORB ON VERMICULITE/SIMILAR
MATERIAL. SWEEP UP & PLACE IN APPROPRIATE CONTAINER/HOLD FOR DISPOSAL. WASH
CONTAMINATED SURFACES TO REMOVE ANY RESIDUES.

Waste Disposal Method: BURN IN A CHEMICAL INCINERATOR EQUIPPED W/AN
AFTERBURNER & SCRUBBER IAW/FEDERAL, STATE & LOCAL REGULATIONS.

Precautions-Handling/Storing: STORE IN A COOL DRY PLACE ONLY W/COMPATIBLE
CHEMICALS. KEEP TIGHTLY CLOSED. FOR LABORATORY USE ONLY.

Other Precautions: AVOID CONTACT W/SKIN, EYES & CLOTHING. DON'T BREATHE
VAPORS. CONTACT LENSES SHOULDN'T BE WORN IN THE LABORATORY. ALL CHEMICALS
SHOULD BE CONSIDERED HAZARDOUS. AVOID DIRECT PHYSICAL CONTACT. READILY
ABSORBED/RETAINED ON CLOTHING/SHOES.

=====
Control Measures
=====

Respiratory Protection: WEAR APPROPRIATE OSHA/MSHA APPROVED SAFETY
EQUIPMENT.

Ventilation: CHEMICAL SHOULD BE HANDLED ONLY IN A HOOD.

Eye Protection: EYE SHIELDS

Work Hygienic Practices: REMOVE/LAUNDER CONTAMINATED CLOTHING BEFORE
REUSE.

Suppl. Safety & Health Data: HEALTH HAZARDS CONT'D: EXPOSURE CAN CAUSE
NERVOUS SYSTEM INJURY & DELAYED ADVERS HEALTH EFFECTS.

=====
Transportation Data
=====

=====
Disposal Data
=====

=====
Label Data
=====

Label Required: YES

Label Status: G

Common Name: F32 1,2-DICHLOROPROPANE

Special Hazard Precautions: SKIN: MAY BE RAPIDLY ABSORBED/HARMFUL/
IRRITATION/ALLERGIC REACTION/SENSITIZATION. INHALATION: HARMFUL/RESPIRATORY
TRACT IRRITATION/MUCOUS MEMBRANE IRRITATION/ALLERGIC RESPIRATORY REACTION.
INGESTION: HARMFUL/LIVER & KIDNEY DAMAGE. EYES: IRRITATION/DAMAGE/SEVERE
BURNS. (SEE SUPP) IRRITATION, BURNS, GI DISTURBANCES, NAUSEA, HEADACHE,
DIZZINESS.

Label Name: CHEM SERVICE INC

Label Street: 660 TOWER LN

Label P.O. Box: 3108

Label City: WEST CHESTER

Label State: PA

Label Zip Code: 19381-3108

Label Country: US

Label Emergency Number: 215-692-3026/800-452-9994

CHEM SERVICE -- 0-770, ETHYLBENZENE
MATERIAL SAFETY DATA SHEET
NSN: 681000N033034
Manufacturer's CAGE: 8Y898
Part No. Indicator: A
Part Number/Trade Name: 0-770, ETHYLBENZENE

=====
General Information
=====

Company's Name: CHEM SERVICE INC
Company's Street: 660 TOWER LANE
Company's P. O. Box: 3108
Company's City: WEST CHESTER
Company's State: PA
Company's Country: US
Company's Zip Code: 19381-3108
Company's Emerg Ph #: 215-692-3026
Company's Info Ph #: 215-692-3026
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 002
Status: SMJ
Date MSDS Prepared: 16MAR92
Safety Data Review Date: 28AUG95
MSDS Serial Number: BPLSP
Hazard Characteristic Code: F3

=====
Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: BENZENE, ETHYL-; (ETHYLBENZENE)
Ingredient Sequence Number: 01
NIOSH (RTECS) Number: DA0700000
CAS Number: 100-41-4
OSHA PEL: 100 PPM, 125 STEL
ACGIH TLV: 100 PPM, 125 STEL

=====
Physical/Chemical Characteristics
=====

Appearance And Odor: COLORLESS LIQUID WITH AN AROMATIC ODOR
Boiling Point: 277F, 136C
Melting Point: -139F, -95C
Vapor Pressure (MM Hg/70 F): 7.1 @20C
Vapor Density (Air=1): 0.887
Solubility In Water: INSOLUBLE

=====
Fire and Explosion Hazard Data
=====

Flash Point: 71.6F, 22C
Lower Explosive Limit: 1%
Upper Explosive Limit: 6.7%
Extinguishing Media: CARBON DIOXIDE, DRY CHEMICAL POWDER OR SPRAY.
Special Fire Fighting Proc: WEAR NIOSH/MSHA APPROVED SCBA & FULL
PROTECTIVE EQUIPMENT (FP N).
Unusual Fire And Expl Hazrds: NONE SPECIFIED BY MANUFACTURER.

=====
Reactivity Data
=====

Stability: YES
Cond To Avoid (Stability): NONE SPECIFIED BY MANUFACTURER.
Materials To Avoid: STRONG OXIDIZING AGENTS.
Hazardous Decomp Products: EMITS TOXIC FUMES UNDER FIRE CONDITIONS.
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NOT RELEVANT.

=====
Health Hazard Data
=====

LD50-LC50 Mixture: LD50:(ORAL RAT):3500 MG/KG.
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: CAN CAUSE SKIN AND EYE IRRITATION. MAY BE HARMFUL IF ABSORBED THROUGH SKIN. MAY BE HARMFUL IF INHALED. MAY BE HARMFUL IF SWALLOWED. CAN BE IRRITATING TO MUCOUS MEMBRANES. PROLONGED EXPOSURE MAY CAUSE NAUSEA, HEADACHE, DIZZINESS AND/OR EYE DAMAGE. CAN CAUSE NERVOUS SYSTEM INJURY. DUST &/OR VAPORS (EFTS OF OVEREXP)
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NOT RELEVANT.
Signs/Symptoms Of Overexp: HLTH HAZ:CAN CAUSE IRRITATION TO RESPIRATORY TRACT.
Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER.
Emergency/First Aid Proc: EYE:FLUSH CONTINUOUSLY WITH WATER FOR 15-20 MINUTES. SKIN:FLUSH WITH WATER FOR 15-20 MINUTES. IF NO BURNS HAVE OCCURED-USE SOAP & WATER TO CLEANSE SKIN. INHAL:MOVE TO FRESH AIR. GIVE OXYGEN IF PATIENT IS HAVING DIFFICULTY BREATHING. IF PATIENT STOPPED BREATHING, GIVE ARTF RESP. IF PATIENT IS IN CARDIAC ARREST GIVE CPR. CONTINUE LIFE SUPPORTING MEASURES UNTIL MD ARRIVES. INGEST:CALL MD IMMED(FP N)

=====
Precautions for Safe Handling and Use
=====

Steps If Matl Released/Spill: EVACUATE AREA. WEAR APPROPRIATE OSHA REGULATED EQUIPMENT. VENTILATE AREA. ABSORB ON VERMICULITE OR SIMILAR MATERIAL. SWEEP UP AND PLACE IN AN APPROPRIATE CONTAINER. HOLD FOR DISPOSAL. WASH CONTAMINATED SURFACES TO REMOVE ANY RESIDUES.
Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.
Waste Disposal Method: BURN IN A CHEMICAL INCINERATOR EQUIPPED WITH AN AFTERBURNER. DISPOSAL MUST BE IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS (FP N).
Precautions-Handling/Storing: KEEP TIGHTLY CLOSED IN A COOL, DRY PLACE. STORE ONLY WITH COMPATIBLE MATERIALS.
Other Precautions: AVOID CONTACT WITH SKIN, EYES AND CLOTHNG. ALL CHEMICALS SHOULD BE CONSIDERED HAZARDOUS-AVOID DIRECT PHYSICAL CONTACT.

=====
Control Measures
=====

Respiratory Protection: NIOSH/MSHA APPROVED RESPIRATOR APPROPRIATE FOR EXPOSURE OF CONCERN (FP N).
Ventilation: THIS CHEMICAL SHOULD ONLY BE HANDLED IN A HOOD.
Protective Gloves: IMPERVIOUS GLOVES (FP N).
Eye Protection: CHEMICAL WORKERS GOGGLES (FP N).
Other Protective Equipment: NONE SPECIFIED BY MANUFACTURER.
Work Hygienic Practices: CONTACT LENSES SHOULD NOT BE WORN.
Suppl. Safety & Health Data: NONE SPECIFIED BY MANUFACTURER.

=====
Transportation Data
=====

Trans Data Review Date: 92363
DOT PSN Code: FYP
DOT Proper Shipping Name: ETHYLBENZENE
DOT Class: 3
DOT ID Number: UN1175
DOT Pack Group: II
DOT Label: FLAMMABLE LIQUID
IMO PSN Code: GQL
IMO Proper Shipping Name: ETHYLBENZENE
IMO Regulations Page Number: 3222

IMO UN Number: 1175
IMO UN Class: 3.2
IMO Subsidiary Risk Label: -
IATA PSN Code: LCB
IATA UN ID Number: 1175
IATA Proper Shipping Name: ETHYLBENZENE
IATA UN Class: 3
IATA Label: FLAMMABLE LIQUID
AFI PSN Code: LCB
AFI Prop. Shipping Name: ETHYLBENZENE
AFI Class: 3
AFI ID Number: UN1175
AFI Pack Group: II
AFI Basic Pac Ref: 7-7

=====
Disposal Data
==========
Label Data
=====

Label Required: YES
Technical Review Date: 22JUL92
Label Date: 22JUL92
Label Status: G
Common Name: 0-770, ETHYLBENZENE
Chronic Hazard: NO
Signal Word: DANGER!
Acute Health Hazard-Moderate: X
Contact Hazard-Moderate: X
Fire Hazard-Severe: X
Reactivity Hazard-None: X
Special Hazard Precautions: FLAMMABLE-POISON! STORE IN A COOL, DRY PLACE.
ACUTE:CAN CAUSE SKIN/EYE IRRITATION. MAY BE HARMFUL IF ABSORBED THROUGH
SKIN. MAY BE HARMFUL IF INHALED/SWALLOWED. CAN BE IRRITATING TO MUCOUS
MEMBRANES. PROLONGED EXPOSURE MAY CAUSE NAUSEA, HEADACHE, DIZZINESS AND/OR
EYE DAMAGE. CAN CAUSE NERVOUS SYSTEM INJURY. DUST AND/OR VAPORS CAN CAUSE
IRRITATION TO RESPIRATORY TRACT. CHRONIC:NONE LISTED BY MANUFACTURER.
Protect Eye: Y
Protect Skin: Y
Protect Respiratory: Y
Label Name: CHEM SERVICE INC
Label Street: 660 TOWER LANE
Label P.O. Box: 3108
Label City: WEST CHESTER
Label State: PA
Label Zip Code: 19381-3108
Label Country: US
Label Emergency Number: 215-692-3026

International Chemical Safety Cards

ETHYL METHACRYLATE

ICSC: 0272

| ETHYL METHACRYLATE Ethyl-2-methyl-2-propenoate Ethyl-2-methylacrylate $\text{CH}_2=\text{C}(\text{CH}_3)\text{COO}(\text{C}_2\text{H}_5)$ Molecular mass: 114.2 | | | |
|--|---|--|---|
| CAS # 97-63-2 RTECS # OZ4550000 ICSC # 0272 UN # 2277 EC # 607-071-00-2 | | | |
| TYPES OF HAZARD/ EXPOSURE | ACUTE HAZARDS/ SYMPTOMS | PREVENTION | FIRST AID/ FIRE FIGHTING |
| FIRE | Highly flammable. | NO open flames, NO sparks, and NO smoking. NO contact with strong oxidants. | Powder, AFFF, foam, carbon dioxide. |
| EXPLOSION | Vapour/air mixtures are explosive. | Closed system, ventilation, explosion-proof electrical equipment and lighting. Do NOT use compressed air for filling, discharging, or handling. | In case of fire: keep drums, etc., cool by spraying with water. Combat fire from a sheltered position. |
| EXPOSURE | | PREVENT GENERATION OF MISTS! | IN ALL CASES CONSULT A DOCTOR! |
| • INHALATION | Burning sensation. Cough. Dizziness. Drowsiness. Headache. Nausea. Unconsciousness. | Ventilation. Local exhaust or breathing protection. | Fresh air, rest. Artificial respiration if indicated. Refer for medical attention. |
| • SKIN | Dry skin. Redness. Roughness. Burning sensation. | Protective clothing. | Remove contaminated clothes. Rinse and then wash skin with water and soap. Refer for medical attention. |
| • EYES | Tearing. Redness. Pain. | Safety goggles. | First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor. |
| • INGESTION | Confusion. Vomiting (further see Inhalation). | Do not eat, drink, or smoke during work. | Rinse mouth. Refer for medical attention. |
| SPILLAGE DISPOSAL | STORAGE | PACKAGING & LABELLING | |
| Evacuate danger area! Consult an expert! Ventilation. Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert absorbent and remove to safe place (extra personal protection: A/P2 filter respirator for organic vapour and harmful dust). | Fireproof. Separated from strong oxidants. Cool. Dry. Keep in the dark. Store only if stabilized. | F symbol Xi symbol R: 11-36/37/38-43 S: 9-16-29-33 UN Hazard Class: 3 UN Packing Group: II | |
| SEE IMPORTANT INFORMATION ON BACK | | | |
| ICSC: 0272 | | Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities © IPCS CEC 1993 | |

International Chemical Safety Cards

ETHYL METHACRYLATE

ICSC: 0272

| | | |
|--|---|---|
| I M P O R T A N T D A T A | <p>PHYSICAL STATE; APPEARANCE: COLOURLESS LIQUID, WITH CHARACTERISTIC ODOUR.</p> <p>PHYSICAL DANGERS: The vapour mixes well with air, explosive mixtures are easily formed.</p> <p>CHEMICAL DANGERS: The substance may polymerize violently due to warming and under the influence of light or when in contact with strong oxidants.</p> <p>OCCUPATIONAL EXPOSURE LIMITS (OELs): TLV not established.</p> | <p>ROUTES OF EXPOSURE: The substance can be absorbed into the body by inhalation of its vapour.</p> <p>INHALATION RISK: A harmful contamination of the air can be reached rather quickly on evaporation of this substance at 20°C.</p> <p>EFFECTS OF SHORT-TERM EXPOSURE: Tear drawing. The substance irritates the eyes, the skin and the respiratory tract.</p> <p>EFFECTS OF LONG-TERM OR REPEATED EXPOSURE: Repeated or prolonged contact with skin may cause dermatitis. Repeated or prolonged contact may cause skin sensitization.</p> |
| | <p>PHYSICAL PROPERTIES</p> <p>Boiling point: 117°C Melting point: <-75°C Relative density (water = 1): 0.91 Solubility in water: poor Vapour pressure, kPa at 20°C: 2 Relative vapour density (air = 1): 3.9</p> | <p>Relative density of the vapour/air-mixture at 20°C (air = 1): 1.01 Flash point: 20°C (o.c.) Auto-ignition temperature: 393°C Explosive limits, vol% in air: 1.8 - saturation Octanol/water partition coefficient as log Pow: 1.94</p> |
| ENVIRONMENTAL DATA | | |
| NOTES | | |
| An added stabilizer or inhibitor can influence the toxicological properties of this substance, consult an expert. NFPA Code: H 2; F 3; R 0; | | |
| ADDITIONAL INFORMATION | | |
| | | |
| ICSC: 0272 | | ETHYL METHACRYLATE |
| © IPCS, CEC, 1993 | | |
| IMPORTANT LEGAL NOTICE: | Neither the CEC or the IPCS nor any person acting on behalf of the CEC or the IPCS is responsible for the use which might be made of this information. This card contains the collective views of the IPCS Peer Review Committee and may not reflect in all cases all the detailed requirements included in national legislation on the subject. The user should verify compliance of the cards with the relevant legislation in the country of use. | |

ALDRICH CHEMICAL -- IODOMETHANE, 99.5%, 28956-6
MATERIAL SAFETY DATA SHEET
NSN: 681000N074543
Manufacturer's CAGE: 60928
Part No. Indicator: A
Part Number/Trade Name: IODOMETHANE, 99.5%, 28956-6

=====
General Information
=====

Company's Name: ALDRICH CHEMICAL CO INC
Company's P. O. Box: 355
Company's City: MILWAUKEE
Company's State: WI
Company's Country: US
Company's Zip Code: 53201
Company's Emerg Ph #: 414-273-3850
Company's Info Ph #: 414-273-3850
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SMJ
Date MSDS Prepared: 13JUN96
Safety Data Review Date: 12NOV96
MSDS Serial Number: CCRVV

=====
Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: METHANE, IODO-; (IODOMETHANE) (SARA 313) (CERCLA) LD50: (ORAL,
RAT) 76 MG/KG
Ingredient Sequence Number: 01
Percent: 99.5
NIOSH (RTECS) Number: PA9450000
CAS Number: 74-88-4
OSHA PEL: 5 PPM, S
ACGIH TLV: 2 PPM, S

=====
Physical/Chemical Characteristics
=====

Appearance And Odor: COLORLESS LIQUID.
Boiling Point: >106F, >41C
Melting Point: -83F, -64C
Vapor Pressure (MM Hg/70 F): SUPDAT
Vapor Density (Air=1): 4.89
Specific Gravity: 2.280

=====
Fire and Explosion Hazard Data
=====

Flash Point: NONE
Extinguishing Media: WATER SPRAY. CARBON DIOXIDE, DRY CHEMICAL POWDER OR
APPROPRIATE FOAM.
Special Fire Fighting Proc: USE NIOSH APPROVED SCBA AND FULL PROTECTIVE
EQUIPMENT (FP N). COMBUSTIBLE.
Unusual Fire And Expl Hazrds: EMITS TOXIC FUMES UNDER FIRE CONDITIONS.

=====
Reactivity Data
=====

Stability: YES
Cond To Avoid (Stability): MAY DISCOLOR ON EXPOSURE TO LIGHT. SENSITIVE TO
MOISTURE.
Materials To Avoid: STRONG OXIDIZING AGENTS, STRONG BASES.
Hazardous Decomp Products: TOXIC FUMES OF CARBON MONOXIDE, CARBON DIOXIDE,
HYDROGEN IODIDE.
Hazardous Poly Occur: NO

=====
Disposal Data
==========
Label Data
=====

Label Required: YES
Technical Review Date: 12NOV96
Label Date: 08NOV96
Label Status: G
Common Name: IODOMETHANE, 99.5%, 28956-6
Chronic Hazard: YES
Signal Word: DANGER!
Acute Health Hazard-Severe: X
Contact Hazard-Severe: X
Fire Hazard-None: X
Reactivity Hazard-Slight: X
MAY BE FATAL IF INHALED, SWALLOWED OR ABSORBED THRU SKIN. CAUSES SEVERE IRRITATION. HIGH CONCS ARE EXTREMELY DESTRUCTIVE TO TISSUES OF MUCOUS MEMBRANES, UPPER RESPIRATORY TRACT, EYES AND SKIN. SYMPTOMS INCLUDE BURNING SENSATION, COUGHING, WHEEZING, LARYNGITIS, SHORTNESS OF BREATH, HEADACHE, NAUSEA, VOMITING, BLISTERS, ALLERGIC RESPIRATORY AND SKIN REACTIONS, BLURRED VISION, WEAKNESS, DROWSINESS, ATAXIA, CONFUSION, CONVULSIONS, NARCOTIC EFFECT, PULMONARY EDEMA. CHRONIC: CARCINOGEN. MAY ALTER GENETIC MATERIAL. REPRODUCTIVE DISORDERS IN LAB ANIMALS. TARGET ORGANS: CNS, LIVER, KIDNEYS, THYROID, LUNGS.
Protect Eye: Y
Protect Skin: Y
Protect Respiratory: Y
Label Name: ALDRICH CHEMICAL CO INC
Label P.O. Box: 355
Label City: MILWAUKEE
Label State: WI
Label Zip Code: 53201
Label Country: US
Label Emergency Number: 414-273-3850

International Chemical Safety Cards

ISOPROPYLBENZENE

ICSC: 0170

| ISOPROPYLBENZENE Cumene (1-Methylethyl)benzene 2-Phenylpropane $C_9H_{12}/C_6H_5CH(CH_3)_2$ Molecular mass: 120.2 | | | |
|--|---|--|---|
| CAS # 98-82-8 0 RTECS # GR8575000 ICSC # 0170 UN # 1918 EC # 601-024-00-X | | | |
| TYPES OF HAZARD/ EXPOSURE | ACUTE HAZARDS/ SYMPTOMS | PREVENTION | FIRST AID/ FIRE FIGHTING |
| FIRE | Flammable. | NO open flames, NO sparks, and NO smoking. | Powder, AFFF, foam, carbon dioxide. |
| EXPLOSION | Above 31°C explosive vapour/air mixtures may be formed. | Above 31°C use a closed system, ventilation, and explosion-proof electrical equipment. Prevent build-up of electrostatic charges (e.g., by grounding). | In case of fire: keep drums, etc., cool by spraying with water. |
| EXPOSURE | | PREVENT GENERATION OF MISTS! | |
| • INHALATION | Ataxia. Cough. Dizziness. Drowsiness. Headache. Sore throat. Unconsciousness. | Ventilation, local exhaust, or breathing protection. | Fresh air, rest. Half-upright position. Refer for medical attention. |
| • SKIN | Dry skin. | Protective gloves. Protective clothing. | Remove contaminated clothes. Rinse and then wash skin with water and soap. |
| • EYES | Redness. Pain. | Safety spectacles. | First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor. |
| • INGESTION | (further see Inhalation). | Do not eat, drink, or smoke during work. | Rinse mouth. Do NOT induce vomiting. Refer for medical attention. |
| SPILLAGE DISPOSAL | STORAGE | PACKAGING & LABELLING | |
| Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert absorbent and remove to safe place. Do NOT let this chemical enter the environment (extra personal protection: A/P2 filter respirator for organic vapour and harmful dust). | Fireproof. Separated from strong oxidants, acids. Cool. Keep in the dark. Store only if stabilized. | Xi symbol R: 10-37 S: (2) Note: C UN Hazard Class: 3 UN Packing Group: III Marine pollutant. | |
| SEE IMPORTANT INFORMATION ON BACK | | | |
| ICSC: 0170 | | Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities © IPCS CEC 1993 | |

International Chemical Safety Cards

ISOPROPYLBENZENE

ICSC: 0170

| | | |
|---|--|--|
| <p style="text-align: center;">I M P O R T A N T D A T A</p> | <p>PHYSICAL STATE; APPEARANCE: COLOURLESS LIQUID, WITH CHARACTERISTIC ODOUR.</p> <p>PHYSICAL DANGERS: As a result of flow, agitation, etc., electrostatic charges can be generated.</p> <p>CHEMICAL DANGERS: The substance can form explosive peroxides. Reacts violently with acids and strong oxidants causing fire and explosion hazard.</p> <p>OCCUPATIONAL EXPOSURE LIMITS (OELs): TLV: 50 ppm; 246 mg/m³ (skin) (ACGIH 1993).</p> | <p>ROUTES OF EXPOSURE: The substance can be absorbed into the body by inhalation and through the skin.</p> <p>INHALATION RISK: A harmful contamination of the air will be reached rather slowly on evaporation of this substance at 20°C.</p> <p>EFFECTS OF SHORT-TERM EXPOSURE: The substance irritates the eyes and the respiratory tract. Swallowing the liquid may cause aspiration into the lungs with the risk of chemical pneumonitis. The substance may cause effects on the central nervous system. Exposure far above the OEL may result in unconsciousness.</p> <p>EFFECTS OF LONG-TERM OR REPEATED EXPOSURE: Repeated or prolonged contact with skin may cause dermatitis.</p> |
| <p style="text-align: center;">PHYSICAL PROPERTIES</p> | <p>Boiling point: 152°C Melting point: -96°C Relative density (water = 1): 0.90 Solubility in water: none Vapour pressure, Pa at 20°C: 427 Relative vapour density (air = 1): 4.2</p> | <p>Relative density of the vapour/air-mixture at 20°C (air = 1): 1.01 Flash point: 31°C Auto-ignition temperature: 420°C Explosive limits, vol% in air: 0.9-6.5 Octanol/water partition coefficient as log Pow: 3.66</p> |
| <p style="text-align: center;">ENVIRONMENTAL DATA</p> | <p>This substance may be hazardous to the environment; special attention should be given to water organisms, and birds.</p> | |
| <p>NOTES</p> | | |
| <p>An added stabilizer or inhibitor can influence the toxicological properties of this substance, consult an expert. Check for peroxides prior to distillation; eliminate if found.</p> <p style="text-align: right;">Transport Emergency Card: TEC (R)-594 NFPA Code: H2; F3; R0</p> | | |
| <p>ADDITIONAL INFORMATION</p> | | |
| | | |
| <p>ICSC: 0170</p> | <p>© IPCS, CEC, 1993</p> | <p>ISOPROPYLBENZENE</p> |
| <p style="text-align: center;">IMPORTANT LEGAL NOTICE:</p> | <p>Neither the CEC or the IPCS nor any person acting on behalf of the CEC or the IPCS is responsible for the use which might be made of this information. This card contains the collective views of the IPCS Peer Review Committee and may not reflect in all cases all the detailed requirements included in national legislation on the subject. The user should verify compliance of the cards with the relevant legislation in the country of use.</p> | |

2-Methylnaphthalene, 95-97%
ACROS97103

**** SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION ****

MSDS Name: 2-Methylnaphthalene, 95-97%

Catalog Numbers:

AC127170000, AC127170050, AC127175000

Synonyms:

Company Identification (Europe): Acros Organics N.V.
Janssen Pharmaceuticaaan 3a
2440 Geel, Belgium

Company Identification (USA): Acros Organics
One Reagent Lane
Fairlawn, NJ 07410

For information in North America, call: 800-ACROS-01

For information in Europe, call: 0032(0) 14575211

For emergencies in the US, call CHEMTREC: 800-424-9300

For emergencies in Europe, call: 0032(0) 14575299

**** SECTION 2 - COMPOSITION, INFORMATION ON INGREDIENTS ****

| CAS# | Chemical Name | % | EINECS# |
|---------|---------------------|---------|-----------|
| 91-57-6 | 2-Methylnaphthalene | 95-97.0 | 202-078-3 |

Hazard Symbols: XN

Risk Phrases: 22

**** SECTION 3 - HAZARDS IDENTIFICATION ****

EMERGENCY OVERVIEW

Appearance: Not available.

Caution! Causes skin irritation. May cause allergic skin reaction.

May be harmful if swallowed. May cause respiratory and digestive tract irritation. Causes eye irritation.

Target Organs: None.

Potential Health Effects

Eye:

Causes eye irritation.

Skin:

Causes skin irritation. May cause photosensitization in certain individuals.

Ingestion:

May be harmful if swallowed.

Inhalation:

Inhalation of dust may cause respiratory tract irritation.

Chronic:

No information found.

**** SECTION 4 - FIRST AID MEASURES ****

Eyes:

Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin:

Get medical aid. Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion:

If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation:

Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician:

Treat symptomatically and supportively.

**** SECTION 5 - FIRE FIGHTING MEASURES ****

General Information:

As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Dusts at sufficient concentrations can form explosive mixtures with air. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media:

In case of fire use water spray, dry chemical, carbon dioxide, or chemical foam.

**** SECTION 6 - ACCIDENTAL RELEASE MEASURES ****

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks:

Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions. Provide ventilation.

**** SECTION 7 - HANDLING and STORAGE ****

Handling:

Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage:

Keep container closed when not in use. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

**** SECTION 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION ****

Engineering Controls:

Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

| Chemical Name | ACGIH | NIOSH | OSHA - Final PELs |
|---------------------|-------------|-------------|-------------------|
| 2-Methylnaphthalene | none listed | none listed | none listed |

OSHA Vacated PELs:

2-Methylnaphthalene:

No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes:

Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin:

Wear appropriate protective gloves to prevent skin exposure.

Clothing:

Wear appropriate protective clothing to prevent skin exposure.

Respirators:

Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

**** SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES ****

Physical State: Solid
Appearance: Not available.
Odor: None reported
pH: Not available.
Vapor Pressure: < 1 mm Hg @25c
Vapor Density: Not available.
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: 241.1 deg C
Freezing/Melting Point: 37-38c
Autoignition Temperature: Not available.
Flash Point: Not available.
NFPA Rating: (est.) Health: 1; Flammability: 1; Reactivity: 0
Explosion Limits, Lower: Not available.
Upper: Not available.
Decomposition Temperature:
Solubility: Insoluble.
Specific Gravity/Density: 1.0000g/cm3
Molecular Formula: C11H10
Molecular Weight: 142.20

**** SECTION 10 - STABILITY AND REACTIVITY ****

Chemical Stability:
Stable under normal temperatures and pressures.
Conditions to Avoid:
Incompatible materials, dust generation, strong oxidants.
Incompatibilities with Other Materials:
Strong oxidizing agents.
Hazardous Decomposition Products:
Carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.
Hazardous Polymerization: Has not been reported.

**** SECTION 11 - TOXICOLOGICAL INFORMATION ****

RTECS#:
CAS# 91-57-6: QJ9635000
LD50/LC50:
CAS# 91-57-6: Oral, mouse: LD50 = 1279 mg/kg; Oral, rat: LD50 = 1630 mg/kg.
Carcinogenicity:
2-Methylnaphthalene -
Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.

**** SECTION 12 - ECOLOGICAL INFORMATION ****

**** SECTION 13 - DISPOSAL CONSIDERATIONS ****

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste.
US EPA guidelines for the classification determination are listed in 40 CFR Part 261. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.
RCRA P-Series: None listed.
RCRA U-Series: None listed.

**** SECTION 14 - TRANSPORT INFORMATION ****

US DOT
No information available
Canadian TDG
Shipping Name: CAESIUM HYDROXIDE SOLUTION
Hazard Class: 8
UN Number: UN2681

**** SECTION 15 - REGULATORY INFORMATION ****

US FEDERAL

TSCA

CAS# 91-57-6 is listed on the TSCA inventory.
Health & Safety Reporting List
None of the chemicals are on the Health & Safety Reporting List.
Chemical Test Rules
None of the chemicals in this product are under a Chemical Test Rule.
Section 12b
None of the chemicals are listed under TSCA Section 12b.
TSCA Significant New Use Rule
None of the chemicals in this material have a SNUR under TSCA.

SARA

Section 302 (RQ)
None of the chemicals in this material have an RQ.
Section 302 (TPQ)
None of the chemicals in this product have a TPQ.
SARA Codes
CAS # 91-57-6: acute.
Section 313
No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.
This material does not contain any Class 1 Ozone depleters.
This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.
None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

2-Methylnaphthalene is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California No Significant Risk Level:

None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols: XN

Risk Phrases:

R 22 Harmful if swallowed.

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 91-57-6: No information available.

United Kingdom Occupational Exposure Limits

Canada

CAS# 91-57-6 is listed on Canada's DSL/NDSL List.
This product has a WHMIS classification of D2A.
CAS# 91-57-6 is not listed on Canada's Ingredient Disclosure List.

Exposure Limits

CAS# 91-57-6: OEL-RUSSIA:STEL 20 mg/m3

**** SECTION 16 - ADDITIONAL INFORMATION ****

MSDS Creation Date: 7/15/1998 Revision #1 Date: 8/02/2000

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no way shall the company be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if the company has been advised of the possibility of such damages.

SIGMA CHEMICAL -- 58600 4-METHYL-2-PENTANONE
MATERIAL SAFETY DATA SHEET
NSN: 681000F045354
Manufacturer's CAGE: 21076
Part No. Indicator: A
Part Number/Trade Name: 58600 4-METHYL-2-PENTANONE

=====
General Information
=====

Company's Name: SIGMA CHEMICAL COMPANY
Company's Street: 3050 SPRUCE ST
Company's P. O. Box: 14508
Company's City: SAINT LOUIS
Company's State: MO
Company's Country: US
Company's Zip Code: 63178-5000
Company's Emerg Ph #: 314-771-5765/800-325-3010
Company's Info Ph #: 314-771-5765/800-325-3010
Distributor/Vendor # 1: ALDRICH CHEMICAL CO SUB OF SIGMA-ALDRICH
Distributor/Vendor # 1 Cage: 60928
Distributor/Vendor # 2: FLUKA CHEMICAL CORP
Distributor/Vendor # 2 Cage: 63181
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SE
Date MSDS Prepared: 01AUG95
Safety Data Review Date: 06DEC95
Preparer's Company: SIGMA CHEMICAL COMPANY
Preparer's St Or P. O. Box: 3050 SPRUCE ST
Preparer's City: SAINT LOUIS
Preparer's State: MO
Preparer's Zip Code: 63178-5000
MSDS Serial Number: BYLNP

=====
Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: HEXONE, METHYL ISOBUTYL KETONE (MIBK), 4-METHYL-2-PENTANONE
Ingredient Sequence Number: 01
NIOSH (RTECS) Number: SA9275000
CAS Number: 108-10-1
OSHA PEL: 410 MG/CUM
ACGIH TLV: 205 MG/CUM
Other Recommended Limit: 50 PPM

=====
Physical/Chemical Characteristics
=====

Appearance And Odor: COLORLESS LIQUID
Boiling Point: 242.6-244F
Melting Point: -112F
Vapor Pressure (MM Hg/70 F): 15
Vapor Density (Air=1): 3.5
Specific Gravity: 0.801

=====
Fire and Explosion Hazard Data
=====

Flash Point: 56F
Lower Explosive Limit: 1.2
Upper Explosive Limit: 8
Extinguishing Media: CO2, DRY CHEMICAL POWDER/APPROPRIATE FOAM. WATER MAY BE EFFECTIVE FOR COOLING, BUT MAY NOT EFFECT EXTINGUISHMENT.
Special Fire Fighting Proc: WEAR SCBA & PROTECTIVE CLOTHING. USE WATER SPRAY TO COOL FIRE-EXPOSED CONTAINERS. PREVENT CONTACT W/SKIN & EYES.

Unusual Fire And Expl Hazrds: FLAMMABLE. VAPOR MAY TRAVEL A LONG DISTANCE TO SOURCES OF IGNITION & FLASH BACK. CONTAINER EXPLOSION MAY OCCUR UNDER FIRE CONDITIONS. (SEE SUPP)

Reactivity Data

Stability: YES

Cond To Avoid (Stability): HEAT, SPARKS, OPEN FLAMES & OTHER SOURCES OF IGNITION, STATIC DISCHARGE.

Materials To Avoid: OXIDIZING AGENTS, REDUCING AGENTS, STRONG BASES.

Hazardous Decomp Products: CO, CO2

Hazardous Poly Occur: NO

Health Hazard Data

LD50-LC50 Mixture: ORAL LD50(RAT): 2080 MG/KG (SEE SUPP)

Route Of Entry - Inhalation: YES

Route Of Entry - Skin: YES

Route Of Entry - Ingestion: YES

Health Haz Acute And Chronic: MAY BE HARMFUL BY INHALATION, INGESTION/SKIN ABSORPTION. EYES/SKIN: IRRITATION. INHALATION: IRRITATING TO MUCOUS MEMBRANES & UPPER RESPIRATORY TRACT.

Carcinogenicity - NTP: NO

Carcinogenicity - IARC: NO

Carcinogenicity - OSHA: NO

Explanation Carcinogenicity: NONE

Signs/Symptoms Of Overexp: IRRITATION.

Emergency/First Aid Proc: EYES/SKIN: IMMEDIATELY FLUSH W/COPIOUS AMOUNTS OF WATER FOR 15 MINS. INHALATION: REMOVE TO FRESH AIR. GIVE CPR/ OXYGEN IF NEEDED. INGESTION: WASH OUT MOUTH W/WATER IF CONSCIOUS. OBTAIN MEDICAL ATTENTION IN ALL CASES.

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: EVACUATE AREA. SHUT OFF SOURCES OF IGNITION. WEAR SCBA, RUBBER BOOTS & HEAVY RUBBER GLOVES. COVER W/AN ACTIVATED CARBON ABSORBENT, TAKE UP & PLACE IN CLOSED CONTAINERS. TRANSPORT OUTDOORS. VENTILATE AREA & WASH SITE AFTER MATERIAL PICKUP IS COMPLETE.

Waste Disposal Method: BURN IN A CHEMICAL INCINERATOR EQUIPPED W/AN AFTERBURNER & SCRUBBER BUT EXERT EXTRA CARE IN IGNITING AS THIS MATERIAL IS HIGHLY FLAMMABLE. DISPOSE OF IAW/FEDERAL, STATE & LOCAL REGULATIONS.

Precautions-Handling/Storing: KEEP TIGHTLY CLOSED. KEEP AWAY FROM HEAT, SPARKS & OPEN FLAME. STORE IN A COOL DRY PLACE. USE NONSPARKING TOOLS.

Other Precautions: DON'T BREATHE VAPOR. AVOID CONTACT W/EYES, SKIN & CLOTHING. HARMFUL LIQUID. TAKE PRECAUTIONARY MEASURES AGAINST STATIC DISCHARGES.

Control Measures

Respiratory Protection: WEAR APPROPRIATE NIOSH/MSHA APPROVED RESPIRATOR.

Ventilation: MECHANICAL EXHAUST: REQUIRED

Protective Gloves: CHEMICAL RESISTANT

Eye Protection: SAFETY GOGGLES

Other Protective Equipment: PROTECTIVE CLOTHING, GLOVES & EYE/FACE PROTECTION.

Work Hygienic Practices: REMOVE/LAUNDER CONTAMINATED CLOTHING BEFORE REUSE. WASH THOROUGHLY AFTER HANDLING.

Suppl. Safety & Health Data: FORMS EXPLOSIVE MIXTURES IN AIR. THIS ORAL LD50 INFORMATION IS FOR 4-METHYL-2-PENTANONE.

Transportation Data

Disposal Data

=====
=====
Label Data
=====

Label Required: YES

Label Status: G

Common Name: 58600 4-METHYL-2-PENTANONE

Special Hazard Precautions: MAY BE HARMFUL BY INHALATION, INGESTION/SKIN
ABSORPTION. EYES/SKIN: IRRITATION. INHALATION: IRRITATING TO MUCOUS
MEMBRANES & UPPER RESPIRATORY TRACT. IRRITATION.

Label Name: SIGMA CHEMICAL COMPANY

Label Street: 3050 SPRUCE ST

Label P.O. Box: 14508

Label City: SAINT LOUIS

Label State: MO

Label Zip Code: 63178-5000

Label Country: US

Label Emergency Number: 314-771-5765/800-325-3010

ULTRA SCIENTIFIC -- PPM-508 METHOD 508 IN METHYL TERT-BUTYL ETHER - LABORATORY PER
 MATERIAL SAFETY DATA SHEET
 NSN: 681000F038187
 Manufacturer's CAGE: 0MU35
 Part No. Indicator: A
 Part Number/Trade Name: PPM-508 METHOD 508 IN METHYL TERT-BUTYL ETHER

=====
 General Information
 =====

Item Name: LABORATORY PERFORMANCE CHECK MIXTURE
 Company's Name: ULTRA SCIENTIFIC
 Company's Street: 250 SMITH STREET
 Company's City: NORTH KINGSTOWN
 Company's State: RI
 Company's Country: US
 Company's Zip Code: 02852-5000
 Company's Emerg Ph #: 401-294-9400
 Company's Info Ph #: 401-294-9400
 Record No. For Safety Entry: 001
 Tot Safety Entries This Stk#: 001
 Status: SE
 Date MSDS Prepared: 01FEB95
 Safety Data Review Date: 02FEB95
 Preparer's Company: ULTRA SCIENTIFIC
 Preparer's St Or P. O. Box: 250 SMITH STREET
 Preparer's City: NORTH KINGSTOWN
 Preparer's State: RI
 Preparer's Zip Code: 02852-5000
 MSDS Serial Number: BWKTS

=====
 Ingredients/Identity Information
 =====

Proprietary: NO
 Ingredient: METHYL TERT BUTYL ETHER (MTBE), 2-METHOXY-2-METHYL PROPANE
 Ingredient Sequence Number: 01
 Percent: 99.999
 NIOSH (RTECS) Number: KN5250000
 CAS Number: 1634-04-4

Proprietary: NO
 Ingredient: CHLOROTHALONIL; TETRACHLOROISOPHTHALONITRILE; DACONIL; BRAVO
 Ingredient Sequence Number: 02
 Percent: <0.001
 NIOSH (RTECS) Number: NT2600000
 CAS Number: 1897-45-6

Proprietary: NO
 Ingredient: CHLORPYRIFOS (O,O,-DIETHYL-O-, 3,5,6-TRICHLORO-2-PYRIDYL
 PHOSPHOROTHIOATE)
 Ingredient Sequence Number: 03
 Percent: <0.001
 NIOSH (RTECS) Number: TF6300000
 CAS Number: 2921-88-2
 OSHA PEL: 0.2 MG/CUM (SKIN)
 ACGIH TLV: 0.2 MG/CUM (SKIN)

Proprietary: NO
 Ingredient: DIMETHYL-2,3,5,6-TETRACHLOROTEREPHTHALATE, CHLORTHAL-DIMETHYL
 Ingredient Sequence Number: 04
 Percent: <0.001
 NIOSH (RTECS) Number: WZ1500000
 CAS Number: 1861-32-1

Proprietary: NO
Ingredient: LINDANE, G-BHC, CYCLOHEXANE,1,2,3,4,5,6-HEXACHLORO (SUSPECTED HUMAN CARC-NTP, SUSPECTED ANIMAL CARC-IARC) *94-4*
Ingredient Sequence Number: 05
Percent: <0.001
NIOSH (RTECS) Number: GV4900000
CAS Number: 58-89-9
OSHA PEL: 0.5 MG/CUM (SKIN)
ACGIH TLV: 0.5 M/CUM (SKIN)

Physical/Chemical Characteristics

Appearance And Odor: LIQUID

Fire and Explosion Hazard Data

Extinguishing Media: CO2, DRY CHEMICAL POWDER, WATER SPRAY
Unusual Fire And Expl Hazrds: COMBUSTIBLE

Reactivity Data

Stability: YES
Materials To Avoid: STRONG OXIDIZERS
Hazardous Poly Occur: NO

Health Hazard Data

LD50-LC50 Mixture: ORAL LD50 (RAT): 1000 MG/KG GAMMA-BHC
Route Of Entry - Inhalation: NO
Route Of Entry - Skin: NO
Route Of Entry - Ingestion: NO
Health Haz Acute And Chronic: TOXIC; IRRITATION.
Carcinogenicity - NTP: YES
Carcinogenicity - IARC: YES
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: SEE INGREDIENTS
Signs/Symptoms Of Overexp: IRRITATION.
Emergency/First Aid Proc: EYES/SKIN: FLUSH W/COPIOUS AMOUNTS OF WATER.
INHALATION: REMOVE TO FRESH AIR. GIVE OXYGEN IF NEEDED. OBTAIN MEDICAL ATTENTION IN ALL CASES.

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: A LEAKING BOTTLE MAY BE PLACED IN A PLASTIC BAG & NORMAL DISPOSAL PROCEDURES FOLLOWED. LIQUID SAMPLES MAY BE ABSORBED ON VERMICULITE/SAND.
Waste Disposal Method: BURN IN A CHEMICAL INCINERATOR EQUIPPED W/AN AFTERBURNER & SCRUBBER. DISPOSE OF IAW/FEDERAL, STATE & LOCAL REGULATIONS.
Precautions-Handling/Storing: KEEP TIGHTLY CLOSED, & STORE IN A COOL, DRY PLACE.
Other Precautions: AVOID CONTACT W/EYES, SKIN & CLOTHING. ALL CHEMICALS SHOULD BE CONSIDERED HAZARDOUS-DIRECT PHYSICAL CONTACT SHOULD BE AVOIDED. THIS MATERIAL SHOULD ONLY BE USED BY THOSE PERSONS TRAINED IN THE SAFE HANDLING OF HAZARDOUS CHEMICALS.

Control Measures

Respiratory Protection: USE APPROPRIATE OSHA/MSHA APPROVED SAFETY EQUIPMENT.
Protective Gloves: CHEMICAL RESISTANT
Eye Protection: CHEMICAL GOGGLES/FACE SHIELD
Other Protective Equipment: CHEMICAL RESISTANT CLOTHING, LABORATORY COAT, RUBBER APRON.

Transportation Data

Disposal Data

Label Data

Label Required: YES
Label Status: G
Common Name: PPM-508 METHOD 508 IN METHYL TERT-BUTYL ETHER
Special Hazard Precautions: TOXIC; IRRITATION. IRRITATION.
Label Name: ULTRA SCIENTIFIC
Label Street: 250 SMITH STREET
Label City: NORTH KINGSTOWN
Label State: RI
Label Zip Code: 02852-5000
Label Country: US
Label Emergency Number: 401-294-9400

Methylene Chloride (With Cyclohexene as Preservative)
89926

**** SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION ****

MSDS Name: Methylene Chloride (With Cyclohexene as Preservative)

Catalog Numbers:

NC9474973, NC9572204, NC9572226, XXD143CP4L, XXD143CP4L/DEL

Synonyms:

Methylene chloride; Methane dichloride; Methane, dichloro-; Methylene bichloride; Freon30

Company Identification: Fisher Scientific
1 Reagent Lane
Fairlawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

**** SECTION 2 - COMPOSITION, INFORMATION ON INGREDIENTS ****

| CAS# | Chemical Name | % | EINECS# |
|---------|--------------------|-----|-----------|
| 75-09-2 | Methylene Chloride | 100 | 200-838-9 |

Hazard Symbols: XN
Risk Phrases: 40

**** SECTION 3 - HAZARDS IDENTIFICATION ****

EMERGENCY OVERVIEW

Appearance: colorless liquid.

Warning! Mutagen. May be harmful if swallowed. This substance has caused adverse reproductive and fetal effects in animals. May cause central nervous system depression. May cause blood abnormalities. Potential cancer hazard. Causes eye and skin irritation and possible burns. Causes digestive and respiratory tract irritation with possible burns.

Target Organs: Blood, heart, central nervous system, liver, pancreas.

Potential Health Effects

Eye:

Contact with eyes may cause severe irritation, and possible eye burns.

Skin:

May be absorbed through the skin. Causes irritation with burning pain, itching, and redness. Prolonged exposure may result in skin burns.

Ingestion:

Causes gastrointestinal irritation with nausea, vomiting and diarrhea. May cause central nervous system depression, characterized by excitement, followed by headache, dizziness, drowsiness, and nausea. Advanced stages may cause collapse, unconsciousness, coma and possible death due to respiratory failure. May be harmful if swallowed.

Inhalation:

Inhalation of high concentrations may cause central nervous system effects characterized by headache, dizziness, unconsciousness and coma. Causes respiratory tract irritation. May cause narcotic effects in high concentration. Vapors may cause dizziness or suffocation. May cause blood changes. Overexposure may cause an increase in carboxyhemoglobin levels in the blood. Can produce delayed pulmonary edema.

Chronic:

Possible cancer hazard based on tests with laboratory animals. Prolonged or repeated skin contact may cause dermatitis. May cause reproductive and fetal effects. Laboratory experiments have resulted in mutagenic effects. Chronic exposure may cause lung, liver, and pancreatic tumors. May cause conjunctivitis and/or corneal burns.

**** SECTION 4 - FIRST AID MEASURES ****

Eyes:

Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately. Do NOT allow victim to rub or keep eyes closed.

Skin:

Get medical aid. Immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion:

Do NOT induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation:

Get medical aid immediately. Remove from exposure to fresh air immediately. If breathing is difficult, give oxygen. DO NOT use mouth-to-mouth respiration. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.

Notes to Physician:

Treat symptomatically and supportively.

**** SECTION 5 - FIRE FIGHTING MEASURES ****

General Information:

As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Use water spray to keep fire-exposed containers cool. Vapors mixed with air in proper proportion will propagate a flame. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas. Containers may explode when heated. Will form explosive mixtures in atmospheres having high oxygen contents.

Extinguishing Media:

For small fires, use dry chemical, carbon dioxide, or water spray. For large fires, use dry chemical, carbon dioxide, alcohol-resistant foam, or water spray. Cool containers with flooding quantities of water until well after fire is out.

**** SECTION 6 - ACCIDENTAL RELEASE MEASURES ****

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks:

Absorb spill with inert material, (e.g., dry sand or earth), then place into a chemical waste container. Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Remove all sources of ignition. Provide ventilation.

**** SECTION 7 - HANDLING and STORAGE ****

Handling:

Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Loosen closure cautiously before opening. Do not get in eyes, on skin, or on clothing. Keep container tightly closed. Avoid contact with heat, sparks and flame. Do not ingest or inhale.

Storage:

Store in a tightly closed container. Keep from contact with oxidizing materials. Store in a cool, dry, well-ventilated area away from incompatible substances. Store below 40C. Keep away from active metals.

**** SECTION 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION ****

Engineering Controls:

Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or

local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

| Exposure Limits | | | |
|--------------------|--------|--|--|
| Chemical Name | ACGIH | NIOSH | OSHA - Final PELs |
| Methylene Chloride | 50 ppm | NIOSH Potential Occupational Carcinogen - see Appendix A Potential NIOSH carcinogen. | 25 ppm TWA; 125 ppm STEL (15 min. TWA); 25 ppm TWA (8 hr.); 125 ppm STEL (15 min.); 12.5 ppm Action Level (see 29 CFR 1910.1052); effective date for respiratory protection for certain employers to |

OSHA Vacated PELs:
Methylene Chloride:
500 ppm TWA

Personal Protective Equipment

Eyes:

Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin:

Wear appropriate protective gloves to prevent skin exposure.

Clothing:

Wear appropriate protective clothing to prevent skin exposure.

Respirators:

A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.

**** SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES ****

Physical State: Liquid
Appearance: colorless liquid
Odor: ethereal odor - chloroform-like
pH: Not available.
Vapor Pressure: 350 mm Hg @ 20
Vapor Density: 2.93 (Air=1)
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: 40 deg C
Freezing/Melting Point: -97 deg C
Autoignition Temperature: 556 deg C (1,032.80 deg F)
Flash Point: Not applicable.
NFPA Rating: (est.) Health: 2; Flammability: 1; Reactivity: 0
Explosion Limits, Lower: 13 vol %
Upper: 23 vol %
Decomposition Temperature: Not available.
Solubility: Moderately soluble in water
Specific Gravity/Density: 1.33 (Water=1)
Molecular Formula: CH₂Cl₂
Molecular Weight: 84.92

**** SECTION 10 - STABILITY AND REACTIVITY ****

Chemical Stability:

Stable at room temperature in closed containers under normal storage and handling conditions. May form explosive mixtures in atmospheres having high oxygen content.

Conditions to Avoid:

Incompatible materials, excess heat, strong oxidants, active metals.

Incompatibilities with Other Materials:

Strong oxidizing agents, nitrogen tetroxide, liquid oxygen, potassium, sodium, sodium potassium alloys, N-methyl-N-nitrosourea + potassium hydroxide, potassium-tert-butoxide, powdered aluminum, powdered magnesium, nitric acid, lithium, caustics (e.g. ammonia, ammonium hydroxide, calcium hydroxide, potassium hydroxide, sodium hydroxide), Active metals (such as potassium and magnesium)..

Hazardous Decomposition Products:

Hydrogen chloride, phosgene, carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.

Hazardous Polymerization: Will not occur.

**** SECTION 11 - TOXICOLOGICAL INFORMATION ****

RTECS#:

CAS# 75-09-2: PA8050000

LD50/LC50:

CAS# 75-09-2: Inhalation, mouse: LC50 =14400 ppm/7H; Inhalation, rat: LC50 =88 gm/m3/30M; Oral, rat: LD50 = 1600 mg/kg.

Carcinogenicity:

Methylene Chloride -

ACGIH: A3 - Animal Carcinogen

California: carcinogen; initial date 4/1/88

NIOSH: occupational carcinogen

NTP: Suspect carcinogen

OSHA: Possible Select carcinogen

IARC: Group 2B carcinogen

Epidemiology:

IARC has determined there is sufficient evidence for carcinogenicity to animals but limited evidence for carcinogenicity to humans.

Teratogenicity:

Inhalation, rat: TCLo = 4500 ppm/24H (female 1-17 day(s) after conception) Effects on Newborn - behavioral.; Inhalation, rat: TCLo = 1250 ppm/7H (female 6-15 day(s) after conception) Specific Developmental Abnormalities - musculoskeletal system and urogenital system.

Reproductive Effects:

Reproductive effects have occurred in experimental animals.

Neurotoxicity:

No information available.

Mutagenicity:

DNA inhibition: Human, Fibroblast = 5000 ppm/1H (Continuous).; Morphological transformation: Rat, Embryo = 160 umol/L.; DNA damage: Oral, rat = 1275 mg/kg.; Inhalation, mouse: TCLo = 2000 ppm/5H/2Y-C (Tumorigenic - Carcinogenic by RTECS criteria--Lungs, Thorax, or Respiration - Tumors).

Other Studies:

See actual entry in RTECS for complete information.

**** SECTION 12 - ECOLOGICAL INFORMATION ****

Ecotoxicity:

Fish: Bluegill/Sunfish: 230 mg/L; 24 Hr; Static bioassay Fish: Fathead Minnow: 196 mg/L; 96 Hr This chemical has a moderate potential to affect some aquatic organisms. It is resistant to biodegradation, and has a low potential to persist in the aquatic environment. 96-hr. EC50 (loss of equilibrium); Fathead minnow: 99mg/L; 96-hr. EC10: 66.3 mg/L. Bluegill sunfish: 96-hr. LC50=220 mg/L; Water flea: 24-hr. LC50=2270 mg/L; No observed effect level:1550 mg/L.

**** SECTION 13 - DISPOSAL CONSIDERATIONS ****

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste.

US EPA guidelines for the classification determination are listed in 40 CFR Part

Additionally, waste generators must consult state and local hazardous waste regu ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: CAS# 75-09-2: waste number U080.

**** SECTION 14 - TRANSPORT INFORMATION ****

US DOT

Shipping Name: DICHLOROMETHANE

Hazard Class: 6.1

UN Number: UN1593

Packing Group: III

Canadian TDG

No information available.

**** SECTION 15 - REGULATORY INFORMATION ****

US FEDERAL

TSCA

CAS# 75-09-2 is listed on the TSCA inventory.

Health & Safety Reporting List

CAS# 75-09-2: Effective Date: October 4, 1982; Sunset Date: October 4, 1992

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

SARA

Section 302 (RQ)

CAS# 75-09-2: final RQ = 1000 pounds (454 kg)

Section 302 (TPQ)

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 75-09-2: acute, chronic.

Section 313

This material contains Methylene Chloride (CAS# 75-09-2, 100%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 372.

Clean Air Act:

CAS# 75-09-2 is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

CAS# 75-09-2 is listed as a Priority Pollutant under the Clean Water Act.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

Methylene Chloride can be found on the following state right to know lists: California, New Jersey, Florida, Pennsylvania, Minnesota, Massachusetts.

The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:

WARNING: This product contains Methylene Chloride, a chemical known to the state of California to cause cancer.

California No Significant Risk Level:

CAS# 75-09-2: no significant risk level = 50 ug/day

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols: XN

Risk Phrases:

R 40 Possible risks of irreversible effects.

Safety Phrases:

S 23C Do not breathe vapour.

S 24/25 Avoid contact with skin and eyes.
S 36/37 Wear suitable protective clothing and gloves.

WGK (Water Danger/Protection)

CAS# 75-09-2: 2

United Kingdom Occupational Exposure Limits

CAS# 75-09-2: OES-United Kingdom, TWA 100 ppm TWA; 350 mg/m3 TWA

CAS# 75-09-2: OES-United Kingdom, STEL 300 ppm STEL; 1060 mg/m3 STEL

Canada

CAS# 75-09-2 is listed on Canada's DSL/NDSL List.

This product has a WHMIS classification of D1B, D2A.

CAS# 75-09-2 is not listed on Canada's Ingredient Disclosure List.

Exposure Limits

CAS# 75-09-2: OEL-AUSTRALIA:TWA 100 ppm (350 mg/m3);Carcinogen

OEL-AUSTRIA:TWA 100 ppm (360 mg/m3)

OEL-BELGIUM:TWA 50 ppm (174 mg/m3);Carcinogen

OEL-CZECHOSLOVAKIA:TWA 500 mg/m3;STEL 2500 mg/m3

OEL-DENMARK:TWA 50 ppm (175 mg/m3);Skin;Carcinogen

OEL-FINLAND:TWA 100 ppm (350 mg/m3);STEL 250 ppm (870 mg/m3)

OEL-FRANCE:TWA 100 ppm (360 mg/m3);STEL 500 ppm (1800 mg/m3)

OEL-GERMANY:TWA 100 ppm (360 mg/m3);Carcinogen

OEL-HUNGARY:STEL 10 mg/m3;Carcinogen

OEL-JAPAN:TWA 100 ppm (350 mg/m3)

OEL-THE NETHERLANDS:TWA 100 ppm (350 mg/m3);STEL 500 ppm

OEL-THE PHILIPINES:TWA 500 ppm (1740 mg/m3)

OEL-POLAND:TWA 50 mg/m3

OEL-RUSSIA:TWA 100 ppm;STEL 50 mg/m3

OEL-SWEDEN:TWA 35 ppm (120 mg/m3);STEL 70 ppm (25 mg/m3);Skin

OEL-SWITZERLAND:TWA 100 ppm (360 mg/m3);STEL 500 ppm

OEL-THAILAND:TWA 500 mg/m3;STEL 1000 mg/m3

OEL-TURKEY:TWA 500 ppm (1740 mg/m3)

OEL-UNITED KINGDOM:TWA 100 ppm (350 mg/m3);STEL 250 ppm

OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA check ACGIH TLV

OEL IN NEW ZEALAND, SINGAPORE, VIETNAM check ACGI TLV

**** SECTION 16 - ADDITIONAL INFORMATION ****

MSDS Creation Date: 4/20/1999 Revision #2 Date: 8/02/2000

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no way shall the company be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if the company has been advised of the possibility of such damages.

POLYSCIENCE -- N-BUTYLBENZENE, 251C-11
MATERIAL SAFETY DATA SHEET
NSN: 681000N047374
Manufacturer's CAGE: 58378
Part No. Indicator: A
Part Number/Trade Name: N-BUTYLBENZENE, 251C-11

General Information

Company's Name: POLYSCIENCE
Company's Street: 7800 MERRIMAC AVE
Company's City: NILES
Company's State: IL
Company's Country: US
Company's Zip Code: 60648
Company's Emerg Ph #: 321-965-0611
Company's Info Ph #: 321-965-0611
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SMJ
Date MSDS Prepared: 01AUG92
Safety Data Review Date: 13NOV95
MSDS Serial Number: BSWMV
Hazard Characteristic Code: F4

Ingredients/Identity Information

Proprietary: NO
Ingredient: BENZENE, BUTYL-; (N-BUTYLBENZENE)
Ingredient Sequence Number: 01
NIOSH (RTECS) Number: CY9070000
CAS Number: 104-51-8
OSHA PEL: N/K (FP N)
ACGIH TLV: N/K (FP N)

Physical/Chemical Characteristics

Appearance And Odor: COLORLESS LIQUID.
Boiling Point: 361F,183C
Melting Point: -126F,-88C
Vapor Pressure (MM Hg/70 F): 1.03 @ 23C
Vapor Density (Air=1): >1
Specific Gravity: 0.86

Fire and Explosion Hazard Data

Flash Point: 139F,59C
Lower Explosive Limit: 0.8%
Upper Explosive Limit: 5.8%
Extinguishing Media: WATER SPRAY, CARBON DIOXIDE, DRY CHEMICAL POWDER OR APPROPRIATE FOAM.
Special Fire Fighting Proc: USE NIOSH/MSHA APPROVED SCBA & FULL PROTECTIVE EQUIPMENT (FP N). COMBUSTIBLE.
Unusual Fire And Expl Hazrds: NONE SPECIFIED BY MANUFACTURER.

Reactivity Data

Stability: YES
Cond To Avoid (Stability): NONE SPECIFIED BY MANUFACTURER.
Materials To Avoid: STRONG OXIDIZING AGENTS.
Hazardous Decomp Products: TOXIC FUMES OF: CARBON MONOXIDE, CARBON DIOXIDE.
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NOT RELEVANT

Signal Word: WARNING!
Acute Health Hazard-Slight: X
Contact Hazard-Slight: X
Fire Hazard-Moderate: X
Reactivity Hazard-None: X
Special Hazard Precautions: COMBUSTIBLE. ACUTE:MAY BE HARMFUL BY
NONE LISTED BY MANUFACTURER.
Protect Eye: Y
Protect Skin: Y
Protect Respiratory: Y
Label Name: POLYSCIENCE
Label Street: 7800 MERRIMAC AVE
Label City: NILES
Label State: IL
Label Zip Code: 60648
Label Country: US
Label Emergency Number: 321-965-0611

CHEM SERVICE -- 7310J N-PROPYLBENZENE - LABORATORY STANDARD
MATERIAL SAFETY DATA SHEET
NSN: 655000F037482
Manufacturer's CAGE: 8Y898
Part No. Indicator: A
Part Number/Trade Name: 7310J N-PROPYLBENZENE

=====
General Information
=====

Item Name: LABORATORY STANDARD
Company's Name: CHEM SERVICE INC
Company's Street: 660 TOWER LN
Company's P. O. Box: 3108
Company's City: WEST CHESTER
Company's State: PA
Company's Country: US
Company's Zip Code: 19381-3108
Company's Emerg Ph #: 215-692-3026/800-452-9994
Company's Info Ph #: 215-692-3026/800-452-9994
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SE
Date MSDS Prepared: 02JUL90
Safety Data Review Date: 07DEC94
Preparer's Company: CHEM SERVICE INC
Preparer's St Or P. O. Box: 660 TOWER LN
Preparer's City: WEST CHESTER
Preparer's State: PA
Preparer's Zip Code: 19381-3108
MSDS Serial Number: BWJDW

=====
Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: N-PROPYLBENZENE
Ingredient Sequence Number: 01
NIOSH (RTECS) Number: DA8750000
CAS Number: 103-65-1

=====
Physical/Chemical Characteristics
=====

Appearance And Odor: COLORLESS LIQUID
Boiling Point: 318.56F
Melting Point: -147.1F
Solubility In Water: INSOLUBLE

=====
Fire and Explosion Hazard Data
=====

Flash Point: 116.6F
Extinguishing Media: CO2, DRY CHEMICAL POWDER/SPRAY.
Unusual Fire And Expl Hazrds: COMBUSTIBLE COMPOUND. SENSITIVE TO HEAT.

=====
Reactivity Data
=====

Stability: YES
Cond To Avoid (Stability): HEAT.
Materials To Avoid: STRONG OXIDIZING AGENTS.
Hazardous Decomp Products: TOXIC FUMES.
Hazardous Poly Occur: NO

=====
Health Hazard Data
=====

LD50-LC50 Mixture: ORAL LD50 (RAT/MOUSE): 6040 MG/KG

Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: EYES: CAN CAUSE IRRITATION. SKIN: CAN CAUSE IRRITATION. HARMFUL IF ABSORBED. INHALATION: HARMFUL. DUST &/VAPORS CAN CAUSE RESPIRATORY TRACT IRRITATION. INGESTION: HARMFUL. CAN BE IRRITATING TO MUCOUS MEMBRANES.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NONE
Signs/Symptoms Of Overexp: IRRITATION.
Emergency/First Aid Proc: N-HEXANE-EYES: FLUSH CONTINUOUSLY W/WATER FOR 15-20 MINS. SKIN: FLUSH W/WATER FOR 15-20 MINS. IF NOT BURNED, WASH W/ SOAP & WATER. INHALATION: REMOVE TO FRESH AIR. GIVE CPR/OXYGEN IF NEEDED. KEEP WARM & QUIET. INGESTION: DON'T INDUCE VOMITING/GIVE LIQUIDS IF UNCONSCIOUS/CONVULSIVE. IF VOMITING, WATCH CLOSELY FOR ANY AIRWAY OBSTRUCTION. OBTAIN MEDICAL ATTENTION IN ALL CASES.

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: EVACUATE AREA. WEAR APPROPRIATE OSHA REGULATED EQUIPMENT. VENTILATE AREA. ABSORB ON VERMICULITE/SIMILAR MATERIAL. SWEEP UP & PLACE IN APPROPRIATE CONTAINER/HOLD FOR DISPOSAL. WASH CONTAMINATED SURFACES TO REMOVE ANY RESIDUES.
Waste Disposal Method: BURN IN A CHEMICAL INCINERATOR EQUIPPED W/AN AFTERBURNER & SCRUBBER IAW/FEDERAL, STATE & LOCAL REGULATIONS.
Precautions-Handling/Storing: STORE IN A COOL DRY PLACE ONLY W/COMPATIBLE CHEMICALS. KEEP TIGHTLY CLOSED.
Other Precautions: AVOID CONTACT W/SKIN, EYES & CLOTHING. DON'T BREATHE VAPORS. CONTACT LENSES SHOULDN'T BE WORN IN THE LABORATORY. ALL CHEMICALS SHOULD BE CONSIDERED HAZARDOUS. AVOID DIRECT PHYSICAL CONTACT.

Control Measures

Respiratory Protection: WEAR APPROPRIATE OSHA/MSHA APPROVED SAFETY EQUIPMENT.
Ventilation: CHEMICAL SHOULD BE HANDLED ONLY IN A HOOD.
Eye Protection: EYE SHIELDS

Transportation Data

Disposal Data

Label Data

Label Required: YES
Label Status: G
Common Name: 7310J N-PROPYLBENZENE
Special Hazard Precautions: EYES: CAN CAUSE IRRITATION. SKIN: CAN CAUSE IRRITATION. HARMFUL IF ABSORBED. INHALATION: HARMFUL. DUST &/VAPORS CAN CAUSE RESPIRATORY TRACT IRRITATION. INGESTION: HARMFUL. CAN BE IRRITATING TO MUCOUS MEMBRANES. IRRITATION.
Label Name: CHEM SERVICE INC
Label Street: 660 TOWER LN
Label P.O. Box: 3108
Label City: WEST CHESTER
Label State: PA
Label Zip Code: 19381-3108
Label Country: US
Label Emergency Number: 215-692-3026/800-452-9994

PETROKEM -- NAPHTHALENE (AROMATIC HYDROCARBON) - INSECTICIDE,NAPHTHA
MATERIAL SAFETY DATA SHEET
NSN: 6840005976111
Manufacturer's CAGE: 0ADH1
Part No. Indicator: A
Part Number/Trade Name: NAPHTHALENE (AROMATIC HYDROCARBON)

=====
General Information
=====

Item Name: INSECTICIDE,NAPHTHA
Company's Name: PETROKEM CORP
Company's Street: 101 OLIVER ST
Company's P. O. Box: 2155
Company's City: PATERSON
Company's State: NJ
Company's Country: US
Company's Zip Code: 07509
Company's Emerg Ph #: 201-742-6468
Company's Info Ph #: 201-742-6468/714-864-2310
Distributor/Vendor # 1: CHEMICAL COMMODITIES AGENCY, INC.
Distributor/Vendor # 1 Cage: 60777
Record No. For Safety Entry: 002
Tot Safety Entries This Stk#: 003
Status: SE
Date MSDS Prepared: 15MAR96
Safety Data Review Date: 12DEC96
Supply Item Manager: CX
MSDS Preparer's Name: C. A. EISENHARD
MSDS Serial Number: BKLJW
Spec Type, Grade, Class: CL A
Hazard Characteristic Code: F7
Unit Of Issue: LB
Unit Of Issue Container Qty: 1
Type Of Container: BOX
Net Unit Weight: 1.0 LB

=====
Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: NAPHTHALENE (SARA III)
Ingredient Sequence Number: 01
Percent: UNKNOWN
NIOSH (RTECS) Number: QJ0525000
CAS Number: 91-20-3
OSHA PEL: 10 PPM/15 STEL
ACGIH TLV: 10 PPM/15 STEL; 9192
Other Recommended Limit: NONE SPECIFIED

=====
Physical/Chemical Characteristics
=====

Appearance And Odor: WHITE SOLID, MOTH BALL ODOR
Boiling Point: 424F,218C
Melting Point: 176F,80C
Vapor Pressure (MM Hg/70 F): 0.082
Vapor Density (Air=1): 4.42
Specific Gravity: 1.145
Decomposition Temperature: UNKNOWN
Evaporation Rate And Ref: 1 (ETHER=1)
Solubility In Water: NEGLIGIBLE (0.003%)
Corrosion Rate (IPY): UNKNOWN

=====
Fire and Explosion Hazard Data
=====

Flash Point: 190F,88C
Flash Point Method: CC
Lower Explosive Limit: 0.9
Upper Explosive Limit: 5.9
Extinguishing Media: CARBON DIOXIDE, DRY CHEMICAL, FOAM AND WATER.
Special Fire Fighting Proc: SMOKE AND VAPORS FROM NAPHTHALENE FIRES SHOULD BE AVOIDED. USE SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACE- PIECE.
Unusual Fire And Expl Hazrds: REACTION BETWEEN WATER AND MOLTEN NAPHTHALENE ABOVE 230F (110C) IS VIOLENT; AVOID USE OF WATER ON HOT MOLTEN NAPHTHALENE.

=====
Reactivity Data
=====

Stability: YES
Cond To Avoid (Stability): AVOID CLOSED ROOM.
Materials To Avoid: AVOID CONTACT BETWEEN WATER AND HOT NAPHTHALENE.
Hazardous Decomp Products: NONE SPECIFIED BY MANUFACTURER.
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NOT APPLICABLE

=====
Health Hazard Data
=====

LD50-LC50 Mixture: LD50 (ORAL RAT) IS UNKNOWN
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: NO
Health Haz Acute And Chronic: CONTACT MAY CAUSE SKIN OR EYE IRRITATION.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NOT CARCINOGENIC. LOWEST PUBLISHED LETHAL HUMAN ORAL DOSE-50 MG/KG (NIOSH).
Signs/Symptoms Of Overexp: INHALATION MAY CAUSE HEADACHE, NAUSEA AND PERSPIRATION. INGESTION MAY CAUSE CRAMPS, NAUSEA, VOMITING AND DIARRHEA.
Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER.
Emergency/First Aid Proc: REMOVE CONTAMINATED CLOTHING AT ONCE. FLUSH SKIN & EYES WITH COPIOUS QUANTITIES OF WATER. SEE A PHYSICIAN IMMEDIATELY FOR BURNS, EYES, INHALATION SYSTEMS & INGESTION.

=====
Precautions for Safe Handling and Use
=====

Steps If Matl Released/Spill: SOLIDIFIED NAPHTHALENE CAN BE PICKED UP WITH BROOM AND NON-SPARKING SHOVEL. WORKERS SHOULD WEAR DUST RESPIRATOR. MOLTEN NAPHTHALENE MAY BE ALLOWED TO SOLIDIFY BEFORE BEING CLEANED UP.
Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.
Waste Disposal Method: WASTE NAPHTHALENE MAY BE INCINERATED OR BURIED AS APPLICABLE CODES AND REGULATIONS PERMIT. WORKERS SHOULD WEAR ORGANIC VAPOR/ DUST RESPIRATOR FOR LIQUID/SOLID HANDLING AND SELF-CONTAINED AIR SUPPLY AROUND BURNING NAPHTHALENE.
Precautions-Handling/Storing: MOLTEN NAPHTHALENE TANKS SHOULD BE ADEQUATELY VENTED; INERT GAS BLANKETING IS RECOMMENDED FOR STORAGE TANKS.
Other Precautions: NONE.

=====
Control Measures
=====

Respiratory Protection: NONE SPECIFIED BY MANUFACTURER.
Ventilation: LOCAL EXHAUST: EXHAUST FANS NEEDED FOR USE IN CLOSED AREAS. MECHANICAL (GENERAL) EXHAUST VENT TANKS OF MOLTEN NAPHTHALENE
Protective Gloves: RUBBER OR OTHER CHEMICAL HAND GLOVES.
Eye Protection: SAFETY GOGGLES.
Other Protective Equipment: FACE SHIELD WHEN HANDLING LIQUID, FRESH AIR MASK FOR FIRES; LOCATE SAFETY SHOWER AND WASH IN AREA.
Work Hygienic Practices: OBSERVE GOOD PERSONAL HYGIENE PRACTICES AND RECOMMENDED PROCEDURES. WASH THOROUGHLY AFTER HANDLING.

Suppl. Safety & Health Data: NONE.

=====
Transportation Data
=====

Trans Data Review Date: 96347
DOT PSN Code: JZV
DOT Proper Shipping Name: NAPHTHALENE, CRUDE OR NAPHTHALENE, REFINED
DOT Class: 4.1
DOT ID Number: UN1334
DOT Pack Group: III
DOT Label: FLAMMABLE SOLID
IMO PSN Code: KIT
IMO Proper Shipping Name: NAPHTHALENE, CRUDE OR REFINED
IMO Regulations Page Number: 4158
IMO UN Number: 1334
IMO UN Class: 4.1
IMO Subsidiary Risk Label: -
IATA PSN Code: ROD
IATA UN ID Number: 1334
IATA Proper Shipping Name: NAPHTHALENE, CRUDE
IATA UN Class: 4.1
IATA Label: FLAMMABLE SOLID
AFI PSN Code: ROD
AFI Prop. Shipping Name: NAPHTHALENE, CRUDE OR REFINED
AFI Class: 4.1
AFI ID Number: UN1334
AFI Pack Group: III
AFI Special Prov: A1
AFI Basic Pac Ref: A8.4

=====
Disposal Data
=====

=====
Label Data
=====

Label Required: YES
Technical Review Date: 12DEC96
Label Status: X *
Common Name: NAPHTHALENE (AROMATIC HYDROCARBON)
Chronic Hazard: YES
Signal Word: WARNING!
Label Name: PETROKEM CORP
Label Street: 101 OLIVER ST
Label P.O. Box: 2155
Label City: PATERSON
Label State: NJ
Label Zip Code: 07509
Label Country: US
Label Emergency Number: 201-742-6468

INSTRUMENTATION LABORATORY -- PROPYLENE GLYCOL
MATERIAL SAFETY DATA SHEET
NSN: 681000F045152
Manufacturer's CAGE: INSTR
Part No. Indicator: A
Part Number/Trade Name: PROPYLENE GLYCOL

=====
General Information
=====

Company's Name: INSTRUMENTATION LABORATORY
Company's Street: 113 HARTWELL AVE
Company's City: LEXINGTON
Company's State: MA
Company's Country: US
Company's Zip Code: 02173-3190
Company's Emerg Ph #: 617-861-0710
Company's Info Ph #: 617-861-0710
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SE
Date MSDS Prepared: 01MAR93
Safety Data Review Date: 30NOV95
Preparer's Company: INSTRUMENTATION LABORATORY
Preparer's St Or P. O. Box: 113 HARTWELL AVE
Preparer's City: LEXINGTON
Preparer's State: MA
Preparer's Zip Code: 02173-3190
MSDS Serial Number: BYLGN

=====
Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: 1,2-PROPANEDIOL (PROPYLENE GLYCOL)
Ingredient Sequence Number: 01
Percent: 100
NIOSH (RTECS) Number: TY2000000
CAS Number: 57-55-6

=====
Physical/Chemical Characteristics
=====

Appearance And Odor: COLORLESS, HYGROSCOPIC, VISCOUS LIQUID W/A SLIGHTLY
ACID TASTE
Boiling Point: 369F
Melting Point: -76F
Specific Gravity: 1
Solubility In Water: MISCIBLE

=====
Fire and Explosion Hazard Data
=====

Extinguishing Media: DRY CHEMICAL, CO2, WATER SPRAY & FOAM
Unusual Fire And Expl Hazrds: SLIGHT FIRE & EXPLOSION HAZARD UNDER NORMAL
CONDITIONS.

=====
Reactivity Data
=====

Stability: YES
Cond To Avoid (Stability): HEAT
Materials To Avoid: OXIDIZING AGENTS.
Hazardous Decomp Products: PEROXIDES & PROPIONALDEHYDE
Hazardous Poly Occur: NO

=====
Health Hazard Data
=====

LD50-LC50 Mixture: ORAL LD50 (RAT): 20GM/KG PROPYLENE GLYCOL
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: INHALATION: MAY CAUSE RESPIRATORY & THROAT IRRITATION, CNS DEPRESSION, BLOOD & KIDNEY DISORDERS. MAY CAUSE NYSTAGMUS, LYMPHOCYTOSIS. SKIN: IRRITATION & DERMATITIS, ABSORPTION. EYES: IRRITATION & CONJUNCTIVITIS. INGESTION: PULMONARY EDEMA, BRAIN DAMAGE, HYPOGLYCEMIA, INTRAVASCULAR HEMOLYSIS/DEATH MAY OCCUR.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NONE
Signs/Symptoms Of Overexp: INTOXICATION, IRRITATION, HEADACHE, DIZZINESS, DROWSINESS, UNCONSCIOUSNESS, DRYNESS, DEFATTING, REDNESS, VOMITING, CYANOSIS, TACHYPNEA, TACHYCARDIA, HYPOTENSION, MUSCLE TENDERNESS, STUPOR, ANURIA, PROSTATION, RESPIRATORY FAILURE, COMA, CONVULSIONS.
Emergency/First Aid Proc: INHALATION: REMOVE TO FRESH AIR. GIVE CPR IF NEEDED. SKIN: WASH AREA W/SOAP & LARGE AMOUNTS OF WATER. EYES: WASH IMMEDIATELY W/LARGE AMOUNTS OF WATER. INGESTION: IF CONSCIOUS, IMMEDIATELY GIVE LARGE AMOUNTS OF WATER & INDUCE VOMITING. OBTAIN MEDICAL ATTENTION IN ALL CASES.

=====

Precautions for Safe Handling and Use

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Steps If Matl Released/Spill: ABSORB W/SAND/OTHER NONCOMBUSTIBLE ABSORBANT MATERIAL & PLACE INTO CONTAINERS FOR DISPOSAL BY APPROVED METHODS.
Waste Disposal Method: DISPOSE OF IAW/FEDERAL, STATE & LOCAL REGULATIONS.
Other Precautions: DON'T WEAR CONTACT LENSES.

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Control Measures

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Protective Gloves: IMPERVIOUS
Eye Protection: SPLASH PROOF GLASSES
Other Protective Equipment: PROTECTIVE CLOTHING.
Work Hygienic Practices: REMOVE/LAUNDER CONTAMINATED CLOTHING BEFORE REUSE.

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Transportation Data

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Disposal Data

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Label Data

=====

Label Required: YES
Label Status: G
Common Name: PROPYLENE GLYCOL
Special Hazard Precautions: INHALATION: MAY CAUSE RESPIRATORY & THROAT IRRITATION, CNS DEPRESSION, BLOOD & KIDNEY DISORDERS. MAY CAUSE NYSTAGMUS, LYMPHOCYTOSIS. SKIN: IRRITATION & DERMATITIS, ABSORPTION. EYES: IRRITATION & CONJUNCTIVITIS. INGESTION: PULMONARY EDEMA, BRAIN DAMAGE, HYPOGLYCEMIA, INTRAVASCULAR HEMOLYSIS/DEATH MAY OCCUR. INTOXICATION, IRRITATION, HEADACHE, DIZZINESS, DROWSINESS, UNCONSCIOUSNESS, DRYNESS, DEFATTING, REDNESS, VOMITING, CYANOSIS, TACHYPNEA, TACHYCARDIA, HYPOTENSION, MUSCLE TENDERNESS, STUPOR, ANURIA, PROSTATION, RESPIRATORY FAILURE, COMA, CONVULSIONS.
Label Name: INSTRUMENTATION LABORATORY
Label Street: 113 HARTWELL AVE
Label City: LEXINGTON
Label State: MA
Label Zip Code: 02173-3190
Label Country: US

Label Emergency Number: 617-861-0710

Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: EYES: CAN CAUSE IRRITATION. SKIN: CAN CAUSE IRRITATION. HARMFUL IF ABSORBED. INHALATION/INGESTION: CAN BE HARMFUL. CAN BE IRRITATING TO MUCOUS MEMBRANES. THIS COMPOUND IS CONSIDERED TO BE SLIGHTLY TOXIC.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NONE
Signs/Symptoms Of Overexp: IRRITATION.
Emergency/First Aid Proc: EYES: FLUSH CONTINUOUSLY W/WATER FOR 15-20 MINS. SKIN: FLUSH W/WATER FOR 15-20 MINS. IF NOT BURNED, WASH W/SOAP & WATER TO CLEANSE. INHALATION: REMOVE TO FRESH AIR. GIVE CPR/OXYGEN IF NEEDED & CONTINUE UNTIL MEDICAL ASSISTANCE ARRIVES. OBTAIN MEDICAL ATTENTION IN ALL CASES.

=====

Precautions for Safe Handling and Use

=====

Steps If Matl Released/Spill: EVACUATE AREA. WEAR APPROPRIATE OSHA REGULATED EQUIPMENT. VENTILATE AREA. ABSORB ON VERMICULITE/SIMILAR MATERIAL. SWEEP UP & PLACE IN APPROPRIATE CONTAINER/HOLD FOR DISPOSAL. WASH CONTAMINATED SURFACES TO REMOVE ANY RESIDUES.
Waste Disposal Method: BURN IN A CHEMICAL INCINERATOR EQUIPPED W/AN AFTERBURNER & SCRUBBER IAW/FEDERAL, STATE & LOCAL REGULATIONS.
Precautions-Handling/Storing: STORE IN A COOL DRY PLACE ONLY W/COMPATIBLE CHEMICALS. KEEP TIGHTLY CLOSED.
Other Precautions: AVOID CONTACT W/SKIN, EYES & CLOTHING. DON'T BREATHE VAPORS. CONTACT LENSES SHOULDN'T BE WORN IN THE LABORATORY. ALL CHEMICALS SHOULD BE CONSIDERED HAZARDOUS. AVOID DIRECT PHYSICAL CONTACT.

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Control Measures

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Respiratory Protection: WEAR APPROPRIATE OSHA/MSHA APPROVED SAFETY EQUIPMENT.
Ventilation: CHEMICAL SHOULD BE HANDLED ONLY IN A HOOD.
Eye Protection: EYE SHIELDS
Suppl. Safety & Health Data: BOILING POINT: 343.4-345.2F.

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Transportation Data

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Disposal Data

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Label Data

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Label Required: YES
Label Status: G
Common Name: 2605F SEC-BUTYLBENZENE
Special Hazard Precautions: EYES: CAN CAUSE IRRITATION. SKIN: CAN CAUSE IRRITATION. HARMFUL IF ABSORBED. INHALATION/INGESTION: CAN BE HARMFUL. CAN BE IRRITATING TO MUCOUS MEMBRANES. THIS COMPOUND IS CONSIDERED TO BE SLIGHTLY TOXIC. IRRITATION.
Label Name: CHEM SERVICE INC
Label Street: 660 TOWER LN
Label P.O. Box: 3108
Label City: WEST CHESTER
Label State: PA
Label Zip Code: 19381-3108
Label Country: US
Label Emergency Number: 215-692-3026/800-452-9994

ARCO CHEMICAL COMPANY DIV OF ATLANTIC RICHFIE -- STYRENE MONOMER - STYRENE, ANALYT
MATERIAL SAFETY DATA SHEET
NSN: 6810009874126
Manufacturer's CAGE: 3D253
Part No. Indicator: A
Part Number/Trade Name: STYRENE MONOMER

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General Information
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Item Name: STYRENE, ANALYTICAL REAGENT
Company's Name: ARCO CHEMICAL COMPANY, DIV OF ATLANTIC RICHFIELD
Company's Street: 3801 WEST CHESTER PIKE
Company's P. O. Box: 7258
Company's City: NEWTOWN SQUARE
Company's State: PA
Company's Country: US
Company's Zip Code: 19073
Company's Emerg Ph #: 215-353-8300/800-424-9300
Company's Info Ph #: 800-321-7000
Distributor/Vendor # 1: TEXTILE CHEMICAL CO (215-926-4151)
Distributor/Vendor # 1 Cage: 2H096
Record No. For Safety Entry: 004
Tot Safety Entries This Stk#: 010
Status: SM
Date MSDS Prepared: 03JAN91
Safety Data Review Date: 25JAN94
Supply Item Manager: CX
MSDS Serial Number: BJYKX
Hazard Characteristic Code: F4
Unit Of Issue: CN
Unit Of Issue Container Qty: 1 GALLON
Type Of Container: CAN
Net Unit Weight: 7.5 LBS

=====
Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: STYRENE, MONOMER (SARA III)
Ingredient Sequence Number: 01
Percent: 99.8%
NIOSH (RTECS) Number: WL3675000
CAS Number: 100-42-5
OSHA PEL: 100 PPM
ACGIH TLV: S,50PPM/100STEL;9394
Other Recommended Limit: NONE RECOMMENDED

Proprietary: NO
Ingredient: P-TERTIARY BUTYL CATECHOL
Ingredient Sequence Number: 02
Percent: 10-60PP
NIOSH (RTECS) Number: 1010755BC
CAS Number: 98-29-3
OSHA PEL: NOT ESTABLISHED
ACGIH TLV: NOT ESTABLISHED
Other Recommended Limit: NONE RECOMMENDED

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Physical/Chemical Characteristics
=====

Appearance And Odor: COLORLESS LIQUID WITH AROMATIC, SWEET ODOR.
Boiling Point: 295F,146C
Melting Point: N/D
Vapor Pressure (MM Hg/70 F): 4.5
Vapor Density (Air=1): 3.6

Steps If Matl Released/Spill: WEAR PROPER SAFETY EQUIP.REMOVE IGNITION SOURCES.PREVENT FLOW TO SEWERS/PUBLIC WATERS.RESTRICT WATER USE FOR CLEANUP;MATERIAL FLOATS/INSOLUBLE.SOAK SM SPILLS W/INERT SOLIDS & COLLECT HARDEN SPILLS FOR DISPOSAL.REPORT ENVIRONMENTAL AUTHORITIES.
Neutralizing Agent: SMALL QUANTITIES CAN BE REACTED WITH THE APPROPRIATE HARDENER TO SOLIDIFY.

Waste Disposal Method: CONTAMINATED MATERIAL MAY BE RCRA/OSHA HAZ WASTE DUE TO POTENTIAL FOR INTERNAL HEAT GENERATION. LANDFILL SOLIDS @ PERMITTED SITES. BURN CONC LIQ IN SYS THAT USE COMPATIBLE FUEL;DILUTE W/CLEAN LOW VISCOSITY FUEL. DISPOSE IAW FED/STATE/LOCAL REGULATION

Precautions-Handling/Storing: CHECK INHIBITOR LEVELS PERIODICALLY.STORE TIGHTLY CLOSED VENTED CONTAINERS AWAY FROM IGNITION SOURCES,STRONG OXIDIZERS.USE NON-SPARKING TOOLS.

Other Precautions: CAN SELF-REACT/POLYMERIZE/LIBERATE HEAT/RAISING TEMP PRESSURE/POSSIBLE RUPTURE CONTAINER UNLESS PROPERLY INHIBITED. AVOID CONDITIONS THAT REMOVES OXYGEN FROM STORED LIQUID.

Control Measures

Respiratory Protection: USE NIOSH/MSHA APPROVED AIR-PURIFYING OR SUPPLIED AIR RESPIRATOR AS APPROPRIATE.

Ventilation: LOCAL EXHAUST VENTILATION MAY BE REQUIRED TO MEET EXPOSURE STANDARD IN ADDITION TO GENERAL ROOM VENTILATION.

Protective Gloves: CHEM GLOVES (NOT RUBBER).

Eye Protection: CHEM SPLASH GOGGLES, FACE SHIELD.

Other Protective Equipment: APRON, SLEEVES, BOOTS, FULL HEAD/FACE PROTECTION. EYEWASH FOUNTAINS & SAFETY SHOWERS.

Work Hygienic Practices: WASH HANDS BEFORE EATING/DRINKING/SMOKING/TOILET FACILITIES.WASH CONTAMINATED CLOTHING & SHOWER AFT WORK W/LOTS SOAP/WAT

Suppl. Safety & Health Data: DO NOT WEAR CONTACT LENS WHILE WORKING W/ MATERIAL.

Transportation Data

Trans Data Review Date: 94025
DOT PSN Code: NNJ
DOT Proper Shipping Name: STYRENE MONOMER, INHIBITED
DOT Class: 3
DOT ID Number: UN2055
DOT Pack Group: III
DOT Label: FLAMMABLE LIQUID
IMO PSN Code: OCX
IMO Proper Shipping Name: STYRENE MONOMER, INHIBITED
IMO Regulations Page Number: 3381
IMO UN Number: 2055
IMO UN Class: 3.3
IMO Subsidiary Risk Label: -
IATA PSN Code: XDS
IATA UN ID Number: 2055
IATA Proper Shipping Name: STYRENE MONOMER, INHIBITED
IATA UN Class: 3
IATA Label: FLAMMABLE LIQUID
AFI PSN Code: XDS
AFI Prop. Shipping Name: STYRENE MONOMER, INHIBITED
AFI Class: 3
AFI ID Number: UN2055
AFI Pack Group: III
AFI Basic Pac Ref: 7-7
Additional Trans Data: FLAMMABLE LIQUID

Disposal Data

Label Data

=====
Label Required: YES
Technical Review Date: 25JAN94
Label Date: 03JAN91
Label Status: G
Common Name: STYRENE MONOMER
Chronic Hazard: YES
Signal Word: DANGER!
Acute Health Hazard-Severe: X
Contact Hazard-Slight: X
Fire Hazard-Severe: X
Reactivity Hazard-None: X
Special Hazard Precautions: IRRIT TO RESP TRACT & OTHER MUC MEM. SKIN/EYE
IRRIT. INGEST HEALTH HAZ.CNS DEPRES,ALLERGIC SENS,ASPIRATION HAZ.TARGET
ORGANS:CNS/EYES/RESP TRACT/INGEST SYS. 1ST AID:INHAL:REMOVE TO FRESH AIR.
GIVE OXYGEN/ART RESP AS NEEDED. EYE:RINSE W/WATER FOR 20MIN OPEN EYELIDS.
SKIN:REMOVE CONTAMINATED CLOTHING. WASH THOROUGHLY W/MILD SOAP/WATER. FLUSH
IF LG AMT GIVE LUKEWARM WATER "PINT" IF CONSCIOUS/ALERT.DO NOT INDUCE
VOMITING.SEE DOCTOR IN ALL CASES.CHECK INHIBITOR LEVELS PERIODICAY.STORE
TIGHTLY CLOSED VENTED CONTAINERS AWAY FROM IGNITION SOURCES,OXIDIZERS.USE
NON-SPARKING TOOLS
Protect Eye: Y
Protect Skin: Y
Protect Respiratory: Y
Label Name: ARCO CHEMICAL COMPANY, DIV OF ATLANTIC
RICHFIELD
Label Street: 3801 WEST CHESTER PIKE
Label P.O. Box: 7258
Label City: NEWTOWN SQUARE
Label State: PA
Label Zip Code: 19073
Label Country: US
Label Emergency Number: 215-353-8300/800-424-9300

CHEM SERVICE -- F85S TETRACHLOROETHENE 100 UG-ML IN METHANOL
MATERIAL SAFETY DATA SHEET
NSN: 655000F039035
Manufacturer's CAGE: 8Y898
Part No. Indicator: A
Part Number/Trade Name: F85S TETRACHLOROETHENE 100 UG/ML IN METHANOL

=====
General Information
=====

Company's Name: CHEM SERVICE INC
Company's Street: 660 TOWER LN
Company's P. O. Box: 3108
Company's City: WEST CHESTER
Company's State: PA
Company's Country: US
Company's Zip Code: 19381-3108
Company's Emerg Ph #: 610-386-2100/610-692-3026
Company's Info Ph #: 610-692-3026/800-452-9994
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SE
Date MSDS Prepared: 11MAY94
Safety Data Review Date: 22MAR95
Preparer's Company: CHEM SERVICE INC
Preparer's St Or P. O. Box: 660 TOWER LN
Preparer's City: WEST CHESTER
Preparer's State: PA
Preparer's Zip Code: 19381-3108
MSDS Serial Number: BWWFK

=====
Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: PERCHLOROETHYLENE (TETRACHLOROETHYLENE) (SUSPECTED ANIMAL
CARCINOGEN BY NTP & IARC - GROUP 2B) *95-1*
Ingredient Sequence Number: 01
NIOSH (RTECS) Number: KX3850000
CAS Number: 127-18-4
OSHA PEL: 50 PPM
ACGIH TLV: 50 PPM
Other Recommended Limit: 50 PPM

Proprietary: NO
Ingredient: METHANOL (METHYL ALCOHOL), COLUMBIAN SPIRITS *95-1*
Ingredient Sequence Number: 02
NIOSH (RTECS) Number: PC1400000
CAS Number: 67-56-1
OSHA PEL: 260 MG/CUM
ACGIH TLV: 262 MG/CUM (SKIN)
Other Recommended Limit: 200 PPM

=====
Physical/Chemical Characteristics
=====

Appearance And Odor: COLORLESS LIQUID
Boiling Point: 148.28F
Melting Point: -144.4F
Vapor Pressure (MM Hg/70 F): 97
Vapor Density (Air=1): 1.11
Solubility In Water: MISCIBLE

=====
Fire and Explosion Hazard Data
=====

Flash Point: 51.8F

Lower Explosive Limit: 6.7
Upper Explosive Limit: 36
Extinguishing Media: CO2/DRY CHEMICAL POWDER. DON'T USE WATER.
Unusual Fire And Expl Hazrds: FLAMMABLE CHEMICAL.

=====
Reactivity Data
=====

Stability: YES
Cond To Avoid (Stability): MOISTURE
Materials To Avoid: STRONG ACIDS, ACID HALIDES, ANHYDRIDES, STRONG
OXIDIZING AGENTS, STRONG REDUCING AGENTS, ACTIVE METALS
Hazardous Decomp Products: TOXIC FUMES
Hazardous Poly Occur: NO

=====
Health Hazard Data
=====

LD50-LC50 Mixture: ORAL LD50 (RAT): 5628 MG/KG
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: MAY BE FATAL IF ABSORBED THROUGH THE SKIN,
INHALED/SWALLOWED. EYES: REPEATED EXPOSURE TO VAPORS/DUST CAN CAUSE INJURY.
EXPOSURE CAN CAUSE LIVER/KIDNEY DAMAGE & CARDIOVASCULAR INJURY. CAN CAUSE
BLINDNESS IF SWALLOWED.
Carcinogenicity - NTP: YES
Carcinogenicity - IARC: YES
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: SEE INGREDIENTS.
Signs/Symptoms Of Overexp: GASTROINTESTINAL DISTURBANCES, CONVULSIONS
Emergency/First Aid Proc: EYES: FLUSH CONTINUOUSLY W/WATER FOR 15-20 MINS.
SKIN: FLUSH W/WATER FOR 15-20 MINS. IF NO BURNS OCCUR, USE SOAP & WATER TO
CLEANSE. INHALATION: REMOVE TO FRESH AIR. GIVE OXYGEN/CPR IF NECESSARY.
OBTAIN MEDICAL ATTENTION IN ALL CASES.

=====
Precautions for Safe Handling and Use
=====

Steps If Matl Released/Spill: EVACUATE AREA. WEAR APPROPRIATE OSHA
REGULATED EQUIPMENT. VENTILATE AREA. ABSORB ON VERMICULITE/SIMILAR
MATERIAL. SWEEP UP & PLACE IN AN APPROPRIATE CONTAINER. HOLD FOR DISPOSAL.
WASH CONTAMINATED SURFACES TO REMOVE ANY RESIDUES.
Waste Disposal Method: BURN IN A CHEMICALS INCINERATOR EQUIPPED W/AN
AFTERBURNER & SCRUBBER IN ACCORDANCE W/FEDERAL, STATE & LOCAL REGULATIONS.
Precautions-Handling/Storing: STORE IN A COOL, DRY PLACE. STORE ONLY W/
COMPATIBLE CHEMICALS. KEEP TIGHTLY CLOSED. THIS PRODUCT IS FOR LABORATORY
USE ONLY.
Other Precautions: PERSONS NOT PROPERLY TRAINED SHOULDN'T HANDLE THIS
CHEMICAL/ITS CONTAINER. AVOID CONTACT W/EYES, SKIN & CLOTHING. AVOID
BREATHING VAPORS. PRODUCTS MAY NOT BE USED AS DRUGS/COSMETICS/PESTICIDAL
PRODUCTS/FOOD ADDITIVES/HOUSEHOLD CHEMICALS.

=====
Control Measures
=====

Respiratory Protection: USE APPROPRIATE OSHA/MSHA APPROVED SAFETY
EQUIPMENT.
Ventilation: THIS CHEMICAL SHOULD BE HANDLED ONLY IN A HOOD.
Protective Gloves: REQUIRED
Eye Protection: EYE SHIELDS
Work Hygienic Practices: REMOVE/LAUNDER CONTAMINATED CLOTHING BEFORE
REUSE. DON'T WEAR CONTACT LENSES IN THE LAB.
Suppl. Safety & Health Data: THE INFORMATION FOR THIS MSDS IS FOR METHYL
ALCOHOL.

=====
Transportation Data
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=====
Disposal Data
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Label Data
=====

Label Required: YES

Label Status: G

Common Name: F85S TETRACHLOROETHENE 100 UG/ML IN METHANOL

Special Hazard Precautions: MAY BE FATAL IF ABSORBED THROUGH THE SKIN,
INHALED/SWALLOWED. EYES: REPEATED EXPOSURE TO VAPORS/DUST CAN CAUSE INJURY.
EXPOSURE CAN CAUSE LIVER/KIDNEY DAMAGE & CARDIOVASCULAR INJURY. CAN CAUSE
BLINDNESS IF SWALLOWED. GASTROINTESTINAL DISTURBANCES, CONVULSIONS

Label Name: CHEM SERVICE INC

Label Street: 660 TOWER LN

Label P.O. Box: 3108

Label City: WEST CHESTER

Label State: PA

Label Zip Code: 19381-3108

Label Country: US

Label Emergency Number: 610-386-2100/610-692-3026

SCIENCE KIT -- TOLUENE - TOLUENE
MATERIAL SAFETY DATA SHEET
NSN: 681000D005045
Manufacturer's CAGE: 57020
Part No. Indicator: A
Part Number/Trade Name: TOLUENE

=====
General Information
=====

Item Name: TOLUENE
Company's Name: SCIENCE KIT INC
Company's Street: 777 E PARK DR
Company's City: TONAWANDA
Company's State: NY
Company's Country: US
Company's Zip Code: 14150-6708
Company's Emerg Ph #: 800-424-9300 (CHEMTREC)
Company's Info Ph #: 800-256-2586
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SE
Date MSDS Prepared: 01DEC94
Safety Data Review Date: 10JUN96
Supply Item Manager: CX
MSDS Preparer's Name: R.M.CARLSON
MSDS Serial Number: BZPCL
Specification Number: NONE
Spec Type, Grade, Class: NONE
Hazard Characteristic Code: F3
Unit Of Issue: NK
Unit Of Issue Container Qty: UNKNOWN
Type Of Container: UNKNOWN
Net Unit Weight: UNKNOWN

=====
Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: TOLUENE (SARA 313) (CERCLA)
Ingredient Sequence Number: 01
Percent: MAJOR
NIOSH (RTECS) Number: XS5250000
CAS Number: 108-88-3
OSHA PEL: 200 PPM; Z-2
ACGIH TLV: S, 50 PPM; 9596
Other Recommended Limit: NONE RECOMMENDED

=====
Physical/Chemical Characteristics
=====

Appearance And Odor: CLEAR COLORLESS LIQUID, AROMATIC BENZENE-LIKE ODOR.
Boiling Point: 232F, 111C
Melting Point: -139F, -95C
Vapor Pressure (MM Hg/70 F): 22
Vapor Density (Air=1): 3.14
Specific Gravity: 0.86
Decomposition Temperature: UNKNOWN
Evaporation Rate And Ref: 4.5 ETHER=1
Solubility In Water: VIRTUALLY INSOLUBLE
Percent Volatiles By Volume: 100
Corrosion Rate (IPY): UNKNOWN
Autoignition Temperature: 896F

=====
Fire and Explosion Hazard Data
=====

Flash Point: 39.2F,4.0C
Flash Point Method: CC
Lower Explosive Limit: 1.2
Upper Explosive Limit: 7.1
Extinguishing Media: DRY CHEMICAL,CARBON DIOXIDE,FOAM.
Special Fire Fighting Proc: USE A SELF-CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE EQUIPMENT.COOL FIRE EXPOSED CONTAINERS WITH WATER FOG.
Unusual Fire And Expl Hazrds: VAPORS ARE HEAVIER THAN AIR,CAN TRAVEL DISTANCES ALONG THE GROUND,AND FLASHBACK AT THE SOURCE.

Reactivity Data

Stability: YES
Cond To Avoid (Stability): HIGH HEAT,SOURCES OF IGNITION.
Materials To Avoid: STRONG OXIDIZERS,NITRIC AND SULFURIC ACIDS,STRONG BASES,SOME PLASTICS,RUBBERS,COATING AND SOME AMINES.
Hazardous Decomp Products: CARBON DIOXIDE,CARBON MONOXIDE.
Hazardous Poly Occur: NO

Health Hazard Data

LD50-LC50 Mixture: TLV IS 100PPM (TWA)
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: EYES:MAY CAUSE IRRITATION.SKIN:MAY CAUSE IRRITATION.INGEST:MAY CAUSE GI TRACT IRRITATION.INHAL:MAY CAUSE RESPIRATORY IRRITATION AND CNS DEPRESSION.CHRONIC:DERMATITIS,LIVER,KIDNEY AND BLOOD DISORDERS.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: THERE ARE NO INGREDIENTS ABOVE 0.1% WHICH ARE IDENTIFIED AS CARCINOGENS BY NTP,IARC OR OSHA.
Signs/Symptoms Of Overexp: NAUSEA,HEADACHE,DIZZINESS,DROWSINESS.
Med Cond Aggravated By Exp: PERSONS WITH PRE-EXISTING SKIN,EYE,KIDNEY,LIVER AND RESPIRATORY AILMENTS MAY BE AT INCREASED RISK FROM EXPOSURE.
Emergency/First Aid Proc: SKIN:REMOVE CONTAMINATED CLOTHING;WASH WITH SOAP OR MILD DETERGENT AND WATER.GET MEDICAL ATTENTION IF IRRITATION PERSISTS.EYES:FLUSH WITH WATER FOR 15 MINUTES.GET IMMEDIATE MEDICAL ATTENTION.INHAL:REMOVE TO FRESH AIR.GIVE OXYGEN OR ARTIFICIAL RESPIRATION IF NEEDED.INGEST:DO NOT INDUCE VOMITING.GET PROMPT QUALIFIED MEDICAL ATTENTION.IF CONSCIOUS,GIVE WATER OR MILK TO DRINK.

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: ELIMINATE SOURCES OF IGNITION.USE PROPER RESPIRATORY AND PROTECTIVE EQUIPMENT.SHUT OFF LEAK IF SAFE.DIKE.SOAK UP WITH A NON-COMBUSTIBLE INERT ABSORBANT(CLAY,SAND);PLACE IN PROPER CONTAINER FOR DISPOSAL.WASH SPILL AREA TO REMOVE SLIPPINESS.
Neutralizing Agent: NOT APPLICABLE.
Waste Disposal Method: DISPOSE OF IN ACCORDANCE WITH FEDERAL,STATE AND LOCAL REGULATIONS.DO NOT FLUSH TO SEWER.
Precautions-Handling/Storing: STORE IN A COOL,DRY,WELL-VENTILATED PLACE.KEEP CONTAINER CLOSED WHEN NOT IN USE.KEEP AWAY FROM HEAT,SPARKS,FLAMES AND INCOMPATIBLE MATERIALS.
Other Precautions: FOLLOW LABEL DIRECTIONS.AVOID BREATHING VAPORS.AVOID SKIN AND EYE CONTACT.

Control Measures

Respiratory Protection: WHERE ENVIRONMENTAL CONTROLS ARE LACKING OR IN ENCLOSED SPACES USE EITHER A SELF-CONTAINED BREATHING APPARATUS OR A NIOSH/MSHA APPROVED RESPIRATOR FOR ORGANIC VAPORS,DEPENDING ON THE AIRBORN

CONCENTRATION.

Ventilation: LOCAL VENTILATION AT THE WORKSITE;MECHANICAL (GENERAL)
VENTILATION TO MAINTAIN TLV/PEL.USE NON-SPARKING EQUIPMENT.

Protective Gloves: VINYL OR RUBBER.

Eye Protection: CHEMICAL SPLASH GOGGLES

Other Protective Equipment: LAB COAT.PROVIDE A LOCAL EYE WASH STATION AND
SAFETY SHOWER.

Work Hygienic Practices: EXECISE GOOD LABORATORY PRACTICES.WASH HANDS
AFTER USE AND BEFORE EATING.

Suppl. Safety & Health Data: NONE

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Transportation Data
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Trans Data Review Date: 96162
DOT PSN Code: OJY
DOT Proper Shipping Name: TOLUENE
DOT Class: 3
DOT ID Number: UN1294
DOT Pack Group: II
DOT Label: FLAMMABLE LIQUID
IMO PSN Code: OSR
IMO Proper Shipping Name: TOLUENE
IMO Regulations Page Number: 3285
IMO UN Number: 1294
IMO UN Class: 3.2
IMO Subsidiary Risk Label: -
IATA PSN Code: YEL
IATA UN ID Number: 1294
IATA Proper Shipping Name: TOLUENE
IATA UN Class: 3
IATA Label: FLAMMABLE LIQUID
AFI PSN Code: YEL
AFI Prop. Shipping Name: TOLUENE
AFI Class: 3
AFI ID Number: UN1294
AFI Pack Group: II
AFI Basic Pac Ref: A7.3
MMAC Code: NR
Additional Trans Data: NONE

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Disposal Data
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Label Data
=====

Label Required: YES
Technical Review Date: 10JUN96
MFR Label Number: UNKNOWN
Label Status: F
Common Name: TOLUENE
Signal Word: WARNING!
Acute Health Hazard-Slight: X
Contact Hazard-Slight: X
Fire Hazard-Moderate: X
Reactivity Hazard-None: X
Special Hazard Precautions: EYES:MAY CAUSE IRRITATION.SKIN:MAY CAUSE
IRRITATION.INGEST:MAY CAUSE GI TRACT IRRITATION.INHAL:MAY CAUSE RESPIRATORY
IRRITATION AND CNS DEPRESSION.CHRONIC:DERMATITIS,LIVER,KIDNEY AND BLOOD
DISORDERS. FIRST AID: SKIN:REMOVE CONTAMINATED CLOTHING;WASH WITH SOAP OR
DO NOT INDUCE VOMITING.GET PROMPT QUALIFIED MEDICAL ATTENTION.IF CONSCIOUS,
GIVE WATER OR MILK TO DRINK.
Protect Eye: Y
Protect Skin: Y
Label Name: SCIENCE KIT INC

Label Street: 777 E PARK DR
Label City: TONAWANDA
Label State: NY
Label Zip Code: 14150-6708
Label Country: US
Label Emergency Number: 800-424-9300 (CHEMTREC)
Year Procured: 1995

DOW CHEMICAL U S A GOVERNMENT MARKETING -- 1,1,1-TRICHLOROETHANE, FILM CLEANING GRA
MATERIAL SAFETY DATA SHEET
NSN: 6810010051862
Manufacturer's CAGE: 96717
Part No. Indicator: A
Part Number/Trade Name: 1,1,1-TRICHLOROETHANE, FILM CLEANING GRADE

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General Information
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Item Name: 1,1,1-TRICHLOROETHANE, TECHNICAL
Company's Name: DOW CHEMICAL U S A GOVERNMENT MARKETING
Company's Street: 2020 DOW CENTER
Company's City: MIDLAND
Company's State: MI
Company's Country: US
Company's Zip Code: 48640-6030
Company's Emerg Ph #: 517-636-4400
Company's Info Ph #: 517-636-4400
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SE
Date MSDS Prepared: 27MAR90
Safety Data Review Date: 21SEP90
Supply Item Manager: CX
MSDS Serial Number: BHYDC
Specification Number: NONE
Spec Type, Grade, Class: NONE
Hazard Characteristic Code: N1
Unit Of Issue: DR
Unit Of Issue Container Qty: 55 GALLONS
Type Of Container: DRUM
Net Unit Weight: 611 POUNDS

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Ingredients/Identity Information
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Proprietary: NO
Ingredient: METHYL CHLOROFORM (1,1,1-TRICHLOROETHANE) (SARA III)
Ingredient Sequence Number: 01
Percent: 99.9
NIOSH (RTECS) Number: KJ2975000
CAS Number: 71-55-6
OSHA PEL: 350 PPM/450 STEL
ACGIH TLV: 350 PPM/450 STEL; 9192
Other Recommended Limit: NONE SPECIFIED

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Physical/Chemical Characteristics
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Appearance And Odor: COLORLESS LIQUID, IRRITATING ODOR AT HIGH
CONCENTRATIONS
Boiling Point: 165F, 74C
Melting Point: UNKNOWN
Vapor Pressure (MM Hg/70 F): 100 MM
Vapor Density (Air=1): 4.55
Specific Gravity: 1.330-1.335
Decomposition Temperature: UNKNOWN
Evaporation Rate And Ref: UNKNOWN
Solubility In Water: 0.07 G/100G
Percent Volatiles By Volume: >.999
Corrosion Rate (IPY): UNKNOWN

=====
Fire and Explosion Hazard Data
=====

Flash Point: NONE

Lower Explosive Limit: 7.5
Upper Explosive Limit: 12.5
Extinguishing Media: USE WATER FOG,
Special Fire Fighting Proc: FIRE FIGHTERS SHOULD USE NIOSH APPROVED SCBA &
FULL PROTECTIVE EQUIPMENT WHEN FIGHTING CHEMICAL FIRE. USE WATER SPRAY TO
COOL NEARBY CONTAINERS EXPOSED TO FIRE.
Unusual Fire And Expl Hazrds: FORMS EXPLOSIVE MIXTURES IN CONFINED AREAS.
'EMPTY' CONTAINERS MAY CONTAIN RESIDUE OR VAPOR. TREAT THEM WITH DUE
RESPECT. DO NOT CUT,WELD,ETC. ON THEM.

=====
Reactivity Data
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Stability: YES
Cond To Avoid (Stability): HIGH TEMPERATURES, PLUS SPARKS, AND OPEN FLAMES
Materials To Avoid: WATER, ALUMINUM AND OTHER REACTIVE METALS.
Hazardous Decomp Products: WHEN INVOLVED IN FIRE, PRODUCT EMITS HIGHLY
TOXIC AND IRRITATING FUMES OF HYDROGEN CHLORIDE AND PHOSGENE.
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NOT APPLICABLE
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Health Hazard Data
=====

LD50-LC50 Mixture: ORAL LD50 (RAT) IS >10,000 MG/KG
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: PRODUCT IS IRRITATING TO BODY TISSUES, AND
IS A CENTRAL NERVOUS SYSTEM DEPRESSANT, CAUSING NAUSEA AND DIZZINESS.
CHRONIC OVER EXPOSURE MAY CAUSE DERMATITIS, LIVER AND/OR KIDNEY DAMAGE.
Carcinogenicity - NTP: YES
Carcinogenicity - IARC: YES
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: 1,4-DIOXANE IS LISTED AS A CARCINOGEN BY
IARC, NTP. TESTED AS A MIXTURE, THE PRODUCT SHOWED NO CARCINOGENICITY.
Signs/Symptoms Of Overexp: HEADACHE, DIZZINESS, DROWSINESS, NAUSEA,
TINGLING OR NUMBNESS OF THE EXTREMITIES, SENSES OF FULLNESS IN THE HEAD,
SENSE OF WARMTH, STUPOR OR DULLNESS, LETHARGY AND DRUNKENNESS. VERY HIGH
CONCENTRATIONS MAY LEAD TO UNCONSCIOUSNESS OR EVEN DEATH IN CONFINED OR
POORLY VENTILATED AREAS.
Med Cond Aggravated By Exp: NONE GIVEN BY MANUFACTURER.
Emergency/First Aid Proc: EYE:FLUSH W/WATER 15 MIN, HOLD LIDS OPEN.
SKIN:WASH WITH SOAP & WATER. REMOVE CONTAMINATED CLOTHING AND LAUNDER
BEFORE REUSE. INHALED:REMOVE TO FRESH AIR. RESTORE BREATHING IF NECESSARY.
INGESTED:DO NOT INDUCE VOMITING. GIVE 2 LARGE GLASSES OF MILK OR WATER AND
GET IMMEDIATE MEDICAL CARE. GIVE NOTHING BY MOUTH IF UNCONSCIOUS. IF
IRRITATION PERSISTS OR IS SEVERE,SEE A DOCTOR.
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Precautions for Safe Handling and Use
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Steps If Matl Released/Spill: SMALL SPILL: WIPE UP WITH RAGS OR TOWELS.
VENTILATE AREA. RESIDUE WILL EVAPORATE QUICKLY. DO NOT FLUSH TO SEWER OR
WATERWAY.
Neutralizing Agent: NONE
Waste Disposal Method: DISPOSE I/A/W ALL FEDERAL, STATE AND LOCAL
REGULATIONS. MANUFACTURER SUGGESTS RECYCLE (PREFERRED) OR INCINERATE.
Precautions-Handling/Storing: STORE IN A COOL, DRY, WELL-VENTILATED
LOCATION, AWAY FROM ANY AREA WHERE THE FIRE HAZARD MAY BE ACUTE. KEEP
CONTAINERS CLOSED WHEN NOT IN USE.
Other Precautions: VAPORS ARE HEAVIER THAN AIR AND WILL COLLECT IN LOW
AREAS. DO NOT ENTER WHERE VAPORS ARE SUSPECTED WITHOUT SELF CONTAINED
BREATHING APPARATUS AND AN OBSERVER.
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Control Measures
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Respiratory Protection: USE NIOSH/MSHA APPROVED AIR SUPPLIED RESPIRATOR OR RESPIRATOR FOR ORGANIC VAPOR IF EXPOSURE IS ABOVE THE TLV/PEL. IF EXPOSED ABOVE 1000 PPM USE ONLY A SUPPLIED AIR RESPIRATOR. SEE 29 CFR 1910.134 FOR REGULATIONS PERTAINING TO RESPIRATOR USE
Ventilation: NORMAL ROOM VENTILATION IS SUFFICIENT. SUPPLEMENT WITH LOCAL EXHAUST IF PEL/TLV IS EXCEEDED.
Protective Gloves: NEOPRENE, PVA GLOVES RECOMMENDED.
Eye Protection: SAFETY GLASSES OR SPLASH GOGGLES
Other Protective Equipment: APRON AND WORK CLOTHING TO MINIMIZE EXPOSURE. EYE WASH STATION & SAFETY SHOWER RECOMMENDED.
Work Hygienic Practices: USE GOOD CHEMICAL HYGIENE PRACTICE. AVOID UNNECESSARY CONTACT. WASH THOROUGHLY BEFORE EATING OR DRINKING.
Suppl. Safety & Health Data: TARGET ORGANS ARE SKIN, CNS, CVS, AND EYES.
DOW PRODUCT CODE 87375. MSDS NUMBER 000699.

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Transportation Data
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Trans Data Review Date: 90264
DOT PSN Code: OQD
DOT Proper Shipping Name: 1,1,1- TRICHLOROETHANE *
DOT Class: 6.1
DOT ID Number: UN2831
DOT Pack Group: III
DOT Label: KEEP AWAY FROM FOOD
IMO PSN Code: OVK
IMO Proper Shipping Name: 1,1,1- TRICHLOROETHANE *
IMO Regulations Page Number: 6272-1
IMO UN Number: 2831
IMO UN Class: 6.1
IMO Subsidiary Risk Label: -
IATA PSN Code: YLY
IATA UN ID Number: 2831
IATA Proper Shipping Name: 1,1,1- TRICHLOROETHANE *
IATA UN Class: 6.1
IATA Label: TOXIC
AFI PSN Code: YLY
AFI Prop. Shipping Name: 1,1,1- TRICHLOROETHANE *
AFI Class: 6.1
AFI ID Number: UN2831
AFI Pack Group: III
AFI Special Prov: N36
AFI Basic Pac Ref: 10-10
Additional Trans Data: RQ IS 1000 POUNDS; OR TWO DRUMS.

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Disposal Data
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Label Data
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Label Required: YES
Technical Review Date: 21SEP90
MFR Label Number: NONE
Label Status: F
Common Name: 1,1,1-TRICHLOROETHANE, FILM CLEANING GRADE
Chronic Hazard: NO
Signal Word: CAUTION!
Acute Health Hazard-None: X
Contact Hazard-Slight: X
Fire Hazard-None: X
Reactivity Hazard-None: X
Special Hazard Precautions: MAY CAUSE EYE IRRITATION. AVOID CONTACT WITH EYES. WASH THOROUGHLY AFTER HANDLING. FIRST AID: IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES WITH PLENTY OF WATER. GET MEDICAL ATTENTION IF IRRITATION PERSISTS. PRODUCT IS IRRITATING TO BODY TISSUES, AND IS A

CENTRAL NERVOUS SYSTEM DEPRESSANT, CAUSING NAUSEA AND DIZZINESS. CHRONIC OVER EXPOSURE MAY CAUSE DERMATITIS, LIVER AND/OR KIDNEY DAMAGE. STORE IN A COOL, DRY, WELL-VENTILATED LOCATION, AWAY FROM ANY AREA WHERE THE FIRE HAZARD MAY BE ACUTE. KEEP CONTAINERS CLOSED WHEN NOT IN USE.

Protect Eye: Y

Protect Respiratory: Y

Label Name: DOW CHEMICAL U S A GOVERNMENT MARKETING

Label Street: 2020 DOW CENTER

Label City: MIDLAND

Label State: MI

Label Zip Code: 48640-6030

Label Country: US

Label Emergency Number: 517-636-4400

CHEM SERVICE -- F14 1,1,2-TRICHLOROETHANE
MATERIAL SAFETY DATA SHEET
NSN: 655000F037542
Manufacturer's CAGE: 8Y898
Part No. Indicator: A
Part Number/Trade Name: F14 1,1,2-TRICHLOROETHANE

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General Information
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Company's Name: CHEM SERVICE INC
Company's Street: 660 TOWER LN
Company's P. O. Box: 3108
Company's City: WEST CHESTER
Company's State: PA
Company's Country: US
Company's Zip Code: 19381-3108
Company's Emerg Ph #: 215-692-3026/800-452-9994
Company's Info Ph #: 215-692-3026/800-452-9994
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SE
Date MSDS Prepared: 05JUL91
Safety Data Review Date: 15DEC94
Preparer's Company: CHEM SERVICE INC
Preparer's St Or P. O. Box: 660 TOWER LN
Preparer's City: WEST CHESTER
Preparer's State: PA
Preparer's Zip Code: 19381-3108
MSDS Serial Number: BWJHQ

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Ingredients/Identity Information
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Proprietary: NO
Ingredient: 1,1,2-TRICHLOROETHANE (SUSPECTED ANIMAL CARCINOGEN BY IARC
GROUP 3) *94-4*
Ingredient Sequence Number: 01
NIOSH (RTECS) Number: KJ3150000
CAS Number: 79-00-5
OSHA PEL: 10 PPM (SKIN)
ACGIH TLV: 10 PPM (SKIN)
Other Recommended Limit: 10 PPM

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Physical/Chemical Characteristics
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Appearance And Odor: COLORLESS LIQUID W/FRUITY/PLEASANT ODOR.
Boiling Point: 230-239F
Melting Point: -34.6F
Vapor Pressure (MM Hg/70 F): 19
Solubility In Water: SLIGHT

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Fire and Explosion Hazard Data
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Flash Point: NON-FLAMMABLE
Lower Explosive Limit: 6
Upper Explosive Limit: 15.5
Extinguishing Media: CO2, DRY CHEMICAL POWDER. DON'T USE WATER.

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Reactivity Data
=====

Stability: YES
Cond To Avoid (Stability): SENSITIVE TO LIGHT & HEAT.
Materials To Avoid: STRONG OXIDIZING AGENTS/BASES, ACTIVE METALS, SODIUM,
POWDERED METALS, MAGNESIUM, ALUMINUM, CAUSTICS.

Hazardous Decomp Products: TOXIC FUMES.

Hazardous Poly Occur: NO

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Health Hazard Data
=====

LD50-LC50 Mixture: ORAL LD50 (RAT/MOUSE): 1140 MG/KG
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: INGESTION: FATAL. INHALATION: FATAL/
RESPIRATORY TRACT IRRITATION/MUCOUS MEMBRANE IRRITATION. EYES: IRRITATION/
INJURY/DAMAGE. SKIN: RAPIDLY ABSORBED/FATAL/ADVERSE HEALTH EFFECTS/
IRRITATION. EXPOSURE CAN CAUSE NERVOUS SYSTEM INJURY, LIVER & KIDNEY
DAMAGE. NARCOTIC AT HIGH CONCENTRATIONS. (SEE SUPP)
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NONE
Signs/Symptoms Of Overexp: IRRITATION, INFLAMMATION, SWELLING, NAUSEA,
HEADACHE, DIZZINESS.
Emergency/First Aid Proc: EYES: FLUSH CONTINUOUSLY W/WATER FOR 15-20 MINS.
SKIN: FLUSH W/WATER FOR 15-20 MINS. IF NOT BURNED, WASH W/SOAP & WATER TO
CLEANSE. INHALATION: REMOVE TO FRESH AIR. GIVE CPR/OXYGEN IF NEEDED. KEEP
WARM & QUIET. INGESTION: DON'T GIVE LIQUIDS/INDUCE VOMITING IF
UNCONSCIOUS/CONVULSIVE. IF VOMITING OCCURS, WATCH CLOSELY FOR ANY AIRWAY
OBSTRUCTION. OBTAIN MEDICAL ATTENTION IN ALL CASES.

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Precautions for Safe Handling and Use
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Steps If Matl Released/Spill: EVACUATE AREA. WEAR APPROPRIATE OSHA
REGULATED EQUIPMENT. VENTILATE AREA. ABSORB ON VERMICULITE/SIMILAR
MATERIAL. SWEEP UP & PLACE IN APPROPRIATE CONTAINER/HOLD FOR DISPOSAL. WASH
CONTAMINATED SURFACES TO REMOVE ANY RESIDUES.
Waste Disposal Method: BURN IN A CHEMICAL INCINERATOR EQUIPPED W/AN
AFTERBURNER & SCRUBBER IAW/FEDERAL, STATE & LOCAL REGULATIONS.
Precautions-Handling/Storing: STORE IN A COOL DRY PLACE ONLY W/COMPATIBLE
CHEMICALS. KEEP TIGHTLY CLOSED. DON'T USE MAGNESIUM/ALUMINUM/THEIR ALLOYS
AS CONTAINERS. (SEE SUPP)
Other Precautions: AVOID CONTACT W/SKIN, EYES & CLOTHING. DON'T BREATHE
VAPORS. CONTACT LENSES SHOULDN'T BE WORN IN THE LABORATORY. FOR LABORATORY
USE ONLY. ALL CHEMICALS SHOULD BE CONSIDERED HAZARDOUS. AVOID DIRECT
PHYSICAL CONTACT.

=====
Control Measures
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Respiratory Protection: WEAR APPROPRIATE OSHA/MSHA APPROVED SAFETY
EQUIPMENT.
Ventilation: CHEMICAL SHOULD BE HANDLED ONLY IN A HOOD.
Eye Protection: EYE SHIELDS
Work Hygienic Practices: REMOVE/LAUNDRER CONTAMINATED CLOTHING BEFORE
REUSE. READILY ABSORBED & RETAINED ON CLOTHING & SHOES.
Suppl. Safety & Health Data: HEALTH HAZARDS CONT'D: AVOID CONSUMPTION OF
ALCOHOL BEFORE & AFTER HANDLING OF THIS COMPOUND BECAUSE IT WILL INCREASE
THE TOXICITY OF THE COMPOUND. STORAGE & HANDLING CONT'D: DARK COLORS DON'T
AFFECT PURITY.

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Transportation Data
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Disposal Data
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Label Data
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Label Required: YES
Label Status: G
Common Name: F14 1,1,2-TRICHLOROETHANE
Special Hazard Precautions: INGESTION: FATAL. INHALATION: FATAL/
RESPIRATORY TRACT IRRITATION/MUCOUS MEMBRANE IRRITATION. EYES: IRRITATION/
INJURY/DAMAGE. SKIN: RAPIDLY ABSORBED/FATAL/ADVERSE HEALTH EFFECTS/
IRRITATION. EXPOSURE CAN CAUSE NERVOUS SYSTEM INJURY, LIVER & KIDNEY
DAMAGE. NARCOTIC AT HIGH CONCENTRATIONS. (SEE SUPP) IRRITATION,
INFLAMMATION, SWELLING, NAUSEA, HEADACHE, DIZZINESS.
Label Name: CHEM SERVICE INC
Label Street: 660 TOWER LN
Label P.O. Box: 3108
Label City: WEST CHESTER
Label State: PA
Label Zip Code: 19381-3108
Label Country: US
Label Emergency Number: 215-692-3026/800-452-9994

CHEM SERVICE -- F87S TRICHLOROETHENE 100 UG-ML IN METHANOL
MATERIAL SAFETY DATA SHEET
NSN: 655000F039037
Manufacturer's CAGE: 8Y898
Part No. Indicator: A
Part Number/Trade Name: F87S TRICHLOROETHENE 100 UG/ML IN METHANOL

=====
General Information
=====

Company's Name: CHEM SERVICE INC
Company's Street: 660 TOWER LN
Company's P. O. Box: 3108
Company's City: WEST CHESTER
Company's State: PA
Company's Country: US
Company's Zip Code: 19381-3108
Company's Emerg Ph #: 610-386-2100/610-692-3026
Company's Info Ph #: 610-692-3026/800-452-9994
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SE
Date MSDS Prepared: 13OCT92
Safety Data Review Date: 22MAR95
Preparer's Company: CHEM SERVICE INC
Preparer's St Or P. O. Box: 660 TOWER LN
Preparer's City: WEST CHESTER
Preparer's State: PA
Preparer's Zip Code: 19381-3108
MSDS Serial Number: BWWFM

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Ingredients/Identity Information
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Proprietary: NO
Ingredient: TRICHLOROETHYLENE, TCE, TRICHLOROETHENE (IARC HUMAN INADEQUATE - GROUP 3). *95-1*
Ingredient Sequence Number: 01
NIOSH (RTECS) Number: KX4550000
CAS Number: 79-01-6
OSHA PEL: 50 PPM
ACGIH TLV: 50 PPM
Other Recommended Limit: 50 PPM

Proprietary: NO
Ingredient: METHANOL (METHYL ALCOHOL), COLUMBIAN SPIRITS *95-1*
Ingredient Sequence Number: 02
NIOSH (RTECS) Number: PC1400000
CAS Number: 67-56-1
OSHA PEL: 260 MG/CUM
ACGIH TLV: 262 MG/CUM (SKIN)
Other Recommended Limit: 200 PPM

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Physical/Chemical Characteristics
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Appearance And Odor: COLORLESS LIQUID
Boiling Point: 148.28F
Melting Point: -144.4F
Vapor Pressure (MM Hg/70 F): 97
Vapor Density (Air=1): 1.11
Solubility In Water: MISCIBLE

=====
Fire and Explosion Hazard Data
=====

Flash Point: 51.8F

Lower Explosive Limit: 6.7
Upper Explosive Limit: 36
Extinguishing Media: CO2/DRY CHEMICAL POWDER. DON'T USE WATER.
Unusual Fire And Expl Hazrds: FLAMMABLE CHEMICAL.

Reactivity Data

Stability: YES
Cond To Avoid (Stability): MOISTURE
Materials To Avoid: STRONG ACIDS, ACID HALIDES, ANHYDRIDES, STRONG
OXIDIZING AGENTS, STRONG REDUCING AGENTS, ACTIVE METALS
Hazardous Decomp Products: TOXIC FUMES
Hazardous Poly Occur: NO

Health Hazard Data

LD50-LC50 Mixture: ORAL LD50(RAT): 5628 MG/KG
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: MAY BE FATAL IF ABSORBED THROUGH THE SKIN,
INHALED/SWALLOWED. EYES: REPEATED EXPOSURE TO VAPORS/DUST CAN CAUSE INJURY.
EXPOSURE CAN CAUSE LIVER/KIDNEY DAMAGE & CARDIOVASCULAR INJURY. CAN CAUSE
BLINDNESS IF SWALLOWED.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NONE
Signs/Symptoms Of Overexp: GASTROINTESTINAL DISTURBANCES, CONVULSIONS
Emergency/First Aid Proc: EYES: FLUSH CONTINUOUSLY W/WATER FOR 15-20 MINS.
SKIN: FLUSH W/WATER FOR 15-20 MINS. IF NO BURNS OCCUR, USE SOAP & WATER TO
CLEANSE. INHALATION: REMOVE TO FRESH AIR. GIVE OXYGEN/CPR IF NECESSARY.
OBTAIN MEDICAL ATTENTION IN ALL CASES.

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: EVACUATE AREA. WEAR APPROPRIATE OSHA
REGULATED EQUIPMENT. VENTILATE AREA. ABSORB ON VERMICULITE/SIMILAR
MATERIAL. SWEEP UP & PLACE IN AN APPROPRIATE CONTAINER. HOLD FOR DISPOSAL.
WASH CONTAMINATED SURFACES TO REMOVE ANY RESIDUES.
Waste Disposal Method: BURN IN A CHEMICALS INCINERATOR EQUIPPED W/AN
AFTERBURNER & SCRUBBER IN ACCORDANCE W/FEDERAL, STATE & LOCAL REGULATIONS.
Precautions-Handling/Storing: STORE IN A COOL, DRY PLACE. STORE ONLY W/
COMPATIBLE CHEMICALS. KEEP TIGHTLY CLOSED. THIS PRODUCT IS FOR LABORATORY
USE ONLY.
Other Precautions: PERSONS NOT PROPERLY TRAINED SHOULDN'T HANDLE THIS
CHEMICAL/ITS CONTAINER. AVOID CONTACT W/EYES, SKIN & CLOTHING. AVOID
BREATHING VAPORS. PRODUCTS MAY NOT BE USED AS DRUGS/COSMETICS/PESTICIDAL
PRODUCTS/FOOD ADDITIVES/HOUSEHOLD CHEMICALS.

Control Measures

Respiratory Protection: USE APPROPRIATE OSHA/MSHA APPROVED SAFETY
EQUIPMENT.
Ventilation: THIS CHEMICAL SHOULD BE HANDLED ONLY IN A HOOD.
Protective Gloves: REQUIRED
Eye Protection: EYE SHIELDS
Work Hygienic Practices: REMOVE/LAUNDER CONTAMINATED CLOTHING BEFORE
REUSE. DON'T WEAR CONTACT LENSES IN THE LAB.
Suppl. Safety & Health Data: THE INFORMATION FOR THIS MSDS IS FOR METHYL
ALCOHOL.

Transportation Data

=====
Disposal Data
==========
Label Data
=====

Label Required: YES

Label Status: G

Common Name: F87S TRICHLOROETHENE 100 UG/ML IN METHANOL

Special Hazard Precautions: MAY BE FATAL IF ABSORBED THROUGH THE SKIN,
INHALED/SWALLOWED. EYES: REPEATED EXPOSURE TO VAPORS/DUST CAN CAUSE INJURY.
EXPOSURE CAN CAUSE LIVER/KIDNEY DAMAGE & CARDIOVASCULAR INJURY. CAN CAUSE
BLINDNESS IF SWALLOWED. GASTROINTESTINAL DISTURBANCES, CONVULSIONS

Label Name: CHEM SERVICE INC

Label Street: 660 TOWER LN

Label P.O. Box: 3108

Label City: WEST CHESTER

Label State: PA

Label Zip Code: 19381-3108

Label Country: US

Label Emergency Number: 610-386-2100/610-692-3026

SCOTT SPECIALTY GASES -- TRICHLOROFLUOROMETHANE
MATERIAL SAFETY DATA SHEET
NSN: 683000F045390
Manufacturer's CAGE: 51847
Part No. Indicator: A
Part Number/Trade Name: TRICHLOROFLUOROMETHANE

=====
General Information
=====

Company's Name: SCOTT SPECIALTY GASES INC
Company's Street: 6141 EASTON RD
Company's P. O. Box: 310
Company's City: PLUMSTEADVILLE
Company's State: PA
Company's Country: US
Company's Zip Code: 18949-0310
Company's Emerg Ph #: 215-766-8861
Company's Info Ph #: 215-766-8861
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SE
Date MSDS Prepared: 20JUL93
Safety Data Review Date: 08DEC95
Preparer's Company: SCOTT SPECIALTY GASES INC
Preparer's St Or P. O. Box: 6141 EASTON RD
Preparer's City: PLUMSTEADVILLE
Preparer's State: PA
Preparer's Zip Code: 18949-0310
MSDS Serial Number: BYLQH

=====
Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: FLUOROTRICHLOROMETHANE, FREON 11, TRICHLOROFLUOROMETHANE,
TRICHLOROMONOFUOROMETHANE
Ingredient Sequence Number: 01
Percent: 100
NIOSH (RTECS) Number: PB6125000
CAS Number: 75-69-4
OSHA PEL: 1000 PPM
ACGIH TLV: C 5600 MG/CUM
Other Recommended Limit: 1000 PPM MSHA

=====
Physical/Chemical Characteristics
=====

Appearance And Odor: COLORLESS LIQUID W/NO ODOR. AT HIGHER CONCENTRATIONS,
MILD ETHEREAL ODOR.
Boiling Point: 74.9F
Vapor Pressure (MM Hg/70 F): 690
Vapor Density (Air=1): 5
Specific Gravity: 1.476
Evaporation Rate And Ref: (SEE SUPP)
Solubility In Water: 0.145%/WT
Percent Volatiles By Volume: 100

=====
Fire and Explosion Hazard Data
=====

Flash Point: NONFLAMMABLE
Extinguishing Media: USE MEDIA APPROPRIATE FOR SURROUNDING AREAS.
Special Fire Fighting Proc: WEAR SCBA & FULL PROTECTIVE CLOTHING. USE
WATER SPRAY TO KEEP CYLINDERS COOL.
Unusual Fire And Expl Hazrds: NONE

Reactivity Data

Stability: YES
Materials To Avoid: ALKALI, ALKALINE EARTH METALS. MAGNESIUM & ALUMINUM
MAY ALSO BE REACTIVE.
Hazardous Decomp Products: FLUORIDES, CHLORIDES, CARBONYL HALIDES,
PHOSGENE GAS.
Hazardous Poly Occur: NO

Health Hazard Data

Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: NO
Health Haz Acute And Chronic: MIXTURE ACTS AS SIMPLE ASPHYXIAN BY
DISPLACING AIR NECESSARY FOR LIFE.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NONE
Signs/Symptoms Of Overexp: RAPID RESPIRATION, MUSCULAR INCOORDINATION,
FATIGUE, NAUSEA, VOMITING, UNCONSCIOUSNESS, DEFATTING.
Emergency/First Aid Proc: INHALATION: REMOVE TO FRESH AIR IMMEDIATELY.
GIVE CPR/OXYGEN IF NEEDED. SKIN/EYES: IMMEDIATELY FLUSH W/COPIOUS AMOUNTS
OF WATER FOR 15 MINS. OBTAIN MEDICAL ATTENTION IN ALL CASES.

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: EVACUATE & VENTILATE AREA. WEAR SCBA & FULL
PROTECTIVE CLOTHING. ATTEMPT TO CLOSE VALVES/REPAIR LEAKS AT SOURCE. TRY TO
PREVENT RELEASE TO ATMOSPHERE DUE TO POTENTIAL DECOMPOSITION OF OZONE IN
THE STRATOSPHERE.
Waste Disposal Method: RETURN CYLINDERS TO SUPPLIER FOR PROPER DISPOSAL
W/ANY VALVE OUTLET PLUGS/CAPS SECURED & VALVE PROTECTION CAP IN PLACE.
Precautions-Handling/Storing: STORE IN WELL VENTILATED AREA ONLY. KEEP
VALVE PROTECTION CAP ON CYLINDERS WHEN NOT IN USE & SECURE CYLINDER WHEN
USING TO PROTECT FROM FALLING.
Other Precautions: USE SUITABLE HAND TRUCK TO MOVE CYLINDERS. PROTECT
CONTAINERS FROM PHYSICAL DAMAGE. DON'T DEFACE CYLINDERS/LABELS. CYLINDER
SHOULD BE REFILLED BY QUALIFIED PRODUCERS OF COMPRESSED GASES.

Control Measures

Respiratory Protection: USE SCBA IN EMERGENCY CASE/NON-ROUTINE USE.
Ventilation: GENERAL & LOCAL EXHAUST VENTILATION TO MAINTAIN CONCENTRATION
BELOW LIMITS.
Protective Gloves: RUBBER
Eye Protection: SAFETY GOGGLES
Other Protective Equipment: SAFETY SHOES, SAFETY SHOWER, EYEWASH STATION.
Work Hygienic Practices: REMOVE/LAUNDER CONTAMINATED CLOTHING BEFORE
REUSE.
Suppl. Safety & Health Data: EVAPORATION CONT'D: (CARBON TETRACHLORIDE =
1): 0.1. SPECIAL ATTENTION SHOULD BE PAID TO LOW LYING AREAS & SMALL
ENCLOSURES WHERE THIS MATERIAL IS STORED/USED AS THE DENSER GAS CAN
DISPLACE AIR. SHIPMENT OF COMPRESSED GAS CYLINDERS NOT FILLED BY OWNER/
WRITTEN CONSENT IS VIOLATION OF FEDERAL LAW.

Transportation Data

Disposal Data

Label Data

Label Required: YES
Label Status: G
Common Name: TRICHLOROFLUOROMETHANE
Special Hazard Precautions: MIXTURE ACTS AS SIMPLE ASPHYXIAN BY
DISPLACING AIR NECESSARY FOR LIFE. RAPID RESPIRATION, MUSCULAR
INCOORDINATION, FATIGUE, NAUSEA, VOMITING, UNCONSCIOUSNESS, DEFATTING.
Label Name: SCOTT SPECIALTY GASES INC
Label Street: 6141 EASTON RD
Label P.O. Box: 310
Label City: PLUMSTEADVILLE
Label State: PA
Label Zip Code: 18949-0310
Label Country: US
Label Emergency Number: 215-766-8861

SUPELCO -- 47669 1,2,3-TRICHLOROPROPANE
MATERIAL SAFETY DATA SHEET
NSN: 655000F041363
Manufacturer's CAGE: 54968
Part No. Indicator: A
Part Number/Trade Name: 47669 1,2,3-TRICHLOROPROPANE

=====
General Information
=====

Company's Name: SUPELCO INC
Company's Street: SUPELCO PARK
Company's City: BELLEFONTE
Company's State: PA
Company's Country: US
Company's Zip Code: 16823-0048
Company's Emerg Ph #: 814-359-3441
Company's Info Ph #: 814-359-3441
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SE
Date MSDS Prepared: 24JUN94
Safety Data Review Date: 04AUG95
Preparer's Company: SUPELCO INC
Preparer's St Or P. O. Box: SUPELCO PARK
Preparer's City: BELLEFONTE
Preparer's State: PA
Preparer's Zip Code: 16823-0048
MSDS Serial Number: BXNPM

=====
Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: METHYL TERT BUTYL ETHER (MTBE), 2-METHOXY-2-METHYL PROPANE
95-2
Ingredient Sequence Number: 01
Percent: 99-100
NIOSH (RTECS) Number: KN5250000
CAS Number: 1634-04-4

Proprietary: NO
Ingredient: 1,2,3-TRICHLOROPROPANE *95-2*
Ingredient Sequence Number: 02
Percent: 0.1
NIOSH (RTECS) Number: TZ9275000
CAS Number: 96-18-4
OSHA PEL: 300 MG/CUM
ACGIH TLV: 60 MG/CUM
Other Recommended Limit: 10 PPM

=====
Physical/Chemical Characteristics
=====

Appearance And Odor: COLORLESS LIQUID
Boiling Point: 127.4F
Vapor Pressure (MM Hg/70 F): 201
Vapor Density (Air=1): 3.1
Specific Gravity: 0.758

=====
Fire and Explosion Hazard Data
=====

Flash Point: -20F
Lower Explosive Limit: 1.6
Upper Explosive Limit: 15.1
Extinguishing Media: CO2, DRY CHEMICAL, ALCOHOL FOAM.

Special Fire Fighting Proc: WEAR SELF CONTAINED BREATHING APPARATUS.
Unusual Fire And Expl Hazrds: TOXIC VAPORS ARE FORMED WHEN THIS MATERIAL
IS HEATED TO DECOMPOSTION (HYDROGEN CHLORIDE).

=====
Reactivity Data
=====

Stability: YES
Cond To Avoid (Stability): IGNITION SOURCES
Materials To Avoid: STRONG ACIDS, OXIDIZING AGENTS
Hazardous Decomp Products: HYDROGEN CHLORIDE
Hazardous Poly Occur: NO
=====

=====
Health Hazard Data
=====

LD50-LC50 Mixture: ORAL LD50 (RAT): 4000 MG/KG
Route Of Entry - Inhalation: NO
Route Of Entry - Skin: NO
Route Of Entry - Ingestion: NO
Health Haz Acute And Chronic: EYES: IRRITATION. SKIN: IRRITATION.
INHALATION: BREATHING DIFFICULTY. INGESTION: GI DISTURBANCES.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NONE
Signs/Symptoms Of Overexp: IRRITATION, BREATHING DIFFICULTY, CHEST PAINS,
HEADACHE, NAUSEA, DIZZINESS, COUGHING, WHEEZING, LARYNGITIS, SHORTNESS OF
BREATH.
Emergency/First Aid Proc: EYES: FLUSH W/WATER FOR 15 MINS. SKIN: FLUSH
W/LARGE VOLUMES OF WATER. INHALATION: REMOVE TO FRESH AIR. INGESTION: NEVER
GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. NEVER TRY TO MAKE AN
UNCONCIOUS PERSON VOMIT. PRESS FINGERS TO BACK TO TONGUE TO INDUCE
VOMITING. OBTAIN MEDICAL ATTENTION IN ALL CASES.
=====

=====
Precautions for Safe Handling and Use
=====

Steps If Matl Released/Spill: TAKE UP W/ABSORBENT MATERIAL. VENTILATE
AREA. ELIMINATE IGNITION SOURCES.
Waste Disposal Method: DISPOSE OF IAW/FEDERAL, STATE & LOCAL REGULATIONS.
Precautions-Handling/Storing: MAY FORM EXPLOSIVE PEROXIDES DURING STORAGE.
STORE IN SEALED CONTAINER IN FLAME CABINET. KEEP AWAY FROM OXIDIZERS/
IGNITION SOURCES.
Other Precautions: AVOID EYE/SKIN CONTACT & BREATHING VAPORS.
=====

=====
Control Measures
=====

Respiratory Protection: WEAR NIOSH/OSHA APROVED RESPIRATORY PROTECTION.
Ventilation: USE ONLY IN EXHAUST HOOD.
Protective Gloves: RECOMMENDED.
Eye Protection: PROTECTIVE GLASSES.
=====

=====
Transportation Data
=====

=====
Disposal Data
=====

=====
Label Data
=====

Label Required: YES
Label Status: G
Common Name: 47669 1,2,3-TRICHLOROPROPANE
Special Hazard Precautions: EYES: IRRITATION. SKIN: IRRITATION.
INHALATION: BREATHING DIFFICULTY. INGESTION: GI DISTURBANCES. IRRITATION,
BREATHING DIFFICULTY, CHEST PAINS, HEADACHE, NAUSEA, DIZZINESS, COUGHING,
=====

WHEEZING, LARYNGITIS, SHORTNESS OF BREATH.

Label Name: SUPELCO INC

Label Street: SUPELCO PARK

Label City: BELLEFONTE

Label State: PA

Label Zip Code: 16823-0048

Label Country: US

Label Emergency Number: 814-359-3441

CHEM SERVICE -- O-777 1,2,4-TRIMETHYLBENZENE - LABORATORY STANDARD
MATERIAL SAFETY DATA SHEET
NSN: 655000F037497
Manufacturer's CAGE: 8Y898
Part No. Indicator: A
Part Number/Trade Name: O-777 1,2,4-TRIMETHYLBENZENE

=====
General Information
=====

Item Name: LABORATORY STANDARD
Company's Name: CHEM SERVICE INC
Company's Street: 660 TOWER LN
Company's P. O. Box: 3108
Company's City: WEST CHESTER
Company's State: PA
Company's Country: US
Company's Zip Code: 19381-3108
Company's Emerg Ph #: 215-692-3026/800-452-9994
Company's Info Ph #: 215-692-3026/800-452-9994
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SE
Date MSDS Prepared: 02JUL90
Safety Data Review Date: 07DEC94
Preparer's Company: CHEM SERVICE INC
Preparer's St Or P. O. Box: 660 TOWER LN
Preparer's City: WEST CHESTER
Preparer's State: PA
Preparer's Zip Code: 19381-3108
MSDS Serial Number: BWJFP

=====
Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: 1,2,4-TRIMETHYLBENZENE
Ingredient Sequence Number: 01
NIOSH (RTECS) Number: DC3325000
CAS Number: 95-63-6
OSHA PEL: 25 PPM
ACGIH TLV: 25 PPM

=====
Physical/Chemical Characteristics
=====

Appearance And Odor: COLORLESS LIQUID W/AROMATIC ODOR.
Boiling Point: 334.4F
Melting Point: -47.2F
Solubility In Water: INSOLUBLE

=====
Fire and Explosion Hazard Data
=====

Flash Point: 118.4F
Extinguishing Media: CO2, DRY CHEMICAL POWDER/SPRAY.
Unusual Fire And Expl Hazrds: COMBUSTIBLE COMPOUND. DECOMPOSITION PRODUCTS ARE CORROSIVE.

=====
Reactivity Data
=====

Stability: YES
Materials To Avoid: STRONG OXIDIZING AGENTS.
Hazardous Decomp Products: TOXIC FUMES.
Hazardous Poly Occur: NO

=====
Health Hazard Data
=====

=====
LD50-LC50 Mixture: ORAL LD50 (RAT/MOUSE): 5000 MG/KG
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: SKIN: HARMFUL IF ABSORBED, IRRITATION,
IRRITATION, DAMAGE. INGESTION: HARMFUL. NARCOTIC AT HIGH CONCENTRATIONS.
THIS COMPOUND IS CONSIDERED TO BE SLIGHTLY TOXIC.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NONE
Signs/Symptoms Of Overexp: IRRITATION, GI DISTURBANCES, NAUSEA, HEADACHE,
DIZZINESS.
Emergency/First Aid Proc: EYES: FLUSH CONTINUOUSLY W/WATER FOR 15-20 MINS.
SKIN: FLUSH W/WATER FOR 15-20 MINS. IF NOT BURNED, WASH W/SOAP & WATER TO
CLEANSE. INHALATION: REMOVE TO FRESH AIR. GIVE CPR/OXYGEN IF NEEDED &
CONTINUE UNTIL MEDICAL ASSISTANCE ARRIVES. OBTAIN MEDICAL ATTENTION IN ALL
CASES.
=====

=====
Precautions for Safe Handling and Use
=====

Steps If Matl Released/Spill: EVACUATE AREA. WEAR APPROPRIATE OSHA
REGULATED EQUIPMENT. VENTILATE AREA. ABSORB ON VERMICULITE/SIMILAR
MATERIAL. SWEEP UP & PLACE IN APPROPRIATE CONTAINER/HOLD FOR DISPOSAL. WASH
CONTAMINATED SURFACES TO REMOVE ANY RESIDUES.
Waste Disposal Method: BURN IN A CHEMICAL INCINERATOR EQUIPPED W/AN
AFTERBURNER & SCRUBBER IAW/FEDERAL, STATE & LOCAL REGULATIONS.
Precautions-Handling/Storing: STORE IN A COOL DRY PLACE ONLY W/COMPATIBLE
CHEMICALS. KEEP TIGHTLY CLOSED.
Other Precautions: AVOID CONTACT W/SKIN, EYES & CLOTHING. DON'T BREATHE
VAPORS. CONTACT LENSES SHOULDN'T BE WORN IN THE LABORATORY. ALL CHEMICALS
SHOULD BE CONSIDERED HAZARDOUS. AVOID DIRECT PHYSICAL CONTACT.
=====

=====
Control Measures
=====

Respiratory Protection: WEAR APPROPRIATE OSHA/MSHA APPROVED SAFETY
EQUIPMENT.
Ventilation: CHEMICAL SHOULD BE HANDLED ONLY IN A HOOD.
Eye Protection: EYE SHIELDS
=====

=====
Transportation Data
=====

=====
Disposal Data
=====

=====
Label Data
=====

Label Required: YES
Label Status: G
Common Name: O-777 1,2,4-TRIMETHYLBENZENE
Special Hazard Precautions: SKIN: HARMFUL IF ABSORBED, IRRITATION,
IRRITATION, DAMAGE. INGESTION: HARMFUL. NARCOTIC AT HIGH CONCENTRATIONS.
THIS COMPOUND IS CONSIDERED TO BE SLIGHTLY TOXIC. IRRITATION, GI
DISTURBANCES, NAUSEA, HEADACHE, DIZZINESS.
Label Name: CHEM SERVICE INC
Label Street: 660 TOWER LN
Label P.O. Box: 3108
Label City: WEST CHESTER
Label State: PA
Label Zip Code: 19381-3108
Label Country: US
Label Emergency Number: 215-692-3026/800-452-9994

CHEM SERVICE -- 0-771 1,3,5-TRIMETHYLBENZENE - LABORATORY STANDARD
MATERIAL SAFETY DATA SHEET
NSN: 655000F037499
Manufacturer's CAGE: 8Y898
Part No. Indicator: A
Part Number/Trade Name: 0-771 1,3,5-TRIMETHYLBENZENE

=====
General Information
=====

Item Name: LABORATORY STANDARD
Company's Name: CHEM SERVICE INC
Company's Street: 660 TOWER LN
Company's P. O. Box: 3108
Company's City: WEST CHESTER
Company's State: PA
Company's Country: US
Company's Zip Code: 19381-3108
Company's Emerg Ph #: 215-692-3026/800-452-9994
Company's Info Ph #: 215-692-3026/800-452-9994
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SE
Date MSDS Prepared: 02JUL90
Safety Data Review Date: 07DEC94
Preparer's Company: CHEM SERVICE INC
Preparer's St Or P. O. Box: 660 TOWER LN
Preparer's City: WEST CHESTER
Preparer's State: PA
Preparer's Zip Code: 19381-3108
MSDS Serial Number: BWJFR

=====
Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: 1,3,5,-TRIMETHYLBENZENE
Ingredient Sequence Number: 01
NIOSH (RTECS) Number: OX6825000
CAS Number: 108-67-8
OSHA PEL: 25 PPM
ACGIH TLV: 25 PPM

=====
Physical/Chemical Characteristics
=====

Appearance And Odor: COLORLESS LIQUID W/CAMPHOR LIKE ODOR.
Boiling Point: 327.2F
Melting Point: -49F
Solubility In Water: INSOLUBLE

=====
Fire and Explosion Hazard Data
=====

Flash Point: 111.2F
Extinguishing Media: CO2, DRY CHEMICAL POWDER/SPRAY.
Unusual Fire And Expl Hazrds: COMBUSTIBLE COMPOUND. DECOMPOSITION PRODUCTS ARE CORROSIVE.

=====
Reactivity Data
=====

Stability: YES
Materials To Avoid: STRONG OXIDIZING AGENTS.
Hazardous Decomp Products: TOXIC FUMES.
Hazardous Poly Occur: NO

=====
Health Hazard Data
=====

LD50-LC50 Mixture: ORAL LD50 (RAT/MOUSE): 1303 MG/KG
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: SKIN: HARMFUL IF ABSORBED, IRRITATION.
INHALATION: HARMFUL, MUCOUS MEMBRANES IRRITATION. EYES: IRRITATION, DAMAGE.
INGESTION: HARMFUL. THIS COMPOUND IS CONSIDERED TO BE SLIGHTLY TOXIC.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NONE
Signs/Symptoms Of Overexp: IRRITATION, NAUSEA, HEADACHE, DIZZINESS.
Emergency/First Aid Proc: EYES: FLUSH CONTINUOUSLY W/WATER FOR 15-20 MINS.
SKIN: FLUSH W/WATER FOR 15-20 MINS. IF NOT BURNED, WASH W/SOAP & WATER TO
CLEANSE. INHALATION: REMOVE TO FRESH AIR. GIVE CPR/OXYGEN IF NEEDED &
CONTINUE UNTIL MEDICAL ASSISTANCE ARRIVES. OBTAIN MEDICAL ATTENTION IN ALL
CASES.

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: EVACUATE AREA. WEAR APPROPRIATE OSHA
REGULATED EQUIPMENT. VENTILATE AREA. ABSORB ON VERMICULITE/SIMILAR
MATERIAL. SWEEP UP & PLACE IN APPROPRIATE CONTAINER/HOLD FOR DISPOSAL. WASH
CONTAMINATED SURFACES TO REMOVE ANY RESIDUES.
Waste Disposal Method: BURN IN A CHEMICAL INCINERATOR EQUIPPED W/AN
AFTERBURNER & SCRUBBER IAW/FEDERAL, STATE & LOCAL REGULATIONS.
Precautions-Handling/Storing: STORE IN A COOL DRY PLACE ONLY W/COMPATIBLE
CHEMICALS. KEEP TIGHTLY CLOSED.
Other Precautions: AVOID CONTACT W/SKIN, EYES & CLOTHING. DON'T BREATHE
VAPORS. CONTACT LENSES SHOULDN'T BE WORN IN THE LABORATORY. ALL CHEMICALS
SHOULD BE CONSIDERED HAZARDOUS. AVOID DIRECT PHYSICAL CONTACT.

Control Measures

Respiratory Protection: WEAR APPROPRIATE OSHA/MSHA APPROVED SAFETY
EQUIPMENT.
Ventilation: CHEMICAL SHOULD BE HANDLED ONLY IN A HOOD.
Eye Protection: EYE SHIELDS

Transportation Data

Disposal Data

Label Data

Label Required: YES
Label Status: G
Common Name: 0-771 1,3,5-TRIMETHYLBENZENE
Special Hazard Precautions: SKIN: HARMFUL IF ABSORBED, IRRITATION.
INHALATION: HARMFUL, MUCOUS MEMBRANES IRRITATION. EYES: IRRITATION, DAMAGE.
INGESTION: HARMFUL. THIS COMPOUND IS CONSIDERED TO BE SLIGHTLY TOXIC.
IRRITATION, NAUSEA, HEADACHE, DIZZINESS.
Label Name: CHEM SERVICE INC
Label Street: 660 TOWER LN
Label P.O. Box: 3108
Label City: WEST CHESTER
Label State: PA
Label Zip Code: 19381-3108
Label Country: US
Label Emergency Number: 215-692-3026/800-452-9994

Stability: YES
Cond To Avoid (Stability): NOT APPLICABLE
Materials To Avoid: NOT APPLICABLE

=====
Health Hazard Data
=====

=====
Precautions for Safe Handling and Use
=====

=====
Control Measures
=====

=====
Transportation Data
=====

=====
Disposal Data
=====

=====
Label Data
=====

Label Required: YES
Technical Review Date: 06APR94
Label Date: 06APR94
Label Status: G
Common Name: VINYL CHLORIDE/VINYL ACETATE COPOLYMER, 422
Chronic Hazard: NO
Signal Word: WARNING!
Acute Health Hazard-Slight: X
Contact Hazard-Moderate: X
Fire Hazard-None: X
Reactivity Hazard-None: X
Special Hazard Precautions: STORE IN DRY, COOL PLACE. ACUTE: BRIEF SKIN CONTACT IS NOT IRRITATING. PROLONGED CONTACT OR COVERED CONTACT MAY CAUSE LOCAL IRRITATION. EYE CONTACT WILL CAUSE MODERATE CONJUNCTIVITIS AND POSSIBLY MILD CORNEAL INJURY. CHRONIC: NONE LISTED BY MANUFACTURER.
Protect Eye: Y
Protect Skin: Y
Protect Respiratory: Y
Label Name: SCIENTIFIC POLYMER PRODUCTS INC
Label Street: 6265 DEAN PARKWAY
Label City: ONTARIO
Label State: NY
Label Zip Code: 14519
Label Country: US
Label Emergency Number: 716-265-0413

M-Xylene, 99+%
ACROS95260

**** SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION ****

MSDS Name: M-Xylene, 99+%

Catalog Numbers:

AC180860000, AC180860010, AC180860025, AC180862500, AC610471000,
AC18086N219, NC9705579

Synonyms:

1,2-Dimethylbenzene.

Company Identification (Europe): Acros Organics N.V.

Janssen Pharmaceutica
2440 Geel, Belgium

Company Identification (USA): Acros Organics

One Reagent Lane
Fairlawn, NJ 07410

For information in North America, call: 800-ACROS-01

For information in Europe, call: 0032(0) 14575211

For emergencies in the US, call CHEMTREC: 800-424-9300

For emergencies in Europe, call: 0032(0) 14575299

**** SECTION 2 - COMPOSITION, INFORMATION ON INGREDIENTS ****

| CAS# | Chemical Name | % | EINECS# |
|----------|---------------|------|-----------|
| 108-38-3 | M-Xylene | 99+% | 203-576-3 |

Hazard Symbols: XN F

Risk Phrases: 11 20/21 38

**** SECTION 3 - HAZARDS IDENTIFICATION ****

EMERGENCY OVERVIEW

Appearance: clear, colorless - colourless. Flash Point: 90 deg F.
Danger! Flammable liquid. Harmful if inhaled. This substance has caused adverse reproductive and fetal effects in animals. May cause central nervous system depression. Poison! May cause respiratory and digestive tract irritation. May cause severe eye irritation and possible injury. May cause liver and kidney damage. Harmful or fatal if swallowed.

Target Organs: Kidneys, central nervous system, liver.

Potential Health Effects

Eye:

Contact with eyes may cause severe irritation, and possible eye burns.

Skin:

Exposure may cause irritation characterized by redness, dryness, and inflammation. Prolonged and/or repeated contact may cause defatting of the skin and dermatitis. Skin absorption is slight. May be absorbed through the skin.

Ingestion:

Aspiration hazard. May cause central nervous system depression, kidney damage, and liver damage. Symptoms may include: headache, excitement, fatigue, nausea, vomiting, stupor, and coma. Causes gastrointestinal irritation with nausea, vomiting and diarrhea. Aspiration of material into the lungs may cause chemical pneumonitis, which may be fatal. Harmful or fatal if swallowed

Inhalation:

Inhalation of high concentrations may cause central nervous system effects characterized by headache, dizziness, unconsciousness and coma. Inhalation of vapor may cause respiratory tract irritation. Prolonged exposure may result in dizziness and general weakness. Irritation may lead to chemical pneumonitis and pulmonary edema. May cause liver and kidney damage. May cause irritation of the respiratory tract with burning pain in the nose and throat, coughing, wheezing, shortness of breath and pulmonary edema. May cause adverse central nervous system effects including headache,

Handling:

Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Ground and bond containers when transferring material. Use spark-proof tools and explosion proof equipment. Avoid contact with skin and eyes. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep container tightly closed. Avoid ingestion and inhalation. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.

Storage:

Keep away from heat and flame. Keep away from sources of ignition. Store in a tightly closed container. Keep from contact with oxidizing materials. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from strong acids.
Flammables-area.

**** SECTION 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION ****

Engineering Controls:

Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local explosion-proof ventilation to keep airborne levels to acceptable levels.

Exposure Limits

| Chemical Name | ACGIH | NIOSH | OSHA - Final PELs |
|---------------|--------------------------|---|---|
| M-Xylene | 100 ppm; 150 ppm STEL | 100 ppm TWA; 435 mg/m3 TWA 900 ppm IDLH | 100 ppm TWA; 435 mg/m3 TWA (listed under ** no name **). |

OSHA Vacated PELs:

M-Xylene:

100 ppm TWA; 435 mg/m3 TWA (listed under ** no name **)

Personal Protective Equipment

Eyes:

Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin:

Wear appropriate protective gloves to prevent skin exposure.

Clothing:

Wear appropriate protective clothing to prevent skin exposure.

Respirators:

Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

**** SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES ****

Physical State: Liquid
Appearance: clear, colorless - colourless
Odor: sweetish odor - mild odor - aromatic odor
pH: Not available.
Vapor Pressure: 6.8 mm Hg @ 21C
Vapor Density: 3.7 (air=1)
Evaporation Rate: 0.7 (butyl acetate=1)
Viscosity: <32.6 SUS
Boiling Point: 292 deg F
Freezing/Melting Point: -13 deg F
Autoignition Temperature: 867 deg F (463.89 deg C)
Flash Point: 90 deg F (32.22 deg C)

NFPA Rating: (est.) Health: 2; Flammability: 3; Reactivity: 0
Explosion Limits, Lower: 0.9
Upper: 6.7
Decomposition Temperature: Not available.
Solubility: Insoluble in water.
Specific Gravity/Density: 0.9 (water=1)
Molecular Formula: C8H10
Molecular Weight: 106.07

**** SECTION 10 - STABILITY AND REACTIVITY ****

Chemical Stability:
Stable at room temperature in closed containers under normal storage and handling conditions.
Conditions to Avoid:
High temperatures, incompatible materials, ignition sources, excess heat.
Incompatibilities with Other Materials:
Strong acids, strong oxidizers.
1,3-Dichloro-5,5-dimethyl-2,4-imidazolidindione.
Hazardous Decomposition Products:
Carbon monoxide, carbon dioxide, hydrocarbons.
Hazardous Polymerization: Has not been reported.

**** SECTION 11 - TOXICOLOGICAL INFORMATION ****

RTECS#:
CAS# 108-38-3: ZE2275000
LD50/LC50:
CAS# 108-38-3: Oral, rat: LD50 = 5 gm/kg; Skin, rabbit: LD50 = 14100 mg/kg.
Carcinogenicity:
M-Xylene -
ACGIH: A4 - Not Classifiable as a Human Carcinogen
IARC: Group 3 carcinogen (listed as ** undefined **).
Epidemiology:
No information available.
Teratogenicity:
Embryo or Fetus: Stunted fetus, inhalation-rat TCLo=1500mg/m3/24H
Specific Developmental Abnormalities: Musculoskeletal, inhalation-rat TCLo=3000mg/m3/24H.
Reproductive Effects:
Paternal Effects: Spermatogenesis, intraperitoneal-rat TDLo=500mg/kg.
Neurotoxicity:
No information available.
Mutagenicity:
No information available.
Other Studies:
See actual entry in RTECS for complete information.

**** SECTION 12 - ECOLOGICAL INFORMATION ****

Other
No information available.

**** SECTION 13 - DISPOSAL CONSIDERATIONS ****

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste.
US EPA guidelines for the classification determination are listed in 40 CFR Part 261. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.
RCRA P-Series: None listed.
RCRA U-Series: None listed.

**** SECTION 14 - TRANSPORT INFORMATION ****

US DOT
Shipping Name: XYLENES
Hazard Class: 3
UN Number: UN1307

Packing Group: III
Canadian TDG
Shipping Name: XYLENES
Hazard Class: 3(9.2)
UN Number: UN1307

**** SECTION 15 - REGULATORY INFORMATION ****

US FEDERAL
TSCA

CAS# 108-38-3 is listed on the TSCA inventory.
Health & Safety Reporting List
CAS# 108-38-3: Effective Date: October 4, 1982; Sunset Date: October 4, 1992
Chemical Test Rules
None of the chemicals in this product are under a Chemical Test Rule.
Section 12b
None of the chemicals are listed under TSCA Section 12b.
TSCA Significant New Use Rule
None of the chemicals in this material have a SNUR under TSCA.

SARA

Section 302 (RQ)
CAS# 108-38-3: final RQ = 1000 pounds (454 kg) (Listed under 'Xylene (Section 302 (TPQ))
None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 108-38-3: acute, chronic, flammable.

Section 313

This material contains M-Xylene (CAS# 108-38-3, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 372.

Clean Air Act:

CAS# 108-38-3 is listed as a hazardous air pollutant (HAP).
This material does not contain any Class 1 Ozone depleters.
This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

CAS# 108-38-3 is listed as a Hazardous Substance under the CWA.
None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

M-Xylene can be found on the following state right to know lists:
California, New Jersey, Florida, Pennsylvania, Minnesota, (listed as ** no name **), Massachusetts.

California No Significant Risk Level:

None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols: XN F

Risk Phrases:

R 11 Highly flammable.
R 20/21 Harmful by inhalation and in contact with skin.
R 38 Irritating to skin.

Safety Phrases:

S 25 Avoid contact with eyes.

WGK (Water Danger/Protection)

CAS# 108-38-3: No information available.

United Kingdom Occupational Exposure Limits

CAS# 108-38-3: OES-United Kingdom, TWA 100 ppm TWA; 441 mg/m3 TWA
CAS# 108-38-3: OES-United Kingdom, STEL 150 ppm STEL; 662 mg/m3 STEL

Canada

CAS# 108-38-3 is listed on Canada's DSL/NDSL List.
This product has a WHMIS classification of B2, D2A.
CAS# 108-38-3 is not listed on Canada's Ingredient Disclosure List.

Exposure Limits

CAS# 108-38-3 (listed as ** undefined **): OEL-ARAB Republic of Egypt:

TWA 0.5 ppm (0.9 mg/m3)
OEL-AUSTRALIA:TWA 80 ppm (330 mg/m3);STEL 150 ppm (655 mg/m3)
OEL-BELGIUM:TWA 100 ppm (434 mg/m3);STEL 150 ppm (651 mg/m3)
OEL-CZECHOSLOVAKIA:TWA 200 mg/m3;STEL 1000 mg/m3
OEL-DENMARK:TWA 50 ppm (217 mg/m3);Skin
OEL-FINLAND:TWA 100 ppm (435 mg/m3);STEL 150 ppm;Skin
OEL-FRANCE:TWA 100 ppm (435 mg/m3);STEL 150 ppm (650 mg/m3)
OEL-GERMANY:TWA 100 ppm (440 mg/m3)
OEL-HUNGARY:TWA 100 mg/m3;STEL 300 mg/m3
OEL-JAPAN:TWA 100 ppm (430 mg/m3)
OEL-THE NETHERLANDS:TWA 100 ppm (435 mg/m3);Skin
OEL-THE PHILIPPINES:TWA 0.1 mg/m3
OEL-POLAND:TWA 100 mg/m3
OEL-SWEDEN:TWA 50 ppm (200 mg/m3);STEL 100 ppm (450 mg/m3);Skin
OEL-SWITZERLAND:TWA 100 ppm (436 mg/m3);STEL 200 ppm (870 mg/m3)
OEL-THAILAND:TWA 100 ppm (435 mg/m3)
OEL-TURKEY:TWA 100 ppm (435 mg/m3)
OEL-UNITED KINGDOM:TWA 100 ppm (435 mg/m3);STEL 150 ppm;Skin
OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA check ACGIH TLV
OEL IN NEW ZEALAND, SINGAPORE, VIETNAM check ACGI TLV

**** SECTION 16 - ADDITIONAL INFORMATION ****

MSDS Creation Date: 12/09/1997 Revision #4 Date: 8/02/2000

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no way shall the company be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if the company has been advised of the possibility of such damages.

Health Hazard Data

LD50-LC50 Mixture: ORAL LD50 (RAT): 12.9 G/KG METHANOL
Route Of Entry - Inhalation: NO
Route Of Entry - Skin: NO
Route Of Entry - Ingestion: NO
Health Haz Acute And Chronic: TOXIC, IRRITANT.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NONE
Signs/Symptoms Of Overexp: TOXIC, IRRITANT.
Emergency/First Aid Proc: EYES/SKIN: FLUSH W/COPIOUS AMOUNTS OF WATER.
INHALATION: REMOVE TO FRESH AIR. GIVE OXYGEN IF NECESSARY. OBTAIN MEDICAL ATTENTION IN ALL CASES.

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: A LEAKING BOTTLE MAY BE PLACED IN A PLASTIC BAG & NORMAL DISPOSAL PROCEDURES FOLLOWED. LIQUID SAMPLES MAY BE ABSORBED ON VERMICULITE/SAND.
Waste Disposal Method: BURN IN A CHEMICAL INCINERATOR EQUIPPED W/AN AFTERBURNER & SCRUBBER. DISPOSE OF IN ACCORDANCE W/LOCAL, STATE & FEDERAL REGULATINS.
Precautions-Handling/Storing: USE APPROPRIATE OSHA/MSHA APPROVED SAFETY EQUIPEMENT. KEEP TIGHTLY CLOSED & STORE IN A COOL, DRY PLACE.
Other Precautions: MATERIAL SHOULD ONLY BE USED BY THOSE PERSONS TRAINED IN THE SAFE HANDLING OF HAZARDOUS CHEMICALS. DIRECT PHYSICAL CONTACT SHOULD BE AVOIDED.

Control Measures

Respiratory Protection: APPROPRIATE OSHA/MSHA APPROVED EQUIPMENT.
Protective Gloves: CHEMICAL RESISTANT
Eye Protection: CHEMICAL GOGGLES, FACE SHIELD
Other Protective Equipment: CHEMICAL RESISTANT CLOTHING; LAB COAT, RUBBER APRON.

Transportation Data

Disposal Data

Label Data

Label Required: YES
Label Status: G
Common Name: AM-300 O-XYLENE SOLUTION AT 100 UG/ML METHANOL
Special Hazard Precautions: TOXIC, IRRITANT. TOXIC, IRRITANT.
Label Name: ULTRA SCIENTIFIC
Label Street: 250 SMITH STREET
Label City: NORTH KINGSTOWN
Label State: RI
Label Zip Code: 02852-5000
Label Country: US
Label Emergency Number: 401-294-9400

P-Xylene, P.A.
ACROS95256

**** SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION ****

MSDS Name: P-Xylene, P.A.

Catalog Numbers:

AC220210000, AC220210010

Synonyms:

1,2-Dimethylbenzene.

Company Identification (Europe): Acros Organics N.V.
Janssen Pharmaceuticlaan 3a
2440 Geel, Belgium

Company Identification (USA): Acros Organics
One Reagent Lane
Fairlawn, NJ 07410

For information in North America, call: 800-ACROS-01

For information in Europe, call: 0032(0) 14575211

For emergencies in the US, call CHEMTREC: 800-424-9300

For emergencies in Europe, call: 0032(0) 14575299

**** SECTION 2 - COMPOSITION, INFORMATION ON INGREDIENTS ****

| CAS# | Chemical Name | % | EINECS# |
|----------|---------------|--------|-----------|
| 106-42-3 | P-Xylene | ca 100 | 203-396-5 |

Hazard Symbols: XN F

Risk Phrases: 11 20/21 38

**** SECTION 3 - HAZARDS IDENTIFICATION ****

EMERGENCY OVERVIEW

Appearance: clear, colorless - colourless. Flash Point: 90 deg F.

Danger! Flammable liquid. Harmful if inhaled. This substance has caused adverse reproductive and fetal effects in animals. May cause central nervous system depression. Aspiration hazard. Poison! May cause liver and kidney damage. Causes eye and skin irritation. Causes digestive and respiratory tract irritation. Harmful or fatal if swallowed.

Target Organs: Kidneys, central nervous system, liver.

Potential Health Effects

Eye:

Contact with eyes may cause severe irritation, and possible eye burns. Prolonged or repeated exposure may cause conjunctivitis.

Skin:

May be absorbed through the skin in harmful amounts. Exposure may cause irritation characterized by redness, dryness, and inflammation. Prolonged and/or repeated contact may cause defatting of the skin and dermatitis. Skin absorption is slight. Causes blistering of the skin.

Ingestion:

Aspiration hazard. May cause central nervous system depression, kidney damage, and liver damage. Symptoms may include: headache, excitement, fatigue, nausea, vomiting, stupor, and coma. Causes gastrointestinal irritation with nausea, vomiting and diarrhea. Aspiration of material into the lungs may cause chemical pneumonitis, which may be fatal. Harmful or fatal if swallowed

Inhalation:

Harmful if inhaled. Inhalation of high concentrations may cause central nervous system effects characterized by headache, dizziness, unconsciousness and coma. Prolonged exposure may result in dizziness and general weakness. Irritation may lead to chemical pneumonitis and pulmonary edema. May cause liver and kidney damage. May cause irritation of the respiratory tract with burning pain in the nose and throat, coughing, wheezing, shortness of breath and pulmonary edema. May cause adverse central nervous system effects including headache, convulsions, and possible death. Exposure may give rise to

flushing of face, skin rash, an increase in heart and respiration rates, headaches, giddiness, nausea, and vomiting.

Chronic:

Chronic exposure to organic solvents has been associated with various neurotoxic effects including permanent brain and nervous system damage. Chronic inhalation may cause effects similar to those of acute inhalation. Prolonged or repeated skin contact may cause defatting and dermatitis. Prolonged or repeated exposure may cause permanent eye damage. May cause reproductive and fetal effects.

**** SECTION 4 - FIRST AID MEASURES ****

Eyes:

Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately. Do NOT allow victim to rub or keep eyes closed.

Skin:

Immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

Ingestion:

Do NOT induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation:

Get medical aid immediately. Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. DO NOT use mouth-to-mouth respiration.

Notes to Physician:

Treat symptomatically and

**** SECTION 5 - FIRE FIGHTING MEASURES ****

General Information:

As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Vapors can travel to a source of ignition and flash back. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Flammable Liquid. Can release vapors that form explosive mixtures at temperatures above the flashpoint. Use water spray to keep fire-exposed containers cool. Vapor may cause flash fire. Water may be ineffective. Material is lighter than water and a fire may be spread by the use of water. Liquid will float and may reignite on the surface of water. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas. May polymerize explosively when involved in a fire. Containers may explode when heated.

Extinguishing Media:

For small fires, use dry chemical, carbon dioxide, water spray or alcohol-resistant foam. Use water spray to cool fire-exposed containers. Water may be ineffective. This material is lighter than water and insoluble in water. The fire could easily be spread by the use of water in an area where the water cannot be contained. For large fires, use water spray, fog or alcohol-resistant foam. Do NOT use straight streams of water. Cool containers with flooding quantities of water until well after fire is out.

**** SECTION 6 - ACCIDENTAL RELEASE MEASURES ****

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks:

Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Wear a self contained breathing apparatus and appropriate Personal protection. (See Exposure Controls, Personal Protection section). Scoop up with a nonsparking tool, then place into a suitable container for disposal. Remove all sources of ignition. Absorb spill using an absorbent, non-combustible material such as earth, sand, or vermiculite. Provide ventilation.

**** SECTION 7 - HANDLING and STORAGE ****

Handling:

Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Ground and bond containers when transferring material. Use spark-proof tools and explosion proof equipment. Avoid contact with skin and eyes. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep container tightly closed. Avoid contact with heat, sparks and flame. Avoid ingestion and inhalation. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.

Storage:

Keep away from heat and flame. Keep away from sources of ignition. Store in a tightly closed container. Keep from contact with oxidizing materials. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from strong acids.
Flammables-area.

**** SECTION 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION ****

Engineering Controls:

Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local explosion-proof ventilation to keep airborne levels to acceptable levels.

Exposure Limits

| Chemical Name | ACGIH | NIOSH | OSHA - Final PELs |
|---------------|--------------------------|---|---|
| P-Xylene | 100 ppm; 150 ppm STEL | 100 ppm TWA; 435 mg/m3 TWA 900 ppm IDLH | 100 ppm TWA; 435 mg/m3 TWA (listed under ** no name **). |

OSHA Vacated PELs:

P-Xylene:

100 ppm TWA; 435 mg/m3 TWA (listed under ** no name **)

Personal Protective Equipment

Eyes:

Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin:

Wear appropriate protective gloves to prevent skin exposure.

Clothing:

Wear appropriate protective clothing to prevent skin exposure.

Respirators:

Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

**** SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES ****

Physical State: Liquid
Appearance: clear, colorless - colourless
Odor: sweetish odor - mild odor - aromatic odor
pH: Not available.
Vapor Pressure: 6.8 mm Hg @ 21C
Vapor Density: 3.7 (air=1)
Evaporation Rate: 0.7 (butyl acetate=1)
Viscosity: <32.6 SUS
Boiling Point: 292 deg F

Freezing/Melting Point: -13 deg F
Autoignition Temperature: 867 deg F (463.89 deg C)
Flash Point: 90 deg F (32.22 deg C)
NFPA Rating: (est.) Health: 2; Flammability: 3; Reactivity: 0
Explosion Limits, Lower: 0.9
Upper: 6.7
Decomposition Temperature: Not available.
Solubility: Insoluble in water.
Specific Gravity/Density: 0.9 (water=1)
Molecular Formula: C8H10
Molecular Weight: 106.07

**** SECTION 10 - STABILITY AND REACTIVITY ****

Chemical Stability:
Stable at room temperature in closed containers under normal storage and handling conditions.
Conditions to Avoid:
High temperatures, incompatible materials, ignition sources, excess heat, strong oxidants.
Incompatibilities with Other Materials:
Strong acids, strong oxidizers.
1,3-Dichloro-5,5-dimethyl-2,4-imidazolidindione.
Hazardous Decomposition Products:
Carbon monoxide, carbon dioxide, hydrocarbons.
Hazardous Polymerization: Has not been reported.

**** SECTION 11 - TOXICOLOGICAL INFORMATION ****

RTECS#:
CAS# 106-42-3: ZE2625000
LD50/LC50:
CAS# 106-42-3: Inhalation, rat: LC50 =4550 ppm/4H; Oral, rat: LD50 = 5 gm/kg.
Carcinogenicity:
P-Xylene -
ACGIH: A4 - Not Classifiable as a Human Carcinogen
IARC: Group 3 carcinogen (listed as ** undefined **).
Epidemiology:
No information available.
Teratogenicity:
Embryo or Fetus: Stunted fetus, inhalation-rat TCLo=1500mg/m3/24H
Specific Developmental Abnormalities: Musculoskeletal, inhalation-rat TCLo=3000mg/m3/24H.
Reproductive Effects:
Paternal Effects: Spermatogenesis, intraperitoneal-rat TDLo=500mg/kg.
Neurotoxicity:
No information available.
Mutagenicity:
No information available.
Other Studies:
See actual entry in RTECS for complete information.

**** SECTION 12 - ECOLOGICAL INFORMATION ****

Other
No information available.

**** SECTION 13 - DISPOSAL CONSIDERATIONS ****

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste.
US EPA guidelines for the classification determination are listed in 40 CFR Part 261. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.
RCRA P-Series: None listed.
RCRA U-Series: None listed.

**** SECTION 14 - TRANSPORT INFORMATION ****

US DOT

Shipping Name: XYLENES
Hazard Class: 3
UN Number: UN1307
Packing Group: III
Canadian TDG
Shipping Name: XYLENES
Hazard Class: 3(9.2)
UN Number: UN1307

**** SECTION 15 - REGULATORY INFORMATION ****

US FEDERAL
TSCA

CAS# 106-42-3 is listed on the TSCA inventory.
Health & Safety Reporting List
CAS# 106-42-3: Effective Date: January 26, 1994; Sunset Date: January 26, 2004
Chemical Test Rules
None of the chemicals in this product are under a Chemical Test Rule.
Section 12b
None of the chemicals are listed under TSCA Section 12b.
TSCA Significant New Use Rule
None of the chemicals in this material have a SNUR under TSCA.

SARA

Section 302 (RQ)
CAS# 106-42-3: final RQ = 100 pounds (45.4 kg) (Listed under 'Xylene (Section 302 (TPQ)
None of the chemicals in this product have a TPQ.
SARA Codes
CAS # 106-42-3: acute, chronic, flammable.
Section 313
This material contains P-Xylene (CAS# 106-42-3, 100%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 372.

Clean Air Act:

CAS# 106-42-3 is listed as a hazardous air pollutant (HAP).
This material does not contain any Class 1 Ozone depletors.
This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 106-42-3 is listed as a Hazardous Substance under the CWA.
None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

P-Xylene can be found on the following state right to know lists:
California, New Jersey, Florida, Pennsylvania, Minnesota, (listed as ** no name **), Massachusetts.

California No Significant Risk Level:

None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols: XN F

Risk Phrases:

R 11 Highly flammable.
R 20/21 Harmful by inhalation and in contact with skin.
R 38 Irritating to skin.

Safety Phrases:

S 25 Avoid contact with eyes.

WGK (Water Danger/Protection)

CAS# 106-42-3: 2

United Kingdom Occupational Exposure Limits

CAS# 106-42-3: OES-United Kingdom, TWA 100 ppm TWA; 441 mg/m3 TWA

CAS# 106-42-3: OES-United Kingdom, STEL 150 ppm STEL; 662 mg/m3 STEL

Canada

CAS# 106-42-3 is listed on Canada's DSL/NDSL List.

This product has a WHMIS classification of B2, D2A.

CAS# 106-42-3 is not listed on Canada's Ingredient Disclosure List.

Exposure Limits

CAS# 106-42-3 (listed as ** undefined **): OEL-ARAB Republic of Egypt:
TWA 0.5 ppm (0.9 mg/m3)
OEL-AUSTRALIA:TWA 80 ppm (330 mg/m3);STEL 150 ppm (655 mg/m3)
OEL-BELGIUM:TWA 100 ppm (434 mg/m3);STEL 150 ppm (651 mg/m3)
OEL-CZECHOSLOVAKIA:TWA 200 mg/m3;STEL 1000 mg/m3
OEL-DENMARK:TWA 50 ppm (217 mg/m3);Skin
OEL-FINLAND:TWA 100 ppm (435 mg/m3);STEL 150 ppm;Skin
OEL-FRANCE:TWA 100 ppm (435 mg/m3);STEL 150 ppm (650 mg/m3)
OEL-GERMANY:TWA 100 ppm (440 mg/m3)
OEL-HUNGARY:TWA 100 mg/m3;STEL 300 mg/m3
OEL-JAPAN:TWA 100 ppm (430 mg/m3)
OEL-THE NETHERLANDS:TWA 100 ppm (435 mg/m3);Skin
OEL-THE PHILIPPINES:TWA 0.1 mg/m3
OEL-POLAND:TWA 100 mg/m3
OEL-SWEDEN:TWA 50 ppm (200 mg/m3);STEL 100 ppm (450 mg/m3);Skin
OEL-SWITZERLAND:TWA 100 ppm (436 mg/m3);STEL 200 ppm (870 mg/m3)
OEL-THAILAND:TWA 100 ppm (435 mg/m3)
OEL-TURKEY:TWA 100 ppm (435 mg/m3)
OEL-UNITED KINGDOM:TWA 100 ppm (435 mg/m3);STEL 150 ppm;Skin
OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA check ACGIH TLV
OEL IN NEW ZEALAND, SINGAPORE, VIETNAM check ACGI TLV

**** SECTION 16 - ADDITIONAL INFORMATION ****

MSDS Creation Date: 9/02/1997 Revision #4 Date: 8/02/2000

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no way shall the company be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if the company has been advised of the possibility of such damages.

CORCO CHEMICAL -- XYLENES #2100 - DYE,LEAK DETECTION
MATERIAL SAFETY DATA SHEET
NSN: 6820000014192
Manufacturer's CAGE: 58571
Part No. Indicator: A
Part Number/Trade Name: XYLENES #2100

=====
General Information
=====

Item Name: DYE,LEAK DETECTION
Company's Name: CORCO CHEMICAL CORP
Company's Street: TYBURN RD AND CEDER LN
Company's City: FAIRLESS HILLS
Company's State: PA
Company's Country: US
Company's Zip Code: 19030-4601
Company's Emerg Ph #: 215-295-0781
Company's Info Ph #: 215-295-0781
Distributor/Vendor # 1: ALPHA MAINTENANCE PRODUCTS, INC.
Distributor/Vendor # 1 Cage: OGYW1
Record No. For Safety Entry: 005
Tot Safety Entries This Stk#: 008
Status: SE
Date MSDS Prepared: 11JUL91
Safety Data Review Date: 12NOV92
Supply Item Manager: CX
MSDS Serial Number: BPHDW
Specification Number: MIL-D-81298
Spec Type, Grade, Class: TYPE I
Hazard Characteristic Code: F3
Unit Of Issue: GL
Unit Of Issue Container Qty: 1 GALLON
Type Of Container: CAN
Net Unit Weight: 7.2 LBS

=====
Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: XYLENES (O-,M-,P- ISOMERS) (SARA III)
Ingredient Sequence Number: 01
Percent: UNKNOWN
NIOSH (RTECS) Number: ZE2100000
CAS Number: 1330-20-7
OSHA PEL: 100 PPM/150 STEL
ACGIH TLV: 100 PPM/150STEL;9192
Other Recommended Limit: NONE SPECIFIED

Proprietary: NO
Ingredient: RED DYE
Ingredient Sequence Number: 02
Percent: UNKNOWN
NIOSH (RTECS) Number: 1004068RD
OSHA PEL: UNKNOWN
ACGIH TLV: UNKNOWN
Other Recommended Limit: NONE SPECIFIED

=====
Physical/Chemical Characteristics
=====

Appearance And Odor: UNIFORM RED LIQUID. AROMATIC SOLVENT ODOR.
Boiling Point: 281F,138C
Melting Point: 54.0F,12.2C
Vapor Pressure (MM Hg/70 F): 6.72
Vapor Density (Air=1): 3.66 AIR=1

Specific Gravity: 0.864
Decomposition Temperature: UNKNOWN
Evaporation Rate And Ref: UNKNOWN
Solubility In Water: NEGLIGIBLE

=====
Fire and Explosion Hazard Data
=====

Flash Point: 62.6F,17.0C
Flash Point Method: CC
Lower Explosive Limit: 1.0
Upper Explosive Limit: 6.0
Extinguishing Media: DRY CHEMICAL, CARBON DIOXIDE, WATER SPRAY, ALCOHOL FOAM.
Special Fire Fighting Proc: WEAR SELF-CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE EQUIPMENT. COOL FLAME EXPOSED CONTAINERS WITH WATER UNTIL WELL AFTER FIRE IS OUT.
Unusual Fire And Expl Hazrds: COMBUSTIBLE. KEEP AWAY FROM HEAT, SPARK, OPEN FLAME, SOURCE OF IGNITION.

=====
Reactivity Data
=====

Stability: YES
Cond To Avoid (Stability): HEAT, SPARKS, FLAMES.
Materials To Avoid: STRONG OXIDIZERS.
Hazardous Decomp Products: OXIDES OF CARBONS, ACRID SMOKE AND FUME.
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): CONTAMINATION.

=====
Health Hazard Data
=====

LD50-LC50 Mixture: UNKNOWN
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: IRRITATION OF EYES, NOSE, THROAT. REVERSIBLE EYE DAMAGE. DERMATITIS, CHEMICAL PNEUMONIA, CENTRAL NERVOUS SSTEM DEPRESSION. MAY CAUSE MINOR REVERSIBLE EFFECTS ON LIVER AND KIDNEYS.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Signs/Symptoms Of Overexp: DIZZINESS, STAGGERING, DROWSINESS, UNCONSCIOUSNESS.
Med Cond Aggravated By Exp: PRE-EXISTING DISEASES INVOLVING THE CENTRAL NERVOUS SYSTEM, EYES, SKIN, BLOOD, LIVER, KIDNEYS, GASTROINTESTINAL SYSTEM. REMOVE CONTAMINATED CLOTHING. FLUSH AREA WITH LARGE AMOUNTS OF WATER. INHALATION: MOVE TO FRESH AIR. RESTORE BREATHING IF NECESSARY. GET MEDICAL ATTENTION. INGESTION: DO NOT INDUCE VOMITING. GET MEDICAL ATTENTION.

=====
Precautions for Safe Handling and Use
=====

Steps If Matl Released/Spill: ELIMINATE IGNITION SOURCES. FOR MAJOR SPILL, WEAR SCBA AND FULL PROTECTIVE EQUIPMENT. USE WATER SPRAY TO REDUCE VAPOR CLOUDS. TAKE UP LIQUID WITH NON-COMBUSTABLE ABSORBENT. CONTAINERIZE WASTE FOR LATER DISPOSAL.
Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.
Waste Disposal Method: DISPOSE OF WASTE IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.
Precautions-Handling/Storing: KEEP CONTAINERS CLOSED, AWAY FROM HEAT AND FLAME. BEFORE EMPTYING, ELECTRICALLY GROUND CONTAINERS TO PREVENT ACCUMULATION OF STATIC ELECTRICITY.
Other Precautions: USE NON-SPARKING TOOLS. PROTECT AGAINST PHYSICAL DAMAGE. AVOID BREATHING VAPORS. DO NOT GET LIQUID OR VAPOR IN EYES, ON SKIN, ON CLOTHING. OBSERVE ALL PRECAUTIONS WHEN HANDLING "EMPTY" CONTAINERS AND POSSIBLE RESIDUE THEREIN.

=====
Control Measures
=====

Respiratory Protection: WEAR SELF-CONTAINED BREATHING APPARATUS WHEN VAPOR CONCENTRATIONS ARE ABOVE 100 PPM.
Ventilation: USE ADEQUATE VENTILATION TO MAINTAIN VAPOR CONC BELOW 100PPM. USE EXPLOSION-PROOF VENTILATION EQUIPMENT.
Protective Gloves: RUBBER
Eye Protection: FULL FACE SHIELD, SPLASH GOGGLES.
Other Protective Equipment: GROUND CONTAINERS. USE NON-SPARKING TOOLS.
Work Hygienic Practices: WASH AFTER HANDLING AND BEFORE EATING, DRINKING, OR SMOKING. LAUNDRER CONTAMINATED CLOTHING BEFORE REUSE.

=====
Transportation Data
=====

Trans Data Review Date: 92317
DOT PSN Code: PWP
DOT Proper Shipping Name: XYLENES
DOT Class: 3
DOT ID Number: UN1307
DOT Pack Group: II
DOT Label: FLAMMABLE LIQUID
IMO PSN Code: PPC
IMO Proper Shipping Name: XYLENES
IMO Regulations Page Number: 3292
IMO UN Number: 1307
IMO UN Class: 3.2
IMO Subsidiary Risk Label: -
IATA PSN Code: ZPJ
IATA UN ID Number: 1307
IATA Proper Shipping Name: XYLENES
IATA UN Class: 3
IATA Label: FLAMMABLE LIQUID
AFI PSN Code: ZPJ
AFI Prop. Shipping Name: XYLENES
AFI Class: 3
AFI ID Number: UN1307
AFI Pack Group: II
AFI Basic Pac Ref: 7-7

=====
Disposal Data
==========
Label Data
=====

Label Required: YES
Technical Review Date: 12NOV92
Label Status: F
Common Name: XYLENES #2100
Chronic Hazard: YES
Signal Word: DANGER!
Acute Health Hazard-Moderate: X
Contact Hazard-Slight: X
Fire Hazard-Severe: X
Reactivity Hazard-None: X
Special Hazard Precautions: IRRITATION OF EYES, NOSE, THROAT. REVERSIBLE EYE DAMAGE. DERMATITIS, CHEMICAL PNEUMONIA, CENTRAL NERVOUS SSTEM DEPRESSION. MAY CAUSE MINOR REVERSIBLE EFFECTS ON LIVER AND KIDNEYS. KEEP CONTAINERS CLOSED, AWAY FROM HEAT AND FLAME. BEFORE EMPTYING, ELECTRICALLY EYES: FLUSH WITH LARGE AMOUNTS OF WATER. SKIN: REMOVE CONTAMINATED CLOTHING. FLUSH AREA WITH LARGE AMOUNTS OF WATER. INHALATION: MOVE TO FRESH AIR. RESTORE BREATHING IF NECESSARY. GET MEDICAL ATTENTION. INGESTION: DO NOT INDUCE VOMITING. GET MEDICAL ATTENTION.
Protect Eye: Y

Protect Skin: Y
Protect Respiratory: Y
Label Name: CORCO CHEMICAL CORP
Label Street: TYBURN RD AND CEDAR LN
Label City: FAIRLESS HILLS
Label State: PA
Label Zip Code: 19030-4601
Label Country: US
Label Emergency Number: 215-295-0781

ENVIRONMENTAL RESOURCE ASSOC -- 570, TOTAL PETROLEUM HYDROCARBONS (TPH) IN (SUPDAT
MATERIAL SAFETY DATA SHEET
NSN: 666500N072167
Manufacturer's CAGE: 1R664
Part No. Indicator: A
Part Number/Trade Name: 570, TOTAL PETROLEUM HYDROCARBONS (TPH) IN (SUPDAT)

=====
General Information
=====

Company's Name: ENVIRONMENTAL RESOURCE ASSOC
Company's Street: 5540 MARSHALL ST
Company's City: ARVADA
Company's State: CO
Company's Country: US
Company's Zip Code: 80002
Company's Emerg Ph #: 303-431-8454
Company's Info Ph #: 303-431-8454
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SMJ
Date MSDS Prepared: 10JUN94
Safety Data Review Date: 14AUG96
MSDS Serial Number: CBPZJ

=====
Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: PETROLEUM HYDROCARBONS; (IN SOIL) (>98% SOIL + <1% PETROLEUM
HYDROCARBONS)
Ingredient Sequence Number: 01
Percent: <1
NIOSH (RTECS) Number: 1000099PH
OSHA PEL: 5 MG/M3 (OIL MIST)
ACGIH TLV: 5 MG/M3 (OIL MIST)

=====
Physical/Chemical Characteristics
=====

Appearance And Odor: BROWN SOIL; ODORLESS.
Boiling Point: SOLID
Melting Point: N/A
Vapor Pressure (MM Hg/70 F): N/A
Vapor Density (Air=1): N/A
Specific Gravity: N/A
Evaporation Rate And Ref: N/A
Solubility In Water: NONE
pH: N/A

=====
Fire and Explosion Hazard Data
=====

Flash Point: NOT IGNITABLE
Lower Explosive Limit: N/A
Upper Explosive Limit: N/A
Extinguishing Media: MEDIA SUITABLE FOR SURROUNDING FIRE (FP N).
Special Fire Fighting Proc: USE NIOSH APPROVED SCBA AND FULL PROTECTIVE
EQUIPMENT (FP N).
Unusual Fire And Expl Hazrds: NONE.

=====
Reactivity Data
=====

Stability: YES
Cond To Avoid (Stability): NONE.
Materials To Avoid: NONE SPECIFIED BY MANUFACTURER.
Hazardous Decomp Products: NONE SPECIFIED BY MANUFACTURER.

Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NOT RELEVANT

=====
Health Hazard Data
=====

LD50-LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: NO SIGNIFICANT HAZARD TO HUMAN HEALTH. MINOR IRRITATION IS POSSIBLE IF EYE EXPOSED TO DUST.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NOT RELEVANT
Signs/Symptoms Of Overexp: SEE HEALTH HAZARDS.
Med Cond Aggravated By Exp: NONE.
Emergency/First Aid Proc: INHAL: REMOVE TO FRESH AIR. SUPPORT BREATHING (GIVE OXYGEN/ARTIFICIAL RESPIRATION) (FP N). EYES: FLUSH WITH WATER FOR AT LEAST 15 MINUTES. SKIN: FLUSH WITH WATER. INGEST: INDUCE VOMITING FOR LARGE INGESTIONS ONLY.

=====
Precautions for Safe Handling and Use
=====

Steps If Matl Released/Spill: SWEEP OR VACUUM AND DISPOSE OF AS ORDINARY WASTE.
Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.
Waste Disposal Method: DISPOSAL MUST BE IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS (FP N). DISPOSE OF AS NON-HAZARDOUS WASTE.
Precautions-Handling/Storing: NONE.
Other Precautions: NONE.

=====
Control Measures
=====

Respiratory Protection: NOT REQUIRED. USE NIOSH APPROVED RESPIRATOR APPROPRIATE FOR EXPOSURE OF CONCERN (FP N).
Ventilation: NOT REQUIRED.
Protective Gloves: IMPERVIOUS GLOVES (FP N).
Eye Protection: ANSI APPRVD CHEM WORKERS GOGGLES (FP N).
Other Protective Equipment: ANSI APPROVED EYE WASH & DELUGE SHOWER (FP N).
Work Hygienic Practices: SOIL MATRIX MAY IRRITATE MUCOUS MEMBRANES.
Suppl. Safety & Health Data: MFR'S TRADE NAME/PART NO: SOIL, TPH-91, WITHOUT FATTY ACIDS.

=====
Transportation Data
=====

=====
Disposal Data
=====

=====
Label Data
=====

Label Required: YES
Technical Review Date: 14AUG96
Label Date: 07AUG96
Label Status: G
Common Name: 570, TOTAL PETROLEUM HYDROCARBONS (TPH) IN (SUPDAT)
Chronic Hazard: NO
Signal Word: CAUTION!
Acute Health Hazard-None: X
Contact Hazard-Slight: X
Fire Hazard-None: X
Reactivity Hazard-None: X
Special Hazard Precautions: ACUTE: MINOR IRRITATION IS POSSIBLE IF EYE

EXPOSED TO DUST. CHRONIC: NONE LISTED BY MANUFACTURER.

Protect Eye: Y

Protect Skin: Y

Protect Respiratory: Y

Label Name: ENVIRONMENTAL RESOURCE ASSOC

Label Street: 5540 MARSHALL ST

Label City: ARVADA

Label State: CO

Label Zip Code: 80002

Label Country: US

Label Emergency Number: 303-431-8454

ALDRICH CHEMICAL -- ACENAPHTHENE, 99%, 21537-6 - ACENAPHTHENE, 1,2-DIHYDRO-
MATERIAL SAFETY DATA SHEET
NSN: 681000N040297
Manufacturer's CAGE: 60928
Part No. Indicator: A
Part Number/Trade Name: ACENAPHTHENE, 99%, 21537-6

=====
General Information
=====

Item Name: ACENAPHTHENE, 1,2-DIHYDRO-
Company's Name: ALDRICH CHEMICAL CO
Company's P. O. Box: 355
Company's City: MILWAUKEE
Company's State: WI
Company's Country: US
Company's Zip Code: 53201
Company's Emerg Ph #: 414-273-3850
Company's Info Ph #: 414-273-3850
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SMJ
Date MSDS Prepared: 23JUL92
Safety Data Review Date: 03MAR93
MSDS Serial Number: BRZJQ
Hazard Characteristic Code: NK

=====
Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: ACENAPHTHENE
Ingredient Sequence Number: 01
Percent: 99
NIOSH (RTECS) Number: AB1000000
CAS Number: 83-32-9

=====
Physical/Chemical Characteristics
=====

Appearance And Odor: PALE-YELLOW NEEDLES.
Boiling Point: 534F,279C
Melting Point: 199F,93C
Vapor Pressure (MM Hg/70 F): 10@131C
Vapor Density (Air=1): 5.32

=====
Fire and Explosion Hazard Data
=====

Extinguishing Media: WATER SPRAY. CARBON DIOXIDE, DRY CHEMICAL POWDER OR
APPROPRIATE FOAM.
Special Fire Fighting Proc: WEAR NIOSH/MSHA APPROVED SCBA AND FULL
PROTECTIVE EQUIPMENT (FP N).
Unusual Fire And Expl Hazrds: NONE SPECIFIED BY MANUFACTURER.

=====
Reactivity Data
=====

Stability: YES
Cond To Avoid (Stability): NONE SPECIFIED BY MANUFACTURER.
Materials To Avoid: STRONG OXIDIZING AGENTS.
Hazardous Decomp Products: TOXIC FUMES OF: CARBON MONOXIDE, CARBON
DIOXIDE.
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NOT RELEVANT

=====
Health Hazard Data
=====

LD50-LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: ACUTE: MAY BE HARMFUL BY INHALATION, INGESTION OR SKIN ABSORPTION. CAUSES EYE AND SKIN IRRITATION. MATERIAL IS IRRITATING TO MUCOUS MEMBRANES AND UPPER RESPIRATORY TRACT. TO THE BEST OF MFR KNOWLEDGE, THE CHEMICAL, PHYSICAL, AND TOXICOLOGICAL PROPERTIES HAVE NOT BEEN THOROUGHLY INVESTIGATED.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NOT RELEVANT
Signs/Symptoms Of Overexp: SEE HEALTH HAZARDS.
Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER.
Emergency/First Aid Proc: EYES: IMMEDIATELY FLUSH WITH COPIOUS AMOUNTS OF WATER FOR AT LEAST 15 MINUTES & SEEK MED ADVICE. SKIN: IMMEDIATELY WASH SKIN WITH SOAP AND COPIOUS AMOUNTS OF WATER. WASH CONTAMINATED CLOTHING BEFORE REUSE. INHAL: REMOVE TO FRESH AIR. IF NOT BREATHING GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN. INGEST: WASH OUT MOUTH WITH WATER PROVIDED PERSON IS CONSCIOUS. CALL A PHYSICIAN.

=====
Precautions for Safe Handling and Use
=====

Steps If Matl Released/Spill: WEAR NIOSH/MSHA APPROVED SCBA, RUBBER BOOTS AND HEAVY RUBBER GLOVES. SWEEP UP, PLACE IN A BAG AND HOLD FOR WASTE DISPOSAL. AVOID RAISING DUST. VENTILATE AREA AND WASH SPILL SITE AFTER MATERIAL PICKUP IS COMPLETE.
Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.
Waste Disposal Method: DISSOLVE/MIX MATERIAL WITH A COMBUSTIBLE SOLVENT AND BURN IN A CHEMICAL INCINERATOR EQUIPPED WITH AN AFTERBURNER AND SCRUBBER. DISPOSE OF I/A/W FEDERAL, STATE AND LOCAL REGULATIONS (FP N).
Precautions-Handling/Storing: KEEP TIGHTLY CLOSED. STORE IN A COOL DRY PLACE. AVOID CONTACT AND INHALATION. DO NOT GET IN EYES, ON SKIN/CLTHG. IRRITANT.
Other Precautions: NONE SPECIFIED BY MANUFACTURER.

=====
Control Measures
=====

Respiratory Protection: NIOSH/MSHA APPROVED RESPIRATOR.
Ventilation: MECHANICAL EXHAUST REQUIRED.
Protective Gloves: RUBBER GLOVES.
Eye Protection: CHEMICAL SAFETY GOGGLES.
Other Protective Equipment: SAFETY SHOWER AND EYE BATH. WEAR SUITABLE PROTECTIVE CLOTHING.
Work Hygienic Practices: WASH THOROUGHLY AFTER HANDLING.
Suppl. Safety & Health Data: NONE SPECIFIED BY MANUFACTURER.

=====
Transportation Data
=====

=====
Disposal Data
=====

=====
Label Data
=====

Label Required: YES
Technical Review Date: 03MAR93
Label Date: 03MAR93
Label Status: G
Common Name: ACENAPHTHENE, 99%, 21537-6
Chronic Hazard: NO
Signal Word: CAUTION!
Acute Health Hazard-Slight: X

Contact Hazard-Slight: X

Fire Hazard-None: X

Reactivity Hazard-None: X

Special Hazard Precautions: STORE IN A COOL DRY PLACE. AVOID CONTACT AND INHALATION. DO NOT GET IN EYES, ON SKIN/CLTHG. IRRITANT. ACUTE: MAY BE HARMFUL BY INHALATION, INGESTION OR SKIN ABSORPTION. CAUSES EYE AND SKIN IRRITATION. MATERIAL IS IRRITATING TO MUCOUS MEMBRANES AND UPPER RESPIRATORY TRACT. TO THE BEST OF MFR KNOWLEDGE, THE CHEMICAL, PHYSICAL, AND TOXICOLOGICAL PROPERTIES HAVE NOT BEEN THOROUGHLY INVESTIGATED. CHRONIC: NONE LISTED BY MANUFACTURER.

Protect Eye: Y

Protect Skin: Y

Protect Respiratory: Y

Label Name: ALDRICH CHEMICAL CO

Label P.O. Box: 355

Label City: MILWAUKEE

Label State: WI

Label Zip Code: 53201

Label Country: US

Label Emergency Number: 414-273-3850

Acenaphthylene, 99+%
ACROS98224

**** SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION ****

MSDS Name: Acenaphthylene, 99+%

Catalog Numbers:

AC310770000, AC310771000

Synonyms:

Company Identification (Europe): Acros Organics N.V.
Janssen Pharmaceuticaaan 3a
2440 Geel, Belgium

Company Identification (USA): Acros Organics
One Reagent Lane
Fairlawn, NJ 07410

For information in North America, call: 800-ACROS-01

For information in Europe, call: 0032(0) 14575211

For emergencies in the US, call CHEMTREC: 800-424-9300

For emergencies in Europe, call: 0032(0) 14575299

**** SECTION 2 - COMPOSITION, INFORMATION ON INGREDIENTS ****

| CAS# | Chemical Name | % | EINECS# |
|----------|----------------|-------|-----------|
| 208-96-8 | Acenaphthylene | 99.0+ | 205-917-1 |

Hazard Symbols: XI
Risk Phrases: 36/37/38

**** SECTION 3 - HAZARDS IDENTIFICATION ****

EMERGENCY OVERVIEW

Appearance: yellow.

Warning! Causes respiratory tract irritation. May cause digestive tract irritation. Causes eye and skin irritation.

Target Organs: None.

Potential Health Effects

Eye:

Causes eye irritation. May cause chemical conjunctivitis.

Skin:

Causes skin irritation.

Ingestion:

May cause gastrointestinal irritation with nausea, vomiting and diarrhea.

Inhalation:

Causes respiratory tract irritation. Can produce delayed pulmonary edema.

Chronic:

Effects may be delayed.

**** SECTION 4 - FIRST AID MEASURES ****

Eyes:

Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin:

Get medical aid. Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion:

If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation:

Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician:
Treat symptomatically and supportively.

**** SECTION 5 - FIRE FIGHTING MEASURES ****

General Information:

As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media:

In case of fire use water spray, dry chemical, carbon dioxide, or chemical foam.

**** SECTION 6 - ACCIDENTAL RELEASE MEASURES ****

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks:

Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Provide ventilation.

**** SECTION 7 - HANDLING and STORAGE ****

Handling:

Wash thoroughly after handling. Use only in a well ventilated area. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation. Wash clothing before reuse.

Storage:

Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

**** SECTION 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION ****

Engineering Controls:

Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

| Chemical Name | ACGIH | NIOSH | OSHA - Final PELs |
|----------------|-------------|-------------|-------------------|
| Acenaphthylene | none listed | none listed | none listed |

OSHA Vacated PELs:

Acenaphthylene:

No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes:

Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin:

Wear appropriate protective gloves to prevent skin exposure.

Clothing:

Wear appropriate protective clothing to prevent skin exposure.

Respirators:

A respiratory protection program that meets OSHA's 29 CFR §1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use. Follow the OSHA respirator regulations found in 29CFR 1910.134 or

European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

**** SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES ****

Physical State: Solid
Appearance: yellow
Odor: Not available.
pH: Not available.
Vapor Pressure: 9.12104 mm Hg @25C
Vapor Density: Not available.
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: 275 deg C
Freezing/Melting Point: 88 - 91 deg C
Autoignition Temperature: Not available.
Flash Point: Not available.
NFPA Rating:
Explosion Limits, Lower: Not available.
Upper: Not available.
Decomposition Temperature:
Solubility: 16.1 mg/l H2O at 25°C
Specific Gravity/Density: .8988 at 16 °C/2°C
Molecular Formula: C12H8
Molecular Weight: 152.056

**** SECTION 10 - STABILITY AND REACTIVITY ****

Chemical Stability:
Stable under normal temperatures and pressures.
Conditions to Avoid:
Incompatible materials, excess heat.
Incompatibilities with Other Materials:
Strong oxidizing agents.
Hazardous Decomposition Products:
Carbon monoxide, carbon dioxide.
Hazardous Polymerization: Has not been reported

**** SECTION 11 - TOXICOLOGICAL INFORMATION ****

RTECS#:
CAS# 208-96-8: AB1254000
LD50/LC50:
Not available.
Carcinogenicity:
Acenaphthylene -
Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.
Epidemiology:
No information available.
Teratogenicity:
No information available.
Reproductive Effects:
No information available.
Neurotoxicity:
No information available.
Mutagenicity:
No information available.
Other Studies:
No data available.

**** SECTION 12 - ECOLOGICAL INFORMATION ****

Ecotoxicity:
Daphnia: Phytobacterium phosphoreum: EC50 =0.23-0.28 mg/L; 5,15,30 minutes; Microtox test; 15 degrees C

**** SECTION 13 - DISPOSAL CONSIDERATIONS ****

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste.

US EPA guidelines for the classification determination are listed in 40 CFR Part 136. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

**** SECTION 14 - TRANSPORT INFORMATION ****

US DOT

No information available

Canadian TDG

No information available.

**** SECTION 15 - REGULATORY INFORMATION ****

US FEDERAL

TSCA

CAS# 208-96-8 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

SARA

Section 302 (RQ)

CAS# 208-96-8: final RQ = 5000 pounds (2270 kg)

Section 302 (TPQ)

None of the chemicals in this product have a TPQ.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

CAS# 208-96-8 is listed as a Priority Pollutant under the Clean Water Act.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

Acenaphthylene can be found on the following state right to know lists: New Jersey, Pennsylvania, Massachusetts.

California No Significant Risk Level:

None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols: XI

Risk Phrases:

R 36/37/38 Irritating to eyes, respiratory system and skin.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 37/39 Wear suitable gloves and eye/face protection.

WGK (Water Danger/Protection)

CAS# 208-96-8: No information available.

United Kingdom Occupational Exposure Limits

Canada

None of the chemicals in this product are listed on the DSL/NDSL list.

This product has a WHMIS classification of D2B.

CAS# 208-96-8 is not listed on Canada's Ingredient Disclosure List.

Exposure Limits

CAS# 208-96-8: Not available.

**** SECTION 16 - ADDITIONAL INFORMATION ****

MSDS Creation Date: 6/25/1999 Revision #1 Date: 8/02/2000

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no way shall the company be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if the company has been advised of the possibility of such damages.

LANCASTER SYNTHESIS LTD -- 7355, ANTHRACENE, PRACT
MATERIAL SAFETY DATA SHEET
NSN: 681000N064557
Manufacturer's CAGE: 0DJY8
Part No. Indicator: A
Part Number/Trade Name: 7355, ANTHRACENE, PRACT

=====
General Information
=====

Company's Name: LANCASTER SYNTHESIS LTD
Company's P. O. Box: 1000
Company's City: WINDHAM
Company's State: NH
Company's Country: US
Company's Zip Code: 03087
Company's Emerg Ph #: 603-889-3306
Company's Info Ph #: 603-889-3306
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SMJ
Date MSDS Prepared: 21JUN90
Safety Data Review Date: 06OCT95
MSDS Serial Number: BZKJV

=====
Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: ANTHRACENE (SARA 313) (CERCLA)
Ingredient Sequence Number: 01
NIOSH (RTECS) Number: CA9350000
CAS Number: 120-12-7
OSHA PEL: N/K (FP N)
ACGIH TLV: N/K (FP N)

Proprietary: NO
Ingredient: SUPDAT: PERSONAL CLOTHING. PROTECTIVE CLOTHING SHOULD ALWAYS
BE WORN INCLUDING GLOVES AND EYE PROTECTION.
Ingredient Sequence Number: 02
NIOSH (RTECS) Number: 9999999ZZ
OSHA PEL: NOT APPLICABLE
ACGIH TLV: NOT APPLICABLE

=====
Physical/Chemical Characteristics
=====

Appearance And Odor: NONE SPECIFIED BY MANUFACTURER.
Vapor Pressure (MM Hg/70 F): 1.0 @ 145C
Specific Gravity: NOT APPLICABLE
Evaporation Rate And Ref: NOT APPLICABLE
Solubility In Water: NOT APPLICABLE

=====
Fire and Explosion Hazard Data
=====

Flash Point: NOT APPLICABLE
Extinguishing Media: DRY POWDER OR CARBON DIOXIDE (NOT WATER)
EXTINGUISHERS.
Special Fire Fighting Proc: USE NIOSH/MSHA APPROVED SCBA & FULL PROTECTIVE
EQUIPMENT (FP N).
Unusual Fire And Expl Hazrds: ALTHOUGH PRESENTING NO SPECIAL FIRE HAZARD
IN NORMAL USE, THE MATERIAL WILL BURN AND COULD CONTRIBUTE TO AN EXISTING
FIRE.

=====
Reactivity Data
=====

Stability: YES
Cond To Avoid (Stability): NONE SPECIFIED BY MANUFACTURER.
Materials To Avoid: STRONG OXIDIZING AGENTS.
Hazardous Decomp Products: CARBON MONOXIDE.
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NOT RELEVANT.

=====
Health Hazard Data
=====

LD50-LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: IRRITANT TO SKIN, EYES, MUCOUS MEMBRANES AND UPPER RESPIRATORY TRACT. HARMFUL BY INGESTION, INHALATION OR ABSORPTION THROUGH SKIN. SYMPTOMS MAY INCLUDE BURNING SENSATION, COUGHING, LARYNGITIS OR VOMITING.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NOT RELEVANT.
Signs/Symptoms Of Overexp: SEE HEALTH HAZARDS.
Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER.
Emergency/First Aid Proc: EYES OR SKIN: IMMEDIATELY FLUSH AFFECTED AREA REMOVE TO FRESH AIR. REMOVE ANY CONTAMINATED CLOTHING. INGEST: GIVE COPIOUS AMOUNTS OF WATER-DO NOT INDUCE VOMITING. IF APPROPRIATE, CALL PHYSICIAN.

=====
Precautions for Safe Handling and Use
=====

Steps If Matl Released/Spill: WEAR NIOSH/MSHA APPROVED RESPIRATOR, EYE PROTECTION AND RUBBER GLOVES. MIX WITH SAND OR SIMILAR ABSORBENT MATERIAL, SWEEP UP AND KEEP IN TIGHTLY CLOSED CONTAINER FOR DISPOSAL.
Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.
Waste Disposal Method: STORE IN CLEARLY LABELLED CONTAINERS UNTIL CAN BE GIVEN TO APPROVED CONTRACTOR FOR DISPOSAL IN ACCORDANCE WITH LOCAL, FEDERAL, AND STATE REGULATIONS.
Precautions-Handling/Storing: STORE IN CLOSED VESSELS IN A DRY PLACE, AWAY FROM SOURCES OF HEAT.
Other Precautions: THIS PROD SHOULD BE HNDLD ONLY BY/UNDER CLOSE SUPERVISION OF, THOSE PROPERLY QUALIFIED IN HNDLG & USE OF POTENTIALLY HAZ CHEMS, WHO SHOULD TAKE INTO ACCOUNT FIRE, HLTH & CHEM HAZ DATA GIVEN ON THIS SHEET. IT SHOULD ALWAYS BE HANDLED(SUPDAT)

=====
Control Measures
=====

Respiratory Protection: WEAR NIOSH/MSHA APPROVED RESPIRATOR.
Ventilation: NONE SPECIFIED BY MANUFACTURER.
Protective Gloves: IMPERVIOUS GLOVES (FP N).
Eye Protection: ANSI APPROVED CHEM WORKERS GOGGS (FP N).
Other Protective Equipment: EYE WASH FOUNTAIN & DELUGE SHOWER WHICH MEET ANSI DESIGN CRITERIA (FP N).
Work Hygienic Practices: NONE SPECIFIED BY MANUFACTURER.
Suppl. Safety & Health Data: OTHER PREC:IN EFFICIENT FUME HOOD/EQUIV SYS. IT SHOULD BE BORNE IN MIND THAT TOXICOLOGICAL & PHYSIOLOGICAL PROPERTIES OF MANY COMPOUNDS ARE NOT YET WELL DEFINED & THAT NEW HAZS PRODS MAY ARISE FROM RXNS BTWN CHEMS. CARE SHOULD BE TAKEN TO PVNT ANY CHEM FROM COMING INTO CONTACT W/SKIN/EYES & FROM CONTAMINATING (ING 2)

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Transportation Data
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Disposal Data
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Label Data

=====
Label Required: YES
Technical Review Date: 06OCT95
Label Date: 06OCT95
Label Status: G
Common Name: 7355, ANTHRACENE, PRACT
Chronic Hazard: NO
Signal Word: CAUTION!
Acute Health Hazard-Slight: X
Contact Hazard-Slight: X
Fire Hazard-None: X
Reactivity Hazard-None: X
Special Hazard Precautions: ACUTE: IRRITANT TO SKIN, EYES, MUCOUS
MEMBRANES AND UPPER RESPIRATORY TRACT. HARMFUL BY INGESTION, INHALATION OR
ABSORPTION THROUGH SKIN. SYMPTOMS MAY INCLUDE BURNING SENSATION, COUGHING,
LARYNGITIS OR VOMITING. CHRONIC: NONE SPECIFIED BY MANUFACTURER.
Protect Eye: Y
Protect Skin: Y
Protect Respiratory: Y
Label Name: LANCASTER SYNTHESIS LTD
Label P.O. Box: 1000
Label City: WINDHAM
Label State: NH
Label Zip Code: 03087
Label Country: US
Label Emergency Number: 603-889-3306

Special Fire Fighting Proc: WEAR NIOSH/MSHA APPROVED PRESSURE DEMAND SCBA AND FULL PROTECTIVE EQUIPMENT (FP N) WHEN FIGHTING A CHEMICAL FIRE.
Unusual Fire And Expl Hazrds: THE FOLLOWING TOXIC VAPORS ARE FORMED WHEN THIS MATERIAL IS HEATED TO DECOMPOSITION. HYDROGEN CHLORIDE & PHOSGENE.

=====
Reactivity Data
=====

Stability: YES
Cond To Avoid (Stability): LIQUID O2 OR OTHER STRONG OXIDANTS MAY FORM EXPLOSIVE MIXTURES WITH METHYLENE CHLORIDE.
Materials To Avoid: STRONG BASES, OXIDIZING AGENTS.
Hazardous Decomp Products: THIS MATL/VAP CAN DECOMPOSE WHEN IN CONT W/ FLAMES, HOT GLOWING SURF OR ELEC ARC TO FORM HYDROGEN CHLORIDE & PHOSGENE.
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NOT RELEVANT.

=====
Health Hazard Data
=====

LD50-LC50 Mixture: SEE INGREDIENTS
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: NO
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: MAY BE FATAL IF INHALED. HARMFUL IF SWALLOWED. LACHRIMATION. IRRITATES SKIN. DERM/HDCH/DIZZ, NARCOS, LIVER & KIDNEY DAM. RESEARCH RECENTLY SHOWS THAT METHYLENE CHLORIDE IS METABOLIZED BY BODY TO CO & CAN STRESS CARDIOVASCULAR SYS THRU ELEVATION OF LEVEL OF CARBOXYHEMOGLOBIN. CHLOROCARBON MAT HAVE (SEE EFTS OF OVEREXP)
Carcinogenicity - NTP: YES
Carcinogenicity - IARC: YES
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: BENZ (A) ANTHRACENE: IARC GROP 2A, NTP GROUP 2 METHYLENE CHLORIDE: IARC GROUP 2B, NTP GROUP 2.
Signs/Symptoms Of Overexp: HLTH HAZ:PRODUCED SENSITIZATION OF MYOCARDIUM TO EPINEPHRINE IN LAB ANIMALS & COULD HAVE A SIMILAR EFFECTS IN HUMANS. ADRENOMIMETICS (E.G., EPINEPHRINE) MAY BE CONTRAINDICATED EXCEPT FOR LIFE-SUSTAINING USES IN HUMANS ACTULEY OR CHRONICALLY EXPOSED TO CHLOROCARBONS (FP N).
Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER.
IMMED MOVE TO FRESH AIR. GIVE O2 IF BRTHG IS LABORED. IF BRTHG STOPS, GIVE ARTF RESP. CONT PHYS. INGEST:NEVER GIVE ANYTHING BY MOUTH TO AN UNCON PERSON. NEVER TRY TO MAKE AN UNCON PERSON VOMIT. DO NOT INDUCE VOMIT. IMMED CONT PHYS. NEVER ADMINISTER ADRENALIN FOLLOWING METHYLENE (SUPDA

=====
Precautions for Safe Handling and Use
=====

Steps If Matl Released/Spill: TAKE UP WITH ABSORBENT MATERIAL. VENTILATE AREA.
Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.
Waste Disposal Method: COMPLY WITH ALL APPLICABLE FEDERAL, STATE, OR LOCAL REGULATIONS.
Precautions-Handling/Storing: REFRIGERATE IN SEALED CONTAINER. METHYLENE CHLORIDE VAPORS ARE HEAVIER THAN AIR AND WILL COLLECT IN LOW AREAS.
Other Precautions: POSSIBLE CANCER HAZARD. AVOID EYE/SKIN CONTACT. AVOID BREATHING VAPORS. NO SMOKING IN AREA OF USE. DO NOT USE IN GEN VICINITY OF ARC WELDING, OPEN FLAMES OR HOT SURF. HEAT &/OR UV RADIATION MAY CAUSE FORM OF HCL &/OR PHOSGENE (FP N).

=====
Control Measures
=====

Respiratory Protection: WEAR NIOSH/MSHA APPROVED FACE MASK WITH ORGANIC VAPOR CANISTER OR RESPIRATORY PROTECTION.
Ventilation: USE ONLY IN WELL VENTILATED AREA.
Protective Gloves: NEOPRENE GLOVES.
Eye Protection: CHEMICAL WORKERS GOGGLES (FP N).

Other Protective Equipment: NOT APPLICABLE
Work Hygienic Practices: NONE SPECIFIED BY MANUFACTURER.
Suppl. Safety & Health Data: FIRST AID PROC: CHLORIDE OVEREXPOSURE.
INCREASED SENSITIVITY OF THE HEART TO ADRENALIN MAY BE CAUSED BY
OVEREXPOSURE TO METHYLENE CHLORIDE.

=====
Transportation Data
=====

Trans Data Review Date: 91344
DOT PSN Code: EUP
DOT Proper Shipping Name: DICHLOROMETHANE
DOT Class: 6.1
DOT ID Number: UN1593
DOT Pack Group: III
DOT Label: KEEP AWAY FROM FOOD
IMO PSN Code: JVB
IMO Proper Shipping Name: METHYL CHLORIDE
IMO Regulations Page Number: 2158
IMO UN Number: 1063
IMO UN Class: 2(2.1)
IMO Subsidiary Risk Label: -
IATA PSN Code: QQM
IATA UN ID Number: 1063
IATA Proper Shipping Name: METHYL CHLORIDE
IATA UN Class: 2.1
IATA Label: FLAMMABLE GAS
AFI PSN Code: QQM
AFI Prop. Shipping Name: METHYL CHLORIDE
AFI Class: 2.1
AFI ID Number: UN1063
AFI Basic Pac Ref: 6-8

=====
Disposal Data
==========
Label Data
=====

Label Required: YES
Technical Review Date: 07OCT91
Label Date: 19SEP91
Label Status: G
Common Name: BENZ A ANTHRACENE-D12 2MG/ML 1ML, 48789
Chronic Hazard: YES
Signal Word: DANGER!
Acute Health Hazard-Severe: X
Contact Hazard-Moderate: X
Fire Hazard-None: X
Reactivity Hazard-Moderate: X
Special Hazard Precautions: ACUTE: MAY BE FATAL IF INHALED, HARMFUL IF SWALLOWED: LACHRIMATION, IRRITATES SKIN, DERMATITIS, HEADACHE, DIZZINESS, NARCOSIS, LIVER & KIDNEY DAMAGE. CAN STRESS THE CARDIOVASCULAR SYSTEM THROUGH ELEVATION OF CARBOXYEMOGLOBIN LEVEL. USE ONLY IN WELL VENTILATED AREA. AVOID EYE OR SKIN CONTACT. AVOID BREATHING VAPORS. REACTIVITY: LIQUID OXYGEN & OTHER STRONG OXIDANTS MAY FORM EXPLOSIVE MIXTURES WITH METHYLENE CHLORIDE. CHRONIC: POSSIBLE CANCER HAZARD. CONTAINS MATERIAL WHICH MAY CAUSE CANCER.
Protect Eye: Y
Protect Skin: Y
Protect Respiratory: Y
Label Name: SUPELCO INC
Label Street: SUPELCO PARK
Label City: BELLEFONTE
Label State: PA
Label Zip Code: 16823-0048

Benzo(a)pyrene, 98%
ACROS37175

**** SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION ****

MSDS Name: Benzo(a)pyrene, 98%

Catalog Numbers:

AC105600000, AC105600010, AC105601000

Synonyms:

3,4-Benzopyrene; 3,4-Benzpyrene.

Company Identification (Europe): Acros Organics N.V.

Janssen Pharmaceuticaaan 3a

2440 Geel, Belgium

Company Identification (USA): Acros Organics

One Reagent Lane

Fairlawn, NJ 07410

For information in North America, call: 800-ACROS-01

For information in Europe, call: 0032(0) 14575211

For emergencies in the US, call CHEMTREC: 800-424-9300

For emergencies in Europe, call: 0032(0) 14575299

**** SECTION 2 - COMPOSITION, INFORMATION ON INGREDIENTS ****

| CAS# | Chemical Name | % | EINECS# |
|---------|----------------|------|-----------|
| 50-32-8 | Benzo[a]pyrene | 98.0 | 200-028-5 |

Hazard Symbols: T

Risk Phrases: 45 46 60 61

**** SECTION 3 - HAZARDS IDENTIFICATION ****

EMERGENCY OVERVIEW

Appearance: slightly brown.

Caution! Cancer suspect agent. The toxicological properties of this material have not been fully investigated. May cause eye and skin irritation. May cause respiratory and digestive tract irritation. Possible risk of harm to the unborn child.

Target Organs: None.

Potential Health Effects

Eye:

May cause eye irritation.

Skin:

May cause skin irritation.

Ingestion:

May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated.

Inhalation:

May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated.

Chronic:

May cause cancer in humans.

**** SECTION 4 - FIRST AID MEASURES ****

Eyes:

Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin:

Get medical aid. Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion:

Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation:

Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician:

Treat symptomatically and supportively.

**** SECTION 5 - FIRE FIGHTING MEASURES ****

General Information:

As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media:

In case of fire, use water, dry chemical, chemical foam, or alcohol-resistant foam. Use agent most appropriate to extinguish fire. In case of fire use water spray, dry chemical, carbon dioxide, or appropriate foam.

**** SECTION 6 - ACCIDENTAL RELEASE MEASURES ****

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks:

Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions. Provide ventilation.

**** SECTION 7 - HANDLING and STORAGE ****

Handling:

Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage:

Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

**** SECTION 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION ****

Engineering Controls:

Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

| Chemical Name | ACGIH | NIOSH | OSHA - Final PELs |
|----------------|--|-------------|--|
| Benzo[a]pyrene | as benzene solubles: 0.2 mg/m3 (listed under ** no name **). | none listed | benzene soluble fraction: 0.2 mg/m3 TWA (includes anthracene, BaP, phenanthrene, acridine, chrysene, and pyrene) (listed under ** no name **). |

OSHA Vacated PELs:

Benzo[a]pyrene:
benzene soluble fraction: 0.2 mg/m3 TWA (anthracene, BaP, phenanthrene, acridine, (listed under ** no name **))

IARC: Group 2A carcinogen

Epidemiology:

No information available.

Teratogenicity:

No information available.

Reproductive Effects:

No information available.

Neurotoxicity:

No information available.

Mutagenicity:

No information available.

Other Studies:

No data available.

**** SECTION 12 - ECOLOGICAL INFORMATION ****

Other

No information available.

**** SECTION 13 - DISPOSAL CONSIDERATIONS ****

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste.

US EPA guidelines for the classification determination are listed in 40 CFR Part 261. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: CAS# 50-32-8: waste number U022.

**** SECTION 14 - TRANSPORT INFORMATION ****

US DOT

Shipping Name: TOXIC SOLID, ORGANIC, N.O.S.*

Hazard Class: 6.1

UN Number: 2811

Packing Group: I

Canadian TDG

No information available.

**** SECTION 15 - REGULATORY INFORMATION ****

US FEDERAL

TSCA

CAS# 50-32-8 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

SARA

Section 302 (RQ)

CAS# 50-32-8: final RQ = 1 pound (0.454 kg)

Section 302 (TPQ)

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 50-32-8: acute, chronic.

Section 313

This material contains Benzo[a]pyrene (CAS# 50-32-8, 98.0%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 372.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

CAS# 50-32-8 is listed as a Priority Pollutant under the Clean Water

Act.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

Benzo[a]pyrene can be found on the following state right to know lists: California, New Jersey, Florida, Pennsylvania, Minnesota, Massachusetts.

The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:

WARNING: This product contains Benzo[a]pyrene, a chemical known to the state of California to cause cancer.

California No Significant Risk Level:

CAS# 50-32-8: no significant risk level = 0.06 ug/day

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols: T

Risk Phrases:

- R 45 May cause cancer.
- R 46 May cause heritable genetic damages.
- R 60 May impair fertility.
- R 61 May cause harm to the unborn child.

Safety Phrases:

- S 53 Avoid exposure - obtain special instructions before use.
- S 28A After contact with skin, wash immediately with plenty of water.
- S 37 Wear suitable gloves.
- S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

WGK (Water Danger/Protection)

CAS# 50-32-8: No information available.

United Kingdom Occupational Exposure Limits

Canada

CAS# 50-32-8 is listed on Canada's DSL/NDSL List.

This product has a WHMIS classification of D2A.

CAS# 50-32-8 is not listed on Canada's Ingredient Disclosure List.

Exposure Limits

CAS# 50-32-8: OEL-AUSTRALIA;Carcinogen

OEL-BELGIUM;Carcinogen

OEL-FINLAND:TWA 0.01 mg/m3;Skin;Carcinogen

OEL-FRANCE;Carcinogen

OEL-GERMANY;Carcinogen

OEL-RUSSIA:STEL 0.00015 mg/m3;Carcinogen

OEL-SWEDEN:TWA 0.005 mg/m3;STEL 0.03 mg/m3;Skin

OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA check ACGIH TLV

OEL IN NEW ZEALAND, SINGAPORE, VIETNAM check ACGI TLV

**** SECTION 16 - ADDITIONAL INFORMATION ****

MSDS Creation Date: 9/02/1997 Revision #4 Date: 8/02/2000

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no way shall the company be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if the company has been advised of the possibility of such damages.

Explanation Carcinogenicity: SEE INGREDIENTS

Emergency/First Aid Proc: EYES: FLUSH W/WATER FOR 15-20 MINS. SKIN: FLUSH W/WATER FOR 15-20 MINS. IF NOT BURNED, WASH W/SOAP & WATER TO CLEANSE. INHALATION: REMOVE TO FRESH AIR. GIVE CPR/OXYGEN IF NEEDED. KEEP WARM & QUIET. INGESTION: DON'T GIVE LIQUIDS/INDUCE VOMITING IF UNCONSCIOUS/ CONVULSING. IF VOMITING OCCURS, WATCH CLOSELY TO AVOID AIRWAY OBSTRUCTION. OBTAIN MEDICAL ATTENTION IN ALL CASES.

=====
Precautions for Safe Handling and Use
=====

Steps If Matl Released/Spill: EVACUATE AREA. WEAR APPROPRIATE OSHA REGULATED EQUIPMENT. VENTILATE AREA. ABSORB ON VERMICULITE/SIMILAR MATERIAL. SWEEP UP & PLACE IN APPROPRIATE CONTAINER/HOLD FOR DISPOSAL. WASH CONTAMINATED SURFACES TO REMOVE ANY RESIDUES.

Waste Disposal Method: BURN IN A CHEMICAL INCINERATOR EQUIPPED W/AN AFTERBURNER & SCRUBBER IAW/FEDERAL, STATE & LOCAL REGULATIONS.

Precautions-Handling/Storing: STORE IN A COOL DRY PLACE ONLY W/COMPATIBLE CHEMICALS. KEEP TIGHTLY CLOSED. FOR LABORATORY USE ONLY.

Other Precautions: AVOID CONTACT W/SKIN, EYES & CLOTHING. DON'T BREATHE VAPORS. CONTACT LENSES SHOULDN'T BE WORN IN THE LABORATORY. ALL CHEMICALS SHOULD BE CONSIDERED HAZARDOUS. AVOID DIRECT PHYSICAL CONTACT.

=====
Control Measures
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Respiratory Protection: WEAR APPROPRIATE OSHA/MSHA APPROVED SAFETY EQUIPMENT.

Ventilation: CHEMICAL SHOULD BE HANDLED ONLY IN A HOOD.

Eye Protection: EYE SHIELDS

Work Hygienic Practices: REMOVE/LAUNDER CONTAMINATED CLOTHING BEFORE REUSE.

=====
Transportation Data
=====

=====
Disposal Data
=====

=====
Label Data
=====

Label Required: YES

Label Status: G

Common Name: F74 BENZO/B/FLUORANTHENE

Special Hazard Precautions: N/K N/K

Label Name: CHEM SERVICE INC

Label Street: 660 TOWER LN

Label P.O. Box: 3108

Label City: WEST CHESTER

Label State: PA

Label Zip Code: 19381-3108

Label Country: US

Label Emergency Number: 215-692-3026/800-452-9994

Benzo(g,h,i)perylene, 98+%
ACROS53817

**** SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION ****

MSDS Name: Benzo(g,h,i)perylene, 98+%

Catalog Numbers:

AC105550000, AC105551000

Synonyms:

1,12-Benzoperylene

Company Identification (Europe): Acros Organics N.V.
Janssen Pharmaceuticaaan 3a
2440 Geel, Belgium

Company Identification (USA): Acros Organics
One Reagent Lane
Fairlawn, NJ 07410

For information in North America, call: 800-ACROS-01

For information in Europe, call: 0032(0) 14575211

For emergencies in the US, call CHEMTREC: 800-424-9300

For emergencies in Europe, call: 0032(0) 14575299

**** SECTION 2 - COMPOSITION, INFORMATION ON INGREDIENTS ****

| CAS# | Chemical Name | % | EINECS# |
|----------|--------------------|------|-----------|
| 191-24-2 | Benzo[ghi]perylene | 98.0 | 205-883-8 |

**** SECTION 3 - HAZARDS IDENTIFICATION ****

EMERGENCY OVERVIEW

Appearance: yellow.

Caution! The toxicological properties of this material have not been fully investigated. May cause eye and skin irritation. May cause respiratory and digestive tract irritation.

Target Organs: None.

Potential Health Effects

Eye:

Dust may cause mechanical irritation.

Skin:

May cause skin irritation.

Ingestion:

May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated.

Inhalation:

Inhalation of dust may cause respiratory tract irritation.

Chronic:

No information found.

**** SECTION 4 - FIRST AID MEASURES ****

Eyes:

Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin:

Get medical aid. Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion:

If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation:

Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician:

Treat symptomatically and supportively.

**** SECTION 5 - FIRE FIGHTING MEASURES ****

General Information:

As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media:

In case of fire use water spray, dry chemical, carbon dioxide, or appropriate foam.

**** SECTION 6 - ACCIDENTAL RELEASE MEASURES ****

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks:

Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Avoid generating dusty conditions. Provide ventilation.

**** SECTION 7 - HANDLING and STORAGE ****

Handling:

Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage:

Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

**** SECTION 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION ****

Engineering Controls:

Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

| Chemical Name | ACGIH | NIOSH | OSHA - Final PELs |
|--------------------|-------------|-------------|-------------------|
| Benzo[ghi]perylene | none listed | none listed | none listed |

OSHA Vacated PELs:

Benzo[ghi]perylene:

No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes:

Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin:

Wear appropriate protective gloves to prevent skin exposure.

Clothing:

Wear appropriate protective clothing to prevent skin exposure.

Respirators:

Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

**** SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES ****

Physical State: Flakes
Appearance: yellow
Odor: None reported.
pH: Not available.
Vapor Pressure: Not available.
Vapor Density: Not available.
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: > 500 deg C @ 760.00mm Hg
Freezing/Melting Point: 277.00 - 279.00 deg C
Autoignition Temperature: Not available.
Flash Point: Not available.
NFPA Rating: (est.) Health: 1; Flammability: 0; Reactivity: 0
Explosion Limits, Lower: Not available.
Upper: Not available.
Decomposition Temperature:
Solubility:
Specific Gravity/Density:
Molecular Formula: C22H12
Molecular Weight: 276.33

**** SECTION 10 - STABILITY AND REACTIVITY ****

Chemical Stability:
Stable under normal temperatures and pressures.
Conditions to Avoid:
Incompatible materials, dust generation.
Incompatibilities with Other Materials:
Oxidizing agents.
Hazardous Decomposition Products:
Carbon monoxide, carbon dioxide.
Hazardous Polymerization: Has not been reported.

**** SECTION 11 - TOXICOLOGICAL INFORMATION ****

RTECS#:
CAS# 191-24-2: DI6200500
LD50/LC50:
Not available.
Carcinogenicity:
Benzo[ghi]perylene -
IARC: Group 3 carcinogen
Epidemiology:
No information available.
Teratogenicity:
No information available.
Reproductive Effects:
No information available.
Neurotoxicity:
No information available.
Mutagenicity:
No information available.
Other Studies:
No data available.

**** SECTION 12 - ECOLOGICAL INFORMATION ****

**** SECTION 13 - DISPOSAL CONSIDERATIONS ****

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste.
US EPA guidelines for the classification determination are listed in 40 CFR Part 261. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.
RCRA P-Series: None listed.
RCRA U-Series: None listed.

**** SECTION 14 - TRANSPORT INFORMATION ****

US DOT

Shipping Name: TOXIC SOLID, ORGANIC, N.O.S.*
Hazard Class: 6.1
UN Number: 2811
Packing Group: I

Canadian TDG

Shipping Name: POISONOUS SOLID NOS (BENZO PERYLENE)
Hazard Class: 6.1(9.2)
UN Number: UN2811

**** SECTION 15 - REGULATORY INFORMATION ****

US FEDERAL

TSCA

CAS# 191-24-2 is not listed on the TSCA inventory.

It is for research and development use only.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

SARA

Section 302 (RQ)

CAS# 191-24-2: final RQ = 5000 pounds (2270 kg)

Section 302 (TPQ)

None of the chemicals in this product have a TPQ.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous

Substances under the CWA.

CAS# 191-24-2 is listed as a Priority Pollutant under the Clean Water Act.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

Benzo[ghi]perylene can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Massachusetts.

California No Significant Risk Level:

None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols: Not available.

Risk Phrases:

Safety Phrases:

S 28A After contact with skin, wash immediately with plenty of water.

S 37 Wear suitable gloves.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

WGK (Water Danger/Protection)

CAS# 191-24-2: No information available.

United Kingdom Occupational Exposure Limits

Canada

None of the chemicals in this product are listed on the DSL/NDSL list.

This product does not have a WHMIS classification.

CAS# 191-24-2 is not listed on Canada's Ingredient Disclosure List.

Exposure Limits

CAS# 191-24-2: Not available.

**** SECTION 16 - ADDITIONAL INFORMATION ****

MSDS Creation Date: 7/20/1998 Revision #1 Date: 8/02/2000

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no way shall the company be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if the company has been advised of the possibility of such damages.

Benzo[k]fluoranthene, 99+% (tlc)
ACROS54641

**** SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION ****

MSDS Name: Benzo[k]fluoranthene, 99+% (tlc)

Catalog Numbers:

AC279730000, AC279732500

Synonyms:

8,9-Benzofluoranthene.

Company Identification (Europe): Acros Organics N.V.
Janssen Pharmaceutica
2440 Geel, Belgium

Company Identification (USA): Acros Organics
One Reagent Lane
Fairlawn, NJ 07410

For information in North America, call: 800-ACROS-01

For information in Europe, call: 0032(0) 14575211

For emergencies in the US, call CHEMTREC: 800-424-9300

For emergencies in Europe, call: 0032(0) 14575299

**** SECTION 2 - COMPOSITION, INFORMATION ON INGREDIENTS ****

| CAS# | Chemical Name | % | EINECS# |
|----------|----------------------------------|-----|-----------|
| 207-08-9 | Benzo[k]fluoranthene, 99+% (TLC) | 99% | 205-916-6 |

Hazard Symbols: T

Risk Phrases: 45

**** SECTION 3 - HAZARDS IDENTIFICATION ****

EMERGENCY OVERVIEW

Appearance: yellow.

Danger! May be fatal if swallowed. May be fatal if absorbed through the skin. Toxic. Carcinogen. May cause lung damage. Causes eye and skin irritation. Causes digestive and respiratory tract irritation. Cancer hazard. May be fatal if inhaled.

Target Organs: Lungs, respiratory system.

Potential Health Effects

Eye:

Causes eye irritation.

Skin:

Causes skin irritation. May be fatal if absorbed through the skin.

Ingestion:

May be fatal if swallowed. Causes gastrointestinal irritation with nausea, vomiting and diarrhea.

Inhalation:

May be fatal if inhaled. Causes respiratory tract irritation.

Chronic:

May cause cancer according to animal studies.

**** SECTION 4 - FIRST AID MEASURES ****

Eyes:

Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin:

Get medical aid. Immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion:

If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately. Induce vomiting by giving one teaspoon of Syrup of Ipecac.

Inhalation:

Get medical aid immediately. Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Notes to Physician:
Treat symptomatically and

**** SECTION 5 - FIRE FIGHTING MEASURES ****

General Information:

As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media:

In case of fire use water spray, dry chemical, carbon dioxide, or chemical foam.

**** SECTION 6 - ACCIDENTAL RELEASE MEASURES ****

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks:

Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section.

**** SECTION 7 - HANDLING and STORAGE ****

Handling:

Wash thoroughly after handling. Wash hands before eating. Remove contaminated clothing and wash before reuse. Use only in a well ventilated area. Do not breathe dust, vapor, mist, or gas. Do not get on skin or in eyes. Do not ingest or inhale.

Storage:

Store in a cool, dry place. Store in a tightly closed container.

**** SECTION 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION ****

Engineering Controls:

Use process enclosure, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.

Exposure Limits

| Chemical Name | ACGIH | NIOSH | OSHA - Final PELs |
|----------------------------------|-------------|-------------|-------------------|
| Benzo[k]fluoranthene, 99+% (TLC) | none listed | none listed | none listed |

OSHA Vacated PELs:

Benzo[k]fluoranthene, 99+% (TLC):
No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes:

Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin:

Wear appropriate protective gloves to prevent skin exposure.

Clothing:

Wear appropriate protective clothing to prevent skin exposure.

Respirators:

Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a

NIOSH or European Standard EN 149 approved respirator
when necessary.

**** SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES ****

Physical State: Solid
Appearance: yellow
Odor: Not available.
pH: Not available.
Vapor Pressure: Not available.
Vapor Density: Not available.
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: 480 deg C @ 760.00mm Hg
Freezing/Melting Point: 216 - 218 deg C
Autoignition Temperature: Not available.
Flash Point: Not available.
NFPA Rating: Not published.
Explosion Limits, Lower: Not available.
Upper: Not available.
Decomposition Temperature:
Solubility:
Specific Gravity/Density:
Molecular Formula: C20H12
Molecular Weight: 252.32

**** SECTION 10 - STABILITY AND REACTIVITY ****

Chemical Stability:
Stable under normal temperatures and pressures.
Conditions to Avoid:
Incompatible materials, dust generation.
Incompatibilities with Other Materials:
Strong oxidants.
Hazardous Decomposition Products:
Carbon monoxide; carbon dioxide.
Hazardous Polymerization: Has not been reported.

**** SECTION 11 - TOXICOLOGICAL INFORMATION ****

RTECS#:
CAS# 207-08-9: DF6350000
LD50/LC50:
Not available.
Carcinogenicity:
Benzo[k]fluoranthene, 99+% (TLC) -
California: carcinogen; initial date 7/1/87
NTP: Suspect carcinogen
OSHA: Possible Select carcinogen
IARC: Group 2B carcinogen
Mutagenicity:
Samonella typhimurium : 10µg/plate

**** SECTION 12 - ECOLOGICAL INFORMATION ****

Ecotoxicity:
From calc logKow of 6.84, the est bioconc factor for fish is 144.
However no accum is likely due to the pres of microsomal mixed funct
oxidases which enables it to be metabolised (Lyman,W.J. Handb of
chem.prop est meth. Env behaviour of org chem 1982; Santodonato, J.
Health and ecol assessment of polynucl arom hydrocarb. 1981)
Short-necked clam cultured in artif seawater at 21-25°C for 10 days
revealed a decr in benzo[k].. of ca 20% on day 8. When clams were
placed in a basket and kept in harbour water, only a small incr in
polycycl arom hydrocarb were found.

**** SECTION 13 - DISPOSAL CONSIDERATIONS ****

Chemical waste generators must determine whether a discarded chemical is classif
as a hazardous waste.
US EPA guidelines for the classification determination are listed in 40 CFR Part

Additionally, waste generators must consult state and local hazardous waste regu ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

**** SECTION 14 - TRANSPORT INFORMATION ****

US DOT

No information available

Canadian TDG

No information available.

**** SECTION 15 - REGULATORY INFORMATION ****

US FEDERAL

TSCA

CAS# 207-08-9 is not listed on the TSCA inventory.

It is for research and development use only.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

SARA

Section 302 (RQ)

CAS# 207-08-9: final RQ = 1 pound (0.454 kg)

Section 302 (TPQ)

None of the chemicals in this product have a TPQ.

Section 313

This material contains Benzo[k]fluoranthene, 99+% (TL (CAS# 207-08-9, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 372.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

CAS# 207-08-9 is listed as a Priority Pollutant under the Clean Water Act.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

Benzo[k]fluoranthene, 99+% (TL can be found on the following state right to know lists: California, New Jersey, Florida, Pennsylvania, Minnesota, Massachusetts.

The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:

WARNING: This product contains Benzo[k]fluoranthene, 99+% (TL, a chemical known to the state of California to cause cancer.

California No Significant Risk Level:

None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols: T

Risk Phrases:

R 45 May cause cancer.

Safety Phrases:

S 53 Avoid exposure - obtain special instructions before use.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

WGK (Water Danger/Protection)

CAS# 207-08-9: No information available.
United Kingdom Occupational Exposure Limits

Canada

None of the chemicals in this product are listed on the DSL/NDSL list.
WHMIS: Not available.

CAS# 207-08-9 is not listed on Canada's Ingredient Disclosure List.

Exposure Limits

CAS# 207-08-9: OEL-FRANCE;Carcinogen

**** SECTION 16 - ADDITIONAL INFORMATION ****

MSDS Creation Date: 9/02/1997 Revision #2 Date: 8/02/2000

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no way shall the company be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if the company has been advised of the possibility of such damages.

CHEM SERVICE -- O-665 BENZYL CHLORIDE - LABORATORY STANDARD
MATERIAL SAFETY DATA SHEET
NSN: 655000F037483
Manufacturer's CAGE: 8Y898
Part No. Indicator: A
Part Number/Trade Name: O-665 BENZYL CHLORIDE

=====
General Information
=====

Item Name: LABORATORY STANDARD
Company's Name: CHEM SERVICE INC
Company's Street: 660 TOWER LN
Company's P. O. Box: 3108
Company's City: WEST CHESTER
Company's State: PA
Company's Country: US
Company's Zip Code: 19381-3108
Company's Emerg Ph #: 215-692-3026/800-452-9994
Company's Info Ph #: 215-692-3026/800-452-9994
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SE
Date MSDS Prepared: 12JAN93
Safety Data Review Date: 07DEC94
Preparer's Company: CHEM SERVICE INC
Preparer's St Or P. O. Box: 660 TOWER LN
Preparer's City: WEST CHESTER
Preparer's State: PA
Preparer's Zip Code: 19381-3108
MSDS Serial Number: BWJDX

=====
Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: BENZYL CHLORIDE (SUSPECTED ANIMAL CARCINOGEN BY IARC) *94-3*
Ingredient Sequence Number: 01
NIOSH (RTECS) Number: XS8925000
CAS Number: 100-44-7
OSHA PEL: 1 PPM
ACGIH TLV: 1 PPM

=====
Physical/Chemical Characteristics
=====

Appearance And Odor: COLORLESS TO LIGHT YELLOW LIQUID W/PUNGENT, ACRID
ODOR.
Boiling Point: 357.8F
Melting Point: -45.4F
Vapor Pressure (MM Hg/70 F): 0.9
Solubility In Water: INSOLUBLE

=====
Fire and Explosion Hazard Data
=====

Flash Point: 163.4F
Lower Explosive Limit: 1.1
Extinguishing Media: CO2, DRY CHEMICAL POWDER/SPRAY.
Unusual Fire And Expl Hazrds: CORROSIVE/COMBUSTIBLE COMPOUND.

=====
Reactivity Data
=====

Stability: YES
Cond To Avoid (Stability): MOISTURE.
Materials To Avoid: STRONG ACIDS/OXIDIZING AGENTS/MAGNESIUM/ALUMINUM/
COPPER/MERCURY/ALKALINE PESTICIDES/IRON/ZINC & OTHER LIGHT METALS.

Hazardous Decomp Products: TOXIC FUMES.

Hazardous Poly Occur: YES

=====
Health Hazard Data
=====

LD50-LC50 Mixture: ORAL LD50 (RAT/MOUSE): 1231 MG/KG

Route Of Entry - Inhalation: YES

Route Of Entry - Skin: YES

Route Of Entry - Ingestion: YES

Health Haz Acute And Chronic: SKIN: FATAL IF ABSORBED/SEVERE BURNS.

INHALATION: MAY BE FATAL/EXTREMELY DESTRUCTIVE TO TISSUE OF MUCOUS MEMBRANES/UPPER RESPIRATORY TRACT. CAN CAUSE EDEMA OF LARYNX/BRONCHI, CHEMICAL PNEUMONITIS/PULMONARY EDEMA. INGESTION: SEVERE CORROSION OF MOUTH/GI TRACT/FATAL. LACHRYMATOR: CAN CAUSE SEVERE EYE IRRITATION. (SUPP)

Carcinogenicity - NTP: NO

Carcinogenicity - IARC: YES

Carcinogenicity - OSHA: NO

Explanation Carcinogenicity: SEE INGREDIENTS

Signs/Symptoms Of Overexp: IRRITATION, SPASM, INFLAMMATION, BURNING SENSATION, COUGHING, WHEEZING, LARYNGITIS, SHORTNESS OF BREATH, HEADACHE, NAUSEA, VOMITING, DIZZINESS.

Emergency/First Aid Proc: EYES: FLUSH CONTINUOUSLY W/WATER FOR 15-20 MINS.

SKIN: FLUSH W/WATER FOR 15-20 MINS. IF NOT BURNED, WASH W/SOAP & WATER TO

CLEANSE. INHALATION: REMOVE TO FRESH AIR. GIVE CPR/OXYGEN IF NEEDED & CONTINUE UNTIL MEDICAL ASSISTANCE ARRIVES. OBTAIN MEDICAL ATTENTION IN ALL CASES.

=====
Precautions for Safe Handling and Use
=====

Steps If Matl Released/Spill: EVACUATE AREA. WEAR APPROPRIATE OSHA REGULATED EQUIPMENT. VENTILATE AREA. ABSORB ON VERMICULITE/SIMILAR MATERIAL. SWEEP UP & PLACE IN APPROPRIATE CONTAINER/HOLD FOR DISPOSAL. WASH CONTAMINATED SURFACES TO REMOVE ANY RESIDUES.

Waste Disposal Method: BURN IN A CHEMICAL INCINERATOR EQUIPPED W/AN AFTERBURNER & SCRUBBER IAW/FEDERAL, STATE & LOCAL REGULATIONS.

Precautions-Handling/Storing: STORE IN A COOL DRY PLACE ONLY W/COMPATIBLE CHEMICALS. KEEP TIGHTLY CLOSED.

Other Precautions: AVOID CONTACT W/SKIN, EYES & CLOTHING. DON'T BREATHE VAPORS. CONTACT LENSES SHOULDN'T BE WORN IN THE LABORATORY. ALL CHEMICALS SHOULD BE CONSIDERED HAZARDOUS. AVOID DIRECT PHYSICAL CONTACT.

=====
Control Measures
=====

Respiratory Protection: WEAR APPROPRIATE OSHA/MSHA APPROVED SAFETY EQUIPMENT.

Ventilation: CHEMICAL SHOULD BE HANDLED ONLY IN A HOOD.

Eye Protection: EYE SHIELDS

Suppl. Safety & Health Data: HEALTH HAZARDS CONT'D: MAY CAUSE BIRTH DEFECTS IN FUTURE GENERATIONS. THIS COMPOUND IS CONSIDERED TO BE SLIGHTLY TOXIC.

=====
Transportation Data
=====

=====
Disposal Data
=====

=====
Label Data
=====

Label Required: YES

Label Status: G

Common Name: O-665 BENZYL CHLORIDE

Special Hazard Precautions: SKIN: FATAL IF ABSORBED/SEVERE BURNS.

INHALATION: MAY BE FATAL/EXTREMELY DESTRUCTIVE TO TISSUE OF MUCOUS

MEMBRANES/UPPER RESPIRATORY TRACT. CAN CAUSE EDEMA OF LARYNX/BRONCHI,
CHEMICAL PNEUMONITIS/PULMONARY EDEMA. INGESTION: SEVERE CORROSION OF MOUTH/
GI TRACT/FATAL. LACHRYMATOR: CAN CAUSE SEVERE EYE IRRITATION. (SUPP)
IRRITATION, SPASM, INFLAMMATION, BURNING SENSATION, COUGHING, WHEEZING,
LARYNGITIS, SHORTNESS OF BREATH, HEADACHE, NAUSEA, VOMITING, DIZZINESS.

Label Name: CHEM SERVICE INC

Label Street: 660 TOWER LN

Label P.O. Box: 3108

Label City: WEST CHESTER

Label State: PA

Label Zip Code: 19381-3108

Label Country: US

Label Emergency Number: 215-692-3026/800-452-9994

CHEM SERVICE -- F18 BIS(2-CHLOROETHYL)ETHER
MATERIAL SAFETY DATA SHEET
NSN: 655000F037492
Manufacturer's CAGE: 8Y898
Part No. Indicator: A
Part Number/Trade Name: F18 BIS(2-CHLOROETHYL)ETHER

=====
General Information
=====

Company's Name: CHEM SERVICE INC
Company's Street: 660 TOWER LN
Company's P. O. Box: 3108
Company's City: WEST CHESTER
Company's State: PA
Company's Country: US
Company's Zip Code: 19381-3108
Company's Emerg Ph #: 215-692-3026/800-452-9994
Company's Info Ph #: 215-692-3026/800-452-9994
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SE
Date MSDS Prepared: 02SEP92
Safety Data Review Date: 06DEC94
Preparer's Company: CHEM SERVICE INC
Preparer's St Or P. O. Box: 660 TOWER LN
Preparer's City: WEST CHESTER
Preparer's State: PA
Preparer's Zip Code: 19381-3108
MSDS Serial Number: BWJFJ

=====
Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: DICHLOROETHYL ETHER, BIS (2-CHLOROETHYL) ETHER
Ingredient Sequence Number: 01
NIOSH (RTECS) Number: KN0875000
CAS Number: 111-44-4
OSHA PEL: 5 PPM (SKIN)
ACGIH TLV: 5 PPM (SKIN)
Other Recommended Limit: 5 PPM

=====
Physical/Chemical Characteristics
=====

Appearance And Odor: COLORLESS LIQUID W/FRUITY/PLEASANT ODOR.
Boiling Point: 352.4F
Melting Point: -58F
Solubility In Water: INSOLUBLE

=====
Fire and Explosion Hazard Data
=====

Flash Point: 145.4F
Extinguishing Media: CO2, DRY CHEMICAL POWDER. DON'T USE WATER.
Unusual Fire And Expl Hazrds: FLAMMABLE CHEMICAL.

=====
Reactivity Data
=====

Stability: YES
Cond To Avoid (Stability): HEAT/FIRE.
Materials To Avoid: STONG OXIDIZING AGENTS/NITRATES/HALOGENS/STRONG ACIDS.
Hazardous Decomp Products: TOXIC FUMES, DECOMPOSITION PRODUCTS ARE
CORROSIVE.
Hazardous Poly Occur: NO

Health Hazard Data

LD50-LC50 Mixture: ORAL LD50 (RAT/MOUSE): 75 MG/KG
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: SKIN: MAY BE RAPIDLY ABSORBED/HARMFUL,
IRRITATION. INHALATION: HARMFUL, IRRITATION OF RESPIRATORY TRACT/MUCOUS
MEMBRANES. INGESTION: HARMFUL. EYES: IRRITATION. CAN CAUSE DELAYED ADVERSE
HEALTH EFFECTS.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NONE
Signs/Symptoms Of Overexp: IRRITATION.
Emergency/First Aid Proc: EYES: FLUSH W/WATER FOR 15-20 MINS. SKIN: FLUSH
W/WATER FOR 15-20 MINS. IF NOT BURNED, WASH W/SOAP & WATER TO CLEANSE.
INHALATION: REMOVE TO FRESH AIR. GIVE CPR/OXYGEN IF NEEDED & CONTINUE UNTIL
MEDICAL ASSISTANCE ARRIVES. KEEP WARM & QUIET. INGESTION: DON'T GIVE
LIQUIDS/INDUCE VOMITING IF UNCONSCIOUS/CONVULSING. IF VOMITING, KEEP CLOSE
WATCH TO AVOID AIRWAY OBSTRUCTION. (SEE SUPP)

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: EVACUATE AREA. WEAR APPROPRIATE OSHA
REGULATED EQUIPMENT. VENTILATE AREA. ABSORB ON VERMICULITE/SIMILAR
MATERIAL. SWEEP UP & PLACE IN APPROPRIATE CONTAINER/HOLD FOR DISPOSAL. WASH
CONTAMINATED SURFACES TO REMOVE ANY RESIDUES.
Waste Disposal Method: BURN IN A CHEMICAL INCINERATOR EQUIPPED W/AN
AFTERBURNER & SCRUBBER IAW/FEDERAL, STATE & LOCAL REGULATIONS.
Precautions-Handling/Storing: STORE IN A COOL DRY PLACE ONLY W/COMPATIBLE
CHEMICALS. KEEP TIGHTLY CLOSED.
Other Precautions: AVOID CONTACT W/SKIN, EYES & CLOTHING. DON'T BREATH
VAPORS. CONTACT LENSES SHOULDN'T BE WORN IN THE LABORATORY. ALL CHEMICALS
SHOULD BE CONSIDERED HAZARDOUS. AVOD DIRECT PHYSICAL CONTACT. READILY
ABSORBED & RETAINED ON CLOTHING & SHOES.

Control Measures

Respiratory Protection: WEAR APPROPRIATE OSHA/MSHA APPROVED SAFETY
EQUIPMENT.
Ventilation: CHEMICAL SHOULD BE HANDLED ONLY IN A HOOD.
Eye Protection: EYE SHIELDS
Work Hygienic Practices: REMOVE/LAUNDER CONTAMINATED CLOTHING BEFORE
REUSE.
Suppl. Safety & Health Data: FIRST AID CONT'D: OBTAIN MEDICAL ATTENTION IN
ALL CASES. PRODUCT IS EASILY OXIDIZED & MAY BE A PEROXIDE FORMER, CHECK FOR
PEROXIDES ON ALL OPENED SAMPLES.

Transportation Data

Disposal Data

Label Data

Label Required: YES
Label Status: G
Common Name: F18 BIS(2-CHLOROETHYL)ETHER
Special Hazard Precautions: SKIN: MAY BE RAPIDLY ABSORBED/HARMFUL,
IRRITATION. INHALATION: HARMFUL, IRRITATION OF RESPIRATORY TRACT/MUCOUS
MEMBRANES. INGESTION: HARMFUL. EYES: IRRITATION. CAN CAUSE DELAYED ADVERSE
HEALTH EFFECTS. IRRITATION.

Label Name: CHEM SERVICE INC
Label Street: 660 TOWER LN
Label P.O. Box: 3108
Label City: WEST CHESTER
Label State: PA
Label Zip Code: 19381-3108
Label Country: US
Label Emergency Number: 215-692-3026/800-452-9994

CHEM SERVICE -- BIS(2-ETHYLHEXYL)PHTHALATE, F66
MATERIAL SAFETY DATA SHEET
NSN: 681000N075709
Manufacturer's CAGE: 8Y898
Part No. Indicator: A
Part Number/Trade Name: BIS(2-ETHYLHEXYL)PHTHALATE, F66

=====
General Information
=====

Company's Name: CHEM SERVICE INC
Company's P. O. Box: 3108
Company's City: WEST CHESTER
Company's State: PA
Company's Country: US
Company's Zip Code: 19381
Company's Emerg Ph #: 610-692-3026
Company's Info Ph #: 610-692-3026
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SMJ
Date MSDS Prepared: 02MAY94
Safety Data Review Date: 02JAN97
MSDS Serial Number: CCWVN

=====
Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: PHTHALIC ACID, BIS(2-ETHYLHEXYL)ESTER; (BIS(2-ETHYLHEXYL)
PHTHALATE) (SARA 313) (CERCLA)
Ingredient Sequence Number: 01
NIOSH (RTECS) Number: TI0350000
CAS Number: 117-81-7
OSHA PEL: 5 MG/M3
ACGIH TLV: 5 MG/M3

Proprietary: NO
Ingredient: SUPDAT:SURE AIRWAY DOES NOT BECOME OBSTRUCTED BY VOMIT. GET
MED ATTN IF NEC. NOTE:AN ANTIDOTE IS A SUBSTANCE (ING 3)
Ingredient Sequence Number: 02
NIOSH (RTECS) Number: 9999999ZZ
OSHA PEL: NOT APPLICABLE
ACGIH TLV: NOT APPLICABLE

Proprietary: NO
Ingredient: ING 2:INTENDED TO COUNTERACT EFT OF POIS. IT SHOULD BE ADMIN
ONLY BY MD/TRAINED EMER PERS. MED ADVICE CAN BE (ING 4)
Ingredient Sequence Number: 03
NIOSH (RTECS) Number: 9999999ZZ
OSHA PEL: NOT APPLICABLE
ACGIH TLV: NOT APPLICABLE

Proprietary: NO
Ingredient: ING 3:OBTAINED FROM A POISON CONTROL CENTER.
Ingredient Sequence Number: 04
NIOSH (RTECS) Number: 9999999ZZ
OSHA PEL: NOT APPLICABLE
ACGIH TLV: NOT APPLICABLE

=====
Physical/Chemical Characteristics
=====

Appearance And Odor: COLORLESS LIQUID.
Boiling Point: 723F,384C
Melting Point: -58F,-50C

Vapor Pressure (MM Hg/70 F): <0.01 @20C
Specific Gravity: 0.985
Solubility In Water: INSOL (IMMISCIBLE)

Fire and Explosion Hazard Data

Flash Point: 405F,207C
Extinguishing Media: CARBON DIOXIDE, DRY CHEMICAL POWDER OR SPRAY.
Special Fire Fighting Proc: USE NIOSH APPROVED SCBA & FULL PROTECTIVE EQUIPMENT (FP N).
Unusual Fire And Expl Hazrds: NO EXPLOSION LIMITS ARE AVAILABLE FOR THIS COMPOUND.

Reactivity Data

Stability: YES
Cond To Avoid (Stability): NONE SPECIFIED BY MANUFACTURER.
Materials To Avoid: INCOMPATIBLE W/STRONG OXIDIZING AGENTS.
Hazardous Decomp Products: DECOMPOSITION LIBERATES TOXIC FUMES.
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NOT RELEVANT

Health Hazard Data

LD50-LC50 Mixture: LD50:(ORAL,RAT) 31,000 MG/KG.
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: ALL CHEMICALS SHOULD BE CONSIDERED HAZARDOUS - AVOID DIRECT PHYSICAL CONTACT! SUSPECTED CARCINOGEN - MAY PRODUCE CANCER. MAY BE HARMFUL IF ABSORBED THROUGH SKIN, INHALED OR SWALLOWED. CAN CAUSE EYE & SKIN IRRITATION. DUST AND/OR VAPORS CAN CAUSE IRRITATION TO RESPIRATORY TRACT. CAN BE IRRITATING TO (EFTS OF OVEREXP)
Carcinogenicity - NTP: YES
Carcinogenicity - IARC: YES
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: PHTHALIC ACID, BIS(2-ETHYLHEXYL)ESTER:IARC MONOGRAPHS, SUPP, VOL 7, PG 56, 1987:GRP 2B. NTP 7TH ANNUAL RPT ON(SUPP DATA)
Signs/Symptoms Of Overexp: HLTH HAZ:MUCOUS MEMBRANES. THIS CHEMICAL IS CONSIDERED TO BE A CARCINOGEN BY THE STATE OF CALIFORNIA. THIS COMPOUND IS GENERALLY CONSIDERED TO BE NON-TOXIC, BASED ON OSHA'S ASSESSMENT OF THE LD50.
Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER.
Emergency/First Aid Proc: EYES:FLUSH CONTINUOUSLY W/WATER FOR AT LST 15-20 MINS. SKIN:FLUSH W/WATER FOR 15-20 MINS. IF NO BURNS HAVE OCCURRED- USE SOAP & WATER TO CLEANSE SKIN. REMOVE & WASH CONTAM CLTHG. INHAL:REMOVE PATIENT TO FRESH AIR. ADMIN OXYG IF PATIENT IS HAVING DFCLTY BRTHG. IF PATIENT HAS STOPPED BRTHG ADMIN ARTF RESP. IF PATIENT IS IN CARDIAC ARREST ADMIN CPR. CONTINUE LIFE SUPPORTING MEASURES UNTIL MED (SUPDAT)

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: EVACUATE AREA. WEAR APPROPRIATE OSHA REGULATED EQUIPMENT. VENTILATE AREA. ABSORB ON VERMICULITE OR SIMILAR MATERIAL. SWEEP UP & PLACE IN AN APPROPRIATE CONTAINER. HOLD FOR DISPOSAL. WASH CONTAMINATED SURFACES TO REMOVE ANY RESIDUES.
Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.
Waste Disposal Method: DISPOSAL MUST BE I/A/W FEDERAL, STATE & LOCAL REGULATIONS (FP N). BURN IN A CHEMICAL INCINERATOR EQUIPPED W/AFTERBURNER & SCRUBBER.
Precautions-Handling/Storing: AVOID CONTACT W/SKIN, EYES & CLOTHING. DO NOT BREATHE VAPORS. KEEP TIGHTLY CLOSED. STORE IN A COOL, DRY PLACE. STORE ONLY W/COMPATIBLE CHEMICALS.

Other Precautions: PERS NOT SPECIFICALLY & PROPERLY TRAINED SHOULD NOT HANDLE THIS CHEM/ITS CNTNR. THIS PROD IS FURNISHED FOR LAB USE ONLY! MFR'S PRODS MAY NOT BE USED AS DRUGS, COSMETICS, AGRICULTURAL/PESTICIDAL PRODS, FOOD ADDITIVE/AS HOUSEHOLD CHEMICALS.

=====
Control Measures
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Respiratory Protection: NIOSH APPROVED RESPIRATOR APPROPRIATE FOR EXPOSURE OF CONCERN (FP N).

Ventilation: THIS CHEMICAL SHOULD BE HANDLED ONLY IN A HOOD.

Protective Gloves: IMPERVIOUS GLOVES (FP N).

Eye Protection: ANSI APPROVED CHEM WORKERS GOGGS (FP N).

Other Protective Equipment: EYE WASH FOUNTAIN & DELUGE SHOWER WHICH MEET ANSI DESIGN CRITERIA (FP N). USE APPROP NIOSH APPROVED SAFETY EQUIPMENT.

Work Hygienic Practices: CONTACT LENSES SHOULD NOT BE WORN IN THE LABORATORY.

Suppl. Safety & Health Data: EXPLAN OF CARCIN:CARCINS, 1994:ANTIC TO BE CARCIN. ANIMAL:LIVER, TESTES. FIRST AID PROC:ASSISTANCE HAS ARRIVED.

INGEST:IF PATIENT IS EXHIBITING SIGNS OF SHOCK - KEEP WARM & QUIET. CONT POIS CTL CTR IMMED IF NEC. DO NOT ADMIN LIQS/INDUCE VOMIT TO UNCON/ CONVULSING PERS. IF PATIENT IS VOMIT-WATCH CLOSELY TO MAKE (ING 2)

=====
Transportation Data
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Disposal Data
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Label Data
=====

Label Required: YES

Technical Review Date: 02JAN97

Label Date: 26DEC96

Label Status: G

Common Name: BIS(2-ETHYLHEXYL)PHTHALATE, F66

Chronic Hazard: YES

Signal Word: WARNING!

Acute Health Hazard-Moderate: X

Contact Hazard-Moderate: X

Fire Hazard-Slight: X

Reactivity Hazard-Slight: X

Special Hazard Precautions: DECOMPOSITION PRODUCTS MAY BE TOXIC. ACUTE:EYE AND SKIN IRRITATION. RESPIRATORY TRACT IRRITATION. MUCOUS MEMBRANE IRRITATION. CHRONIC:CANCER HAZARD. CONTAINS PHTHALIC ACID, BIS(2-ETHYLHEXYL)ESTER, WHICH IS LISTED AS AN ANIMAL LIVER CARCINOGEN (FP N).

Protect Eye: Y

Protect Skin: Y

Protect Respiratory: Y

Label Name: CHEM SERVICE INC

Label P.O. Box: 3108

Label City: WEST CHESTER

Label State: PA

Label Zip Code: 19381

Label Country: US

Label Emergency Number: 610-692-3026

Safety data for 4-bromophenyl phenyl ether

General

Synonyms: p-bromophenyl phenyl ether, 4-bromodiphenyl ether

Molecular formula: $C_{12}H_9BrO$

CAS No: 101-55-3

EC No:

Physical data

Appearance: liquid

Melting point: 17 C

Boiling point: 305 C

Vapour density:

Vapour pressure:

Density ($g\ cm^{-3}$): 1.42

Flash point:

Explosion limits:

Autoignition temperature:

Water solubility:

Stability

Stable. Combustible. Incompatible with strong oxidizing agents.

Toxicology

n/a

Toxicity data

(The meaning of any abbreviations which appear in this section is given here.)

Risk phrases

(The meaning of any risk phrases which appear in this section is given here.)

Transport information

Personal protection

Safety glasses. Treat as potentially harmful.

Safety phrases

(The meaning of any safety phrases which appear in this section is given here.)

[\[Return to Physical & Theoretical Chemistry Lab. Safety home page.\]](#)

This information was last updated on December 5, 2000. We have tried to make it as accurate and useful as possible, but can take no responsibility for its use, misuse, or accuracy. We have not verified this information, and cannot guarantee that it is up-to-date.

GE SILICONES -- GE91, LATEX ACRYLIC CAULK
MATERIAL SAFETY DATA SHEET
NSN: 803000N061258
Manufacturer's CAGE: 01139
Part No. Indicator: A
Part Number/Trade Name: GE91, LATEX ACRYLIC CAULK

=====
General Information
=====

Company's Name: GE SILICONES
Company's Street: 260 HUDSON RIVER ROAD
Company's City: WATERFORD
Company's State: NY
Company's Country: US
Company's Zip Code: 12188
Company's Emerg Ph #: 518-237-3330
Company's Info Ph #: 518-237-3330
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SMJ
Date MSDS Prepared: 30JAN92
Safety Data Review Date: 05JUL95
MSDS Preparer's Name: D A POLSINELLI
Preparer's Company: SAME
MSDS Serial Number: BXZTP

=====
Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: ACRYLIC ACID, ETHYL ESTER; (ETHYL ACRYLATE) (SARA 313)
(CERCLA)
Ingredient Sequence Number: 01
Percent: 0.0007
NIOSH (RTECS) Number: AT0700000
CAS Number: 140-88-5
OSHA PEL: 25 PPM,S
ACGIH TLV: 5 PPM; 15 STEL

Proprietary: NO
Ingredient: PHTHALIC ACID, BENZYL BUTYL ESTER; (BUTYL BENZYL PHTHALATE)
(SARA 313) (CERCLA)
Ingredient Sequence Number: 02
Percent: <10.0
NIOSH (RTECS) Number: TH9990000
CAS Number: 85-68-7
OSHA PEL: N/K (FP N)
ACGIH TLV: N/K (FP N)

Proprietary: NO
Ingredient: ACRYLIC POLYMER
Ingredient Sequence Number: 03
Percent: 16-22
NIOSH (RTECS) Number: 1007956AA
OSHA PEL: N/K (FP N)
ACGIH TLV: N/K (FP N)

Proprietary: NO
Ingredient: CALCIUM CARBONATE
Ingredient Sequence Number: 04
Percent: 50.0
NIOSH (RTECS) Number: EV9580000
CAS Number: 1317-65-3
OSHA PEL: 15 MG/M3 TDUST

ACGIH TLV: 10 MG/M3 TDUST

Proprietary: NO
Ingredient: TITANIUM OXIDE; (TITANIUM DIOXIDE)
Ingredient Sequence Number: 05
Percent: 1.0
NIOSH (RTECS) Number: XR2275000
CAS Number: 13463-67-7
OSHA PEL: 15 MG/M3 TDUST
ACGIH TLV: 10 MG/M3 TDUST

Proprietary: NO
Ingredient: WATER
Ingredient Sequence Number: 06
Percent: 13-18
NIOSH (RTECS) Number: ZC0110000
CAS Number: 7732-18-5
OSHA PEL: N/K (FP N)
ACGIH TLV: N/K (FP N)
=====

Physical/Chemical Characteristics

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Appearance And Odor: WHITISH PASTE W/ MILD ODOR.
Boiling Point: N/A
Melting Point: N/A
Vapor Pressure (MM Hg/70 F): N/A
Specific Gravity: 1.57(H*20=1)
Evaporation Rate And Ref: <1 (BUAC=1)
Solubility In Water: PARTIAL
pH: N/A
=====

Fire and Explosion Hazard Data

=====

Flash Point: N/A
Extinguishing Media: ALL STANDARD FIREFIGHTING MEDIA.
Special Fire Fighting Proc: WEAR NIOSH/MSHA APPROVED SCBA & FULL
PROTECTIVE EQUIPMENT(FP N).
Unusual Fire And Expl Hazrds: NONE SPECIFIED BY MANUFACTURER.
=====

Reactivity Data

=====

Stability: YES
Cond To Avoid (Stability): NONE KNOWN.
Materials To Avoid: NONE KNOWN.
Hazardous Decomp Products: CARBON MONOXIDE, CARBON DIOXIDE.
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NOT RELEVANT.
=====

Health Hazard Data

=====

LD50-LC50 Mixture: LD50: (ORAL,RAT) >51,000 MG/KG
Route Of Entry - Inhalation: NO
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: NO
MAY CAUSE MILD EYE IRRITATION.
Carcinogenicity - NTP: YES
Carcinogenicity - IARC: YES
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: ACRYLIC ACID, ETHYL ESTER: IARC MONOGRAPHS,
SUPP. VOL 7, PG 56, 1987: GROUP 2B. NTP 7TH ANNUAL REPORT ON CARCINS,
(SUDAT)
Signs/Symptoms Of Overexp: SEE HEALTH HAZARDS.
Med Cond Aggravated By Exp: NONE KNOWN.
Emergency/First Aid Proc: INGEST: CALL MD IMMEDIATELY(FP N). SKIN: WASH
=====

WITH SOAP & WATER. INHAL: REMOVE TO FRESH AIR. SUPPORT BREATHING (GIVE O*2/ARTF RESP) (FP N). EYES: IMMED FLUSH W/PLENTY OF WATER FOR AT LEAST 15 MINS & GET MED ATTN IF IRRIT PERSISTS.

=====

Precautions for Safe Handling and Use

=====

Steps If Matl Released/Spill: WIPE, SCRAPE/SOAK UP IN AN INERT MATL & PUT IN CNTNR FOR DISP. WASH WALKING SURFS W/DETERGENT & WATER TO REDUCE SLIPPING HAZ. WEAR PROPER PROT EQUIP AS SPEC IN PROT EQUIP. AVOID RUNOFF TO NATURAL WATERS, COMPONENT IS KNOWN TO BE TOXIC TO MARINE LIFE.

Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.

Waste Disposal Method: DISPOSAL SHOULD BE MADE I/A/W FEDERAL, STATE & LOCAL REGULATIONS. BURY IN LICENSED LANDFILL OR BURN IN AN APPROVED BUTYLBENZYLPHTHALATE RQ=100#.

Precautions-Handling/Storing: AVOID CONTACT W/EYES. DO NOT HANDLE CONT LENSES UNTIL ALL CAULK HAS BEEN CLEANED FROM FINGERTIPS. CAULK MAY TRANSFER TO LENSES & CAUSE IRRITATION.

Other Precautions: NONE SPECIFIED BY MANUFACTURER.

=====

Control Measures

=====

Respiratory Protection: USE NIOSH/MSHA APPROVED RESPIRATOR APPROPRIATE FOR EXPOSURE OF CONCERN (FP N).

Ventilation: NONE KNOWN.

Protective Gloves: CLOTH GLOVES.

Eye Protection: ANSI APPRVD CHEM WORKERS GOGGS (FP N).

Other Protective Equipment: EYEWASH STATIONS.

Work Hygienic Practices: NONE SPECIFIED BY MANUFACTURER.

Suppl. Safety & Health Data: NONE SPECIFIED BY MANUFACTURER.

=====

Transportation Data

=====

Disposal Data

=====

Label Data

=====

Label Required: YES

Technical Review Date: 05JUL95

Label Date: 05JUL95

Label Status: G

Common Name: GE91, LATEX ACRYLIC CAULK

Chronic Hazard: YES

Signal Word: CAUTION!

Acute Health Hazard-Slight: X

Contact Hazard-Slight: X

Fire Hazard-None: X

Reactivity Hazard-None: X

Special Hazard Precautions: ACUTE: SKIN: MAY CAUSE MILD SKIN IRRITATION.

EYE: MAY CAUSE MILD EYE IRRITATION. CHRONIC: CANCER HAZARD. CONTAINS ACRYLIC ACID, ETHYL ESTER WHICH IS LISTED AS AN ANIMAL STOMACH CARCINOGEN.

THIS SUBSTANCE IS PRESENT IN LESS THAN 0.1 %, THUS PROBABLY DOES NOT CONSTITUTE A SIGNIFICANT CARCINOGEN HAZARD (FP N).

Protect Eye: Y

Protect Skin: Y

Protect Respiratory: Y

Label Name: GE SILICONES

Label Street: 260 HUDSON RIVER ROAD

Label City: WATERFORD

Label State: NY

Label Zip Code: 12188

Label Country: US

Label Emergency Number: 518-237-3330

CHEM SERVICE -- 0-669, CHLOROBENZENE
MATERIAL SAFETY DATA SHEET
NSN: 681000N033519
Manufacturer's CAGE: 8Y898
Part No. Indicator: A
Part Number/Trade Name: 0-669, CHLOROBENZENE

=====
General Information
=====

Company's Name: CHEM SERVICE INC
Company's P. O. Box: 3108
Company's City: WEST CHESTER
Company's State: PA
Company's Country: US
Company's Zip Code: 19381
Company's Emerg Ph #: 215-692-3026
Company's Info Ph #: 215-692-3026
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SMJ
Date MSDS Prepared: 16MAR92
Safety Data Review Date: 24AUG92
MSDS Serial Number: BPTDF
Hazard Characteristic Code: NK

=====
Ingredients/Identity Information
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Proprietary: NO
Ingredient: BENZENE, CHLORO-; (CHLOROBENZENE) (SARA III)
Ingredient Sequence Number: 01
NIOSH (RTECS) Number: CZ0175000
CAS Number: 108-90-7
OSHA PEL: 75 PPM
ACGIH TLV: 10 PPM

=====
Physical/Chemical Characteristics
=====

Appearance And Odor: COLORLESS LIQUID WITH PLEASANT FRUITY ODOR.
Boiling Point: 270F,132C
Melting Point: -49F,-45C
Vapor Pressure (MM Hg/70 F): 6.8 @ 20C
Vapor Density (Air=1): N/A
Evaporation Rate And Ref: NOT AVAILABLE
Solubility In Water: INSOLUBLE

=====
Fire and Explosion Hazard Data
=====

Flash Point: 73.4F,23.0C
Lower Explosive Limit: 1.3%
Upper Explosive Limit: 7.1%
Extinguishing Media: CARBON DIOXIDE, DRY CHEMICAL POWDER OR SPRAY.
Special Fire Fighting Proc: USE NIOSH/MSHA APPROVED SCBA AND FULL
PROTECTIVE EQUIPMENT (FP N).
Unusual Fire And Expl Hazrds: THIS IS A FLAMMABLE CHEMICAL.

=====
Reactivity Data
=====

Stability: YES
Cond To Avoid (Stability): NONE SPECIFIED BY MANUFACTURER.
Materials To Avoid: STRONG OXIDIZING AGENTS.
Hazardous Decomp Products: DECOMPOSITION LIBERATES TOXIC FUMES.
DECOMPOSITION PRODUCTS ARE CORROSIVE.
Hazardous Poly Occur: NO

Conditions To Avoid (Poly): NOT RELEVANT

=====
Health Hazard Data
=====

LD50-LC50 Mixture: LD50 (ORAL, RAT):2910 MG/KG
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: ALL CHEMICALS SHOULD BE CONSIDERED HAZARDOUS
- AVOID DIRECT PHYSICAL CONTACT. MAY BE HARMFUL IF ABSORBED THROUGH SKIN.
MAY BE HARMFUL IF INHALED. CAN CAUSE SKIN IRRITATION. CAN BE IRRITATING TO
MUCOUS MEMBRANES. CAN CAUSE EYE AND/OR SKIN IRRITATION. PROLONGED EXPOSURE
MAY CAUSE NAUSEA, HEADACHE, (EFTS OF OVEREXPOS)
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NOT RELEVANT
Signs/Symptoms Of Overexp: HLTH HAZ:DIZZINESS AND/OR EYE DAMAGE. MAY BE
HARMFUL IF SWALLOWED. DUST AND/OR VAPORS CAN CAUSE IRRITATION TO
RESPIRATORY TRACT. EXPOSURE CAN CAUSE LIVER AND KIDNEY DAMAGE.
Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER.
Emergency/First Aid Proc: INGEST:CALL MD IMMED (FP N). EYE:FLUSH
CONTINUOUSLY W/WATER FOR AT LEAST 15-20 MIN. SKIN:FLUSH W/WATER FOR AT
LEAST 15-20 MIN. IF NO BURNS HAVE OCCURRED, USE SOAP & WATER TO CLEANSE
SKIN. INHAL:REMOVE PATIENT TO FRESH AIR. ADMIN O*2 IF HAVING DFCLTY BRTHG.
IF BRTHG HAS STOPPED, ADMIN ARTIF RESP. IF PATIENT IS IN CARDIAC ARREST
ADMIN CPR. CONT LIFE SUPPORTING MEASURES UNTIL MD ASSIST (SUPDAT)

=====
Precautions for Safe Handling and Use
=====

Steps If Matl Released/Spill: EVACUATE AREA. WEAR APPROPRIATE OSHA
REGULATED EQUIPMENT. VENTILATE AREA. ABSORB ON VERMICULITE OR SIMILAR
MATERIAL. SWEEP UP AND PLACE IN AN APPROPRIATE CONTAINER. HOLD FOR
DISPOSAL. WASH CONTAMINATED SURFACES TO REMOVE ANY RESIDUE.
Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.
Waste Disposal Method: DISPOSAL MUST BE IN ACCORDANCE WITH LOCAL, STATE
AND FEDERAL REGULATIONS (FP N). BURN IN A CHEMICAL INCINERATOR EQUIPPED
WITH AN AFTERBURNER AND SCRUBBER.
Precautions-Handling/Storing: CHEM SHOULD BE HANDLED ONLY IN A HOOD. AVOID
CONT W/SKIN, EYES & CLTHG. KEEP TIGHTLY CLSD IN A COOL, DRY PLACE.
Other Precautions: STORE ONLY WITH COMPATIBLE CHEMICALS. ALL CHEMICALS
SHOULD BE CONSIDERED HAZARDOUS. AVOID DIRECT PHYSICAL CONTACT.

=====
Control Measures
=====

Respiratory Protection: USE NIOSH/MSHA APPROVED RESPIRATOR APPROPRIATE FOR
EXPOSURE OF CONCERN (FP N).
Ventilation: CHEMICAL SHOULD ONLY BE HANDLED IN HOOD.
Protective Gloves: IMPERVIOUS GLOVES (FP N).
Eye Protection: CHEMICAL WORKERS GOGGLES (FP N).
Other Protective Equipment: NONE SPECIFIED BY MANUFACTURER.
Work Hygienic Practices: CONTACT LENSES SHOULD NOT BE WORN IN LAB.
Suppl. Safety & Health Data: FIRST AID PROC:HAS ARRIVED. AN ANTIDOTE IS A
SUBSTANCE INTENDED TO COUNTERACT EFFECT OF A POISON. IT SHOULD BE
ADMINISTERED ONLY BY A PHYSICIAN OR TRAINED EMERGENCY PERSONNEL. MEDICAL
ADVICE CAN BE OBTAINED FROM A POISON CONTROL CENTER.

=====
Transportation Data
=====

Trans Data Review Date: 93027
DOT PSN Code: DGJ
DOT Proper Shipping Name: CHLOROBENZENE
DOT Class: 3
DOT ID Number: UN1134

DOT Pack Group: III
DOT Label: FLAMMABLE LIQUID
IMO PSN Code: EBV
IMO Proper Shipping Name: CHLOROBENZENE
IMO Regulations Page Number: 3318
IMO UN Number: 1134
IMO UN Class: 3.3
IMO Subsidiary Risk Label: -
IATA PSN Code: GEY
IATA UN ID Number: 1134
IATA Proper Shipping Name: CHLOROBENZENE
IATA UN Class: 3
IATA Label: FLMMABLE LIQUID
AFI PSN Code: GEY
AFI Prop. Shipping Name: CHLOROBENZENE
AFI Class: 3
AFI ID Number: UN1134
AFI Pack Group: III
AFI Basic Pac Ref: 7-7

=====
Disposal Data
=====

=====
Label Data
=====

Label Required: YES
Technical Review Date: 24AUG92
Label Date: 10AUG92
Label Status: G
Common Name: 0-669, CHLOROBENZENE
Chronic Hazard: YES
Signal Word: DANGER!
Acute Health Hazard-Moderate: X
Contact Hazard-Moderate: X
Fire Hazard-Severe: X
Reactivity Hazard-None: X
Special Hazard Precautions: FLAMMABLE. KEEP AWAY FROM HEAT, SPARKS AND
FLAME. ACUTE:CAN CAUSE MUCOUS MEMBRANE IRRITATION. MAY CAUSE NAUSEA,
HEADACHE, DIZZINESS. MAY BE HARMFUL IF SWALLOWED. DUST AND VAPORS CAN CAUSE
IRRITATION TO RESPIRATORY TRACT. CAN CAUSE EYE AND SKIN IRRITATAION. MAY
CAUSE EYE DAMAGE. CHRONIC:OVEREXPOSURE CAN CAUSE LIVER AND KIDNEY DAMAGE.
Protect Eye: Y
Protect Skin: Y
Protect Respiratory: Y
Label Name: CHEM SERVICE INC
Label P.O. Box: 3108
Label City: WEST CHESTER
Label State: PA
Label Zip Code: 19381
Label Country: US
Label Emergency Number: 215-692-3026

Chloroethane
ACROS89460

**** SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION ****

MSDS Name: Chloroethane

Catalog Numbers:

AC404600000, AC404601000, AC404605000

Synonyms:

Ethyl chloride; monchloroethane.

Company Identification (Europe): Acros Organics N.V.

Janssen Pharmaceuticaaan 3a

2440 Geel, Belgium

Company Identification (USA):

Acros Organics

One Reagent Lane

Fairlawn, NJ 07410

For information in North America, call: 800-ACROS-01

For information in Europe, call: 0032(0) 14575211

For emergencies in the US, call CHEMTREC: 800-424-9300

For emergencies in Europe, call: .0032(0) 14575299

**** SECTION 2 - COMPOSITION, INFORMATION ON INGREDIENTS ****

| CAS# | Chemical Name | % | EINECS# |
|---------|----------------|--------|-----------|
| 75-00-3 | Ethyl chloride | ca.100 | 200-830-5 |

Hazard Symbols: XN F+

Risk Phrases: 12 40 52/53

**** SECTION 3 - HAZARDS IDENTIFICATION ****

EMERGENCY OVERVIEW

Appearance: colourless. Flash Point: -50 deg C.

Danger! Extremely flammable liquid. Dangerous to the environment.

Cancer suspect agent. Possible risk of irreversible effects. May cause eye and skin irritation. May cause respiratory and digestive tract irritation.

Target Organs: Reproductive system.

Potential Health Effects

Eye:

May cause eye irritation.

Skin:

May cause skin irritation.

Ingestion:

May cause irritation of the digestive tract.

Inhalation:

May cause respiratory tract irritation. Vapors may cause dizziness or suffocation. Inhalation of vapors causes irritation of the mucous membranes.

Chronic:

Possible risk of irreversible effects.

**** SECTION 4 - FIRST AID MEASURES ****

Eyes:

Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin:

Get medical aid. Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion:

Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation:

Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician:

Treat symptomatically and supportively.

**** SECTION 5 - FIRE FIGHTING MEASURES ****

General Information:

As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Vapors may form an explosive mixture with air. Vapors can travel to a source of ignition and flash back. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use water spray to keep fire-exposed containers cool. Extremely flammable liquid. Containers may explode in the heat of a fire. Will be easily ignited by heat, sparks or flame.

Extinguishing Media:

For small fires, use dry chemical, carbon dioxide, water spray or alcohol-resistant foam. For large fires, use water spray, fog, or alcohol-resistant foam. Use water spray to cool fire-exposed containers. Water may be ineffective. Use agent most appropriate to extinguish fire. Do NOT use straight streams of water.

**** SECTION 6 - ACCIDENTAL RELEASE MEASURES ****

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks:

Absorb spill with inert material, (e.g., dry sand or earth), then place into a chemical waste container. Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Remove all sources of ignition. Use a spark-proof tool. Provide ventilation. A vapor suppressing foam may be used to reduce vapors.

**** SECTION 7 - HANDLING and STORAGE ****

Handling:

Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Ground and bond containers when transferring material. Avoid contact with eyes, skin, and clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep container tightly closed. Avoid contact with heat, sparks and flame. Avoid ingestion and inhalation. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.

Storage:

Keep away from heat, sparks, and flame. Keep away from sources of ignition. Keep container closed when not in use. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Refrigerator/flammables.

**** SECTION 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION ****

Engineering Controls:

Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local explosion-proof ventilation to keep airborne levels to acceptable levels.

Exposure Limits

| Chemical Name | ACGIH | NIOSH | OSHA - Final PELs |
|----------------|--|--|------------------------------|
| Ethyl chloride | 100 ppm; skin - potential for cutaneous absorption | Handle with caution in the workplace; see Appendix C for | 1000 ppm TWA; 2600 mg/m3 TWA |

| | |
|--|-------------------|
| | supplementary |
| | exposure limits |
| | 3800 ppm IDLH (10 |
| | percent lower |
| | explosive limit) |

OSHA Vacated PELs:
Ethyl chloride:
1000 ppm TWA; 2600 mg/m3 TWA

Personal Protective Equipment

Eyes:

Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin:

Wear appropriate protective gloves to prevent skin exposure.

Clothing:

Wear appropriate protective clothing to prevent skin exposure.

Respirators:

A respiratory protection program that meets OSHA's 29 CFR §1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.

**** SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES ****

| | |
|----------------------------|--|
| Physical State: | Gas |
| Appearance: | colourless |
| Odor: | pungent odor |
| pH: | Not available. |
| Vapor Pressure: | Not available. |
| Vapor Density: | 2.22 |
| Evaporation Rate: | Not available. |
| Viscosity: | Not available. |
| Boiling Point: | 12 - 14 deg C |
| Freezing/Melting Point: | Not available. |
| Autoignition Temperature: | Not available. |
| Flash Point: | -50 deg C (-58.00 deg F) |
| NFPA Rating: | (est.) Health: 1; Flammability: 4; Reactivity: 0 |
| Explosion Limits, Lower: | Not available. |
| Upper: | Not available. |
| Decomposition Temperature: | |
| Solubility: | |
| Specific Gravity/Density: | .9200g/cm3 |
| Molecular Formula: | C2H5Cl |
| Molecular Weight: | 64.51 |

**** SECTION 10 - STABILITY AND REACTIVITY ****

Chemical Stability:

Stable under normal temperatures and pressures. Forms explosive mixtures with air (flash point -58F/-50C).

Conditions to Avoid:

Incompatible materials, ignition sources, moisture, excess heat, strong oxidants.

Incompatibilities with Other Materials:

Metals, strong oxidizing agents, plastics, rubber, potassium, sodium.

Hazardous Decomposition Products:

Hydrogen chloride, carbon monoxide, irritating and toxic fumes and gases, carbon dioxide, phosgene gas.

Hazardous Polymerization: Has not been reported

**** SECTION 11 - TOXICOLOGICAL INFORMATION ****

RTECS#:

CAS# 75-00-3: KH7525000
LD50/LC50:
CAS# 75-00-3: Inhalation, mouse: LC50 =146 gm/m3/2H; Inhalation,
rat: LC50 =160 gm/m3/2H.
Carcinogenicity:
Ethyl chloride -
ACGIH: A3 - animal carcinogen
California: carcinogen; initial date 7/1/90
IARC: Group 3 carcinogen
Epidemiology:
No data available.
Teratogenicity:
No data available.
Reproductive Effects:
No data available.
Neurotoxicity:
No data available.
Mutagenicity:
No data available.
Other Studies:
No data available.

**** SECTION 12 - ECOLOGICAL INFORMATION ****

Other
No information available.

**** SECTION 13 - DISPOSAL CONSIDERATIONS ****

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste.
US EPA guidelines for the classification determination are listed in 40 CFR Part 261. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.
RCRA P-Series: None listed.
RCRA U-Series: None listed.

**** SECTION 14 - TRANSPORT INFORMATION ****

US DOT
No information available
Canadian TDG
Shipping Name: CHLORO BENZENE
Hazard Class: 3(9.2)
UN Number: UN1134
Other Information: FLASHPOINT 28 C

**** SECTION 15 - REGULATORY INFORMATION ****

US FEDERAL
TSCA
CAS# 75-00-3 is listed on the TSCA inventory.
Health & Safety Reporting List
CAS# 75-00-3: Effective Date: June 1, 1987; Sunset Date: June 1, 1997
Chemical Test Rules
None of the chemicals in this product are under a Chemical Test Rule.
Section 12b
CAS# 75-00-3: 4/12b
TSCA Significant New Use Rule
None of the chemicals in this material have a SNUR under TSCA.
SARA
Section 302 (RQ)
CAS# 75-00-3: final RQ = 100 pounds (45.4 kg)
Section 302 (TPQ)
None of the chemicals in this product have a TPQ.
SARA Codes
CAS # 75-00-3: acute, chronic, flammable, sudden release of pressure.
Section 313
This material contains Ethyl chloride (CAS# 75-00-3, 100%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 372.

Clean Air Act:

CAS# 75-00-3 is listed as a hazardous air pollutant (HAP).
This material does not contain any Class 1 Ozone depletors.
This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.
CAS# 75-00-3 is listed as a Priority Pollutant under the Clean Water Act.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

Ethyl chloride can be found on the following state right to know lists: California, New Jersey, Florida, Pennsylvania, Minnesota, Massachusetts.

The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:

WARNING: This product contains Ethyl chloride, a chemical known to the state of California to cause cancer.

California No Significant Risk Level:

None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols: XN F+

Risk Phrases:

R 12 Extremely flammable.
R 40 Possible risks of irreversible effects.
R 52/53 Harmful to aquatic organisms; may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

S 9 Keep container in a well-ventilated place.
S 16 Keep away from sources of ignition - No smoking.
S 28A After contact with skin, wash immediately with plenty of water.
S 33 Take precautionary measures against static discharges.
S 36/37 Wear suitable protective clothing and gloves.
S 37 Wear suitable gloves.
S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S 61 Avoid release to the environment. Refer to special instructions/Safety data sheets.

WGK (Water Danger/Protection)

CAS# 75-00-3: 2

United Kingdom Occupational Exposure Limits

CAS# 75-00-3: OES-United Kingdom, TWA 1000 ppm TWA; 2700 mg/m³ TWA

CAS# 75-00-3: OES-United Kingdom, STEL 1250 ppm STEL; 3380 mg/m³ STEL

Canada

CAS# 75-00-3 is listed on Canada's DSL/NDSL List.

This product has a WHMIS classification of B1, D2B.

CAS# 75-00-3 is not listed on Canada's Ingredient Disclosure List.

Exposure Limits

CAS# 75-00-3: OEL-AUSTRALIA:TWA 1000 ppm (2600 mg/m³)

OEL-AUSTRIA:TWA 1000 ppm (2600 mg/m³)

OEL-BELGIUM:TWA 1000 ppm (2640 mg/m³)

OEL-DENMARK:TWA 1000 ppm (2600 mg/m³)

OEL-FINLAND:TWA 500 ppm (1300 mg/m³); STEL 625 ppm (1625 mg/m³)

OEL-FRANCE:TWA 1000 ppm (2600 mg/m³)

OEL-GERMANY:TWA 1000 ppm (2600 mg/m³)

OEL-HUNGARY:TWA 100 mg/m³; STEL 300 mg/m³

OEL-JAPAN:TWA 1000 ppm (2600 mg/m³)

OEL-THE NETHERLANDS:TWA 1000 ppm (2600 mg/m³)

OEL-THE PHILIPPINES:TWA 1000 ppm (2600 mg/m³)

OEL-POLAND:TWA 200 mg/m³

OEL-RUSSIA:TWA 1000 ppm;STEL 50 mg/m3
OEL-SWEDEN:TWA 500 ppm (1300 mg/m3);STEL 700 ppm (1900 mg/m3)
OEL-SWITZERLAND:TWA 1000 ppm (2600 mg/m3)
OEL-TURKEY:TWA 1000 ppm (2600 mg/m3)
OEL-UNITED KINGDOM:TWA 1000 ppm (2600 mg/m3);STEL 1250 ppm
OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA check ACGIH TLV
OEL IN NEW ZEALAND, SINGAPORE, VIETNAM check ACGI TLV

**** SECTION 16 - ADDITIONAL INFORMATION ****

MSDS Creation Date: 4/05/1997 Revision #6 Date: 8/02/2000

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no way shall the company be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if the company has been advised of the possibility of such damages.

Chrysene, 98%
ACROS95251

**** SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION ****

MSDS Name: Chrysene, 98%

Catalog Numbers:

AC224140000, AC224140010, AC224140050, AC224145000

Synonyms:

1,2 Benzophenanthrene; Benzo(a)phenanthrene.

Company Identification (Europe): Acros Organics N.V.

Janssen Pharmaceuticaaan 3a

2440 Geel, Belgium

Company Identification (USA): Acros Organics

One Reagent Lane

Fairlawn, NJ 07410

For information in North America, call: 800-ACROS-01

For information in Europe, call: 0032(0) 14575211

For emergencies in the US, call CHEMTREC: 800-424-9300

For emergencies in Europe, call: 0032(0) 14575299

**** SECTION 2 - COMPOSITION, INFORMATION ON INGREDIENTS ****

| CAS# | Chemical Name | % | EINECS# |
|----------|---------------|------|-----------|
| 218-01-9 | Chrysene | 98.0 | 205-923-4 |

Hazard Symbols: T

Risk Phrases: 45

**** SECTION 3 - HAZARDS IDENTIFICATION ****

EMERGENCY OVERVIEW

Appearance: very light beige.

Caution! Carcinogen. Mutagen. May cause eye and skin irritation. May cause respiratory and digestive tract irritation. May cause cancer in humans.

Target Organs: Liver, skin.

Potential Health Effects

Eye:

May cause eye irritation.

Skin:

May cause skin irritation.

Ingestion:

May cause gastrointestinal irritation with nausea, vomiting and diarrhea.

Inhalation:

May cause respiratory tract irritation.

Chronic:

May cause cancer in humans. May cause cancer according to animal studies.

**** SECTION 4 - FIRST AID MEASURES ****

Eyes:

Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin:

Get medical aid. Immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion:

Do NOT induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation:

Get medical aid immediately. Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If

breathing is difficult, give oxygen.

Notes to Physician:

Treat symptomatically and

**** SECTION 5 - FIRE FIGHTING MEASURES ****

General Information:

As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media:

In case of fire use water spray, dry chemical, carbon dioxide, or chemical foam.

**** SECTION 6 - ACCIDENTAL RELEASE MEASURES ****

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks:

Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Wear a self contained breathing apparatus and appropriate Personal protection. (See Exposure Controls, Personal Protection section). Provide ventilation.

**** SECTION 7 - HANDLING and STORAGE ****

Handling:

Wash thoroughly after handling. Wash hands before eating. Use only in a well ventilated area. Do not breathe dust, vapor, mist, or gas. Do not get on skin or in eyes. Do not ingest or inhale.

Storage:

Store in a cool, dry place. Store in a tightly closed container. Store in a cool, dry area away from incompatible substances.

**** SECTION 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION ****

Engineering Controls:

Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

| Chemical Name | ACGIH | NIOSH | OSHA - Final PELs |
|---------------|--|-------------|--|
| Chrysene | as benzene solubles: 0.2 mg/m3 (listed under ** no name **). | none listed | benzene soluble fraction: 0.2 mg/m3 TWA (includes anthracene, BaP, phenanthrene, acridine, chrysene, and pyrene) (listed under ** no name **). |

OSHA Vacated PELs:

Chrysene:

benzene soluble fraction: 0.2 mg/m3 TWA (anthracene, BaP, phenanthrene, acridine, (listed under ** no name **))

Personal Protective Equipment

Eyes:

Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

- Skin: Wear appropriate protective gloves to prevent skin exposure.
- Clothing: Wear appropriate protective clothing to prevent skin exposure.
- Respirators: Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

**** SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES ****

Physical State: Solid
Appearance: very light beige
Odor: Not available.
pH: Not available.
Vapor Pressure: Not available.
Vapor Density: Not available.
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: 448 deg C @ 760.00mm Hg
Freezing/Melting Point: 254 - 255 deg C
Autoignition Temperature: Not available.
Flash Point: Not available.
NFPA Rating:
Explosion Limits, Lower: Not available.
Upper: Not available.
Decomposition Temperature:
Solubility: insoluble
Specific Gravity/Density:
Molecular Formula: C18H12
Molecular Weight: 228.29

**** SECTION 10 - STABILITY AND REACTIVITY ****

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, dust generation.
Incompatibilities with Other Materials: Strong oxidizing agents.
Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.
Hazardous Polymerization: Has not been reported.

**** SECTION 11 - TOXICOLOGICAL INFORMATION ****

RTECS#:
CAS# 218-01-9: GC0700000
LD50/LC50: Not available.
Carcinogenicity:
Chrysene -
ACGIH: A3 - Animal Carcinogen
California: carcinogen; initial date 1/1/90
NIOSH: occupational carcinogen (listed as ** undefined **)
OSHA: Select carcinogen (listed as ** undefined **).
IARC: Group 3 carcinogen
Epidemiology: No information available.
Teratogenicity: No information available.
Reproductive Effects: No information available.
Neurotoxicity: No information available.
Mutagenicity: Chrysene was mutagenic to S. Typhimurium in the presence of an exogenous metabolic system.

Other Studies:

Genotoxicity : Salmonella typhimurium TA97,TA98,TA100 with metabolic activation positive (Sakai.M.et al Mutat.Res1985); Saccharomyces cerevisiae (Miotic recombination) D3 strain 330mg/kg negative.

**** SECTION 12 - ECOLOGICAL INFORMATION ****

Ecotoxicity:

Water flea LC50 = 1.9 mg/L; 2 Hr.; UnspecifiedFish toxicity : LC50 (96hr) Neaethes arenacedentata >1ppm.(Rossi,S.S. et al Marine Pollut. Bull. 1978) Invertebrate toxicity : lethal treshold concentration (24hr) Daphnia Magna 0,7æg/l.(* Newsted,J.L. et al Environ. Toxicol. Chem. 1987) Bioaccumulation : 24hr Daphnia Magna log bioconcentration factor 3.7845 (*)

**** SECTION 13 - DISPOSAL CONSIDERATIONS ****

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste.

US EPA guidelines for the classification determination are listed in 40 CFR Part Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: CAS# 218-01-9: waste number U050.

**** SECTION 14 - TRANSPORT INFORMATION ****

US DOT

No information available

Canadian TDG

No information available.

**** SECTION 15 - REGULATORY INFORMATION ****

US FEDERAL

TSCA

CAS# 218-01-9 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

SARA

Section 302 (RQ)

CAS# 218-01-9: final RQ = 100 pounds (45.4 kg)

Section 302 (TPQ)

None of the chemicals in this product have a TPQ.

Section 313

This material contains Chrysene (CAS# 218-01-9, 98 0%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 372.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

CAS# 218-01-9 is listed as a Priority Pollutant under the Clean Water Act.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

Chrysene can be found on the following state right to know lists: California, New Jersey, Florida, Pennsylvania, Minnesota,

Massachusetts.

The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:

WARNING: This product contains Chrysene, a chemical known to the state of California to cause cancer.

California No Significant Risk Level:

None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols: T

Risk Phrases:

R 45 May cause cancer.

Safety Phrases:

S 53 Avoid exposure - obtain special instructions before use.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

WGK (Water Danger/Protection)

CAS# 218-01-9: No information available.

United Kingdom Occupational Exposure Limits

Canada

CAS# 218-01-9 is listed on Canada's DSL/NDSL List.

This product has a WHMIS classification of D2A.

CAS# 218-01-9 is not listed on Canada's Ingredient Disclosure List.

Exposure Limits

CAS# 218-01-9: OEL-AUSTRALIA;Carcinogen

OEL-BELGIUM;Carcinogen

OEL-GERMANY;Carcinogen

OEL-SWITZERLAND;Carcinogen

OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA check ACGIH TLV

OEL IN NEW ZEALAND, SINGAPORE, VIETNAM check ACGI TLV

**** SECTION 16 - ADDITIONAL INFORMATION ****

MSDS Creation Date: 6/30/1999 Revision #2 Date: 8/02/2000

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no way shall the company be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if the company has been advised of the possibility of such damages.

Dibenz (a,h)Anthracene, 99% (UV-Vis)
ACROS66416

**** SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION ****

MSDS Name: Dibenz (a,h)Anthracene, 99% (UV-Vis)

Catalog Numbers:

AC406430000, AC406430010, AC406432500

Synonyms:

1,2:5,6-Dibenz(a)Anthracene.

Company Identification (Europe): Acros Organics N.V.

Janssen Pharmaceuticaaan 3a

2440 Geel, Belgium

Company Identification (USA):

Acros Organics

One Reagent Lane

Fairlawn, NJ 07410

For information in North America, call: 800-ACROS-01

For information in Europe, call: 0032(0) 14575211

For emergencies in the US, call CHEMTREC: 800-424-9300

For emergencies in Europe, call: 0032(0) 14575299

**** SECTION 2 - COMPOSITION, INFORMATION ON INGREDIENTS ****

| CAS# | Chemical Name | % | EINECS# |
|---------|-----------------------|----|-----------|
| 53-70-3 | Dibenz(a,h)anthracene | 99 | 200-181-8 |

Hazard Symbols: T

Risk Phrases: 23/24/25 45

**** SECTION 3 - HAZARDS IDENTIFICATION ****

EMERGENCY OVERVIEW

Appearance: off white.

Caution! Cancer suspect agent. May cause eye and skin irritation.

May cause respiratory and digestive tract irritation. May cause

cancer in humans.

Target Organs: None known.

Potential Health Effects

Eye:

May cause eye irritation.

Skin:

May cause skin irritation.

Ingestion:

May cause irritation of the digestive tract.

Inhalation:

May cause respiratory tract irritation.

Chronic:

May cause cancer in humans.

**** SECTION 4 - FIRST AID MEASURES ****

Eyes:

Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin:

Get medical aid. Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Remove contaminated clothing and shoes.

Ingestion:

Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation:

Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician:

Treat symptomatically and supportively.

**** SECTION 5 - FIRE FIGHTING MEASURES ****

General Information:

As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media:

Use agent most appropriate to extinguish fire. In case of fire use water spray, dry chemical, carbon dioxide, or appropriate foam.

**** SECTION 6 - ACCIDENTAL RELEASE MEASURES ****

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks:

Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

**** SECTION 7 - HANDLING and STORAGE ****

Handling:

Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage:

Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

**** SECTION 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION ****

Engineering Controls:

Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

| Chemical Name | ACGIH | NIOSH | OSHA - Final PELs |
|-----------------------|-------------|-------------|-------------------|
| Dibenz(a,h)anthracene | none listed | none listed | none listed |

OSHA Vacated PELs:

Dibenz(a,h)anthracene:

No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes:

Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin:

Wear appropriate protective gloves to prevent skin exposure.

Clothing:

Wear appropriate protective clothing to prevent skin exposure.

Respirators:

A respiratory protection program that meets OSHA's 29 CFR §1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.

**** SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES ****

Physical State: Solid
Appearance: off white
Odor: Not available.
pH: Not available.
Vapor Pressure: Not available.
Vapor Density: Not available.
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point: 265 deg C
Autoignition Temperature: Not applicable.
Flash Point: Not applicable.
NFPA Rating: (est.) Health: 1; Flammability: 0; Reactivity: 0
Explosion Limits, Lower: Not available.
Upper: Not available.
Decomposition Temperature:
Solubility:
Specific Gravity/Density:
Molecular Formula: C22H14
Molecular Weight: 278.34

**** SECTION 10 - STABILITY AND REACTIVITY ****

Chemical Stability:
Stable under normal temperatures and pressures.
Conditions to Avoid:
Incompatible materials, dust generation, excess heat, strong oxidants.
Incompatibilities with Other Materials:
Oxidizing agents.
Hazardous Decomposition Products:
Carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.
Hazardous Polymerization: Has not been reported

**** SECTION 11 - TOXICOLOGICAL INFORMATION ****

RTECS#:
CAS# 53-70-3: HN2625000
LD50/LC50:
Not available.
Carcinogenicity:
Dibenz(a,h)anthracene -
California: carcinogen; initial date 1/1/88
NTP: Suspect carcinogen
OSHA: Possible Select carcinogen
IARC: Group 2A carcinogen
Epidemiology:
No information available.
Teratogenicity:
No information available.
Reproductive Effects:
No information available.
Neurotoxicity:
No information available.
Mutagenicity:
No information available.
Other Studies:
See actual entry in RTECS for complete information.

**** SECTION 12 - ECOLOGICAL INFORMATION ****

Ecotoxicity:
LC50 Neanthes arenaceodentata = >1 ppm/96 hour in a static bioassay
/Other conditions of bioassay not specified.
Other
For more information, see "HANDBOOK OF ENVIRONMENTAL FATE AND EXPOSURE DATA."

**** SECTION 13 - DISPOSAL CONSIDERATIONS ****

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste.

US EPA guidelines for the classification determination are listed in 40 CFR Part 261. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: CAS# 53-70-3: waste number U063.

**** SECTION 14 - TRANSPORT INFORMATION ****

US DOT

Shipping Name: DYE INTERMEDIATE, SOLID, TOXIC, N.O.S.*

Hazard Class: 6.1

UN Number: 3143

Packing Group: II

Canadian TDG

No information available.

**** SECTION 15 - REGULATORY INFORMATION ****

US FEDERAL

TSCA

CAS# 53-70-3 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

SARA

Section 302 (RQ)

CAS# 53-70-3: final RQ = 1 pound (0.454 kg)

Section 302 (TPQ)

None of the chemicals in this product have a TPQ.

Section 313

This material contains Dibenz(a,h)anthracene (CAS# 53-70-3, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 372.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

CAS# 53-70-3 is listed as a Priority Pollutant under the Clean Water Act.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

Dibenz(a,h)anthracene can be found on the following state right to know lists: California, New Jersey, Florida, Pennsylvania, Minnesota, Massachusetts.

The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:

WARNING: This product contains Dibenz(a,h)anthracene, a chemical known to the state of California to cause cancer.

California No Significant Risk Level:

CAS# 53-70-3: no significant risk level = 0.2 ug/day

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols: T

Risk Phrases:

R 23/24/25 Toxic by inhalation, in contact with skin and if swallowed.

R 45 May cause cancer.

Safety Phrases:

S 53 Avoid exposure - obtain special instructions before use.

S 28A After contact with skin, wash immediately with plenty of water.

S 36/39 Wear suitable protective clothing and eye/face protection.

S 37 Wear suitable gloves.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

WGK (Water Danger/Protection)

CAS# 53-70-3: No information available.

United Kingdom Occupational Exposure Limits

Canada

None of the chemicals in this product are listed on the DSL/NDSL list.

This product has a WHMIS classification of D2A.

CAS# 53-70-3 is not listed on Canada's Ingredient Disclosure List.

Exposure Limits

CAS# 53-70-3: OEL-FRANCE;Carcinogen

OEL-GERMANY;Carcinogen

**** SECTION 16 - ADDITIONAL INFORMATION ****

MSDS Creation Date: 6/24/1999 Revision #2 Date: 8/02/2000

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no way shall the company be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if the company has been advised of the possibility of such damages.

ALDRICH CHEMICAL -- DIBENZOFURAN, 99+%, 23637-3
MATERIAL SAFETY DATA SHEET
NSN: 681000N065301
Manufacturer's CAGE: 60928
Part No. Indicator: A
Part Number/Trade Name: DIBENZOFURAN, 99+%, 23637-3

=====
General Information
=====

Company's Name: ALDRICH CHEMICAL CO INC
Company's P. O. Box: 355
Company's City: MILWAUKEE
Company's State: WI
Company's Country: US
Company's Zip Code: 53201
Company's Emerg Ph #: 414-273-3850
Company's Info Ph #: 414-273-3850
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SMJ
Date MSDS Prepared: 05JAN95
Safety Data Review Date: 20OCT95
MSDS Serial Number: BZRGF

=====
Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: DIBENZOFURAN (SARA 313) (CERCLA)
Ingredient Sequence Number: 01
Percent: >99
NIOSH (RTECS) Number: HP4430000
CAS Number: 132-64-9
OSHA PEL: N/K (FP N)
ACGIH TLV: N/K (FP N)

=====
Physical/Chemical Characteristics
=====

Appearance And Odor: WHITE CRYSTALLINE POWDER.
Boiling Point: >309F,>154C
Melting Point: >181F,>83C

=====
Fire and Explosion Hazard Data
=====

Extinguishing Media: WATER SPRAY, CARBON DIOXIDE, DRY CHEMICAL POWDER OR APPROPRIATE FOAM.
Special Fire Fighting Proc: WEAR NIOSH/MSHA APPROVED SCBA & FULL PROTECTIVE EQUIPMENT (FP N).
Unusual Fire And Expl Hazrds: NONE SPECIFIED BY MANUFACTURER.

=====
Reactivity Data
=====

Stability: YES
Cond To Avoid (Stability): NONE SPECIFIED BY MANUFACTURER.
Materials To Avoid: STRONG OXIDIZING AGENTS.
Hazardous Decomp Products: TOXIC FUMES OF: CARBON MONOXIDE, CARBON DIOXIDE.
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NOT RELEVANT

=====
Health Hazard Data
=====

LD50-LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES

Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: ACUTE:MAY BE HARMFUL BY INHALATION,
INGESTION OR SKIN ABSORPTION. MAY CAUSE IRRITATION. TO THE BEST OF MFR'S
KNOWLEDGE, THE CHEMICAL, PHYSICAL AND TOXICOLOGICAL PROPERTIES HAVE NOT
BEEN THOROUGHLY INVESTIGATED.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NOT RELEVANT
Signs/Symptoms Of Overexp: SEE HEALTH HAZARDS.
Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER.
Emergency/First Aid Proc: EYES:IMMEDIATELY FLUSH WITH COPIOUS AMOUNTS OF
WATER FOR AT LEAST 15 MINUTES. SKIN:IMMEDIATELY WASH WITH SOAP AND COPIOUS
AMOUNTS OF WATER. WASH CONTAMINATED CLOTHING BEFORE REUSE.
INHALATION:REMOVE TO FRESH AIR. IF NOT BREATHING GIVE ARTIFICIAL
RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN. INGESTION:WASH OUT
MOUTH WITH WATER PROVIDED PERSON IS CONSCIOUS. CALL A PHYSICIAN.

=====
Precautions for Safe Handling and Use
=====

Steps If Matl Released/Spill: WEAR NIOSH/MSHA APPROVED RESPIRATOR, RUBBER
BOOTS AND HEAVY RUBBER GLOVES. SWEEP UP, PLACE IN A BAG AND HOLD FOR WASTE
DISPOSAL. AVOID RAISING DUST. VENTILATE AREA AND WASH SITE AFTER MATERIAL
PICKUP IS COMPLETE.
Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.
Waste Disposal Method: DISSOLVE OR MIX THE MATERIAL WITH A COMBUSTIBLE
SOLVENT AND BURN IN A CHEMICAL INCINERTOR EQUIPPED WITH AN AFTERBURNER AND
SCRUBBER. OBSERVE ALL FEDERAL, STATE AND LOCAL ENVIRONMENTAL REGULATIONS.
Precautions-Handling/Storing: AVOID CONTACT AND INHALATION. DO NOT GET IN
EYES, ON SKIN ON CLOTHING. KEEP TIGHTLY CLOSED. USE WITH ADEQUATE
VENTILATION. STORE IN A COOL, DRY PLACE.
Other Precautions: NONE SPECIFIED BY MANUFACTURER.

=====
Control Measures
=====

Respiratory Protection: NIOSH/MSHA APPROVED RESPIRATOR.
Ventilation: MECHANICAL EXHAUST REQUIRED.
Protective Gloves: RUBBER GLOVES.
Eye Protection: ANSI APPROVED CHEM WORKERS GOGGS (FP N).
Other Protective Equipment: ANSI APPROVED EMERGENCY EYE WASH AND DELUGE
SHOWER (FP N).
Work Hygienic Practices: NONE SPECIFIED BY MANUFACTURER.
Suppl. Safety & Health Data: NONE SPECIFIED BY MANUFACTURER.

=====
Transportation Data
=====

=====
Disposal Data
=====

=====
Label Data
=====

Label Required: YES
Technical Review Date: 20OCT95
Label Status: G
Common Name: DIBENZOFURAN, 99+%, 23637-3
Chronic Hazard: NO
Signal Word: WARNING!
Acute Health Hazard-Moderate: X
Contact Hazard-Moderate: X
Fire Hazard-Slight: X
Reactivity Hazard-None: X
Special Hazard Precautions: ACUTE:MAY BE HARMFUL BY INHALATION, INGESTION
OR SKIN ABSORPTION. MAY CAUSE IRRITATION. TO THE BEST OF MFR'S KNOWLEDGE,

THE CHEMICAL, PHYSICAL AND TOXICOLOGICAL PROPERTIES HAVE NOT BEEN THOROUGHLY INVESTIGATED. CHRONIC:NONE SPECIFIED BY MANUFACTURER.

Protect Eye: Y

Protect Skin: Y

Protect Respiratory: Y

Label Name: ALDRICH CHEMICAL CO INC

Label P.O. Box: 355

Label City: MILWAUKEE

Label State: WI

Label Zip Code: 53201

Label Country: US

Label Emergency Number: 414-273-3850

SPI SUPPLIES -- 2831 DIBUTYL PHTHALATE
MATERIAL SAFETY DATA SHEET
NSN: 681000N062594
Manufacturer's CAGE: 66688
Part No. Indicator: A
Part Number/Trade Name: 2831 DIBUTYL PHTHALATE

=====
General Information
=====

Company's Name: SPI SUPPLIES
Company's Street: 569 E GAY ST
Company's P. O. Box: 656
Company's City: WEST CHESTER
Company's State: PA
Company's Country: US
Company's Zip Code: 19381-0656
Company's Emerg Ph #: 800-424-9300 (CHEMTREC)
Company's Info Ph #: 800-242-4774
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SMJ
Date MSDS Prepared: 21NOV90
Safety Data Review Date: 21AUG95
MSDS Serial Number: BYVBY

=====
Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: PHTHALIC ACID DIBUTYL ESTER; (DIBUTYL PHTHALATE) (SARA 313)
(CERCLA)
Ingredient Sequence Number: 01
Percent: 100
NIOSH (RTECS) Number: TI0875000
CAS Number: 84-74-2
OSHA PEL: 5 MG/M3
ACGIH TLV: 5 MG/M3

=====
Physical/Chemical Characteristics
=====

Appearance And Odor: COLORLESS OILY LIQUID
Boiling Point: 343F,173C
Vapor Pressure (MM Hg/70 F): 2 @ 302F
Vapor Density (Air=1): 9.6
Specific Gravity: 1.049 20/20
Evaporation Rate And Ref: WATER: <1
Solubility In Water: 0.03% @ 77F

=====
Fire and Explosion Hazard Data
=====

Flash Point: 315F,157C
Flash Point Method: TCC
Extinguishing Media: WATER FOG, CARBON DIOXIDE, DRY CHEMICAL, FOAM.
Special Fire Fighting Proc: SAME AS OIL FIRE. WEAR NIOSH/MSHA APPROVED
SCBA & FULL PROTECTIVE EQUIPMENT (FP N).
Unusual Fire And Expl Hazrds: NONE SPECIFIED BY MANUFACTURER.

=====
Reactivity Data
=====

Stability: YES
Cond To Avoid (Stability): NONE SPECIFIED BY MANUFACTURER.
Materials To Avoid: OXIDIZING MATERIALS.
Hazardous Decomp Products: TOXIC FUMES OF CARBON MONOXIDE, CARBON DIOXIDE.
Hazardous Poly Occur: NO

Conditions To Avoid (Poly): NOT RELEVANT.

=====
Health Hazard Data
=====

LD50-LC50 Mixture: LD50 (ORAL RAT): 8000 MG/KG.
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: ACUTE: INHAL: HARMFUL AS SPRAY/AT ELEVATED TEMPS, VAPOR/MIST IRRITATING TO MUCOUS MEMBRANES & UPPER RESPIRATORY TRACT. EYES: VAPOR/MIST IRRITATING. INGEST: CAN CAUSE GASTROINTESTINAL DISTURBANCES. CAN CAUSE POSSIBLE TERATOGEN, REPRODUCTIVE DISORDERS, NAUSEA, DIZZINESS & HEADACHES. CHRONIC: NONE SPECIFIED BY MFR.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NOT RELEVANT.
Signs/Symptoms Of Overexp: SEE HEALTH HAZARDS.
Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER.
Emergency/First Aid Proc: EYES: IRRIGATE THOROUGHLY WITH WATER FOR AT LEAST 15 MINUTES. GET MEDICAL ATTENTION. SKIN: WASH AFFECTED AREA WITH SOAP AND WATER. GET MEDICAL ATTENTION IF IRRITATION DEVELOPS. INGESTION: WASH OUT MOUTH WITH WATER. GET IMMEDIATE MEDICAL ATTENTION. INHALATION: REMOVE TO FRESH AIR. ADMINISTER ARTIFICIAL RESPIRATION OR OXYGEN AS NEEDED. GET MEDICAL ATTENTION.

=====
Precautions for Safe Handling and Use
=====

Steps If Matl Released/Spill: EVACUATE AREA. WEAR SCBA, RUBBER BOOTS & HEAVY RUBBER GLOVES. DILUTE WITH PLENTY OF WATER & ABSORB WITH INERT MATERIAL, E.G. SAND, VERMICULITE, ETC. TRANSFER TO CLOSED CONTAINER FOR DISPOSAL. VENTILATE AREA & WASH SPILL SITE WITH WATER & DETERGENT.
Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.
Waste Disposal Method: DISSOLVE OR MIX THE MATERIAL WITH A COMBUSTIBLE SOLVENT AND BURN IN A CHEMICAL INCINERATOR EQUIPPED WITH AN AFTERBURNER AND SCRUBBER. OBSERVE ALL FEDERAL, STATE, AND LOCAL LAWS.
Precautions-Handling/Storing: DO NOT BREATHE MIST. AVOID PROLONGED OR REPEATED EXPOSURE. KEEP AWAY FROM HEAT, SPARKS, AND OPEN FLAME.
Other Precautions: STORE IN A COOL, DRY PLACE. MAXIMUM STORAGE AT 120F. COLOR AND ACIDITY INCREASES. ELECTRICAL GROUNDING OF ALL EQUIPMENT.

=====
Control Measures
=====

Respiratory Protection: USE NIOSH/MSHA APPROVED RESPIRATOR IN NON-VOLATILE AREAS AND/OR FOR EXPOSURE ABOVE THE ACGIH TLV.
Ventilation: LOCAL EXHAUST.
Protective Gloves: IMPERVIOUS GLOVES.
Eye Protection: ANSI APPRVD CHEM WORKERS GOGGS (FP N).
Other Protective Equipment: EYEWASH FACILITY & SAFETY SHOWER WHICH MEET ANSI DESIGN CRITERIA (FP N). PROTECTIVE CLOTHING.
Work Hygienic Practices: WASH THOROUGHLY AFTER HANDLING.
Suppl. Safety & Health Data: NONE SPECIFIED BY MANUFACTURER.

=====
Transportation Data
=====

=====
Disposal Data
=====

=====
Label Data
=====

Label Required: YES
Technical Review Date: 21AUG95
Label Date: 21AUG95

Label Status: G
Common Name: 2831 DIBUTYL PHTHALATE
Chronic Hazard: NO
Signal Word: WARNING!
Acute Health Hazard-Moderate: X
Contact Hazard-Slight: X
Fire Hazard-Slight: X
Reactivity Hazard-None: X
Special Hazard Precautions: ACUTE: INHALATION: HARMFUL AS SPRAY OR AT
ELEVATED TEMPERATURES, VAPOR OR MIST IS IRRITATING TO MUCOUS MEMBRANES AND
UPPER RESPIRATORY TRACT. EYES: VAPOR OR MIST IS IRRITATING. INGESTION: CAN
CAUSE GASTROINTESTINAL DISTURBANCES. CAN CAUSE POSSIBLE TERATOGEN,
REPRODUCTIVE DISORDERS, NAUSEA, DIZZINESS AND HEADACHES. CHRONIC: NONE
SPECIFIED BY MANUFACTURER.
Protect Eye: Y
Protect Skin: Y
Protect Respiratory: Y
Label Name: SPI SUPPLIES
Label Street: 569 E GAY ST
Label P.O. Box: 656
Label City: WEST CHESTER
Label State: PA
Label Zip Code: 19381-0656
Label Country: US
Label Emergency Number: 800-424-9300 (CHEMTREC)

Diethyl Phthalate, 99%
ACROS00534

**** SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION ****

MSDS Name: Diethyl Phthalate, 99%

Catalog Numbers:

AC114520000, AC114520010, AC114520025, AC114520200, AC114520250

Synonyms:

Company Identification (Europe): Acros Organics N.V.
Janssen Pharmaceuticaaan 3a
2440 Geel, Belgium

Company Identification (USA): Acros Organics
One Reagent Lane
Fairlawn, NJ 07410

For information in North America, call: 800-ACROS-01

For information in Europe, call: 0032(0) 14575211

For emergencies in the US, call CHEMTREC: 800-424-9300

For emergencies in Europe, call: 0032(0) 14575299

**** SECTION 2 - COMPOSITION, INFORMATION ON INGREDIENTS ****

| CAS# | Chemical Name | % | EINECS# |
|---------|-------------------|----|-----------|
| 84-66-2 | Diethyl Phthalate | 99 | 201-550-6 |

Hazard Symbols: XI

Risk Phrases: 36/37/38

**** SECTION 3 - HAZARDS IDENTIFICATION ****

EMERGENCY OVERVIEW

Appearance: colourless.

Caution! Causes respiratory tract irritation. May cause digestive tract irritation. May cause central nervous system depression. May cause fetal effects based upon animal studies. Causes eye and skin irritation.

Target Organs: Central nervous system.

Potential Health Effects

Eye:

Contact produces irritation, tearing, and burning pain.

Skin:

Causes skin irritation.

Ingestion:

Ingestion of large amounts may cause gastrointestinal irritation.

Inhalation:

Causes respiratory tract irritation. May cause narcotic effects in high concentration.

Chronic:

May cause fetal effects.

**** SECTION 4 - FIRST AID MEASURES ****

Eyes:

Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin:

Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion:

If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation:

Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician:
Treat symptomatically and

**** SECTION 5 - FIRE FIGHTING MEASURES ****

General Information:

As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media:

In case of fire, use water, dry chemical, chemical foam, or alcohol-resistant foam. Use water spray to cool fire-exposed containers.

**** SECTION 6 - ACCIDENTAL RELEASE MEASURES ****

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks:

Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal.

**** SECTION 7 - HANDLING and STORAGE ****

Handling:

Wash thoroughly after handling. Use only in a well ventilated area. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage:

Store in a cool, dry place. Store in a tightly closed container.

**** SECTION 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION ****

Engineering Controls:

Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

| Chemical Name | ACGIH | NIOSH | OSHA - Final PELs |
|-------------------|---------|-------------|-------------------|
| Diethyl Phthalate | 5 mg/m3 | 5 mg/m3 TWA | none listed |

OSHA Vacated PELs:

Diethyl Phthalate:
5 mg/m3 TWA

Personal Protective Equipment

Eyes:

Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin:

Wear appropriate gloves to prevent skin exposure.

Clothing:

Wear appropriate protective clothing to prevent skin exposure.

Respirators:

Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

**** SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES ****

Physical State: Liquid
Appearance: colourless
Odor: Odorless.
pH: Not available.

Vapor Pressure: 14 mm Hg @163C
Vapor Density: 7.66
Evaporation Rate: Not available.
Viscosity: 12 cPs 20 deg C
Boiling Point: 298 - 299 deg C @ 760.00mm Hg
Freezing/Melting Point: -3 deg C
Autoignition Temperature: Not available.
Flash Point: 160 deg C (320.00 deg F)
NFPA Rating: health-0; flammability-1; reactivity-0
Explosion Limits, Lower: Not available.
Upper: Not available.
Decomposition Temperature:
Solubility: IN WATER: 0.15% (25°C)
Specific Gravity/Density: 1.1180g/cm3
Molecular Formula: C12H14O4
Molecular Weight: 222.24

**** SECTION 10 - STABILITY AND REACTIVITY ****

Chemical Stability:
Stable.
Conditions to Avoid:
Not available.
Incompatibilities with Other Materials:
Strong acids such as nitric acid, strong oxidizing agents, and permanganates.
Hazardous Decomposition Products:
Carbon monoxide, carbon dioxide.
Hazardous Polymerization: Has not been reported.

**** SECTION 11 - TOXICOLOGICAL INFORMATION ****

RTECS#:
CAS# 84-66-2: TI1050000
LD50/LC50:
CAS# 84-66-2: Oral, mouse: LD50 = 6172 mg/kg; Oral, rabbit: LD50 = 1 gm/kg; Oral, rat: LD50 = 8600 mg/kg.
Carcinogenicity:
Diethyl Phthalate -
ACGIH: A4 - Not Classifiable as a Human Carcinogen
Epidemiology:
No data available.
Teratogenicity:
No data available.
Reproductive Effects:
No data available.
Neurotoxicity:
No data available.
Mutagenicity:
No data available.
Other Studies:
No data available.

**** SECTION 12 - ECOLOGICAL INFORMATION ****

**** SECTION 13 - DISPOSAL CONSIDERATIONS ****

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste.
US EPA guidelines for the classification determination are listed in 40 CFR Part 171. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.
RCRA P-Series: None listed.
RCRA U-Series: CAS# 84-66-2: waste number U088.

**** SECTION 14 - TRANSPORT INFORMATION ****

US DOT
No information available

Canadian TDG
No information available.

**** SECTION 15 - REGULATORY INFORMATION ****

US FEDERAL

TSCA

CAS# 84-66-2 is listed on the TSCA inventory.
Health & Safety Reporting List
None of the chemicals are on the Health & Safety Reporting List.
Chemical Test Rules
None of the chemicals in this product are under a Chemical Test Rule.
Section 12b
None of the chemicals are listed under TSCA Section 12b.
TSCA Significant New Use Rule
None of the chemicals in this material have a SNUR under TSCA.

SARA

Section 302 (RQ)
CAS# 84-66-2: final RQ = 1000 pounds (454 kg)
Section 302 (TPQ)
None of the chemicals in this product have a TPQ.
Section 313
No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.
This material does not contain any Class 1 Ozone depletors.
This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.
CAS# 84-66-2 is listed as a Priority Pollutant under the Clean Water Act.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

Diethyl Phthalate can be found on the following state right to know lists: California, New Jersey, Florida, Pennsylvania, Minnesota, Massachusetts.

California No Significant Risk Level:

None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols: XI

Risk Phrases:

R 36/37/38 Irritating to eyes, respiratory system and skin.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S 37/39 Wear suitable gloves and eye/face protection.

WGK (Water Danger/Protection)

CAS# 84-66-2: 2

United Kingdom Occupational Exposure Limits

CAS# 84-66-2: OES-United Kingdom, TWA 5 mg/m3 TWA

CAS# 84-66-2: OES-United Kingdom, STEL 10 mg/m3 STEL

Canada

CAS# 84-66-2 is listed on Canada's DSL/NDSL List.

WHMIS: Not available.

CAS# 84-66-2 is not listed on Canada's Ingredient Disclosure List.

Exposure Limits

CAS# 84-66-2: OEL-AUSTRALIA:TWA 5 mg/m3

OEL-BELGIUM:TWA 5 mg/m3

OEL-DENMARK:TWA 5 mg/m3

OEL-FINLAND:TWA 5 mg/m3;STEL 10 mg/m3;Skin

OEL-FRANCE:TWA 5 mg/m3

OEL-THE NETHERLANDS:TWA 5 mg/m3

OEL-RUSSIA:STEL 0.5 mg/m3

OEL-SWEDEN:TWA 3 mg/m3;STEL 5 mg/m3
OEL-SWITZERLAND:TWA 5 mg/m3
OEL-UNITED KINGDOM:TWA 5 mg/m3;STEL 10 mg/m3 JAN9
OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA check ACGIH TLV
OEL IN NEW ZEALAND, SINGAPORE, VIETNAM check ACGI TLV

**** SECTION 16 - ADDITIONAL INFORMATION ****

MSDS Creation Date: 3/05/1998 Revision #2 Date: 8/02/2000

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no way shall the company be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if the company has been advised of the possibility of such damages.

ICN BIOMEDICALS -- 2,6-DINITROTOLUENE, 205707
MATERIAL SAFETY DATA SHEET
NSN: 681000N020907
Manufacturer's CAGE: 30060
Part No. Indicator: A
Part Number/Trade Name: 2,6-DINITROTOLUENE, 205707

General Information

Company's Name: ICN BIOMEDICALS INC
Company's P. O. Box: 28050
Company's City: CLEVELAND
Company's State: OH
Company's Country: US
Company's Zip Code: 44128-0250
Company's Emerg Ph #: 216-831-3000; 800-321-6842
Company's Info Ph #: 216-831-3000; 800-321-6842
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SMJ
Date MSDS Prepared: 01OCT90
Safety Data Review Date: 21OCT91
MSDS Serial Number: BLRPX
Hazard Characteristic Code: T3

Ingredients/Identity Information

Proprietary: NO
Ingredient: 2,6-DINITROTOLUENE (SEE LIMITS FOR OTHER ISOMERS CAS 121-14-2 & 25321-14-6) (SARA III)
Ingredient Sequence Number: 01
NIOSH (RTECS) Number: XT1925000
CAS Number: 606-20-2
OSHA PEL: NOT ESTABLISHED
ACGIH TLV: NOT ESTABLISHED

Physical/Chemical Characteristics

Appearance And Odor: NONE SPECIFIED BY MANUFACTURER.
Solubility In Water: SOLUBLE

Fire and Explosion Hazard Data

Flash Point: NOT AVAILABLE
Extinguishing Media: CO2, DRY CHEMICAL, FOAM.
Special Fire Fighting Proc: WEAR NIOSH/MSHA APPROVED SCBA & FULL PROTECTIVE EQUIPMENT (FP N).
Unusual Fire And Expl Hazrds: HEAT, OPEN FLAME.

Reactivity Data

Cond To Avoid (Stability): NONE SPECIFIED BY MANUFACTURER.
Materials To Avoid: NONE SPECIFIED BY MANUFACTURER.
Hazardous Decomp Products: TOXIC FUMES OF NOX.
Conditions To Avoid (Poly): NONE SPECIFIED BY MANUFACTURER.

Health Hazard Data

LD50-LC50 Mixture: LD50: ORL(RAT) 177 MG/KG.
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: ACUTE: IRRITATION OF MUCOUS MEMBRANES.

CHRONIC: BONE MARROW DEPRESSION. POSSIBLE MUTAGENICITY DATA.

Carcinogenicity - NTP: NO

Carcinogenicity - IARC: NO

Carcinogenicity - OSHA: NO

Explanation Carcinogenicity: NOT RELEVANT

Signs/Symptoms Of Overexp: RESTLESSNESS, CONVULSIONS, DEPRESSION.

Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER.

Emergency/First Aid Proc: SKIN: REMOVE CONTAM CLTHG. RINSE LIBERALLY W/SOAP & WATER FOR A CONSIDERABLE PERIOD. INGEST: RINSE THE MOUTH SEVERAL RINSE LIBERALLY W/WATER FOR A MINIMUM OF 15 MINUTES. SEND OR BRING THE PATIENT TO MD OR HOSPITAL. INHAL: TAKE THE PATIENT INTO THE FRESH AIR & ALLOW TO REST. ALWAYS CALL AN MD.

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: ABSORB THE LIQUID IN DRY SAND, DIATONITE, VERMICULITE, ETC., SHOVEL THE MIXTURE INTO PLASTIC BAGS & REMOVE TO THE CENTRAL DEPOT FOR CHEMICAL WASTE. SWEEP INTO SUITABLE CONTAINER FOR DISPOSAL.

Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.

Waste Disposal Method: INCINERATE OR LANDFILL AS COMPLIES WITH FEDERAL, STATE, AND LOCAL LAWS.

Precautions-Handling/Storing: ALWAYS WEAR GLOVES, MASK, GOGGLES AND USE A HOOD. STORE AT ROOM TEMPERATURE.

Other Precautions: NONE SPECIFIED BY MANUFACTURER.

Control Measures

Respiratory Protection: NIOSH/MSHA APPROVED VAPOR MASK.

Ventilation: LOCAL EXHAUST SYTEM REQUIRED.

Protective Gloves: IMPERVIOUS GLOVES (FP N).

Eye Protection: CHEMICAL WORKERS GOGGLES (FP N).

Other Protective Equipment: NONE SPECIFIED BY MANUFACTURER.

Work Hygienic Practices: NONE SPECIFIED BY MANUFACTURER.

Suppl. Safety & Health Data: NONE SPECIFIED BY MANUFACTURER.

Transportation Data

Trans Data Review Date: 92017

DOT PSN Code: FMZ

DOT Proper Shipping Name: DINITROTOLUENES

DOT Class: 6.1

DOT ID Number: UN2038

DOT Pack Group: II

DOT Label: POISON

IMO PSN Code: DGE

IMO Proper Shipping Name: DINITROTOLUENES, SOLID

IMO Regulations Page Number: 6137

IMO UN Number: 2038

IMO UN Class: 6.1

IMO Subsidiary Risk Label: -

IATA PSN Code: KEK

IATA UN ID Number: 2038

IATA Proper Shipping Name: DINITROTOLUENES, SOLID

IATA UN Class: 6.1

IATA Label: TOXIC

AFI PSN Code: KEK

AFI Prop. Shipping Name: DINITROTOLUENES, SOLID

AFI Class: 6.1

AFI ID Number: UN2038

AFI Pack Group: II

AFI Label: POISON

AFI Basic Pac Ref: 10-12

Disposal Data

Label Data

Label Required: YES
Technical Review Date: 21OCT91
Label Date: 21OCT91
Label Status: G
Common Name: 2,6-DINITROTOLUENE, 205707
Chronic Hazard: YES
Signal Word: WARNING!
Acute Health Hazard-Moderate: X
Contact Hazard-Slight: X
Fire Hazard-None: X
Reactivity Hazard-None: X
Special Hazard Precautions: ACUTE: MUCOUS MEMBRANE IRRITANT. MAY CAUSE RESTLESSNESS, CONVULSIONS, AND DEPRESSION. CHRONIC EFFECTS: BONE MARROW DEPRESSION. POSSIBLE MUTAGEN.
Protect Eye: Y
Protect Skin: Y
Protect Respiratory: Y
Label Name: ICN BIOMEDICALS INC
Label P.O. Box: 28050
Label City: CLEVELAND
Label State: OH
Label Zip Code: 44128-0250
Label Country: US
Label Emergency Number: 216-831-3000; 800-321-6842

Di-n-octyl phthalate, 95% (gc)
59857

**** SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION ****

MSDS Name: Di-n-octyl phthalate, 95% (gc)

Catalog Numbers:

AC408800000, AC408801000, AC408805000

Synonyms:

Company Identification: Acros Organics N.V.
One Reagent Lane
Fairlawn, NJ 07410

For information in North America, call: 800-ACROS-01

For emergencies in the US, call CHEMTREC: 800-424-9300

**** SECTION 2 - COMPOSITION, INFORMATION ON INGREDIENTS ****

| CAS# | Chemical Name | % | EINECS# |
|----------|----------------------|---|-----------|
| 117-84-0 | Di-n-octyl phthalate | | 204-214-7 |

**** SECTION 3 - HAZARDS IDENTIFICATION ****

EMERGENCY OVERVIEW

Not available.

Appearance: Not available.

Not available.

Target Organs: None.

Potential Health Effects

The toxicological properties of this material have not been investigated. Use appropriate procedures to prevent opportunities for direct contact with the skin or eyes and to prevent inhalation.

**** SECTION 4 - FIRST AID MEASURES ****

Eyes:

Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower lids. Get medical aid immediately.

Skin:

Get medical aid. Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Remove contaminated clothing and shoes.

Ingestion:

If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical aid immediately.

Inhalation:

Get medical aid immediately. Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Notes to Physician:

Treat symptomatically and supportively.

**** SECTION 5 - FIRE FIGHTING MEASURES ****

General Information:

As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media:

Use agent most appropriate to extinguish fire.

Autoignition Temperature: Not available.

Flash Point: 199 deg C (390.20 deg F)

NFPA Rating: health-0; flammability-1; reactivity-0

Explosion Limits, Lower: Not available.

Upper: Not available.

Chemical Stability:
Stable under normal temperatures and pressures.
Conditions to Avoid:
Incompatible materials, strong oxidants.
Incompatibilities with Other Materials:
Not available.
Hazardous Decomposition Products:
Irritating and toxic fumes and gases.
Hazardous Polymerization: Not available.

**** SECTION 11 - TOXICOLOGICAL INFORMATION ****

RTECS#:
CAS# 117-84-0: TI1925000
LD50/LC50:
CAS# 117-84-0: Oral, mouse: LD50 = 6513 mg/kg; Oral, rat: LD50 = 47 gm/kg.
Carcinogenicity:
Di-n-octyl phthalate -
Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.

**** SECTION 12 - ECOLOGICAL INFORMATION ****

**** SECTION 13 - DISPOSAL CONSIDERATIONS ****

Dispose of in a manner consistent with federal, state, and local regulations.
RCRA D-Series Maximum Concentration of Contaminants:
None listed.
RCRA D-Series Chronic Toxicity Reference Levels: None listed.
RCRA F-Series: None listed.
RCRA P-Series: None listed.
RCRA U-Series: CAS# 117-84-0: waste number U107.
CAS# 117-84-0 is banned from land disposal according to RCRA.

**** SECTION 14 - TRANSPORT INFORMATION ****

US DOT
No information available
IMO
No information available.
IATA
No information available.
RID/ADR
No information available.
Canadian TDG
No information available.

**** SECTION 15 - REGULATORY INFORMATION ****

US FEDERAL

TSCA
CAS# 117-84-0 is listed on the TSCA inventory.
Health & Safety Reporting List
None of the chemicals are on the Health & Safety Reporting List.
Chemical Test Rules
None of the chemicals in this product are under a Chemical Test Rule.
Section 12b
None of the chemicals are listed under TSCA Section 12b.
TSCA Significant New Use Rule
None of the chemicals in this material have a SNUR under TSCA.
SARA
Section 302 (RQ)
CAS# 117-84-0: final RQ = 5000 pounds (2270 kg)
Section 302 (TPQ)
None of the chemicals in this product have a TPQ.
Section 313
No chemicals are reportable under Section 313.
Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

CAS# 117-84-0 is listed as a Priority Pollutant under the Clean Water Act.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

Di-n-octyl phthalate can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Massachusetts.

California No Significant Risk Level:

None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols: Not available.

Risk Phrases:

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 117-84-0: 3

Canada

CAS# 117-84-0 is listed on Canada's DSL/NDSL List.

WHMIS: Not available.

CAS# 117-84-0 is not listed on Canada's Ingredient Disclosure List.

Exposure Limits

**** SECTION 16 - ADDITIONAL INFORMATION ****

MSDS Creation Date: 2/28/1995 Revision #1 Date: 3/04/1996

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no way shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

Ethylene Glycol
09400

**** SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION ****

MSDS Name: Ethylene Glycol

Catalog Numbers:

AC410010040, AC410010200, S80005, S80005-1, S80005-2, BP230 1, BP230 4, BP230-1, BP230-4, BP2301, BP2304, E177 20, E177 4, E177-20, E177-4, E17720, E1774, E178 1, E178 200, E178 4, E178 500, E178-1, E178-200, E178-4, E178-500, E1781, E178200, E178200001, E1784, E1784LOT003, E178500, E178J4, S79007, S800051, S800052, ZZE1785C15

Synonyms:

1,2-Dihydroxyethane, 1,2-Ethandiol, Ethylene alcohol, Ethylene dihydrate.

Company Identification: Fisher Scientific
1 Reagent Lane
Fairlawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

**** SECTION 2 - COMPOSITION, INFORMATION ON INGREDIENTS ****

| CAS# | Chemical Name | % | EINECS# |
|----------|-----------------|-------|-----------|
| 107-21-1 | Ethylene glycol | >99.0 | 203-473-3 |

Hazard Symbols: XN
Risk Phrases: 22

**** SECTION 3 - HAZARDS IDENTIFICATION ****

EMERGENCY OVERVIEW

Appearance: clear, colorless.

Warning! Hygroscopic. This substance has caused adverse reproductive and fetal effects in animals. May cause kidney damage. May cause central nervous system effects. May cause eye and skin irritation. May cause respiratory and digestive tract irritation. May cause cardiac disturbances. Harmful or fatal if swallowed.

Target Organs: Kidneys, heart, central nervous system.

Potential Health Effects

Eye:

May cause moderate eye irritation.

Skin:

May cause skin irritation. Low hazard for usual industrial handling.

Ingestion:

May cause nausea and vomiting.

Toxicity follows 3-stage progression. (1) involves central nervous system effects including paralysis of eye muscles, convulsions, and coma. Metabolic acidosis and cerebral swelling may also occur. (2) involves cardiopulmonary system with symptoms of hypertension, rapid heart beat, and possible cardiac failure. (3) involves severe kidney abnormalities including possible renal

Inhalation:

May cause respiratory tract irritation. Heated or misted substance may cause headache, irregular eye movements, and possible coma.

Chronic:

May cause kidney injury.

**** SECTION 4 - FIRST AID MEASURES ****

Eyes:

Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately. Do NOT allow victim to rub or keep eyes closed.

Skin:

Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

Ingestion:

If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation:

Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician:

Ethanol may inhibit methanol metabolism.

**** SECTION 5 - FIRE FIGHTING MEASURES ****

General Information:

As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas.

Extinguishing Media:

In case of fire, use water, dry chemical, chemical foam, or alcohol-resistant foam. Water or foam may cause frothing. Use agent most appropriate to extinguish fire.

**** SECTION 6 - ACCIDENTAL RELEASE MEASURES ****

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks:

Absorb spill with inert material, (e.g., dry sand or earth), then place into a chemical waste container. Remove all sources of ignition. Provide ventilation.

**** SECTION 7 - HANDLING and STORAGE ****

Handling:

Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Ground and bond containers when transferring material. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage:

Keep away from sources of ignition. Store in a cool, dry, well-ventilated area away from incompatible substances.

**** SECTION 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION ****

Engineering Controls:

Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

| Chemical Name | ACGIH | NIOSH | OSHA - Final PELs |
|-----------------|-------------------------|--|-------------------|
| Ethylene glycol | aerosol: C 100 mg/m3 | no established RELs - see Appendix D | none listed |

OSHA Vacated PELs:

Ethylene glycol:

No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes:

Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European

Skin: Standard EN166.
Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

**** SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES ****

Physical State: Liquid
Appearance: clear, colorless
Odor: odorless
pH: Not available.
Vapor Pressure: .05 mm Hg @ 20C
Vapor Density: 2.1 (air=1)
Evaporation Rate: Not available.
Viscosity: 21cP @ 20 deg C
Boiling Point: 195 deg C @ 760.00mm Hg
Freezing/Melting Point: -13 deg C
Autoignition Temperature: 410 deg C (770.00 deg F)
Flash Point: 111 deg C (231.80 deg F)
NFPA Rating: (est.) Health: 1; Flammability: 1; Reactivity: 0
Explosion Limits, Lower: 3.20 vol %
Upper: 15.30 vol %
Decomposition Temperature:
Solubility: soluble in water
Specific Gravity/Density: 1.1200g/cm3
Molecular Formula: C2H6O2
Molecular Weight: 62.06

**** SECTION 10 - STABILITY AND REACTIVITY ****

Chemical Stability:
Stable at room temperature in closed containers under normal storage and handling conditions.

Conditions to Avoid:
Incompatible materials, ignition sources, moisture, excess heat.

Incompatibilities with Other Materials:
Chlorosulfonic acid, dimethyl terephthalate, oleum, phosphorus pentasulfide, silvered-copper wire, sodium hydroxide, sulfuric acid, titanium butoxide. Causes ignition at room temperature with chromium trioxide, potassium permanganate, and sodium peroxide. Causes ignition at 100C with ammonium dichromate, silver chlorate, sodium chloride, and uranyl nitrate.

Hazardous Decomposition Products:
Carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.

Hazardous Polymerization: Has not been reported.

**** SECTION 11 - TOXICOLOGICAL INFORMATION ****

RTECS#:
CAS# 107-21-1: KW2975000

LD50/LC50:
CAS# 107-21-1: Inhalation, rat: LC50 =10876 mg/kg; Oral, mouse: LD50 = 5500 mg/kg; Oral, rat: LD50 = 4700 mg/kg; Skin, rabbit: LD50 = 9530 mg/kg.

Carcinogenicity:
Ethylene glycol -
ACGIH: aerosol: A4 - not classifiable as a human carcinogen

Epidemiology:
No data available.

Teratogenicity:
No data available.

Reproductive Effects:

No data available.
Neurotoxicity:
No data available.
Mutagenicity:
No data available.
Other Studies:
Please refer to RTECS KW2975000 for additional information.

**** SECTION 12 - ECOLOGICAL INFORMATION ****

Ecotoxicity:

Fish: Rainbow trout: LC50 = 41000 mg/L; 96 Hr.; UnspecifiedFish:
Bluegill/Sunfish: LC50 = 27500-41000 mg/L; 96 Hr.; UnspecifiedFish:
Goldfish: LC50 = 27500-41000 mg/L; 96 Hr.; UnspecifiedWater flea
LC50 = 46300 mg/L; 48 Hr.; UnspecifiedBacteria: Phytobacterium
phosphoreum: EC50 = 620 mg/L; 30 minutes; Microtox testGoldfish LD50=
>5000mg/L/24Hr Guppies LC50= 493,000ppm/7D Shrimp (salt water)
LC50= >100ppm/48Hr

**** SECTION 13 - DISPOSAL CONSIDERATIONS ****

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste.
US EPA guidelines for the classification determination are listed in 40 CFR Part 261. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.
RCRA P-Series: None listed.
RCRA U-Series: None listed.

**** SECTION 14 - TRANSPORT INFORMATION ****

US DOT

No information available
Canadian TDG
No information available.

**** SECTION 15 - REGULATORY INFORMATION ****

US FEDERAL

TSCA

CAS# 107-21-1 is listed on the TSCA inventory.
Health & Safety Reporting List
None of the chemicals are on the Health & Safety Reporting List.
Chemical Test Rules
None of the chemicals in this product are under a Chemical Test Rule.
Section 12b
CAS# 107-21-1: 4a/12b
TSCA Significant New Use Rule
None of the chemicals in this material have a SNUR under TSCA.

SARA

Section 302 (RQ)
None of the chemicals in this material have an RQ.
Section 302 (TPQ)
None of the chemicals in this product have a TPQ.
SARA Codes
CAS # 107-21-1: acute, chronic.
Section 313
This material contains Ethylene glycol (CAS# 107-21-1, 99 0%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 372.

Clean Air Act:

CAS# 107-21-1 is listed as a hazardous air pollutant (HAP).
This material does not contain any Class 1 Ozone depletors.
This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.
None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

Ethylene glycol can be found on the following state right to know lists: California, New Jersey, Florida, Pennsylvania, Minnesota, Massachusetts.

California No Significant Risk Level:

None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols: XN

Risk Phrases:

R 22 Harmful if swallowed.

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 107-21-1: 0

United Kingdom Occupational Exposure Limits

CAS# 107-21-1: OES-United Kingdom, TWA particulate: 10 mg/m3 TWA;

vapour: 60 mg/m3 TWA

CAS# 107-21-1: OES-United Kingdom, STEL vapour: 125 mg/m3 STEL

Canada

CAS# 107-21-1 is listed on Canada's DSL/NDSL List.

This product has a WHMIS classification of D2A.

CAS# 107-21-1 is not listed on Canada's Ingredient Disclosure List.

Exposure Limits

CAS# 107-21-1: OEL-AUSTRALIA:TWA 60 mg/m3;STEL 120 mg/m3

OEL-BELGIUM:STEL 50 ppm (127 mg/m3)

OEL-DENMARK:STEL 50 ppm (130 mg/m3)

OEL-DENMARK:TWA 10 mg/m3

OEL-FINLAND:TWA 10 mg/m3;STEL 20 mg/m3

OEL-FINLAND:TWA 50 ppm (125 mg/m3);STEL 75 ppm (190 mg/m3)

OEL-FRANCE:STEL 50 ppm (125 mg/m3)

OEL-HUNGARY:STEL 50 mg/m3;Skin

OEL-THE NETHERLANDS:TWA 10 mg/m3

OEL-THE NETHERLANDS:TWA 50 ppm (125 mg/m3)

OEL-RUSSIA:STEL 5 mg/m3

OEL-SWEDEN:TWA 50 ppm (130 mg/m3);STEL 75 ppm (19 mg/m3)

OEL-SWITZERLAND:TWA 1 mg/m3

OEL-SWITZERLAND:TWA 50 ppm (125 mg/m3)

OEL-UNITED KINGDOM:TWA 10 mg/m3

OEL-UNITED KINGDOM:TWA 60 mg/m3;STEL 125 mg/m3

OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA check ACGIH TLV

OEL IN NEW ZEALAND, SINGAPORE, VIETNAM check ACGI TLV

**** SECTION 16 - ADDITIONAL INFORMATION ****

MSDS Creation Date: 5/12/1999 Revision #2 Date: 8/02/2000

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no way shall the company be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if the company has been advised of the possibility of such damages.

clothing and shoes. Remove contaminated clothing and shoes.

Ingestion:

Never give anything by mouth to an unconscious person. Get medical aid immediately. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation:

Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician:

Treat symptomatically and supportively.

**** SECTION 5 - FIRE FIGHTING MEASURES ****

General Information:

As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media:

In case of fire, use water, dry chemical, chemical foam, or alcohol-resistant foam.

**** SECTION 6 - ACCIDENTAL RELEASE MEASURES ****

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks:

Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions. Provide ventilation.

**** SECTION 7 - HANDLING and STORAGE ****

Handling:

Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use only in a well ventilated area. Do not get in eyes, on skin, or on clothing. Do not ingest or inhale. Use only in a chemical fume hood. Do not breathe dust.

Storage:

Keep containers tightly closed. Store in a cool, dry area away from incompatible substances.

**** SECTION 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION ****

Engineering Controls:

Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

| Chemical Name | ACGIH | NIOSH | OSHA - Final PELs |
|---------------|-------------|-------------|-------------------|
| Fluoranthene | none listed | none listed | none listed |

OSHA Vacated PELs:

Fluoranthene:

No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes:

Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin:

Wear appropriate protective gloves and clothing to prevent skin exposure.

Clothing:

Ecotoxicity:

Fish: Bluegill/Sunfish: 3980 um/L; 96 H; (not specified)

**** SECTION 13 - DISPOSAL CONSIDERATIONS ****

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste.

US EPA guidelines for the classification determination are listed in 40 CFR Part 261. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: CAS# 206-44-0: waste number U120.

**** SECTION 14 - TRANSPORT INFORMATION ****

US DOT

No information available

Canadian TDG

No information available.

**** SECTION 15 - REGULATORY INFORMATION ****

US FEDERAL

TSCA

CAS# 206-44-0 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

SARA

Section 302 (RQ)

CAS# 206-44-0: final RQ = 100 pounds (45.4 kg)

Section 302 (TPQ)

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 206-44-0: acute.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous

Substances under the CWA.

CAS# 206-44-0 is listed as a Priority Pollutant under the Clean Water Act.

CAS# 206-44-0 is listed as a Toxic Pollutant under the Clean Water Act.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

Fluoranthene can be found on the following state right to know lists:

California, New Jersey, Pennsylvania, Massachusetts.

California No Significant Risk Level:

None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols: XN

Risk Phrases:

R 21/22 Harmful in contact with skin and if swallowed.

Safety Phrases:

S 22 Do not breathe dust.

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAMBRIDGE ISOTOPE LABS -- 1-METHYLNAPHTHALENE,M5680-8
MATERIAL SAFETY DATA SHEET
NSN: 681000N017587
Manufacturer's CAGE: 5Y748
Part No. Indicator: A
Part Number/Trade Name: 1-METHYLNAPHTHALENE,M5680-8

=====
General Information
=====

Company's Name: CAMBRIDGE ISOTOPE LABS
Company's Street: 20 COMMERCE WAY
Company's City: WOBURN
Company's State: MA
Company's Country: US
Company's Zip Code: 01801
Company's Emerg Ph #: 800-322-1174
Company's Info Ph #: 617-938-0067
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SMJ
Date MSDS Prepared: 26JUN91
Safety Data Review Date: 18DEC91
MSDS Serial Number: BLXXM
Hazard Characteristic Code: N/

=====
Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: NAPHTHALINE, 1-METHYL
Ingredient Sequence Number: 01
NIOSH (RTECS) Number: QJ9630000
CAS Number: 90-12-0
OSHA PEL: NOT APPLICABLE
ACGIH TLV: NOT APPLICABLE

=====
Physical/Chemical Characteristics
=====

Boiling Point: 464F,240C
Melting Point: -8F,-22C
Specific Gravity: 1.001

=====
Fire and Explosion Hazard Data
=====

Flash Point: 180F,82C
Extinguishing Media: WATER SPRAY, CARBON DIOXIDE, DRY CHEMICAL POWDER,
ALCOHOL OR POLYMER FOAM.
Special Fire Fighting Proc: WEAR NIOSH/MSHA APPROVED SCBA & FULL
PROTECTIVE EQUIPMENT (FP N) TO PREVENT CONTACT WITH SKIN & EYES.
Unusual Fire And Expl Hazrds: EMITS TOXIC FUMES UNDER FIRE CONDITIONS.

=====
Reactivity Data
=====

Stability: YES
Cond To Avoid (Stability): NONE SPECIFIED BY MANUFACTURER.
Materials To Avoid: STRONG OXIDIZING AGENTS
Hazardous Decomp Products: TOXIC FUMES OF: CO & CO*2.
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NONE SPECIFIED BY MANUFACTURER.

=====
Health Hazard Data
=====

LD50-LC50 Mixture: LD50(ORL/RAT):1840 MG/KG
Route Of Entry - Inhalation: YES

Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: ACUTE: INHAL/INGEST/SKIN ABSORP: MAY BE HARMFUL. VAPOR/MIST IS IRRITATING TO EYES, MUCCOUS MEMBRANED & UPPER RESP TRACT. CAUSES SKIN IRRITATION. TO THE BEST OF MFR KNOWLEDGE THE CHEMICAL, PHYSICAL & TOXICOLOGICAL PROPERTIES HAVE NOT BEEN THOROUGHLY INVESTIGATED.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NOT RELEVANT
Signs/Symptoms Of Overexp: SEE HEALTH HAZARDS
Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER.
Emergency/First Aid Proc: EYES: IMMEDIATELY FLUSH W/COPIOUS AMOUNTS OF WATER FOR AT LEAST 15 MINUTES. SKIN: IMMEDIATELY WASH WITH SOAP & COPIOUS AMOUNTS OF WATER. INHAL: REMOVE TO FRESH AIR. IF NOT BREATHING GIVE ARTIFICIAL RESPIRATION. PREFERABLY MOUTH-TO-MOUTH. IF BREATHING IS DIFFICULT, CALL MD. GIVE OXYGEN. WASH CONTAMINATED CLOTHING BEFORE REUSE.

=====
Precautions for Safe Handling and Use
=====

Steps If Matl Released/Spill: COVER WITH DRY LIME OR SODA ASH, PICK UP, KEEP IN CLOSED CONTAINER & HOLD FOR WASTE DISPOSAL. VENTILATE AREA AND WASH SPILL SITE AFTER MATERIAL PICKUP IS COMPLETE.
Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.
Waste Disposal Method: THIS COMBUSTIBLE MATERIAL MAY BE BURNED IN A CHEMICAL INCINERATOR EQUIPPED WITH AFTERBURNER & SCRUBBER. OBSERVE ALL FEDERAL, STATE & LOCAL LAWS.
Precautions-Handling/Storing: AVOID CONTACT/INHAL. DO NOT GET IN EYES/ON SKIN OR CLOTHING. IRRITANT. KEEP TIGHTLY CLSD. STORE IN COOL/DRY AREA. KEEP AWAY FROM HEAT & OPEN FLAME.
Other Precautions: NONE SPECIFIED BY MANUFACTURER.

=====
Control Measures
=====

Respiratory Protection: NIOSH/MSHA APPROVED RESPIRATOR.
Ventilation: MECHANICAL EXHAUST REQUIRED.
Protective Gloves: RUBBER GLOVES.
Eye Protection: CHEMICAL WORKERS GOGGLES (FP N).
Other Protective Equipment: SAFETY SHOWER & EYE BATH.
Work Hygienic Practices: WASH THOROUGHLY AFTER HANDLING.
Suppl. Safety & Health Data: NONE SPECIFIED BY MANUFACTURER.

=====
Transportation Data
=====

Trans Data Review Date: 92065
DOT PSN Code: ZZZ
DOT Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION
IMO PSN Code: ZZZ
IMO Proper Shipping Name: NOT REGULATED FOR THIS MODE OF TRANSPORTATION
IATA PSN Code: ZZZ
IATA Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION
AFI PSN Code: ZZZ
AFI Prop. Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION
Additional Trans Data: NOT REGULATED FOR TRANSPORTATION

=====
Disposal Data
=====

=====
Label Data
=====

Label Required: YES
Technical Review Date: 18DEC91
Label Status: G
Common Name: 1-METHYLNAPHTHALENE,M5680-8

Chronic Hazard: NO
Signal Word: WARNING!
Acute Health Hazard-Slight: X
Contact Hazard-Moderate: X
Fire Hazard-Moderate: X
Reactivity Hazard-None: X
Special Hazard Precautions: COMBUSTIBLE. ACUTE: HARMFUL IF INHALED,
SWALLOWED, OR ABSORBED THROUGH THE SKIN. CAUSES EYE, SKIN, MUCOUS MEMBRANE,
AND RESPIRATORY TRACT IRRITATION. CHRONIC: NONE LISTED BY MANUFACTURER.
Protect Eye: Y
Protect Skin: Y
Protect Respiratory: Y
Label Name: CAMBRIDGE ISOTOPE LABS
Label Street: 20 COMMERCE WAY
Label City: WOBURN
Label State: MA
Label Zip Code: 01801
Label Country: US
Label Emergency Number: 800-322-1174

2-Methylnaphthalene, 95-97%
ACROS97103

**** SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION ****

MSDS Name: 2-Methylnaphthalene, 95-97%

Catalog Numbers:

AC127170000, AC127170050, AC127175000

Synonyms:

Company Identification (Europe): Acros Organics N.V.
Janssen Pharmaceuticalaan 3a
2440 Geel, Belgium

Company Identification (USA): Acros Organics
One Reagent Lane
Fairlawn, NJ 07410

For information in North America, call: 800-ACROS-01

For information in Europe, call: 0032(0) 14575211

For emergencies in the US, call CHEMTREC: 800-424-9300

For emergencies in Europe, call: 0032(0) 14575299

**** SECTION 2 - COMPOSITION, INFORMATION ON INGREDIENTS ****

| CAS# | Chemical Name | % | EINECS# |
|---------|---------------------|---------|-----------|
| 91-57-6 | 2-Methylnaphthalene | 95-97.0 | 202-078-3 |

Hazard Symbols: XN

Risk Phrases: 22

**** SECTION 3 - HAZARDS IDENTIFICATION ****

EMERGENCY OVERVIEW

Appearance: Not available.

Caution! Causes skin irritation. May cause allergic skin reaction.

May be harmful if swallowed. May cause respiratory and digestive tract irritation. Causes eye irritation.

Target Organs: None.

Potential Health Effects

Eye:

Causes eye irritation.

Skin:

Causes skin irritation. May cause photosensitization in certain individuals.

Ingestion:

May be harmful if swallowed.

Inhalation:

Inhalation of dust may cause respiratory tract irritation.

Chronic:

No information found.

**** SECTION 4 - FIRST AID MEASURES ****

Eyes:

Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin:

Get medical aid. Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion:

If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation:

Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician:

Treat symptomatically and supportively.

**** SECTION 5 - FIRE FIGHTING MEASURES ****

General Information:

As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Dusts at sufficient concentrations can form explosive mixtures with air. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media:

In case of fire use water spray, dry chemical, carbon dioxide, or chemical foam.

**** SECTION 6 - ACCIDENTAL RELEASE MEASURES ****

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks:

Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions. Provide ventilation.

**** SECTION 7 - HANDLING and STORAGE ****

Handling:

Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage:

Keep container closed when not in use. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

**** SECTION 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION ****

Engineering Controls:

Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

| Chemical Name | ACGIH | NIOSH | OSHA - Final PELs |
|---------------------|-------------|-------------|-------------------|
| 2-Methylnaphthalene | none listed | none listed | none listed |

OSHA Vacated PELs:

2-Methylnaphthalene:

No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes:

Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin:

Wear appropriate protective gloves to prevent skin exposure.

Clothing:

Wear appropriate protective clothing to prevent skin exposure.

Respirators:

Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

**** SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES ****

Physical State: Solid
Appearance: Not available.
Odor: None reported
pH: Not available.
Vapor Pressure: < 1 mm Hg @25c
Vapor Density: Not available.
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: 241.1 deg C
Freezing/Melting Point: 37-38c
Autoignition Temperature: Not available.
Flash Point: Not available.
NFPA Rating: (est.) Health: 1; Flammability: 1; Reactivity: 0
Explosion Limits, Lower: Not available.
Upper: Not available.
Decomposition Temperature:
Solubility: Insoluble.
Specific Gravity/Density: 1.0000g/cm3
Molecular Formula: C11H10
Molecular Weight: 142.20

**** SECTION 10 - STABILITY AND REACTIVITY ****

Chemical Stability:
Stable under normal temperatures and pressures.
Conditions to Avoid:
Incompatible materials, dust generation, strong oxidants.
Incompatibilities with Other Materials:
Strong oxidizing agents.
Hazardous Decomposition Products:
Carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.
Hazardous Polymerization: Has not been reported.

**** SECTION 11 - TOXICOLOGICAL INFORMATION ****

RTECS#:
CAS# 91-57-6: QJ9635000
LD50/LC50:
CAS# 91-57-6: Oral, mouse: LD50 = 1279 mg/kg; Oral, rat: LD50 = 1630 mg/kg.
Carcinogenicity:
2-Methylnaphthalene -
Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.

**** SECTION 12 - ECOLOGICAL INFORMATION ****

**** SECTION 13 - DISPOSAL CONSIDERATIONS ****

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste.
US EPA guidelines for the classification determination are listed in 40 CFR Part 261. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.
RCRA P-Series: None listed.
RCRA U-Series: None listed.

**** SECTION 14 - TRANSPORT INFORMATION ****

US DOT
No information available
Canadian TDG
Shipping Name: CAESIUM HYDROXIDE SOLUTION
Hazard Class: 8
UN Number: UN2681

**** SECTION 15 - REGULATORY INFORMATION ****

US FEDERAL

TSCA

CAS# 91-57-6 is listed on the TSCA inventory.
Health & Safety Reporting List
None of the chemicals are on the Health & Safety Reporting List.
Chemical Test Rules
None of the chemicals in this product are under a Chemical Test Rule.
Section 12b
None of the chemicals are listed under TSCA Section 12b.
TSCA Significant New Use Rule
None of the chemicals in this material have a SNUR under TSCA.

SARA

Section 302 (RQ)
None of the chemicals in this material have an RQ.
Section 302 (TPQ)
None of the chemicals in this product have a TPQ.
SARA Codes
CAS # 91-57-6: acute.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.
This material does not contain any Class 1 Ozone depleters.
This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.
None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

2-Methylnaphthalene is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California No Significant Risk Level:

None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols: XN

Risk Phrases:

R 22 Harmful if swallowed.

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 91-57-6: No information available.

United Kingdom Occupational Exposure Limits

Canada

CAS# 91-57-6 is listed on Canada's DSL/NDSL List.

This product has a WHMIS classification of D2A.

CAS# 91-57-6 is not listed on Canada's Ingredient Disclosure List.

Exposure Limits

CAS# 91-57-6: OEL-RUSSIA:STEL 20 mg/m3

**** SECTION 16 - ADDITIONAL INFORMATION ****

MSDS Creation Date: 7/15/1998 Revision #1 Date: 8/02/2000

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no way shall the company be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if the company has been advised of the possibility of such damages.

CHEM SERVICE -- 2-METHYLPHENOL, F711
MATERIAL SAFETY DATA SHEET
NSN: 681000N069942
Manufacturer's CAGE: 8Y898
Part No. Indicator: A
Part Number/Trade Name: 2-METHYLPHENOL, F711

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General Information
=====

Company's Name: CHEM SERVICE INC
Company's P. O. Box: 3108
Company's City: WEST CHESTER
Company's State: PA
Company's Country: US
Company's Zip Code: 19381
Company's Emerg Ph #: 215-692-3026
Company's Info Ph #: 215-692-3026
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SMJ
Date MSDS Prepared: 01SEP92
Safety Data Review Date: 18MAR96
MSDS Serial Number: BZSLK

=====
Ingredients/Identity Information
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Proprietary: NO
Ingredient: O-CRESOL; (2-METHYLPHENOL) (SARA 302/313) (CERCLA) LD50(ORAL, RAT):121 MG/KG
Ingredient Sequence Number: 01
NIOSH (RTECS) Number: G06300000
CAS Number: 95-48-7
OSHA PEL: S, 5 PPM
ACGIH TLV: S, 5. PPM

Proprietary: NO
Ingredient: SUPDAT:EXHIBITING SIGNS OF SHOCK-KEEP WARM & QUIET. CONT POIS CTL CTR IMMED IF NEC. INGEST:DO NOT ADMIN LIQS OR (ING 3)
Ingredient Sequence Number: 02
NIOSH (RTECS) Number: 9999999ZZ
OSHA PEL: NOT APPLICABLE
ACGIH TLV: NOT APPLICABLE

Proprietary: NO
Ingredient: ING 2:INDUCE VOMIT TO AN UNCON/CONVULSING PERS. IF VOMIT-WATCH CLOSELY TO MAKE SURE AIRWAY DOES NOT BECOME (ING 4)
Ingredient Sequence Number: 03
NIOSH (RTECS) Number: 9999999ZZ
OSHA PEL: NOT APPLICABLE
ACGIH TLV: NOT APPLICABLE

Proprietary: NO
Ingredient: ING 3:OBSTRUCTED BY VOMIT. GET MEDICAL ATTENTION IF NECESSARY.
Ingredient Sequence Number: 04
NIOSH (RTECS) Number: 9999999ZZ
OSHA PEL: NOT APPLICABLE
ACGIH TLV: NOT APPLICABLE

Proprietary: NO
Ingredient: EFTS OF OVEREXP:SEV EYE INFLAM & SWELLING OF ADJOINING TISS. CAN CAUSE ALLERGIC RESP RXN. CAN CAUSE DELAYED (ING 6)
Ingredient Sequence Number: 05
NIOSH (RTECS) Number: 9999999ZZ

OSHA PEL: NOT APPLICABLE
ACGIH TLV: NOT APPLICABLE

Proprietary: NO
Ingredient: ING 5:ADVERSE HLTH HEFTS. BASED ON TOX OF CMPDS OF SIMILAR
STUCTURE MATL IS PROBABLY HIGHLY HAZ. INGEST MAY (ING 7)
Ingredient Sequence Number: 06
NIOSH (RTECS) Number: 999999ZZ
OSHA PEL: NOT APPLICABLE
ACGIH TLV: NOT APPLICABLE

Proprietary: NO
Ingredient: ING 6:CAUSE SEV CORR OF MOUTH & GI TRACT. CAN CAUSE CYANOSIS.
CAN CAUSE CARDIOVASCULAR SYS INJURY. CAN CAUSE GEN (ING 8)
Ingredient Sequence Number: 07
NIOSH (RTECS) Number: 999999ZZ
OSHA PEL: NOT APPLICABLE
ACGIH TLV: NOT APPLICABLE

Proprietary: NO
Ingredient: ING 7:FEELING OF DISORIENTATION. CAN CAUSE CONVULSIONS.
Ingredient Sequence Number: 08
NIOSH (RTECS) Number: 999999ZZ
OSHA PEL: NOT APPLICABLE
ACGIH TLV: NOT APPLICABLE

=====

Physical/Chemical Characteristics

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Appearance And Odor: LIQUID OR SOLID DEPENDING ON STORAGE, COLORLESS, WITH
A PHENOLIC LIKE ODOR.
Boiling Point: >376F,>191C
Melting Point: 86.0F,30.0C
Vapor Pressure (MM Hg/70 F): 0.25 @ 20C
Specific Gravity: 1.047
Solubility In Water: SLIGHTLY SOLUBLE

=====

Fire and Explosion Hazard Data

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Flash Point: >178F,>81C
Extinguishing Media: THIS IS A COMBUSTIBLE COMPOUND. CARBON DIOXIDE, DRY
CHEMICAL POWDER OR SPRAY.
Special Fire Fighting Proc: WEAR NIOSH/MSHA APPROVED SCBA & FULL
PROTECTIVE EQUIPMENT (FP N).
Unusual Fire And Expl Hazrds: NONE SPECIFIED BY MANUFACTURER.

=====

Reactivity Data

=====

Stability: YES
Cond To Avoid (Stability): NONE SPECIFIED BY MANUFACTURER.
Materials To Avoid: INCOMPAT W/STRONG OXIDIZING AGENTS. COMBUST. READILY
ABSORBED & RETAINED ON CLTHG &/OR SHOES. SENSITIVE TO HEAT (SUPDAT)
Hazardous Decomp Products: DECOMPOSITION LIBERATES TOXIC FUMES.
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NOT RELEVANT

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Health Hazard Data

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LD50-LC50 Mixture: SEE INGREDIENT 1.
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: CONT LENSES SHOULD NOT BE WORN IN LAB. ALL
CHEMS SHOULD BE CONSIDERED HAZ-AVOID DIRECT PHYSICAL CONT!. MAY BE FATAL IF
ABSORBED THRU SKIN, INHALED & SWALLOWED! MAY BE RAPIDLY ABSORBED THRU SKIN

W/POTNTL ADVERSE HLTH EFTS. MAY CAUSE SKIN BURNS. CAN CAUSE SEV SKIN BURNS.
VAPS &/OR DIRECT EYE CONT CAN (EFTS OF OVEREXP)

Carcinogenicity - NTP: NO

Carcinogenicity - IARC: NO

Carcinogenicity - OSHA: NO

Explanation Carcinogenicity: NOT RELEVANT

Signs/Symptoms Of Overexp: HLTH HAZS:CAUSE SEV BURNS. RPTD EXPOS TO VAPS
&/OR DUST CAN CAUSE EYE INJURY. EXPOS CAN CAUSE KIDNEY DMG. PRLNGD EXPOS
MAY CAUSE NAUS/HDCH/DIZZ &/OR EYE DMG. CAN CAUSE GI DISTURBS. CAN CAUSE
NERV SYS INJURY. EXPOS CAN CAUSE LIVER DMG. CAN CAUSE AN ALLERGIC SKIN RXN.
CAN CAUSE SENSIT BY SKIN CONT. VAPS CAN CAUSE (ING 5)

Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER.

Emergency/First Aid Proc: AN ANTIDOTE IS SUBSTANCE INTENDED TO COUNTERACT
EFT OF POIS. IT SHOULD BE ADMIN ONLY BY MD/TRAINED EMER PERS. MED ADVICE
CAN BE OBTAINED FROM POIS CTL CTR. EYES:FLUSH CONTINUOUSLY W/ WATER FOR @
LST 15 MIN. SKIN:FLUSH W/WATER FOR 15-20 MIN. IF NO BURNS HAVE OCCURRED-USE
SOAP & WATER TO CLEANSE. REMOVE & WASH CONTAM CLTHG. INHAL: REMOVE TO FRESH
AIR. ADMIN OXYG IF PATIENT IS HAVING DFCLTY (SUPP DATA)

=====
Precautions for Safe Handling and Use
=====

Steps If Matl Released/Spill: EVACUATE AREA. WEAR APPROPRIATE OSHA
REGULATED, NIOSH/MSHA APPROVED EQUIPMENT. VENTILATE AREA. ABSORB ON
VERMICULITE OR SIMILAR MATERIAL. SWEEP UP AND PLACE IN AN APPROPRIATE
CONTAINER. HOLD FOR DISPOSAL. WASH CONTAM SURFACES TO REMOVE RESIDUES.

Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.

Waste Disposal Method: DISPOSAL MUST BE I/A/W FEDERAL, STATE & LOCAL
REGULATIONS (FP N). BURN IN A CHEMICAL INCINERATOR EQUIPPED WITH AN
AFTERBURNER AND SCRUBBER.

Precautions-Handling/Storing: USE APPROPRIATE OSHA/MSHA APPROVED SAFETY
EQUIPMENT. AVOID CONTACT WITH SKIN, EYES AND CLOTHING. DO NOT BREATHE
VAPORS. KEEP TIGHTLY CLOSED.

Other Precautions: STORE IN A COOL, DRY PLACE. STORE ONLY WITH COMPATIBLE
CHEMICALS. THIS PRODUCT IS FURNISHED FOR LABORATORY USE ONLY!. OUR PRODUCTS
MAY NOT BE USED AS DRUGS, COSMETICS, AGRICULTURAL OR PESTICIDAL PRODS, FOOD
ADDITIVES/AS HOUSEHOLD CHEMICALS.

=====
Control Measures
=====

Respiratory Protection: USE NIOSH/MSHA APPROVED RESPIRATOR APPROPRIATE FOR
EXPOSURE OF CONCERN (FP N).

Ventilation: THIS CHEMICAL SHOULD BE HANDLED ONLY IN A HOOD.

Protective Gloves: IMPERVIOUS GLOVES (FP N).

Eye Protection: ANSI APPROVED CHEM WORKERS GOGGS(SUPDAT)

Other Protective Equipment: ANSI APPROVED EMERGENCY EYE WASH AND DELUGE
SHOWER (FP N).

Work Hygienic Practices: NONE SPECIFIED BY MANUFACTURER.

Suppl. Safety & Health Data: MATLS TO AVOID:& LIGHT-DARK COLOR DOES NOT
AFFECT PURITY. AIR SENSITIVE. EYE PROT:& FULL LENGTH FSHLD (FP N). FIRST
AID PROC:BRTHG. IF PATIENT HAS STOPPED BRTHG ADMIN ARTF RESP. IF PATIENT IS
IN CARDIAC ARREST ADMIN CPR. CONTINUE LIFE SUPPORTING MEASURES UNTIL MED
ASSISTANCE HAS ARRIVED. IF PATIENT IS (ING 2)

=====
Transportation Data
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Disposal Data
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Label Data
=====

Label Required: YES

Technical Review Date: 18MAR96

Label Status: G

Common Name: 2-METHYLPHENOL, F711

Chronic Hazard: YES

Signal Word: WARNING!

Acute Health Hazard-Moderate: X

Contact Hazard-Moderate: X

Fire Hazard-Moderate: X

Reactivity Hazard-None: X

Special Hazard Precautions: COMBUSTIBLE. ACUTE: CAN BE FATAL IF ABSORBED THROUGH SKIN, INHALED AND SWALLOWED! MAY BE RAPIDLY ABSORBED THROUGH SKIN WITH POTENTIAL ADVERSE HEALTH EFFECTS. MAY CAUSE SKIN BURNS. CAN CAUSE SEVERE SKIN BURNS. VAPORS AND/OR DIRECT EYE CONTACT CAN CAUSE SEVERE BURNS. CAN CAUSE GASTROINTESTINAL DISTURBANCES, CENTRAL NERVOUS SYSTEM INJURY, LIVER DAMAGE, AND ALLERGIC SKIN REACTION. INGESTION: SEVERE CORROSION OF MOUTH AND GASTROINTESTINAL TRACT, CARDIOVASCULAR SYSTEM INJURY. CHRONIC: EYE DAMAGE, NAUSEA, HEADACHE, DIZZINESS.

Protect Eye: Y

Protect Skin: Y

Protect Respiratory: Y

Label Name: CHEM SERVICE INC

Label P.O. Box: 3108

Label City: WEST CHESTER

Label State: PA

Label Zip Code: 19381

Label Country: US

Label Emergency Number: 215-692-3026

International Chemical Safety Cards

m-CRESOL
ICSC: 0646

| m-CRESOL 3-Cresol 3-Methylphenol 3-Hydroxytoluene $C_7H_8O/C_6H_4(OH)CH_3$ Molecular mass: 108.15 CAS # 108-39-4 RTECS # GO6125000 ICSC # 0646 UN # 2076 EC # 604-004-00-9 | | | |
|---|--|---|---|
| TYPES OF HAZARD/ EXPOSURE | ACUTE HAZARDS/ SYMPTOMS | PREVENTION | FIRST AID/ FIRE FIGHTING |
| FIRE | Combustible. Gives off irritating or toxic fumes (or gases) in a fire. | NO open flames. | Powder, water spray, foam, carbon dioxide. |
| EXPLOSION | Vapour/air mixtures are explosive. Above 86°C explosive vapour/air mixtures may be formed. | Above 86°C use a closed system, ventilation. | In case of fire: keep drums, etc., cool by spraying with water. |
| EXPOSURE | | STRICT HYGIENE! | IN ALL CASES CONSULT A DOCTOR! |
| • INHALATION | Cough. Headache. Laboured breathing. Nausea. Unconsciousness. | Ventilation, local exhaust, or breathing protection. | Fresh air, rest. Half-upright position. Artificial respiration if indicated. Refer for medical attention. |
| • SKIN | MAY BE ABSORBED! Roughness (further see Inhalation). | Protective gloves. Protective clothing. | Remove contaminated clothes. Rinse skin with plenty of water or shower. Refer for medical attention. Wear protective gloves when administering first aid. |
| • EYES | Severe deep burns. | Safety goggles or eye protection in combination with breathing protection. | First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor. |
| • INGESTION | Dizziness. Dullness. Headache. Unconsciousness. | Do not eat, drink, or smoke during work. | Rinse mouth. Give vegetable oil to drink. Induce vomiting (ONLY IN CONSCIOUS PERSONS!). Rest. Refer for medical attention. |
| SPILLAGE DISPOSAL | | STORAGE | PACKAGING & LABELLING |
| Collect leaking liquid in sealable containers. Absorb remaining liquid in sand or inert absorbent and remove to safe place. Do NOT wash away into sewer (extra personal protection: complete protective clothing including self-contained breathing apparatus). | | Separated from food and feedstuffs, oxidizing materials. Cool. Dry. Keep in a well-ventilated room. | Do not transport with food and feedstuffs. Should be stored in iron or steel containers. T symbol R: 24/25-34 S: 36/37/39-44 UN Hazard Class: 6.1 UN Packing Group: II |

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0646

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities © IPCS CEC 1993

International Chemical Safety Cards

m-CRESOL

ICSC: 0646

| | | |
|---|--|---|
| I M P O R T A N T D A T A | <p>PHYSICAL STATE; APPEARANCE: COLOURLESS TO YELLOW LIQUID , WITH CHARACTERISTIC ODOUR.</p> <p>PHYSICAL DANGERS:</p> <p>CHEMICAL DANGERS: The substance decomposes on burning producing toxic and irritating fumes. Reacts with strong oxidants.</p> <p>OCCUPATIONAL EXPOSURE LIMITS (OELs): TLV not established.</p> | <p>ROUTES OF EXPOSURE: The substance can be absorbed into the body by inhalation of its vapour, through the skin and by ingestion.</p> <p>INHALATION RISK: No indication can be given about the rate in which a harmful concentration in the air is reached on evaporation of this substance at 20°C.</p> <p>EFFECTS OF SHORT-TERM EXPOSURE: Exposure may result in unconsciousness. The effects may be delayed.</p> <p>EFFECTS OF LONG-TERM OR REPEATED EXPOSURE: Repeated or prolonged contact with skin may cause dermatitis. Lungs may be affected by repeated or prolonged exposure to the vapour. The substance may have effects on the liver, kidneys, central nervous system.</p> |
| | <p>PHYSICAL PROPERTIES</p> <p>Boiling point: 202°C Melting point: 11-12°C Relative density (water = 1): 1.03 Solubility in water: moderate (2.5 g/100ml at 25°C) Vapour pressure, Pa at 25°C: 20</p> | <p>Relative vapour density (air = 1): 3.72 Flash point: 86°C Auto-ignition temperature: 558°C Explosive limits, vol% in air: 1.1-? Octanol/water partition coefficient as log Pow: 1.96</p> |
| ENVIRONMENTAL DATA | | |
| NOTES | | |
| Do NOT take working clothes home. | | |
| Transport Emergency Card: TEC (R)-37c NFPA Code: H 3; F 1; R 0; | | |
| ADDITIONAL INFORMATION | | |
| | | |
| ICSC: 0646 | | m-CRESOL |
| © IPCS, CEC, 1993 | | |
| IMPORTANT LEGAL NOTICE: | Neither the CEC or the IPCS nor any person acting on behalf of the CEC or the IPCS is responsible for the use which might be made of this information. This card contains the collective views of the IPCS Peer Review Committee and may not reflect in all cases all the detailed requirements included in national legislation on the subject. The user should verify compliance of the cards with the relevant legislation in the country of use. | |

CHEM SERVICE -- 4-METHYLPHENOL, F712
MATERIAL SAFETY DATA SHEET
NSN: 861000N069926
Manufacturer's CAGE: 8Y898
Part No. Indicator: A
Part Number/Trade Name: 4-METHYLPHENOL, F712

General Information

Company's Name: CHEM SERVICE INC
Company's P. O. Box: 3108
Company's City: WEST CHESTER
Company's State: PA
Company's Country: US
Company's Zip Code: 19381
Company's Emerg Ph #: 215-692-3026
Company's Info Ph #: 215-692-3026
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SMJ
Date MSDS Prepared: 04JAN95
Safety Data Review Date: 14MAR96
MSDS Serial Number: CBKZK

Ingredients/Identity Information

Proprietary: NO
Ingredient: P-CRESOL;(4-METHYLPHENOL)
Ingredient Sequence Number: 01
NIOSH (RTECS) Number: GO6475000
CAS Number: 106-44-5
OSHA PEL: 5 PPM, S
ACGIH TLV: 5 PPM, S

Proprietary: NO
Ingredient: SUPP DATA: DO NOT ADMIN LIQUIDS/INDUCE VOMITING TO AN UNCON/
CONVULSING PERS. IF PATIENT IS VOMITING-WATCH CLOSELY(ING 3)
Ingredient Sequence Number: 02
NIOSH (RTECS) Number: 9999999ZZ
OSHA PEL: NOT APPLICABLE
ACGIH TLV: NOT APPLICABLE

Proprietary: NO
Ingredient: ING 2: TO MAKE SURE AIRWAY DOES NOT BECOME OBSTRUCTED BY
VOMIT. GET MED ATTN IF NEC. REMOVE & WASH CONTAMD CLTHG.(ING 4)
Ingredient Sequence Number: 03
NIOSH (RTECS) Number: 9999999ZZ
OSHA PEL: NOT APPLICABLE
ACGIH TLV: NOT APPLICABLE

Proprietary: NO
Ingredient: ING 3: DISCARD CONTAMINATED SHOES.
Ingredient Sequence Number: 04
NIOSH (RTECS) Number: 9999999ZZ
OSHA PEL: NOT APPLICABLE
ACGIH TLV: NOT APPLICABLE

Proprietary: NO
Ingredient: EYE PROTECTION: AND FULL LENGTH FACESHIELD (FP N).
Ingredient Sequence Number: 05
NIOSH (RTECS) Number: 9999999ZZ
OSHA PEL: NOT APPLICABLE
ACGIH TLV: NOT APPLICABLE

Physical/Chemical Characteristics

Appearance And Odor: WHITE SOLID, WITH PHENOL LIKE ODOR.
Boiling Point: 396F,202C
Melting Point: 95.5F,35.3C
Vapor Pressure (MM Hg/70 F): 1.0 @ 20C
Vapor Density (Air=1): 3.72
Specific Gravity: 1.034
Solubility In Water: SOLUBLE IN HOT

Fire and Explosion Hazard Data

Flash Point: 192F,89C
Extinguishing Media: WATER SPRAY, CARBON DIOXIDE, DRY CHEMICAL POWDER,
ALCOHOL OR POLYMER FOAM.
Special Fire Fighting Proc: WEAR NIOSH/MSHA APPROVED SCBA & FULL
PROTECTIVE EQUIPMENT(FP N).
Unusual Fire And Expl Hazrds: NONE SPECIFIED BY MANUFACTURER.

Reactivity Data

Stability: YES
Cond To Avoid (Stability): NONE SPECIFIED BY MANUFACTURER.
Materials To Avoid: CORROSIVE. COMBUSTIBLE. HYGROSCOPIC. INCOMPATIBLE W/
OXIDIZING AGENTS. INCOMP W/BASES.
Hazardous Decomp Products: DECOMPOSITION LIBERATES TOXIC FUMES: CARBON
MONOXIDE AND CARBON DIOXIDE.
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NOT RELEVANT.

Health Hazard Data

LD50-LC50 Mixture: LD50: (ORAL,RAT) 207 MG/KG
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: CONTACT LENSES SHOULD NOT BE WORN IN LAB.
ALL CHEMICALS SHOULD BE CONSIDERED HAZARDOUS - AVOID DIRECT PHYSICAL
CONTACT. MAY BE FATAL IF INHALED, SWALLOWED OR ABSORBED THRU SKIN. MATL IS
EXTREMELY DESTRUCTIVE TO TISSUE OF MUCOUS MEMBRANES AND UPPER RESP TRACT,
EYES & SKIN. INGEST MAY CAUSE SEV CORR OF(EFTS OF OVEREXP)
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NOT RELEVANT.
Signs/Symptoms Of Overexp: HLTH HAZ:GI TRACT. CAUSES BURNS. READILY
ABSORBED THRU SKIN. INHAL MAY BE FATAL AS RSLT OF SPASM, INFLAMM & EDEMA OF
LARYNX & BRONCHI, CHEM PNEUM & PULM EDEMA. SYMPS MAY INCL BURNING
SENSATION, COUGHING, WHEEZING, LARYNGITIS, SHORT OF BRTH, HDCH, NAUS &/
VOMIT. EXPOS CAN CAUSE EYE & KIDNEY DMG.
Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER.
Emergency/First Aid Proc: AN ANTIDOTE IS A SUBSTANCE INTENDED TO
COUNTERACT EFT OF POIS. IT SHOULD BE ADMIN ONLY BY MD/TRAINED EMER PERS.
MED ADVICE CAN BE OBTAINED FROM POIS CNTRL CNTR. EYE: FLUSH CONTINUOUSLY W/
WATER FOR AT LEAST 15-20 MINS. SKIN:FLUSH W/WATER FOR 15-20 MINS. IF NO
BURNS HAVE OCCURED - USE SOAP & WATER TO CLEANSE SKIN. INHAL: REMOVE TO
FRESH AIR. ADMIN O*2 IF HAVING DFCLTY BRTHG. IF STOPPED (SUPDAT)

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: EVAC AREA. WEAR APPROP OSHA REGULATED
EQUIPMENT. VENT AREA. SWEEP UP & PLACE IN AN APPROP CNTNR. HOLD FOR DISP.
WASH CONTAMD SURFS TO REMOVE ANY RESIDUES.

Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.
Waste Disposal Method: BURN IN CHEMICALS INCINERATOR EQUIPPED W/AN
AFTERBURNER AND SCRUBBER. DISPOSE OF IN ACCORDANCE W/LOCAL, STATE & FEDERAL
REGULATIONS(FP N).
Precautions-Handling/Storing: KEEP TIGHTLY CLOSED. STORE IN COOL DRY
PLACE. STORE ONLY W/COMPATIBLE CHEMICALS.
Other Precautions: AVOID CONTACT W/SKIN, EYES AND CLOTHING. DO NOT BREATHE
VAPORS. THIS PRODUCT IS FURNISHED FOR LABORATORY USE ONLY! OUR PRODUCTS MAY
NOT BE USED AS DRUGS, COSMETICS, AGRICULTURAL OR PESTICIDAL PRODUCTS, FOOD
ADDITIVES/AS HOUSEHOLD CHEMICALS.

=====
Control Measures
=====

Respiratory Protection: USE NIOSH/MSHA APPROVED RESPIRATOR APPROPRIATE FOR
EXPOSURE OF CONCERN(FP N).
Ventilation: THIS CHEMICAL SHOULD BE HANDLED ONLY IN A HOOD.
Protective Gloves: IMPERVIOUS GLOVES(FP N).
Eye Protection: ANSI APPRVD CHEM WORKERS GOGGS (ING 5)
Other Protective Equipment: EMERGENCY EYEWASH & DELUGE SHOWER MEETING ANSI
DESIGN CRITERIA(FP N).
Work Hygienic Practices: NONE SPECIFIED BY MANUFACTURER.
Suppl. Safety & Health Data: FIRST AID PROC: BRTHG ADMIN ARTF RESP. IF IN
CARD ARREST ADMIN CPR. CONTINUE LIFE SUPPORTING MEASURES UNTIL MD ASSIST
HAS ARRIVED. IF PATIENT IS EXHIBITING SIGNS OF SHOCK-KEEP WARM & QUIET.
INGEST:IS EXHIBITING SIGNS OF SHOCK-KEEP WARM & QUIET. INGEST: DO NOT
INDUCE VOMIT. CONT POIS CNTRL CNTR IMMED IF NEC.(ING 2)

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Transportation Data
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Disposal Data
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Label Data
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Label Required: YES
Technical Review Date: 14MAR96
Label Date: 14MAR96
Label Status: G
Common Name: 4-METHYLPHENOL, F712
Chronic Hazard: YES
Signal Word: DANGER!
Acute Health Hazard-Severe: X
Contact Hazard-Severe: X
Fire Hazard-Moderate: X
Reactivity Hazard-None: X
Special Hazard Precautions: COMBUSTIBLE. ACUTE: MAY BE FATAL IF INHALED,
SWALLOWED OR ABSORBED THROUGH THE SKIN. MATERIAL IS EXTREMELY DESTRUCTIVE
TO TISSUE OF MUCOUS MEMBRANES AND UPPER RESPIRATORY TRACT, EYES AND SKIN.
INGESTION MAY CAUSE SEVERE CORROSION OF GASTROINTESTINAL TRACT. CAUSES
BURNS. INHALATION: MAY BE FATAL DUE TO SPASM, INFLAMMATION, EDEMA/
PNEUMONIA. CHRONIC: EYE AND KIDNEY DAMAGE.
Protect Eye: Y
Protect Skin: Y
Protect Respiratory: Y
Label Name: CHEM SERVICE INC
Label P.O. Box: 3108
Label City: WEST CHESTER
Label State: PA
Label Zip Code: 19381
Label Country: US
Label Emergency Number: 215-692-3026

Naphthalene, 98%
ACROS96302

**** SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION ****

MSDS Name: Naphthalene, 98%

Catalog Numbers:

AC164210000, AC164210010, AC164210025

Synonyms:

Coal tar camphor, Naphthalin, Napthalinium, Naphthene; Albocarbon;
Moth Balls

Company Identification (Europe): Acros Organics N.V.
Janssen Pharmaceuticaaan 3a
2440 Geel, Belgium

Company Identification (USA): Acros Organics
One Reagent Lane
Fairlawn, NJ 07410

For information in North America, call: 800-ACROS-01

For information in Europe, call: 0032(0) 14575211

For emergencies in the US, call CHEMTREC: 800-424-9300

For emergencies in Europe, call: 0032(0) 14575299

**** SECTION 2 - COMPOSITION, INFORMATION ON INGREDIENTS ****

| CAS# | Chemical Name | % | EINECS# |
|---------|---------------|----|-----------|
| 91-20-3 | Naphthalene | 98 | 202-049-5 |

Hazard Symbols: XN
Risk Phrases: 20/21/22

**** SECTION 3 - HAZARDS IDENTIFICATION ****

EMERGENCY OVERVIEW

Appearance: white.

Warning! Flammable solid. May cause allergic skin reaction.

Hygroscopic. Harmful if swallowed. May cause fetal effects based upon animal studies. May cause lung damage. May cause liver and kidney damage. Causes eye and skin irritation. Causes digestive and respiratory tract irritation. May be fatal if inhaled. May cause blood abnormalities. Possible sensitizer.

Target Organs: Blood, kidneys, central nervous system, liver, lungs, eyes, skin.

Potential Health Effects

Eye:

Causes mild eye irritation.

This substance is retinotoxic and systemic absorption of its vapors above 15 ppm, may cause cataracts, optical neuritis, injuries to the cornea and marked eye irritation.

Skin:

Causes mild skin irritation. May be absorbed through the skin in harmful amounts. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material.

Ingestion:

Harmful if swallowed. May cause liver and kidney damage. May cause methemoglobinemia, cyanosis, convulsions, and death. May cause severe digestive tract irritation with abdominal pain, nausea, vomiting and diarrhea. Ingestion of large quantities may cause severe hemolytic anemia and hemoglobinuria.

Inhalation:

May be fatal if inhaled. Causes respiratory tract irritation. May cause salivation, nausea, vomiting, abdominal pain, fever, and labored breathing. Readily absorbed when inhaled.

Chronic:

Prolonged or repeated skin contact may cause dermatitis. May cause liver and kidney damage. May cause anemia and other blood cell abnormalities. Animal studies have reported that fetal effects/abnormalities may occur when maternal toxicity is seen.

Effects may be delayed. Chronic exposure may cause lung damage. Laboratory experiments have resulted in mutagenic effects. Chronic exposure may cause corneal injury, optical neuritis, blurred vision, and possible cataract formation.

**** SECTION 4 - FIRST AID MEASURES ****

Eyes:

Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin:

Get medical aid. Immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion:

Do NOT induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation:

Remove from exposure to fresh air immediately. If breathing is difficult, give oxygen. Get medical aid. DO NOT use mouth-to-mouth respiration. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.

Notes to Physician:

If cyanosis is severe, intravenous injection of Methylene blue, 1mg/kg of body weight may be of value. For methemoglobinemia, administer oxygen alone or with Methylene blue depending on the methemoglobinemia concentration in the blood.

**** SECTION 5 - FIRE FIGHTING MEASURES ****

General Information:

As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Water runoff can cause environmental damage. Dike and collect water used to fight fire. Use water spray to keep fire-exposed containers cool. Dust can be an explosion hazard when exposed to heat or flame. Flammable solid. May be ignited by friction, heat, sparks, or flame. May re-ignite after fire is extinguished. Containers may explode when heated.

Extinguishing Media:

Use dry sand or earth to smother fire. Water or foam may cause frothing. Cool containers with flooding quantities of water until well after fire is out. Use dry chemical, carbon dioxide, or appropriate foam.

**** SECTION 6 - ACCIDENTAL RELEASE MEASURES ****

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks:

Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Scoop up with a nonsparking tool, then place into a suitable container for disposal. Avoid generating dusty conditions. Remove all sources of ignition.

**** SECTION 7 - HANDLING and STORAGE ****

Handling:

Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Do not breathe dust, vapor, mist, or gas. Keep container tightly closed. Do not ingest or inhale. Use only in a chemical fume hood.

Storage:

Keep away from sources of ignition. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Store protected from moisture.

**** SECTION 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION ****

Engineering Controls:

Use explosion-proof ventilation equipment. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use only under a chemical fume hood.

Exposure Limits

| Chemical Name | ACGIH | NIOSH | OSHA - Final PELs |
|---------------|--|---------------------------------------|--------------------------|
| Naphthalene | 10 ppm; 15 ppm STEL; skin - potential for cutaneous absorption | 10 ppm TWA; 50 mg/m3 TWA 250 ppm IDLH | 10 ppm TWA; 50 mg/m3 TWA |

OSHA Vacated PELs:

Naphthalene:
10 ppm TWA; 50 mg/m3 TWA

Personal Protective Equipment

Eyes:

Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin:

Wear appropriate protective gloves to prevent skin exposure.

Clothing:

Wear appropriate protective clothing to prevent skin exposure.

Respirators:

A respiratory protection program that meets OSHA's 29 CFR §1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.

**** SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES ****

Physical State: Crystalline powder
 Appearance: white
 Odor: Distinctive mothball-like.
 pH: Not available.
 Vapor Pressure: 0.054 mm Hg @20C
 Vapor Density: 4.42 (air=1)
 Evaporation Rate: <1.0 (butyl acetate=1)
 Viscosity: Not available.
 Boiling Point: 218 deg C
 Freezing/Melting Point: 80 - 82 deg C
 Autoignition Temperature: 526 deg C (978.80 deg F)
 Flash Point: Not applicable.
 NFPA Rating: (est.) Health: 2; Flammability: 2; Reactivity: 0
 Explosion Limits, Lower: 0.90 vol %
 Upper: 5.90 vol %
 Decomposition Temperature: 540 deg C
 Solubility: insoluble
 Specific Gravity/Density: 0.9970g/cm3
 Molecular Formula: C10H8
 Molecular Weight: 128.17

**** SECTION 10 - STABILITY AND REACTIVITY ****

Chemical Stability:

Stable at room temperature in closed containers under normal storage and handling conditions. Volatile in steam.

Conditions to Avoid:

Incompatible materials, ignition sources, dust generation, moisture,

excess heat, exposure to moist air or water, steam.

Incompatibilities with Other Materials:

Oxidizing agents, chromium trioxide, chromic anhydride, dinitrogen pentaoxide, mineral acids, moisture, strong alkalies, aluminum chloride + benzoyl chloride.

Hazardous Decomposition Products:

Carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.

Hazardous Polymerization: Will not occur.

**** SECTION 11 - TOXICOLOGICAL INFORMATION ****

RTECS#:

CAS# 91-20-3: QJ0525000

LD50/LC50:

CAS# 91-20-3: Oral, mouse: LD50 = 533 mg/kg; Oral, rat: LD50 = 490 mg/kg; Skin, rabbit: LD50 = >20 gm/kg; Skin, rat: LD50 = >2500 mg/kg.

Carcinogenicity:

Naphthalene -

ACGIH: A4 - Not Classifiable as a Human Carcinogen

Epidemiology:

Subcutaneous, rat: TDLo = 3500 mg/kg/12W-I (Tumorigenic - equivocal tumorigenic agent by RTECS criteria - Blood - lymphoma, including Hodgkin's disease and Reproductive - Tumorigenic effects - uterine tumors).; Inhalation, mouse: TCLo = 30 ppm/6H/2Y-I (Tumorigenic - neoplastic by RTECS criteria - Lungs, Thorax, or Respiration - tumors).

Teratogenicity:

Naphthalene and its metabolites have been reported to cross the human placenta in amounts sufficient to cause fetal toxicity. Oral, rat: TDLo = 4500 mg/kg (female 6-15 day(s) after conception) Effects on Embryo or Fetus - fetotoxicity (except death, e.g., stunted fetus) and Specific Developmental Abnormalities - other developmental abnormalities.; Intraperitoneal, rat: TDLo = 5925 mg/kg (female 1-15 day(s) after conception) Specific Developmental Abnormalities - musculoskeletal system and cardiovascular (circulatory) system.

Reproductive Effects:

No information available.

Neurotoxicity:

No information available.

Mutagenicity:

Micronucleus Test: Human, Lymphocyte = 30 mg/L.; Cytogenetic Analysis: Hamster, Ovary = 30 mg/L.; Sister Chromatid Exchange: Hamster, Ovary = 15 mg/L.

Other Studies:

Standard Draize Test: Administration onto the skin (rabbit) = 495 mg (Mild).; Standard Draize Test: Administration into the eye (rabbit) = 100 mg (Mild).

**** SECTION 12 - ECOLOGICAL INFORMATION ****

Ecotoxicity:

Fish: Rainbow trout: LC50 = 1.60 mg/L; 96 Hr; Flow-through at 15 CFish: Fathead Minnow: LC50 = 6.14 mg/L; 96 Hr; Flow-through at 24.5 CWater flea Daphnia: EC50 = 2.16-8.60 mg/L; 48 Hr; Unspecified Bacteria: Phytobacterium phosphoreum: EC50 = 0.93 mg/L; 30 min; Microtox test Fish: Pink salmon: LC50 = 1.24 mg/L; 96 Hr; (fry) Static bioassay at 12°C Releases into water are lost due to volatilization, photolysis, adsorption, and biodegradation. The principal loss processes will depend on local conditions but half-lives can be expected to range from a couple of days to a few months. When adsorbed to sediment, biodegradation occurs much more

Other

Harmful to aquatic life in very low concentrations.

**** SECTION 13 - DISPOSAL CONSIDERATIONS ****

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste.

US EPA guidelines for the classification determination are listed in 40 CFR Part Additionally, waste generators must consult state and local hazardous waste regu

ensure complete and accurate classification.
RCRA P-Series: None listed.
RCRA U-Series: CAS# 91-20-3: waste number U165.

**** SECTION 14 - TRANSPORT INFORMATION ****

US DOT

Shipping Name: NAPHTHALENE, REFINED
Hazard Class: 4.1
UN Number: UN1334
Packing Group: III

Canadian TDG

Shipping Name: NAPHTHALENE
Hazard Class: 4.1(9.2)
UN Number: UN1334

**** SECTION 15 - REGULATORY INFORMATION ****

US FEDERAL

TSCA

CAS# 91-20-3 is listed on the TSCA inventory.
Health & Safety Reporting List
CAS# 91-20-3: Effective Date: June 1, 1987; Sunset Date: June 1, 1997
Chemical Test Rules
None of the chemicals in this product are under a Chemical Test Rule.
Section 12b
None of the chemicals are listed under TSCA Section 12b.
TSCA Significant New Use Rule
None of the chemicals in this material have a SNUR under TSCA.

SARA

Section 302 (RQ)
CAS# 91-20-3: final RQ = 100 pounds (45.4 kg)
Section 302 (TPQ)
None of the chemicals in this product have a TPQ.
SARA Codes
CAS # 91-20-3: flammable.
Section 313
This material contains Naphthalene (CAS# 91-20-3, 98%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 372.

Clean Air Act:

CAS# 91-20-3 is listed as a hazardous air pollutant (HAP).
This material does not contain any Class 1 Ozone depletors.
This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 91-20-3 is listed as a Hazardous Substance under the CWA.
CAS# 91-20-3 is listed as a Priority Pollutant under the Clean Water Act.
CAS# 91-20-3 is listed as a Toxic Pollutant under the Clean Water Act.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

Naphthalene can be found on the following state right to know lists:
California, New Jersey, Florida, Pennsylvania, Minnesota, Massachusetts.

California No Significant Risk Level:

None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols: XN

Risk Phrases:

R 20/21/22 Harmful by inhalation, in contact with skin and if swallowed.

Safety Phrases:

S 36/37 Wear suitable protective clothing and gloves.

WGK (Water Danger/Protection)

CAS# 91-20-3: 2

United Kingdom Occupational Exposure Limits

Canada

CAS# 91-20-3 is listed on Canada's DSL/NDSL List.

This product has a WHMIS classification of B4, D1A, D2A.

CAS# 91-20-3 is not listed on Canada's Ingredient Disclosure List.

Exposure Limits

CAS# 91-20-3: OEL-ARAB Republic of Egypt:TWA 10 ppm (50 mg/m3)

OEL-AUSTRALIA:TWA 10 ppm (50 mg/m3);STEL 15 ppm (75 mg/m3)

OEL-BELGIUM:TWA 10 ppm (52 mg/m3);STEL 15 ppm (79 mg/m3)

OEL-DENMARK:TWA 10 ppm (50 mg/m3)

OEL-FINLAND:TWA 10 ppm (50 mg/m3);STEL 20 ppm (10 mg/m3)

OEL-FRANCE:TWA 10 ppm (50 mg/m3)

OEL-GERMANY:TWA 10 ppm (50 mg/m3)

OEL-HUNGARY:TWA 40 mg/m3;STEL 80 mg/m3;Skin

OEL-THE NETHERLANDS:TWA 10 ppm (50 mg/m3)

OEL-THE PHILIPPINES:TWA 10 ppm (50 mg/m3)

OEL-POLAND:TWA 20 mg/m3

OEL-RUSSIA:STEL 20 mg/m3

OEL-SWITZERLAND:TWA 10 ppm (50 mg/m3)

OEL-UNITED KINGDOM:TWA 10 ppm (50 mg/m3);STEL 15 ppm (75 mg/m3)

OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA check ACGIH TLV

OEL IN NEW ZEALAND, SINGAPORE, VIETNAM check ACGI TLV

**** SECTION 16 - ADDITIONAL INFORMATION ****

MSDS Creation Date: 5/14/1999 Revision #2 Date: 8/02/2000

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no way shall the company be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if the company has been advised of the possibility of such damages.

ICN BIOMEDICALS -- N-NITROSODIPHENYLAMINE, 206649
MATERIAL SAFETY DATA SHEET
NSN: 681000N055271
Manufacturer's CAGE: 30060
Part No. Indicator: A
Part Number/Trade Name: N-NITROSODIPHENYLAMINE, 206649

=====
General Information
=====

Company's Name: ICN BIOMEDICALS
Company's Street: 1263 S CHILLICOTHE RD
Company's City: AURORA
Company's State: OH
Company's Country: US
Company's Zip Code: 44202
Company's Emerg Ph #: 800-424-9300 (CHEMTREC)
Company's Info Ph #: 216-562-1500
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SMJ
Date MSDS Prepared: 14APR93
Safety Data Review Date: 15NOV94
MSDS Preparer's Name: T.C.
Preparer's Company: SAME
MSDS Serial Number: BWDFV
Hazard Characteristic Code: NK

=====
Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: DIPHENYLAMINE, N-NITROSO-; (N-NITROSODIPHENYLAMINE) (SARA III)
Ingredient Sequence Number: 01
NIOSH (RTECS) Number: JJ9800000
CAS Number: 86-30-6
OSHA PEL: N/K (FP N)
ACGIH TLV: N/K (FP N)

=====
Physical/Chemical Characteristics
=====

Appearance And Odor: BROWN GRAINS.
Melting Point: >147F, >64C
Solubility In Water: INSOLUBLE

=====
Fire and Explosion Hazard Data
=====

Extinguishing Media: CO*2, DRY CHEMICAL, FOAM.
Special Fire Fighting Proc: USE NIOSH/MSHA APPROVED SCBA & FULL PROTECTIVE EQUIPMENT (FP N).
Unusual Fire And Expl Hazrds: NONE SPECIFIED BY MANUFACTURER.

=====
Reactivity Data
=====

Stability: YES
Cond To Avoid (Stability): NONE SPECIFIED BY MANUFACTURER.
Materials To Avoid: STRONG OXIDIZERS.
Hazardous Decomp Products: DECOMPOSITION/HEATED OR BURNED: EMITS TOXIC FUMES OF NO*X, DECR ABOVE 100C.
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NOT RELEVANT

=====
Health Hazard Data
=====

LD50-LC50 Mixture: LD50: (ORAL, RAT) 1650 MG/KG.

Route Of Entry - Inhalation: YES
 Route Of Entry - Skin: YES
 Route Of Entry - Ingestion: YES
 Health Haz Acute And Chronic: TOXIC CARCINOGENS, TERATOGENS & MUTAGENS BY ALMOST ALL ROUTES OF EXPOSURE. MODERATE TO SEVERE ERYTHEMA (REDNESS) & MODERATE EDEMA (RAISED SKIN).
 Carcinogenicity - NTP: NO
 Carcinogenicity - IARC: NO
 Carcinogenicity - OSHA: NO
 Explanation Carcinogenicity: NOT RELEVANT
 Signs/Symptoms Of Overexp: SEE HEALTH HAZARDS.
 Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER.
 Emergency/First Aid Proc: SKIN:REMOVE CONTAM CLTHG, RINSE LIBERALLY W/ SOAP & WATER FOR A CONSIDERABLE PERIOD. CALL MD. INGEST:RINSE MOUTH SEVERAL TIMES W/WATER, DO NOT SWALLOW. CALL MD/TAKE PATIENT TO HOSPITAL. EYES:RINSE LIBERALLY W/WATER FOR AT LST 15 MINS. CALL MD/TAKE PATIENT TO HOSPITAL.
 INHAL:TAKE PATIENT INTO FRESH AIR & ALLOW TO REST. CALL MD/TAKE PATIENT TO HOSPITAL.

=====
 Precautions for Safe Handling and Use
 =====

Steps If Matl Released/Spill: SWEEP INTO SUITABLE CONTAINER FOR DISPOSAL.
 Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.
 Waste Disposal Method: INCINERATE OR LANDFILL AS COMPLIES W/FEDERAL, STATE & LOCAL LAWS.
 Precautions-Handling/Storing: STORAGE: ROOM TEMPERATURE, IN A PROPERLY SEALED CONTAINER.
 Other Precautions: MAY HAVE HAZARDOUS INSTABILITIES UNDER APPROPRIATE CONDITIONS.

=====
 Control Measures
 =====

Respiratory Protection: NIOSH/MSHA APPROVED RESPIRATOR APPROPRIATE FOR EXPOSURE OF CONCERN (FP N).
 Ventilation: LOCAL EXHAUST REQUIRED. ALWAYS USE A HOOD.
 Protective Gloves: IMPERVIOUS GLOVES (FP N).
 Eye Protection: ANSI APPROVED CHEM WORKERS GOGGS (FP N).
 Other Protective Equipment: ANSI APPROVED EYE WASH FOUNTAIN / DELUGE SHOWER (FP N).
 Work Hygienic Practices: NONE SPECIFIED BY MANUFACTURER.
 Suppl. Safety & Health Data: NONE SPECIFIED BY MANUFACTURER.

=====
 Transportation Data
 =====

=====
 Disposal Data
 =====

=====
 Label Data
 =====

Label Required: YES
 Technical Review Date: 15NOV94
 Label Date: 14NOV94
 Label Status: G
 Common Name: N-NITROSODIPHENYLAMINE, 206649
 Chronic Hazard: YES
 Signal Word: WARNING!
 Acute Health Hazard-Moderate: X
 Contact Hazard-Moderate: X
 Fire Hazard-None: X
 Reactivity Hazard-None: X
 Special Hazard Precautions: ACUTE:MODERATE TO SEVERE ERYTHEMA (REDNESS) & MODERATE EDEMA (RAISED SKIN). CHRONIC: TOXIC CARCINOGENS, TERATOGENS AND MUTAGENS BY ALMOST ALL ROUTES OF EXPOSURE.

Protect Eye: Y
Protect Skin: Y
Protect Respiratory: Y
Label Name: ICN BIOMEDICALS
Label Street: 1263 S CHILLICOTHE RD
Label City: AURORA
Label State: OH
Label Zip Code: 44202
Label Country: US
Label Emergency Number: 800-424-9300 (CHEMTREC)

ALDRICH CHEMICAL -- PHENANTHRENE 98%, P1140-9
MATERIAL SAFETY DATA SHEET
NSN: 681000N014546
Manufacturer's CAGE: 60928
Part No. Indicator: B
Part Number/Trade Name: PHENANTHRENE 98%, P1140-9

=====
General Information
=====

Company's Name: ALDRICH CHEMICAL CO INC
Company's P. O. Box: 355
Company's City: MILWAUKEE
Company's State: MI
Company's Country: US
Company's Zip Code: 52301
Company's Emerg Ph #: 414-273-3850
Company's Info Ph #: 414-273-3850
Record No. For Safety Entry: 002
Tot Safety Entries This Stk#: 002
Status: SMJ
Date MSDS Prepared: 28MAY97
Safety Data Review Date: 24FEB98
MSDS Serial Number: CGNRV
Hazard Characteristic Code: NK

=====
Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: PHENANTHRENE (CERCLA)
Ingredient Sequence Number: 01
NIOSH (RTECS) Number: SF7175000
CAS Number: 85-01-8
OSHA PEL: N/K (FP N)
ACGIH TLV: N/K (FP N)

=====
Physical/Chemical Characteristics
=====

Appearance And Odor: WHITE TO OFF-WHITE CRYSTALS.
Boiling Point: 637F, 336C
Melting Point: >210F, >99C
Specific Gravity: 1.063
Evaporation Rate And Ref: NOT KNOWN
Solubility In Water: NOT KNOWN

=====
Fire and Explosion Hazard Data
=====

Extinguishing Media: WATER SPRAY. CARBON DIOXIDE, DRY CHEMICAL POWDER OR APPROPRIATE FOAM.
Special Fire Fighting Proc: USE NIOSH APPROVED SCBA & FULL PROTECTIVE EQUIPMENT (FP N).
Unusual Fire And Expl Hazrds: EMITS TOXIC FUMES UNDER FIRE CONDITONS.

=====
Reactivity Data
=====

Stability: YES
Cond To Avoid (Stability): NONE SPECIFIED BY MANUFACTURER.
Materials To Avoid: STRONG OXIDIZING AGENTS.
Hazardous Decomp Products: TOXIC FUMES OF: CARBON MONOXIDE, CARBON DIOXIDE.
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NOT RELEVANT.

=====
Health Hazard Data
=====

LD50-LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: ACUTE: HARMFUL IF SWALLOWED. MAY BE HARMFUL IF INHALED. MAY BE HARMFUL IF ABSORBED THRU SKIN. CAUSES EYE & SKIN IRRIT. MATL IS IRRITATING TO MUC MEMBRANES & UPPER RESP TRACT. CAUSES PHOTOSENSITIVITY. EXPOS TO LIGHT CAN RSLT IN ALLERGIC REACTIONS RESULTING IN DERMATOLOGIC LESIONS, WHICH CAN VARY FROM (EFTS OF OVEREXP)
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NOT RELEVANT.
Signs/Symptoms Of Overexp: HLTH HAZ: SUNBURNLIKE RESPONSES TO EDEMATOUS, VESTICULATED LESIONS/BULLAE. CHRONIC: LAB EXPERIMENTS HAVE SHOWN MUTAGENIC SKIN & APPENDAGES(TUMORS). TUMORIGENIC: (NEOPLASTIC BY RTECS CRITERIA) (TUMORS AT SITE OF APPLIC). ONLY SELECTED (SUPDAT)
Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER.
Emergency/First Aid Proc: EYES: IMMEDIATELY FLUSH WITH COPIOUS AMTS OF WATER FOR AT LST 15 MINUTES. SKIN: IMMEDIATELY WASH WITH SOAP & COPIOUS AMTS OF WATER. INHAL: REMOVE TO FRESH AIR. IF NOT BREATHING GIVE ARTF RESP. IF BREATHING IS DIFFICULT, GIVE OXYGEN. INGEST: WASH OUT MOUTH WITH WATER PROVIDED PERSON IS CONSCIOUS. CALL PHYS. DISCARD CONTAMINATED CLOTHING AND SHOES.

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: WEAR NIOSH APPRVD SCBA, RUBBER BOOTS AND HEAVY RUBBER GLOVES. SWEEP UP, PLACE IN BAG AND HOLD FOR WASTE DISPOSAL. AVOID RAISING DUST. VENTILATE AREA AND WASH SPILL SITE AFTER MATERIAL PICKUP IS COMPLETE.
Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.
Waste Disposal Method: DISSOLVE OR MIX MATL W/COMBUST SOLVENT & BURN IN CHEMICAL INCINERATOR EQUIPPED WITH AN AFTERBURNER AND SCRUBBER. OBSERVE ALL FEDERAL, STATE AND LOCAL ENVIRONMENTAL REGULATIONS.
Precautions-Handling/Storing: HARMFUL. HARMFUL IF SWALLOWED. IRRITATING TO EYES, RESP SYS & SKIN. POSS RISK OF IRREVERSIBLE EFTS. POSSIBLE MUTAGEN. PHOTOSENSITIZER.
Other Precautions: WEAR SUITABLE PROT CLTHG. DO NOT BREATHE DUST. AVOID INHALATION. DO NOT GET IN EYES, ON SKIN, ON CLTHG. AVOID PRLNGD/RPTD EXPOSURE. HARMFUL SOLID. IRRITANT. KEEP TIGHTLY CLOSED. STORE IN COOL DRY PLACE.

Control Measures

Respiratory Protection: NIOSH APPROVED RESPIRATOR.
Ventilation: MECHANICAL EXHAUST REQUIRED.
Protective Gloves: RUBBER GLOVES.
Eye Protection: ANSI APPRVD CHEM WORKERS GOGGLES (FP N).
Other Protective Equipment: ANSI APPRVD EYE WASH & DELUGE SHOWER (FP N).
Work Hygienic Practices: WASH THOROUGHLY AFTER HANDLING.
Suppl. Safety & Health Data: EFTS OF OVEREXP: REGISTRY OF TOX EFTS OF CHEM SUBSTANCES (RTECS) DATA IS PRESENTED HERE. SEE ACTUAL ENTRY IN RTECS FOR COMPLETE INFO.

Transportation Data

Disposal Data

Label Data

Label Required: YES
Technical Review Date: 24FEB98
Label Date: 18FEB98
Label Status: G
Common Name: PHENANTHRENE 98%, P1140-9
Chronic Hazard: YES
Signal Word: WARNING!
Acute Health Hazard-Moderate: X
Contact Hazard-Moderate: X
Fire Hazard-None: X
Reactivity Hazard-None: X
Special Hazard Precautions: ACUTE: HARMFUL IF SWALLOWED. MAY BE HARMFUL IF INHALED. MAY BE HARMFUL IF ABSORBED THRU SKIN. CAUSES EYE & SKIN IRRIT. MATL IS IRRITATING TO MUC MEMBRANES & UPPER RESP TRACT. CAUSES PHOTSENSITIVITY. EXPOS TO LIGHT CAN RSLT IN ALLERGIC REACTIONS RESULTING IN DERMATOLOGIC LESIONS, WHICH CAN VARY FROM SUNBURNLIKE RESPONSES TO EDEMATOUS, VESICULATED LESIONS OR BULLAE. CHRONIC: LABORATORY EXPERIMENTS HAVE SHOWN MUTAGENIC EFFECTS. CAN CAUSE SKIN PHOTSENSITIZATION AND ALLERGIC REACTIONS.
Protect Eye: Y
Protect Skin: Y
Protect Respiratory: Y
Label Name: ALDRICH CHEMICAL CO INC
Label P.O. Box: 355
Label City: MILWAUKEE
Label State: MI
Label Zip Code: 52301
Label Country: US
Label Emergency Number: 414-273-3850

CHEMETRICS -- R-8012S PHENOL CHEMETS - WATER SAMPLING TEST FOR PHENOL
MATERIAL SAFETY DATA SHEET
NSN: 663000F019618
Manufacturer's CAGE: 7K791
Part No. Indicator: A
Part Number/Trade Name: R-8012S PHENOL CHEMETS

=====
General Information
=====

Item Name: WATER SAMPLING TEST FOR PHENOL
Company's Name: CHEMETRICS INCORPORATED
Company's Street: ROUTE 28
Company's City: CALVERTON
Company's State: VA
Company's Zip Code: 22016
Company's Emerg Ph #: (800) 356-3072
Company's Info Ph #: (800) 356-3072
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Date MSDS Prepared: 18MAR91
Safety Data Review Date: 19NOV91
MSDS Preparer's Name: TERESA A. NEALE
Preparer's Company: CHEMETRICS INCORPORATED
Preparer's St Or P. O. Box: ROUTE 28
Preparer's City: CALVERTON
Preparer's State: VA
Preparer's Zip Code: 22016
MSDS Serial Number: BLQPV

=====
Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: SODIUM BOROHYDRIDE
Ingredient Sequence Number: 01
Percent: <0.1%
NIOSH (RTECS) Number: ED3325000
CAS Number: 16940-66-2

Proprietary: NO
Ingredient: 4-AMINOANTIPYRINE
Ingredient Sequence Number: 02
Percent: 0.2%
NIOSH (RTECS) Number: CD2480000
CAS Number: 83-07-8

Proprietary: NO
Ingredient: PERMA KLEER DI CRYSTALS, DISODIUM EDTA
Ingredient Sequence Number: 03
Percent: 0.2%
NIOSH (RTECS) Number: AH4375000
CAS Number: 139-33-3

Proprietary: NO
Ingredient: 1,3-PROPANEDIOL , 2-AMINO-2-(HYDROXYMETHYL)
Ingredient Sequence Number: 04
Percent: 0.2%
NIOSH (RTECS) Number: TY2900000
CAS Number: 77-86-1

Proprietary: NO
Ingredient: SODIUM CARBONATE (SODA ASH, TRONA, CARBONIC ACID, CRYSTOL
CARBONATE, DISODIUM CARBONATE)
Ingredient Sequence Number: 05

Percent: 1%
NIOSH (RTECS) Number: VZ4050000
CAS Number: 497-19-8

Proprietary: NO
Ingredient: WATER, H2O
Ingredient Sequence Number: 06
Percent: >98%
NIOSH (RTECS) Number: ZC0110000
CAS Number: 7732-18-5

=====

Physical/Chemical Characteristics

=====

Appearance And Odor: LIQUID
Solubility In Water: COMPLETE

=====

Fire and Explosion Hazard Data

=====

Flash Point: NON-COMBUSTIBLE

=====

Reactivity Data

=====

Stability: YES
Hazardous Poly Occur: NO

=====

Health Hazard Data

=====

Route Of Entry - Inhalation: NO
Route Of Entry - Skin: NO
Route Of Entry - Ingestion: NO
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NONE

=====

Precautions for Safe Handling and Use

=====

Waste Disposal Method: DISPOSE OF IN ACCORDANCE W/LOCAL, STATE, & FEDERAL REGULATIONS.
Precautions-Handling/Storing: IF THIS PRODUCT IS USED AS DIRECTED, THE USER WILL NOT COME IN CONTACT W/OR BE EXPOSED TO ANY OF ITS CHEMICAL COMPONENTS.

=====

Control Measures

=====

=====

Transportation Data

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=====

Disposal Data

=====

=====

Label Data

=====

Label Required: YES
Label Status: G
Common Name: R-8012S PHENOL CHEMETS
Special Hazard Precautions: N/K N/K
Label Name: CHEMETRICS INCORPORATED
Label Street: ROUTE 28
Label City: CALVERTON
Label State: VA
Label Zip Code: 22016
Label Emergency Number: (800) 356-3072

ALDRICH CHEMICAL -- PYRENE, 99%, 18551-5
MATERIAL SAFETY DATA SHEET
NSN: 685000N014585
Manufacturer's CAGE: 60928
Part No. Indicator: A
Part Number/Trade Name: PYRENE, 99%, 18551-5

=====
General Information
=====

Company's Name: ALDRICH CHEMICAL CO
Company's P. O. Box: 355
Company's City: MILWAUKEE
Company's State: WI
Company's Country: US
Company's Zip Code: 53201
Company's Info Ph #: 414-273-3850
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SMJ
Date MSDS Prepared: 24JAN90
Safety Data Review Date: 25MAR91
MSDS Serial Number: BKPQW
Hazard Characteristic Code: N1

=====
Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: PYRENE (SARA III)
Ingredient Sequence Number: 01
Percent: 99
NIOSH (RTECS) Number: UR2450000
CAS Number: 129-00-0
OSHA PEL: NOT ESTABLISHED
ACGIH TLV: NOT ESTABLISHED

=====
Physical/Chemical Characteristics
=====

Appearance And Odor: YELLOW CRYSTALS AND POWDER
Boiling Point: 739F, 393C
Melting Point: 300F, 149C
Vapor Pressure (MM Hg/70 F): VERY LOW
Vapor Density (Air=1): N/A
Specific Gravity: 1.271 (FP N)
Evaporation Rate And Ref: NOT APPLICABLE
Solubility In Water: INSOLUBLE (FP N)
pH: N/A

=====
Fire and Explosion Hazard Data
=====

Extinguishing Media: WATER SPRAY. CO*2, DRY CHEMICAL POWDER, ALCOHOL OR
POLYMER FOAM.
Special Fire Fighting Proc: WEAR NIOSH/MSHA APPROVED SCBA AND FULL
PROTECTIVE EQUIPMENT TO PREVENT CONTACT WITH SKIN AND EYES.
Unusual Fire And Expl Hazrds: NONE SPECIFIED BY MANUFACTURER.

=====
Reactivity Data
=====

Stability: YES
Cond To Avoid (Stability): NONE SPECIFIED BY MANUFACTURER.
Materials To Avoid: STRONG OXIDIZING AGENTS.
Hazardous Decomp Products: TOXIC FUMES OF: CO, CO*2
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NOT RELEVANT

=====
Health Hazard Data
=====

LD50-LC50 Mixture: SEE SUPP DATA
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: NO
Health Haz Acute And Chronic: ACUTE: HARMFUL IF SWALLOWED. MAY BE HARMFUL IF INHALED. MAY CAUSE EYE OR SKIN IRRITATION. INHALATION STUDIES IN ANIMALS HAVE CAUSED HEPATIC, PULMONARY & INTRAGASTRIC PATHOLOGIC CHANGES. NEUTROPHIL, LEUKOCYTE & ERYTHROCYTE LEVELS DECREASED. CUTANEOUS APPLICATION CAUSED HYPEREMIA, WEIGHT LOSS AND (SEE EFTS OF OVEREXP)
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: N/A
Signs/Symptoms Of Overexp: HLTH HAZ: HEMATOPOIETIC CHANGES AND DERMATITIS. PYRENE IS READILY ABSORBED THROUGH THE SKIN (FP N). CHRONIC: LEUKOCYTOSIS. DERMATITIS (FP N). TARGET ORGANS: LIVER, KIDNEY, LUNG, SKIN AND BLOOD SYSTEM (FP N).
Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER.
Emergency/First Aid Proc: EYES: IMMEDIATELY FLUSH WITH COPIOUS AMOUNTS OF WATER FOR AT LEAST 15 MINUTES. SKIN: IMMEDIATELY WASH WITH SOAP AND COPIOUS AMOUNTS OF WATER. INHAL: REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN. CALL MD. WASH CONTAMINATED CLOTHING BEFORE REUSE.

=====
Precautions for Safe Handling and Use
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Steps If Matl Released/Spill: WEAR NIOSH/MSHA APPROVED SCBA, RUBBER BOOTS AND HEAVY RUBBER GLOVES. SWEEP UP, PLACE IN A BAG AND HOLD FOR WASTE DISPOSAL. AVOID RAISING DUST. VENTILATE AREA AND WASH SPILL SITE AFTER MATERIAL PICKUP IS COMPLETE.
Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.
Waste Disposal Method: DISSOLVE OR MIX THE MATERIAL WITH A COMBUSTIBLE SOLVENT AND BURN IN A CHEMICAL INCINERATOR EQUIPPED WITH AN AFTERBURNER AND SCRUBBER. DISPOSE I/A/W FEDERAL, STATE AND LOCAL LAWS.
Precautions-Handling/Storing: KEEP TIGHTLY CLOSED. STORE IN A COOL, DRY PLACE.
Other Precautions: AVOID INHALATION. DO NOT GET IN EYES, ON SKIN OR CLOTHING. AVOID PROLONGED OR REPEATED EXPOSURE. HARMFUL VAPOR.

=====
Control Measures
=====

Respiratory Protection: NIOSH/MSHA APPROVED RESPIRATOR.
Ventilation: MECHANICAL EXHAUST REQUIRED.
Protective Gloves: RUBBER GLOVES
Eye Protection: CHEMICAL WORKERS GOGGLES (FP N)
Other Protective Equipment: RUBBER BOOTS, SAFETY SHOWER AND EYE BATH
Work Hygienic Practices: WASH HANDS THOROUGHLY AFTER USE AND BEFORE EATING, DRINKING, SMOKING OR USING SANITARY FACILITIES (FP N).
Suppl. Safety & Health Data: LD50-LC50 MIX: LD50: (ORL/RAT)=2700 MG/KG, (ORL/MUS)=800 MG/KG, (IPR/MUS)=514 MG/KG.

=====
Transportation Data
=====

Trans Data Review Date: 91269
DOT PSN Code: ZZZ
DOT Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION
IMO PSN Code: ZZZ
IMO Proper Shipping Name: NOT REGULATED FOR THIS MODE OF TRANSPORTATION
IATA PSN Code: ZZZ
IATA Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION
AFI PSN Code: ZZZ

AFI Prop. Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION
Additional Trans Data: NOT REGULATED FOR TRANSPORTATION

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Disposal Data
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Label Data
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Label Required: YES
Technical Review Date: 25MAR91
Label Status: G
Common Name: PYRENE, 99%
Chronic Hazard: YES
Signal Word: WARNING!
Acute Health Hazard-Moderate: X
Contact Hazard-Slight: X
Fire Hazard-None: X
Reactivity Hazard-None: X
Special Hazard Precautions: ACUTE: MAY BE HARMFUL IF INGESTED OR INHALED.
MAY CAUSE EYE & SKIN IRRITATION. AVOID BREATHING DUST. KEEP CONTAINER
CLOSED. USE WITH ADEQUATE VENTILATION. AVOID CONTACT WITH EYES, SKIN AND
CLOTHING. WASH THOROUGHLY AFTER HANDLING. FIRE HAZARD NOT DETERMINED.
CHRONIC: POSSIBLE CANCER HAZARD BASED ON ANIMAL DATA. TARGET ORGANS: LIVER,
KIDNEY, SKIN, LUNGS AND BLOOD SYSTEM.
Protect Eye: Y
Protect Skin: Y
Protect Respiratory: Y
Label Name: ALDRICH CHEMICAL CO
Label P.O. Box: 355
Label City: MILWAUKEE
Label State: WI
Label Zip Code: 53201
Label Country: US

POLYSCIENCE -- DIELDRIN, 510C-12
MATERIAL SAFETY DATA SHEET
NSN: 681000N047403
Manufacturer's CAGE: 58378
Part No. Indicator: A
Part Number/Trade Name: DIELDRIN, 510C-12

=====
General Information
=====

Company's Name: POLYSCIENCE
Company's Street: 7800 MERRIMAC AVE
Company's City: NILES
Company's State: IL
Company's Country: US
Company's Zip Code: 60648
Company's Emerg Ph #: 321-965-0611
Company's Info Ph #: 321-965-0611
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SMJ
Date MSDS Prepared: 01MAR92
Safety Data Review Date: 14NOV95
MSDS Serial Number: BTYBT
Hazard Characteristic Code: T3

=====
Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: 1,4:5,8-DIMETHANONAPHTHALENE, 1,2,3,4,10,10- HEXACHLORO-6,7-
EPOXY-1,4,4A,5,6,7,8,8A-OCTAHYDRO, ENDO, EXO-; (ING 2)
Ingredient Sequence Number: 01
NIOSH (RTECS) Number: IO1750000
CAS Number: 60-57-1
OSHA PEL: 0.25 MG/M3, S
ACGIH TLV: 0.25 MG/M3, S

Proprietary: NO
Ingredient: ING 1: (DIELDRIN (SARA III))
Ingredient Sequence Number: 02
NIOSH (RTECS) Number: 9999999ZZ
OSHA PEL: NOT APPLICABLE
ACGIH TLV: NOT APPLICABLE

=====
Physical/Chemical Characteristics
=====

Appearance And Odor: ORANGE-TAN POWDER
Melting Point: 289F,143C
Vapor Density (Air=1): 13.2

=====
Fire and Explosion Hazard Data
=====

Extinguishing Media: WATER SPRAY, CARBON DIOXIDE, DRY CHEMICAL POWDER OR
APPROPRIATE FOAM.
Special Fire Fighting Proc: WEAR NIOSH/MSHA APPROVED SCBA AND FULL
PROTECTIVE EQUIPMENT (FP N).
Unusual Fire And Expl Hazrds: EMITS TOXIC FUMES UNDER FIRE CONDITIONS.

=====
Reactivity Data
=====

Stability: YES
Cond To Avoid (Stability): NONE SPECIFIED BY MANUFACTURER.
Materials To Avoid: STRONG OXIDIZING AGENTS.
Hazardous Decomp Products: TOXIC FUMES OF: CARBON MONOXIDE, CARBON

DIOXIDE, HYDROGEN CHLORIDE GAS.
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NOT RELEVANT

Health Hazard Data

LD50-LC50 Mixture: LD50: (ORAL, RAT) 38300 UG/KG
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: ACUTE: MAY BE FATAL IF INHALED, SWALLOWED,
OR ABSORBED THROUGH SKIN. MAY CAUSE IRRITATION. CARCINOGEN. MAY ALTER
GENETIC MATERIAL. OVEREXP MAY CAUSE REPROD DISORDER(S) BASED ON TESTS W/LAB
ANIMALS. TARGET ORGANS: CNS, LIVER, BLOOD. OVEREXP CAN CAUSE: MALAISE,
HEADACHE, NAUSEA, VOMITING, DIZZ, (EFTS OF OVEREXP)
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NOT RELEVANT
Signs/Symptoms Of Overexp: HLTH HAZ: TREMORS, CLONIC AND TONIC
CONVULSIONS, COMA, RESPIRATORY FAILURE.
Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER.
Emergency/First Aid Proc: EYE/SKIN: FLUSH WITH COPIOUS AMOUNTS OF WATER
REMOVE TO FRESH AIR. IF NOT BRTHG GIVE ARTF RESP. IF BRTHG IS DIFFICULT,
GIVE OXYGEN. INGEST: WASH OUT MOUTH WITH WATER PROVIDED PERSON IS
CONSCIOUS. CALL A PHYSICIAN. WASH CONTAMINATED CLOTHING BEFORE REUSE.

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: EVACUATE AREA. WEAR NIOSH/MSHA APPROVED
SCBA, RUBBER BOOTS AND HEAVY RUBBER GLOVES. SWEEP UP, PLACE IN BAG AND HOLD
FOR WASTE DISPOSAL. AVOID RAISING DUST. VENTILATE AREA AND WASH SPILL SITE
AFTER MATL PICKUP IS COMPLETE.
Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.
Waste Disposal Method: DISSOLVE OR MIX THE MATL W/A COMBUSTIBLE SOLVENT
AND BURN IN A CHEMICAL INCINERATOR EQUIPPED WITH AFTERBURNER AND SCRUBBER.
OBSERVE ALL FEDERAL, STATE AND LOCAL LAWS.
Precautions-Handling/Storing: DO NOT BREATHE DUST. DO NOT GET IN EYES, ON
SKIN, ON CLOTHING. AVOID PRLNGD/RPTD EXPOSURE. READILY ABSORBED THROUGH
SKIN. HIGHTLY TOXIC. CARCINOGEN.
Other Precautions: MUTAGEN. REPRODUCTIVE HAZARD. KEEP TIGHTLY CLOSED. STORE
IN A COOL DRY PLACE. MAY CAUSE CANCER. MAY CAUSE HERITABLE GENETIC DAMAGE.
VERY TOXIC BY INHALATION, IN CONTACT WITH SKIN & IF SWALLOWED. IF YOU FEEL
UNWELL, SEEK MED ADVICE.

Control Measures

Respiratory Protection: WEAR APPROPRIATE NIOSH/MSHA APPROVED RESPIRATOR.
Ventilation: USE ONLY IN A CHEMICAL FUME HOOD.
Protective Gloves: CHEMICAL-RESISTANT GLOVES.
Eye Protection: ANSI APPROVED CHEM WORK GOGG (FP N).
Other Protective Equipment: PROTECTIVE CLOTHING. ANSI APPROVED SAFETY
SHOWER AND EYE BATH (FP N).
Work Hygienic Practices: WASH THOROUGHLY AFTER HANDLING.
Suppl. Safety & Health Data: NONE SPECIFIED BY MANUFACTURER.

Transportation Data

Disposal Data

Label Data

Label Required: YES
Technical Review Date: 26JAN94
Label Date: 19JAN94
Label Status: G
Common Name: DIELDRIN, 510C-12
Chronic Hazard: YES
Signal Word: DANGER!
Acute Health Hazard-Severe: X
Contact Hazard-Severe: X
Fire Hazard-None: X
Reactivity Hazard-None: X
Special Hazard Precautions: ACUTE: MAY BE FATAL IF INHALED, SWALLOWED OR MALAISE, HEADACHE, NAUSEA, VOMITING, DIZZINESS, TREMORS, CLONIC AND TONIC CONVULSIONS, COMA, RESPIRATORY FAILURE. CHRONIC: CARCINOGEN. MAY ALTER GENETIC MATERIAL. OVEREXPOSURE MAY CAUSE REPRODUCTIVE DISORDER(S) BASED ON TESTS W/LAB ANIMALS. TARGET ORGANS: CNS, LIVER, BLOOD.
Protect Eye: Y
Protect Skin: Y
Protect Respiratory: Y
Label Name: POLYSCIENCE
Label Street: 7800 MERRIMAC AVE
Label City: NILES
Label State: IL
Label Zip Code: 60648
Label Country: US
Label Emergency Number: 321-965-0611

CHEM SERVICE -- F202AS ENDOSULFAN I 100 MG-ML IN +-BUTYLMETHYL
MATERIAL SAFETY DATA SHEET
NSN: 655000F050829
Manufacturer's CAGE: 8Y898
Part No. Indicator: A
Part Number/Trade Name: F202AS ENDOSULFAN I 100 MG/ML IN +-BUTYLMETHYL
ETHER

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General Information
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Company's Name: CHEM SERVICE INC
Company's Street: 660 TOWER LN
Company's P. O. Box: 3108
Company's City: WEST CHESTER
Company's State: PA
Company's Country: US
Company's Zip Code: 19381-3108
Company's Emerg Ph #: 215-386-2100/215-692-3026
Company's Info Ph #: 215-692-3026/800-452-9994
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SE
Date MSDS Prepared: 01DEC90
Safety Data Review Date: 12SEP96
Preparer's Company: CHEM SERVICE INC
Preparer's St Or P. O. Box: 660 TOWER LN
Preparer's City: WEST CHESTER
Preparer's State: PA
Preparer's Zip Code: 19381-3108
MSDS Serial Number: CCDBM

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Ingredients/Identity Information
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Proprietary: NO
Ingredient: ENDOSULFAN I *96-3*
Ingredient Sequence Number: 01
NIOSH (RTECS) Number: RB9275100
CAS Number: 959-98-8

Proprietary: NO
Ingredient: METHYL TERT BUTYL ETHER (MTBE), 2-METHOXY-2-METHYL PROPANE,
T-BUTYLMETHYL ETHER *96-3*
Ingredient Sequence Number: 02
NIOSH (RTECS) Number: KN5250000
CAS Number: 1634-04-4

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Physical/Chemical Characteristics
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Appearance And Odor: COLORLESS LIQUID W/ETHER LIKE ODOR.
Boiling Point: 131.3F
Melting Point: -164.2F
Vapor Pressure (MM Hg/70 F): 245
Vapor Density (Air=1): 3.1
Solubility In Water: SLIGHT

=====
Fire and Explosion Hazard Data
=====

Flash Point: 18.4F
Lower Explosive Limit: 1.6
Upper Explosive Limit: 15.1
Extinguishing Media: CO2, DRY CHEMICAL POWDER/SPRAY
Unusual Fire And Expl Hazrds: AUTOIGNITION TEMP: 377.6F. FORMS EXPLOSIVE
MIXTURES IN AIR, MAY TRAVEL CONSIDERABLE DISTANCES TO IGNITION SOURCES &

FLASH BACK.

=====
Reactivity Data
=====

Stability: YES
Materials To Avoid: STRONG OXIDIZING AGENTS, STRONG ACIDS
Hazardous Decomp Products: TOXIC FUMES
Hazardous Poly Occur: NO
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Health Hazard Data
=====

Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: MAY BE HARMFUL BY INHALATION, INGESTION &
SKIN ABSORPTION. INGESTION: FATAL AS A RESULT OF SPASM, INFLAMMATION &
EDEMA OF THE LARYNX & BRON-CHEMICAL PNEUMONITIS & PULMONARY EDEMA.
IRRITATION TO EYES, MUCOUS MEMBRANES, UPPER RESPIRATORY TRACT & SKIN.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NONE
Signs/Symptoms Of Overexp: IRRITATION.
Emergency/First Aid Proc: EYES: FLUSH W/WATER FOR 15-20 MINS. SKIN: FLUSH
W/WATER. IF NO BURNS OCCUR, USE SOAP & WATER TO CLEANSE. INHALATION: REMOVE
TO FRESH AIR. GIVE OXYGEN/CPR IF NEEDED. IF PATIENT IS EXHIBITING SIGNS OF
SHOCK, KEEP WARM & QUIET. INGESTION: RINSE OUT MOUTH W/WATER, PROVIDING
PERSON IS CONSCIOUS. OBTAIN MEDICAL ATTENTION IN ALL CASES.
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Precautions for Safe Handling and Use
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Steps If Matl Released/Spill: EVACUATE & VENTILATE AREA. WEAR APPROPRIATE
EQUIPMENT. SWEEP UP & PLACE IN AN APPROPRIATE CONTAINER/DISPOSAL. WASH
CONTAMINATED SURFACES TO REMOVE ANY RESIDUES.
Waste Disposal Method: BURN IN A CHEMICAL INCINERATOR EQUIPPED W/
AFTERBURNER & SCRUBBER. DISPOSE OF IAW/FEDERAL, STATE & LOCAL REGULATIONS.
Precautions-Handling/Storing: KEEP TIGHTLY CLOSED. STORE ONLY W/COMPATIBLE
CHEMICALS. STORE UNDER REFRIGERATION.
Other Precautions: AVOID CONTACT W/SKIN, EYES & CLOTHING. DON'T BREATHE
VAPORS. FOR LABORATORY USE ONLY.
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Control Measures
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Ventilation: HANDLE ONLY IN A HOOD.
Eye Protection: EYESHIELDS
Other Protective Equipment: WEAR APPROPRIATE OSHA REGULATED/APPROVED
EQUIPMENT.
Work Hygienic Practices: REMOVE/LAUNDRER CONTAMINATED CLOTHING BEFORE
REUSE.
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Transportation Data
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Disposal Data
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Label Data
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ULTRA SCIENTIFIC -- PP-210, ENDOSULFAN II SOLUTION AT 100 UG-ML
MATERIAL SAFETY DATA SHEET
NSN: 685000N058062
Manufacturer's CAGE: 0MU35
Part No. Indicator: A
Part Number/Trade Name: PP-210, ENDOSULFAN II SOLUTION AT 100 UG/ML
(SUPDAT)

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General Information
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Company's Name: ULTRA SCIENTIFIC
Company's Street: 250 SMITH ST
Company's City: N KINGSTOWN
Company's State: RI
Company's Country: US
Company's Zip Code: 02852
Company's Emerg Ph #: 401-294-9400
Company's Info Ph #: 401-294-9400
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SMJ
Date MSDS Prepared: 20SEP93
Safety Data Review Date: 10MAR95
MSDS Serial Number: BWZFS

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Ingredients/Identity Information
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Proprietary: NO
Ingredient: METHYL ALCOHOL; (METHANOL) (SARA 313) (CERCLA). LD50:(ORAL,
RAT) 12,900 MG/KG.
Ingredient Sequence Number: 01
Percent: 99.99
NIOSH (RTECS) Number: PC1400000
CAS Number: 67-56-1
OSHA PEL: 200 PPM, S
ACGIH TLV: 200 PPM;250 STEL, S

Proprietary: NO
Ingredient: 5-NORBORNENE-2, 3-DIMETHANOL, 1,4,5,6,7,7- HEXACHLORO-, CYCLIC
SULFITE, EXO-; (ENDOSULFAN II) (CERCLA)
Ingredient Sequence Number: 02
Percent: 0.013
NIOSH (RTECS) Number: RB9875200
CAS Number: 33213-65-9
OSHA PEL: N/K (FP N)
ACGIH TLV: N/K (FP N)

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Physical/Chemical Characteristics
=====

Appearance And Odor: LIQUID.

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Fire and Explosion Hazard Data
=====

Flash Point: NOT APPLICABLE
Extinguishing Media: CARBON DIOXIDE, DRY CHEMICAL POWDER OR WATER SPRAY.
Special Fire Fighting Proc: USE NIOSH/MSHA APPROVED SCBA & FULL PROTECTIVE
EQUIPMENT (FP N).
Unusual Fire And Expl Hazrds: COMBUSTIBLE.

=====
Reactivity Data
=====

Stability: YES
Cond To Avoid (Stability): LOW REACTIVITY.

Materials To Avoid: NONE SPECIFIED BY MANUFACTURER.
Hazardous Decomp Products: NONE SPECIFIED BY MANUFACTURER.
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NOT RELEVANT

=====
Health Hazard Data
=====

LD50-LC50 Mixture: SEE INGREDIENT 1.
Route Of Entry - Inhalation: NO
Route Of Entry - Skin: NO
Route Of Entry - Ingestion: NO
Health Haz Acute And Chronic: CONTAINS CARCINOGEN(S) OR CANCER SUSPECT AGENT(S). TOXIC; IRRITANT. ALL CHEMICALS SHOULD BE CONSIDERED HAZARDOUS - DIRECT PHYSICAL CONTACT SHOULD BE AVOIDED.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NOT RELEVANT
Signs/Symptoms Of Overexp: SEE HEALTH HAZARDS.
Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER.
Emergency/First Aid Proc: INGEST:CALL MD IMMEDIATELY (FP N). SKIN: FLUSH W/COPIOUS AMOUNTS OF WATER. EYES:FLUSH W/COPIOUS AMOUNTS OF WATER FOR AT LEAST 15 MINUTES. INHAL:REMOVE TO FRESH AIR - GIVE OXYGEN, IF NECESSARY. CONTACT MD.

=====
Precautions for Safe Handling and Use
=====

Steps If Matl Released/Spill: DUE TO THE SMALL QUANTITY INVOLVED, SPILLS OR LEAKS SHOULD NOT POSE A SIGNIFICANT PROBLEM. A LEAKING BOTTLE MAY BE PLACED IN A PLASTIC BAG & NORMAL DISPOSAL PROCEDURES FOLLOWED. LIQUID SAMPLES MAY BE ABSORBED ON VERMICULITE OR SAND.
Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.
Waste Disposal Method: BURN IN A CHEMICAL INCINERATOR EQUIPPED W/ AFTERBURNER & SCRUBBER. OBSERVE ALL FEDERAL, STATE & LOCAL LAWS CONCERNING DISPOSAL.
Precautions-Handling/Storing: KEEP TIGHTLY CLOSED & STORE IN A COOL, DRY PLACE.
Other Precautions: THIS MATERIAL SHOULD ONLY BE USED BY THOSE PERSONS TRAINED IN THE SAFE HANDLING OF HAZARDOUS CHEMICALS.

=====
Control Measures
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Respiratory Protection: NIOSH/MSHA APPROVED RESPIRATOR APPROPRIATE FOR EXPOSURE OF CONCERN (FP N).
Ventilation: NONE SPECIFIED BY MANUFACTURER.
Protective Gloves: IMPERVIOUS GLOVES (FP N).
Eye Protection: ANSI APPROVED CHEM WORKERS GOGGS(SUPDAT)
Other Protective Equipment: EYE WASH FOUNTAIN & DELUGE SHOWER WHICH MEET ANSI DESIGN CRITERIA (FP N). USE APPROP NIOSH/MSHA APPRVD SAFETY (SUPDAT)
Work Hygienic Practices: NONE SPECIFIED BY MANUFACTURER.
Suppl. Safety & Health Data: MFR'S TRADE NAME/PART NO:IN METHANOL. EYE PROT:& FULL LENGTH FACESHIELD (FP N). OTHER PROT EQUIP:EQUIPMENT. WEAR CHEMICAL RESISTANT CLOTHING SUCH AS LAB COAT &/OR RUBBER APRON TO PREVENT CONTACT W/EYES, SKIN & CLOTHING.

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Transportation Data
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Disposal Data
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Label Data
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Label Required: YES

Technical Review Date: 10MAR95
Label Date: 09MAR95
Label Status: G
Common Name: PP-210, ENDOSULFAN II SOLUTION AT 100 UG/ML
(SUPDAT)
Chronic Hazard: YES
Signal Word: WARNING!
Acute Health Hazard-Slight: X
Contact Hazard-Moderate: X
Fire Hazard-Moderate: X
Reactivity Hazard-None: X
Special Hazard Precautions: TOXIC. IRRITANT. ACUTE:ALL CHEMICALS SHOULD BE
CONTAINS CARCINOGEN(S) OR CANCER SUSPECT AGENT(S).
Protect Eye: Y
Protect Skin: Y
Protect Respiratory: Y
Label Name: ULTRA SCIENTIFIC
Label Street: 250 SMITH ST
Label City: N KINGSTOWN
Label State: RI
Label Zip Code: 02852
Label Country: US
Label Emergency Number: 401-294-9400

ULTRA SCIENTIFIC -- RPK-1A AROCLOR 1016 AT 100 UG-ML IN HEXANE
MATERIAL SAFETY DATA SHEET
NSN: 681000F036740
Manufacturer's CAGE: OMU35
Part No. Indicator: A
Part Number/Trade Name: RPK-1A AROCLOR 1016 AT 100 UG/ML IN HEXANE

General Information

Company's Name: ULTRA SCIENTIFIC
Company's Street: 250 SMITH STREET
Company's City: NORTH KINGSTOWN
Company's State: RI
Company's Country: US
Company's Zip Code: 02852
Company's Emerg Ph #: 401-294-9400
Company's Info Ph #: 401-294-9400
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: KE
Date MSDS Prepared: 23NOV93
Safety Data Review Date: 30SEP94
Preparer's Company: ULTRA SCIENTIFIC
Preparer's St Or P. O. Box: 250 SMITH STREET
Preparer's City: NORTH KINGSTOWN
Preparer's State: RI
Preparer's Zip Code: 02852
MSDS Serial Number: BVSHK

Ingredients/Identity Information

Proprietary: NO
Ingredient: HEXANE, N-HEXANE
Ingredient Sequence Number: 01
Percent: 99.87
NIOSH (RTECS) Number: MN9275000
CAS Number: 110-54-3
OSHA PEL: 1800 MG/CUM
ACGIH TLV: 176 MG/CUM
Other Recommended Limit: 50 PPM

Proprietary: NO
Ingredient: POLYCHLORINATED BIPHENYL, PCB, AROCLOR 1016 (CL 41%) *94-3*
Ingredient Sequence Number: 02
Percent: 0.015
NIOSH (RTECS) Number: TQ1351000
CAS Number: 12674-11-2
Other Recommended Limit: 0.001 MG/CUM NIOSH

Physical/Chemical Characteristics

Appearance And Odor: LIQUID

Fire and Explosion Hazard Data

Extinguishing Media: CO2, DRY CHEMICAL POWDER/WATER SPRAY

Reactivity Data

Stability: YES
Hazardous Poly Occur: NO

Health Hazard Data

=====
Route Of Entry - Inhalation: NO
Route Of Entry - Skin: NO
Route Of Entry - Ingestion: NO
Health Haz Acute And Chronic: TOXIC; IRRITANT.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NONE
Signs/Symptoms Of Overexp: TOXIC; IRRITANT.
Emergency/First Aid Proc: EYE/SKIN: FLUSH W/COPIOUS AMOUNTS OF WATER.
INHALATION: REMOVE TO FRESH AIR. GIVE OXYGEN IF NECESSARY. OBTAIN MEDICAL
ATTENTION IN ALL CASES.
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Precautions for Safe Handling and Use
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Steps If Matl Released/Spill: A LEAKING BOTTLE MAY BE PLACED IN A PLASTIC
BAG & NORMAL DISPOSAL PROCEDURES FOLLOWED. LIQUID SAMPLES MAY BE ABSORBED
ON VERMICULITE/SNAD.
Waste Disposal Method: BURN IN A CHEMICAL INCINERATOR EQUIPPED W/AN
AFTERBURNER & SCRUBBER. OBSERVE ALL FEDERAL, STATE & LOCAL LAWS CONCERNING
DISPOSAL.
Precautions-Handling/Storing: USE APPROPRIATE OSHA/MSHA APPROVED SAFETY
EQUIPMENT. KEEP TIGHTLY CLOSED & STORE IN A COOL, DRY PLACE.
Other Precautions: PREVENT CONTACT W/EYES & SKIN. MATERIAL SHOULD BE USED
BY THOSE PERSONS TRAINED IN THE SAFE HANDLING OF HAZARDOUS CHEMICALS. ALL
CHEMICALS SHOULD BE CONSIDERED HAZARDOUS, DIRECT PHYSICAL CONTACT SHOULD BE
AVOIDED.
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Control Measures
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Respiratory Protection: USE OSHA/MSMA APPROVED SAFETY EQUIPMENT
Protective Gloves: CHEMICAL RESISTANT
Eye Protection: CHEMICAL GOGGLES, FACE SHIELD
Other Protective Equipment: CHEMICAL RESISTANT CLOTHING: LAB COAT, RUBBER
APRON.
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Transportation Data
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Disposal Data
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Label Data
=====

Label Required: YES
Label Status: G
Common Name: RPCK-1A AROCLOR 1016 AT 100 UG/ML IN HEXANE
Special Hazard Precautions: TOXIC; IRRITANT. TOXIC; IRRITANT.
Label Name: ULTRA SCIENTIFIC
Label Street: 250 SMITH STREET
Label City: NORTH KINGSTOWN
Label State: RI
Label Zip Code: 02852
Label Country: US
Label Emergency Number: 401-294-9400

ULTRA SCIENTIFIC -- 1242TK-B AROCLOR 1242 AT 50 UG-GM - IN PCB FREE TRANSFORMER OI
MATERIAL SAFETY DATA SHEET
NSN: 655000F040199
Manufacturer's CAGE: 0MU35
Part No. Indicator: A
Part Number/Trade Name: 1242TK-B AROCLOR 1242 AT 50 UG/GM

=====
General Information
=====

Item Name: IN PCB FREE TRANSFORMER OIL - AROCLOR 1242 KIT
Company's Name: ULTRA SCIENTIFIC
Company's Street: 250 SMITH STREET
Company's City: NORTH KINGSTOWN
Company's State: RI
Company's Country: US
Company's Zip Code: 02852-5000
Company's Emerg Ph #: 401-294-9400
Company's Info Ph #: 401-294-9400
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 002
Status: KE
Date MSDS Prepared: 09FEB95
Safety Data Review Date: 31MAY95
Preparer's Company: ULTRA SCIENTIFIC
Preparer's St Or P. O. Box: 250 SMITH STREET
Preparer's City: NORTH KINGSTOWN
Preparer's State: RI
Preparer's Zip Code: 02852-5000
MSDS Serial Number: BXLZDZ

=====
Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: TRANSFORMER OIL
Ingredient Sequence Number: 01
Percent: 99.95
NIOSH (RTECS) Number: 1001743TO

Proprietary: NO
Ingredient: CHLORODIPHENYL (42% CL), PCB, POLYCHLORINATED BIPHENYL,
AROCHLOR 1242 (SUSPECTED HUMAN CARCINOGEN BY IARC - 2A) *95-1*
Ingredient Sequence Number: 02
Percent: 0.05
NIOSH (RTECS) Number: TQ1356000
CAS Number: 53469-21-9
OSHA PEL: 1 MG/CUM
ACGIH TLV: 1 MG/CUM
Other Recommended Limit: 0.001 MG/CUM NIOSH

=====
Physical/Chemical Characteristics
=====

Appearance And Odor: LIQUID

=====
Fire and Explosion Hazard Data
=====

Flash Point: COMBUSTIBLE
Extinguishing Media: CO2, DRY CHEMICAL POWDER/WATER SPRAY

=====
Reactivity Data
=====

Stability: YES
Materials To Avoid: STRONG OXIDIZERS
Hazardous Poly Occur: NO

=====
Health Hazard Data
=====

LD50-LC50 Mixture: ORAL LD50(RAT): 4250 MG/KG AROCLOR 1242
Route Of Entry - Inhalation: NO
Route Of Entry - Skin: NO
Route Of Entry - Ingestion: NO
Health Haz Acute And Chronic: TOXIC; IRRITANT.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: YES
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: SEE INGREDIENTS.
Signs/Symptoms Of Overexp: TOXIC; IRRITANT.
Emergency/First Aid Proc: EYES/SKIN: FLUSH W/COPIOUS AMOUNTS OF WATER.
INHALATION: REMOVE TO FRESH AIR, GIVE OXYGEN IF NECESSARY. OBTAIN MEDICAL
ATTENTION IN ALL CASES.

=====
Precautions for Safe Handling and Use
=====

Steps If Matl Released/Spill: A LEAKING BOTTLE MAY BE PLACED IN A PLASTIC
BAG & NORMAL DISPOSAL PROCEDURES FOLLOWED. LIQUID SAMPLES MAY BE ABSORBED
ON VERMICULITE/SAND.
Waste Disposal Method: BURN IN A CHEMICAL INCINERATOR EQUIPPED W/AN
AFTERBURNER & SCRUBBER IN ACCORDANCE W/LOCAL, STATE & FEDERAL REGULATIONS.
Precautions-Handling/Storing: KEEP TIGHTLY CLOSED & STORE IN A COOL, DRY
PLACE.
Other Precautions: THIS MATERIAL SHOULD ONLY BE USED BY THOSE PERSONS
TRAINED IN THE SAFE HANDLING OF HAZARDOUS CHEMICALS. PREVENT CONTACT W/
EYES, SKIN & CLOTHING.

=====
Control Measures
=====

Respiratory Protection: USE APPROPRIATE OSHA/MSHA APPROVED SAFETY
EQUIPMENT.
Protective Gloves: CHEMICAL RESISTANT
Eye Protection: CHEMICAL GOGGLES, FACE SHIELD
Other Protective Equipment: CHEMICAL RESISTANT CLOTHING, LABORATORY COAT,
RUBBER APRON
Suppl. Safety & Health Data: ALL CHEMICALS SHOULD BE CONSIDERED
HAZARDOUS-DIRECT PHYSICAL CONTACT SHOULD BE AVOIDED.

=====
Transportation Data
=====

=====
Disposal Data
=====

=====
Label Data
=====

Label Required: YES
Label Status: G
Common Name: 1242TK-B AROCLOR 1242 AT 50 UG/GM
Special Hazard Precautions: TOXIC; IRRITANT. TOXIC; IRRITANT.
Label Name: ULTRA SCIENTIFIC
Label Street: 250 SMITH STREET
Label City: NORTH KINGSTOWN
Label State: RI
Label Zip Code: 02852-5000
Label Country: US
Label Emergency Number: 401-294-9400

ULTRA SCIENTIFIC -- RPKC-1A AROCLOR 1248 AT 100 UG-ML IN HEXANE
MATERIAL SAFETY DATA SHEET
NSN: 681000F036744
Manufacturer's CAGE: 0MU35
Part No. Indicator: E
Part Number/Trade Name: RPKC-1A AROCLOR 1248 AT 100 UG/ML IN HEXANE

=====
General Information
=====

Company's Name: ULTRA SCIENTIFIC
Company's Street: 250 SMITH STREET
Company's City: NORTH KINGSTOWN
Company's State: RI
Company's Country: US
Company's Zip Code: 02852
Company's Emerg Ph #: 401-294-9400
Company's Info Ph #: 401-294-9400
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: KE
Date MSDS Prepared: 23NOV93
Safety Data Review Date: 25OCT94
Preparer's Company: ULTRA SCIENTIFIC
Preparer's St Or P. O. Box: 250 SMITH STREET
Preparer's City: NORTH KINGSTOWN
Preparer's State: RI
Preparer's Zip Code: 02852
MSDS Serial Number: BVSHP

=====
Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: HEXANE, N-HEXANE
Ingredient Sequence Number: 01
Percent: 99.87
NIOSH (RTECS) Number: MN9275000
CAS Number: 110-54-3
OSHA PEL: 1800 MG/CUM
ACGIH TLV: 176 MG/CUM
Other Recommended Limit: 50 PPM

Proprietary: NO
Ingredient: POLYCHLORINATED BIPHEYNL, PCB, AROCLOR 1248, (CL 48%)
(SUSPECTED HUMAN CARCINOGEN BY IARC) * 94-3 *
Ingredient Sequence Number: 02
Percent: 0.015
NIOSH (RTECS) Number: TQ1358000
CAS Number: 12672-29-6
Other Recommended Limit: 0.001 MG/CUM NIOSH

=====
Physical/Chemical Characteristics
=====

Appearance And Odor: LIQUID

=====
Fire and Explosion Hazard Data
=====

Extinguishing Media: CO2, DRY CHEMICAL POWDER/WATER SPRAY

=====
Reactivity Data
=====

Stability: YES
Hazardous Poly Occur: NO

Health Hazard Data

LD50-LC50 Mixture: ORAL LD50(RAT): 11,000 MG/KG
Route Of Entry - Inhalation: NO
Route Of Entry - Skin: NO
Route Of Entry - Ingestion: NO
Health Haz Acute And Chronic: TOXIC; IRRITANT.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NONE
Signs/Symptoms Of Overexp: TOXIC; IRRITANT.
Emergency/First Aid Proc: EYE/SKIN: FLUSH W/COPIOUS AMOUNTS OF WATER.
INHALATION: REMOVE TO FRESH AIR. GIVE OXYGEN IF NECESSARY. OBTAIN MEDICAL ATTENTION IN ALL CASES.

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: A LEAKING BOTTLE MAY BE PLACED IN A PLASTIC BAG & NORMAL DISPOSAL PROCEDURES FOLLOWED. LIQUID SAMPLES MAY BE ABSORBED ON VERMICULITE/SNAD.
Waste Disposal Method: BURN IN A CHEMICAL INCINERATOR EQUIPPED W/AN AFTERBURNER & SCRUBBER. OBSERVE ALL FEDERAL, STATE & LOCAL LAWS CONCERNING DISPOSAL.
Precautions-Handling/Storing: USE APPROPRIATE OSHA/MSHA APPROVED SAFETY EQUIPMENT. KEEP TIGHTLY CLOSED & STORE IN A COOL, DRY PLACE.
Other Precautions: PREVENT CONTACT W/EYES & SKIN. MATERIAL SHOULD BE USED BY THOSE PERSONS TRAINED IN THE SAFE HANDLING OF HAZARDOUS CHEMICALS. ALL CHEMICALS SHOULD BE CONSIDERED HAZARDOUS, DIRECT PHYSICAL CONTACT SHOULD BE AVOIDED.

Control Measures

Respiratory Protection: USE OSHA/MSMA APPROVED SAFETY EQUIPMENT
Protective Gloves: CHEMICAL RESISTANT
Eye Protection: CHEMICAL GOGGLES, FACE SHIELD
Other Protective Equipment: CHEMICAL RESISTANT CLOTHING: LAB COAT, RUBBER APRON.

Transportation Data

Disposal Data

Label Data

Label Required: YES
Label Status: G
Common Name: RPK-1A AROCLOR 1248 AT 100 UG/ML IN HEXANE
Special Hazard Precautions: TOXIC; IRRITANT. TOXIC; IRRITANT.
Label Name: ULTRA SCIENTIFIC
Label Street: 250 SMITH STREET
Label City: NORTH KINGSTOWN
Label State: RI
Label Zip Code: 02852
Label Country: US
Label Emergency Number: 401-294-9400

ULTRA SCIENTIFIC -- 1254TK-B AROCLOR 1254 AT 50 UG-GM - IN PCB FREE TRANSFORMER OI
MATERIAL SAFETY DATA SHEET

NSN: 655000F040200

Manufacturer's CAGE: 0MU35

Part No. Indicator: A

Part Number/Trade Name: 1254TK-B AROCLOR 1254 AT 50 UG/GM

=====
General Information
=====

Item Name: IN PCB FREE TRANSFORMER OIL - AROCLOR 1254 KIT

Company's Name: ULTRA SCIENTIFIC

Company's Street: 250 SMITH STREET

Company's City: NORTH KINGSTOWN

Company's State: RI

Company's Country: US

Company's Zip Code: 02852-5000

Company's Emerg Ph #: 401-294-9400

Company's Info Ph #: 401-294-9400

Record No. For Safety Entry: 001

Tot Safety Entries This Stk#: 002

Status: KE

Date MSDS Prepared: 09FEB95

Safety Data Review Date: 31MAY95

Preparer's Company: ULTRA SCIENTIFIC

Preparer's St Or P. O. Box: 250 SMITH STREET

Preparer's City: NORTH KINGSTOWN

Preparer's State: RI

Preparer's Zip Code: 02852-5000

MSDS Serial Number: BXLFC
=====

Ingredients/Identity Information
=====

Proprietary: NO

Ingredient: TRANSFORMER OIL

Ingredient Sequence Number: 01

Percent: 99.95

NIOSH (RTECS) Number: 1001743TO

Proprietary: NO

Ingredient: CHLORODIPHENYL (54% CL), PCB, AROCLOR 1254, POLYCHLORINATED
BIPHENYL (SUSP HUMAN CARC BY IARC; NTP - GROUP 2A) *95-1*

Ingredient Sequence Number: 02

Percent: 0.05

NIOSH (RTECS) Number: TQ1360000

CAS Number: 11097-69-1

OSHA PEL: 0.5 MG/CUM (SKIN)

ACGIH TLV: 0.5 MG/CUM (SKIN)

Other Recommended Limit: 0.001 MG/CUM NIOSH
=====

Physical/Chemical Characteristics
=====

Appearance And Odor: LIQUID
=====

Fire and Explosion Hazard Data
=====

Flash Point: COMBUSTIBLE

Extinguishing Media: CO2, DRY CHEMICAL POWDER/WATER SPRAY
=====

Reactivity Data
=====

Stability: YES

Materials To Avoid: STRONG OXIDIZERS

Hazardous Poly Occur: NO

=====
Health Hazard Data
=====

LD50-LC50 Mixture: ORAL LD50(RAT): 1295 MG/KG AROCLOR 1254
Route Of Entry - Inhalation: NO
Route Of Entry - Skin: NO
Route Of Entry - Ingestion: NO
Health Haz Acute And Chronic: TOXIC; IRRITANT.
Carcinogenicity - NTP: YES
Carcinogenicity - IARC: YES
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: SEE INGREDIENTS.
Signs/Symptoms Of Overexp: TOXIC; IRRITANT.
Emergency/First Aid Proc: EYES/SKIN: FLUSH W/COPIOUS AMOUNTS OF WATER.
INHALATION: REMOVE TO FRESH AIR, GIVE OXYGEN IF NECESSARY. OBTAIN MEDICAL
ATTENTION IN ALL CASES.

=====
Precautions for Safe Handling and Use
=====

Steps If Matl Released/Spill: A LEAKING BOTTLE MAY BE PLACED IN A PLASTIC
BAG & NORMAL DISPOSAL PROCEDURES FOLLOWED. LIQUID SAMPLES MAY BE ABSORBED
ON VERMICULITE/SAND.
Waste Disposal Method: BURN IN A CHEMICAL INCINERATOR EQUIPPED W/AN
AFTERBURNER & SCRUBBER IN ACCORDANCE W/LOCAL, STATE & FEDERAL REGULATIONS.
Precautions-Handling/Storing: KEEP TIGHTLY CLOSED & STORE IN A COOL, DRY
PLACE.
Other Precautions: THIS MATERIAL SHOULD ONLY BE USED BY THOSE PERSONS
TRAINED IN THE SAFE HANDLING OF HAZARDOUS CHEMICALS. PREVENT CONTACT W/
EYES, SKIN & CLOTHING.

=====
Control Measures
=====

Respiratory Protection: USE APPROPRIATE OSHA/MSHA APPROVED SAFETY
EQUIPMENT.
Protective Gloves: CHEMICAL RESISTANT
Eye Protection: CHEMICAL GOGGLES, FACE SHIELD
Other Protective Equipment: CHEMICAL RESISTANT CLOTHING, LABORATORY COAT,
RUBBER APRON
Suppl. Safety & Health Data: ALL CHEMICALS SHOULD BE CONSIDERED
HAZARDOUS-DIRECT PHYSICAL CONTACT SHOULD BE AVOIDED.

=====
Transportation Data
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Disposal Data
=====

=====
Label Data
=====

Label Required: YES
Label Status: G
Common Name: 1254TK-B AROCLOR 1254 AT 50 UG/GM
Special Hazard Precautions: TOXIC; IRRITANT. TOXIC; IRRITANT.
Label Name: ULTRA SCIENTIFIC
Label Street: 250 SMITH STREET
Label City: NORTH KINGSTOWN
Label State: RI
Label Zip Code: 02852-5000
Label Country: US
Label Emergency Number: 401-294-9400

ULTRA SCIENTIFIC -- 1260TK-B AROCLOR 1260 AT 50 UG-GM - IN PCB FREE TRANSFORMER OIL
MATERIAL SAFETY DATA SHEET
NSN: 655000F040201
Manufacturer's CAGE: 0MU35
Part No. Indicator: A
Part Number/Trade Name: 1260TK-B AROCLOR 1260 AT 50 UG/GM

=====
General Information
=====

Item Name: IN PCB FREE TRANSFORMER OIL - AROCLOR 1260 KIT
Company's Name: ULTRA SCIENTIFIC
Company's Street: 250 SMITH STREET
Company's City: NORTH KINGSTOWN
Company's State: RI
Company's Country: US
Company's Zip Code: 02852-5000
Company's Emerg Ph #: 401-294-9400
Company's Info Ph #: 401-294-9400
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 002
Status: KE
Date MSDS Prepared: 09FEB95
Safety Data Review Date: 31MAY95
Preparer's Company: ULTRA SCIENTIFIC
Preparer's St Or P. O. Box: 250 SMITH STREET
Preparer's City: NORTH KINGSTOWN
Preparer's State: RI
Preparer's Zip Code: 02852-5000
MSDS Serial Number: BXLFF

=====
Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: TRANSFORMER OIL
Ingredient Sequence Number: 01
Percent: 99.95
NIOSH (RTECS) Number: 1001743TO

Proprietary: NO
Ingredient: POLYCHLORINATED BIPHENYL, PCB, AROCLOR 1260, (CL 60%)
(SUSPECTED HUMAN CARCINOGEN BY IARC, NTP - GROUP 2A) *95-1*
Ingredient Sequence Number: 02
Percent: 0.05
NIOSH (RTECS) Number: TQ1362000
CAS Number: 11096-82-5
Other Recommended Limit: 0.001 MG/CUM NIOSH

=====
Physical/Chemical Characteristics
=====

Appearance And Odor: LIQUID

=====
Fire and Explosion Hazard Data
=====

Flash Point: COMBUSTIBLE
Extinguishing Media: CO2, DRY CHEMICAL POWDER/WATER SPRAY

=====
Reactivity Data
=====

Stability: YES
Materials To Avoid: STRONG OXIDIZERS
Hazardous Poly Occur: NO

=====
Health Hazard Data
=====

=====
LD50-LC50 Mixture: ORAL LD50(RAT): 1315 MG/KG AROCLOR 1260
Route Of Entry - Inhalation: NO
Route Of Entry - Skin: NO
Route Of Entry - Ingestion: NO
Health Haz Acute And Chronic: TOXIC; IRRITANT.
Carcinogenicity - NTP: YES
Carcinogenicity - IARC: YES
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: SEE INGREDIENTS.
Signs/Symptoms Of Overexp: TOXIC; IRRITANT.
Emergency/First Aid Proc: EYES/SKIN: FLUSH W/COPIOUS AMOUNTS OF WATER.
INHALATION: REMOVE TO FRESH AIR, GIVE OXYGEN IF NECESSARY. OBTAIN MEDICAL
ATTENTION IN ALL CASES.
=====

=====
Precautions for Safe Handling and Use
=====

Steps If Matl Released/Spill: A LEAKING BOTTLE MAY BE PLACED IN A PLASTIC
BAG & NORMAL DISPOSAL PROCEDURES FOLLOWED. LIQUID SAMPLES MAY BE ABSORBED
ON VERMICULITE/SAND.
Waste Disposal Method: BURN IN A CHEMICAL INCINERATOR EQUIPPED W/AN
AFTERBURNER & SCRUBBER IN ACCORDANCE W/LOCAL, STATE & FEDERAL REGULATIONS.
Precautions-Handling/Storing: KEEP TIGHTLY CLOSED & STORE IN A COOL, DRY
PLACE..
Other Precautions: THIS MATERIAL SHOULD ONLY BE USED BY THOSE PERSONS
TRAINED IN THE SAFE HANDLING OF HAZARDOUS CHEMICALS. PREVENT CONTACT W/
EYES, SKIN & CLOTHING.
=====

=====
Control Measures
=====

Respiratory Protection: USE APPROPRIATE OSHA/MSHA SAFETY EQUIPMENT.
Protective Gloves: CHEMICAL RESISTANT
Eye Protection: CHEMICAL GOGGLES, FACE SHIELD
Other Protective Equipment: CHEMICAL RESISTANT CLOTHING, LABORATORY COAT,
RUBBER APRON
Suppl. Safety & Health Data: ALL CHEMICALS SHOULD BE CONSIDERED
HAZARDOUS-DIRECT PHYSICAL CONTACT SHOULD BE AVOIDED.
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=====
Transportation Data
=====

=====
Disposal Data
=====

=====
Label Data
=====

Label Required: YES
Label Status: G
Common Name: 1260TK-B AROCLOR 1260 AT 50 UG/GM
Special Hazard Precautions: TOXIC; IRRITANT. TOXIC; IRRITANT.
Label Name: ULTRA SCIENTIFIC
Label Street: 250 SMITH STREET
Label City: NORTH KINGSTOWN
Label State: RI
Label Zip Code: 02852-5000
Label Country: US
Label Emergency Number: 401-294-9400

ULTRA SCIENTIFIC -- RPK-1A AROCLOR 1268 AT 100 UG-ML IN HEXANE
MATERIAL SAFETY DATA SHEET
NSN: 681000F036748
Manufacturer's CAGE: OMU35
Part No. Indicator: I
Part Number/Trade Name: RPK-1A AROCLOR 1268 AT 100 UG/ML IN HEXANE

=====
General Information
=====

Company's Name: ULTRA SCIENTIFIC
Company's Street: 250 SMITH STREET
Company's City: NORTH KINGSTOWN
Company's State: RI
Company's Country: US
Company's Zip Code: 02852
Company's Emerg Ph #: 401-294-9400
Company's Info Ph #: 401-294-9400
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: KE
Date MSDS Prepared: 23NOV93
Safety Data Review Date: 25OCT94
Preparer's Company: ULTRA SCIENTIFIC
Preparer's St Or P. O. Box: 250 SMITH STREET
Preparer's City: NORTH KINGSTOWN
Preparer's State: RI
Preparer's Zip Code: 02852
MSDS Serial Number: BVSHT

=====
Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: HEXANE, N-HEXANE
Ingredient Sequence Number: 01
Percent: 99.87
NIOSH (RTECS) Number: MN9275000
CAS Number: 110-54-3
OSHA PEL: 1800 MG/CUM
ACGIH TLV: 176 MG/CUM
Other Recommended Limit: 50 PPM

Proprietary: NO
Ingredient: POLYCHLORINATED BIPHENYL, AROCLOR 1268, PCB, (CL 68%)
(SUSPECTED HUMAN CARCINOGEN BY IARC) *94-3*
Ingredient Sequence Number: 02
Percent: 0.015
NIOSH (RTECS) Number: TQ1366000
CAS Number: 11100-14-4
Other Recommended Limit: 0.001 MG/CUM NIOSH

=====
Physical/Chemical Characteristics
=====

Appearance And Odor: LIQUID

=====
Fire and Explosion Hazard Data
=====

Extinguishing Media: CO2, DRY CHEMICAL POWDER/WATER SPRAY

=====
Reactivity Data
=====

Stability: YES
Hazardous Poly Occur: NO
=====

Health Hazard Data

LD50-LC50 Mixture: ORAL LD50 (RAT): 10,900 MG/KG
Route Of Entry - Inhalation: NO
Route Of Entry - Skin: NO
Route Of Entry - Ingestion: NO
Health Haz Acute And Chronic: TOXIC; IRRITANT.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NONE
Signs/Symptoms Of Overexp: TOXIC; IRRITANT.
Emergency/First Aid Proc: EYE/SKIN: FLUSH W/COPIOUS AMOUNTS OF WATER.
INHALATION: REMOVE TO FRESH AIR. GIVE OXYGEN IF NECESSARY. OBTAIN MEDICAL ATTENTION IN ALL CASES.

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: A LEAKING BOTTLE MAY BE PLACED IN A PLASTIC BAG & NORMAL DISPOSAL PROCEDURES FOLLOWED. LIQUID SAMPLES MAY BE ABSORBED ON VERMICULITE/SNAD.
Waste Disposal Method: BURN IN A CHEMICAL INCINERATOR EQUIPPED W/AN AFTERBURNER & SCRUBBER. OBSERVE ALL FEDERAL, STATE & LOCAL LAWS CONCERNING DISPOSAL.
Precautions-Handling/Storing: USE APPROPRIATE OSHA/MSHA APPROVED SAFETY EQUIPMENT. KEEP TIGHTLY CLOSED & STORE IN A COOL, DRY PLACE.
Other Precautions: PREVENT CONTACT W/EYES & SKIN. MATERIAL SHOULD BE USED BY THOSE PERSONS TRAINED IN THE SAFE HANDLING OF HAZARDOUS CHEMICALS. ALL CHEMICALS SHOULD BE CONSIDERED HAZARDOUS, DIRECT PHYSICAL CONTACT SHOULD BE AVOIDED.

Control Measures

Respiratory Protection: USE OSHA/MSMA APPROVED SAFETY EQUIPMENT
Protective Gloves: CHEMICAL RESISTANT
Eye Protection: CHEMICAL GOGGLES, FACE SHIELD
Other Protective Equipment: CHEMICAL RESISTANT CLOTHING: LAB COAT, RUBBER APRON.

Transportation Data

Disposal Data

Label Data

Label Required: YES
Label Status: G
Common Name: RPK-1A AROCLOR 1268 AT 100 UG/ML IN HEXANE
Special Hazard Precautions: TOXIC; IRRITANT. TOXIC; IRRITANT.
Label Name: ULTRA SCIENTIFIC
Label Street: 250 SMITH STREET
Label City: NORTH KINGSTOWN
Label State: RI
Label Zip Code: 02852
Label Country: US
Label Emergency Number: 401-294-9400

ALCAN ALUMINUM -- ALUMINUM METAL, 5352 SERIES ALLOY
MATERIAL SAFETY DATA SHEET
NSN: 952500N032156
Manufacturer's CAGE: 01371
Part No. Indicator: B
Part Number/Trade Name: ALUMINUM METAL, 5352 SERIES ALLOY

General Information

Company's Name: ALCAN ALUMINUM CORP
Company's Street: 100 ERIEVIEW PLAZA
Company's City: CLEVELAND
Company's State: OH
Company's Country: US
Company's Zip Code: 44114
Company's Emerg Ph #: 216-523-6860
Company's Info Ph #: 216-523-6860
Record No. For Safety Entry: 002
Tot Safety Entries This Stk#: 002
Status: SMJ
Date MSDS Prepared: 12OCT90
Safety Data Review Date: 27JUL95
MSDS Serial Number: BYGGV

Ingredients/Identity Information

Proprietary: NO
Ingredient: ALUMINUM (SARA 313)
Ingredient Sequence Number: 01
Percent: 92-99
NIOSH (RTECS) Number: BD0330000
CAS Number: 7429-90-5
OSHA PEL: 15 MG/M3 DUST
ACGIH TLV: 10 MG/M3 DUST

Proprietary: NO
Ingredient: MAGNESIUM
Ingredient Sequence Number: 02
Percent: 0.2-5.6
NIOSH (RTECS) Number: OM2100000
CAS Number: 7439-95-4
OSHA PEL: N/K (FP N)
ACGIH TLV: N/K (FP N)

Proprietary: NO
Ingredient: MANGANESE (SARA 313). % WT: 0.05-1.4. LD50: (ORAL, RAT) 9000
MG/KG.
Ingredient Sequence Number: 03
Percent: <1.4
NIOSH (RTECS) Number: OO9275000
CAS Number: 7439-96-5
OSHA PEL: 5 MG/M3 DUST, C
ACGIH TLV: 5 MG/M3 DUST

Proprietary: NO
Ingredient: CHROMIUM (SARA 313) (CERCLA) % WT: 0.05-0.35
Ingredient Sequence Number: 04
Percent: <0.35
NIOSH (RTECS) Number: GB4200000
CAS Number: 7440-47-3
OSHA PEL: 1 MG/M3
ACGIH TLV: 0.5 MG/M3

Proprietary: NO
Ingredient: OTHER PRECS: HANDLING MOLTEN ALUMINUM" AND "RECOMMENDATIONS FOR STORAGE AND HANDLING OF ALUMINUM POWDERS AND (ING 6)
Ingredient Sequence Number: 05
NIOSH (RTECS) Number: 9999999ZZ
OSHA PEL: NOT APPLICABLE
ACGIH TLV: NOT APPLICABLE

Proprietary: NO
Ingredient: ING 5: PASTE" PUBLISHED BY ALUMINUM ASSOCIATION.
Ingredient Sequence Number: 06
NIOSH (RTECS) Number: 9999999ZZ
OSHA PEL: NOT APPLICABLE
ACGIH TLV: NOT APPLICABLE

Proprietary: NO
Ingredient: VENT: MAY BE REQUIRED TO AVOID EXPLOSION HAZARDS. SEE "NATIONAL FIRE PROTECTION ASSOCIATION CODES, NFPA 65 AND 651.
Ingredient Sequence Number: 07
NIOSH (RTECS) Number: 9999999ZZ
OSHA PEL: NOT APPLICABLE
ACGIH TLV: NOT APPLICABLE

Physical/Chemical Characteristics

Appearance And Odor: GREY TO SILVER SOLID; ODORLESS.
Boiling Point: N/A
Melting Point: >900F, >482C
Vapor Pressure (MM Hg/70 F): N/A
Vapor Density (Air=1): N/A
Specific Gravity: 2.5-2.9(H*20=1)
Evaporation Rate And Ref: N/A
Solubility In Water: N/A
Percent Volatiles By Volume: N/A
pH: N/A

Fire and Explosion Hazard Data

Flash Point: N/A
Lower Explosive Limit: N/A
Upper Explosive Limit: N/A
Extinguishing Media: IN CASE OF ALUMINUM FIRE, USE A CLASS D DRY POWDER EXTING OR DRY SAND. DO NOT USE WATER OR HALOGENATED EXTING MEDIA.
Special Fire Fighting Proc: USE NIOSH/MSHA APPROVED SCBA AND FULL PROTECTIVE EQUIPMENT (FP N).
Unusual Fire And Expl Hazrds: NOT A FIRE HAZARD UNLESS IN FINELY-DIVIDED FORM. SUSPENSIONS OF ALUMINUM DUST IN AIR MAY POSE A SEVERE EXPLOSION HAZARD.

Reactivity Data

Stability: YES
Cond To Avoid (Stability): MOLTEN ALUMINUM MAY EXPLODE ON CONTACT WITH WATER.
Materials To Avoid: FINELY-DIVIDED ALUMINUM MAY EXPLODE WHEN MIXED W/ HALOGENATED ACIDS, HALOGENATED SOLVENTS, BROMATES, IODATES (SUPDAT)
Hazardous Decomp Products: FINELY DIVIDED ALUMINUM REACTS WITH HALOGENATED ACIDS, WATER & SODIUM HYDROXIDE TO PRODUCE HYDROGEN GAS.
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NOT RELEVANT

Health Hazard Data

LD50-LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.

Route Of Entry - Inhalation: YES
 Route Of Entry - Skin: NO
 Route Of Entry - Ingestion: NO
 Health Haz Acute And Chronic: INHAL: IN FORM OF INGOT, ALUMINUM DOES NOT PRESENT INHAL HAZ. ALUMINUM DUSTS GENERATED DURING USE ARE CONSIDERED NUISANCE PARTICULATES WHICH HAVE LITTLE EFT ON LUNGS. SKIN: CNTCT W/HOT ALUMINUM METAL CAN CAUSE BURNS. EYES: ALUMINUM DUST CAN IRRIT EYES (MECH ABRASION). ALUMINUM FUMES GENERATED DURING (EFTS OF OVEREXP)
 Carcinogenicity - NTP: NO
 Carcinogenicity - IARC: NO
 Carcinogenicity - OSHA: NO
 Explanation Carcinogenicity: NOT RELEVANT
 Signs/Symptoms Of Overexp: HLTH HAZ: WELDING OR MELTING PRESENT LOW HLTH RISKS. MIG WELDING OR PLASMA ARC CUTTING OF ALUMINUM ALLOYS CAN GENERATE OZONE, NITRIC OXIDES & ULTRAVIOLET RADIA. OZONE OVEREXP MAY RSLT IN MUC MEMB IRRIT OR PULM DISCOMFORT. UV RADIA CAN CAUSE SKIN ERYTHEMA & WELDERS FLASH. HIGH CONCS OF FRESHLY-FORMED MAGNESIUM (SUPDAT)
 Med Cond Aggravated By Exp: NOT APPLICABLE.
 Emergency/First Aid Proc: INGEST: CALL MD IMMEDIATELY (FP N). INHAL: IN CASE OF DISCOMFORT, GO TO A VENTILATED AREA. IF DISCOMFORT PERSISTS, CONSULT MD. SKIN: IN CASE OF BURNS, RINSE WITH PLENTY OF COLD WATER. IF BURN IS SEVERE, CONSULT MD. EYES: FLUSH EYES THOROUGHLY WITH WATER FOR AT LEAST 15 MINUTES. IF IRRITATION PERSISTS, CONSULT MD.

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: RECYCLE. FINELY-DIVIDED ALUMINUM MAY BE REACTIVE AND ITS HAZARD CHARACTERISTICS SHOULD BE DETERMINED PRIOR TO DISPSOAL.
 Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.
 Waste Disposal Method: DISPOSE OF THE WASTE IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS.
 Precautions-Handling/Storing: BECAUSE OF RISK OF EXPLOSION, ALUMINUM INGOTS & METAL SCRAP SHOULD BE THOROUGHLY DRIED PRIOR TO REMELTING.
 Other Precautions: USE STD TECHNIQUES TO CHECK METAL TEMP BEFORE HNDLG. HOT ALUMINUM DOES NOT PRESENT ANY WARNING COLOR CHANGE. EXERCISE GREAT CAUTION SINCE METAL MAY BE HOT. FOR MORE INFO ON HANDLING/STORAGE OF ALUMINUM, CONSULT "GUIDELINES FOR (ING 5)

Control Measures

Respiratory Protection: USE NIOSH/MSHA APPROVED DUST FILTER RESPIRATOR OR DUST MASK DESIGNED FOR USE WHERE CONCENTRATION EXCEEDS EXPOSURE LIMITS.
 Ventilation: IF VENT IS USED TO CONVEY FINELY DIVIDED ALUMINUM GENERATED BY GRINDING, SAWING, ETC, SPECIAL VENT PROVISIONS (ING 10)
 Protective Gloves: IMPERVIOUS GLOVES (FP N).
 Eye Protection: ANSI APPRVD CHEM WORKERS GOGGLES (FP N).
 Other Protective Equipment: ANSI APPROVED DELUGE SHOWER (FP N). USE OF BOTH PRIMARY & SECONDARY PERSONAL PROT EQUIP IS NEC WHEN HNDLG MOLTEN METAL.
 Work Hygienic Practices: REFER TO "ALUMINUM ASSOCIATION" GUIDELINES.
 Suppl. Safety & Health Data: MATL TO AVOID: OR AMMONIUM NITRATE. FINELY-DIVIDED ALUMINUM CAN THERMITE IN PRESENCE OF COPPER, LEAD OR IRON OXIDES. EFTS OF OVEREXP: OXIDE & MANGANESE OXIDE FUMES CAN PRDCE SYMPS OF METAL FUME FEVER. HIGH CONCS OF MANGANESE DUST CAN AFFECT CNS (APATHY, DROW, WEAK & OTHER PROBS RESEMBLING PARKINSONISM).

Transportation Data

Disposal Data

Label Data

=====
Label Required: YES
Technical Review Date: 27JUL95
Label Date: 19JUL95
Label Status: G
Common Name: ALUMINUM METAL, 5352 SERIES ALLOY
Chronic Hazard: NO
Signal Word: CAUTION!
Acute Health Hazard-Slight: X
Contact Hazard-Slight: X
Fire Hazard-None: X
Reactivity Hazard-None: X
Special Hazard Precautions: ACUTE: SKIN: CONTACT W/HOT ALUMINUM METAL CAN CAUSE BURNS. EYES: ALUMINUM DUST CAN IRRITATE EYES (MECHANICAL ABRASION). MIG WELDING OR PLASMA ARC CUTTING OF ALUMINUM ALLOYS CAN GENERATE OZONE, NITRIC OXIDES & ULTRAVIOLET RADIATION. OZONE OVEREXPOSURE MAY CAUSE MUCOUS MEMBRANE IRRITATION OR PULMONARY DISCOMFORT. UV RADIATION CAN CAUSE SKIN ERYTHEMA & WELDERS FLASH. MAGNESIUM OXIDE AND ITS FUMES CAN PRODUCE SYMPTOMS OF METAL FUME FEVER; ITS DUST CAN AFFECT CENTRAL NERVOUS SYSTEM W/ APATHY, DROWSINESS, WEAKNESS & OTHER PROBLEMS RESEMBLING PARKINSONISM. CHRONIC: NONE SPECIFIED BY MANUFACTURER.
Protect Eye: Y
Protect Skin: Y
Protect Respiratory: Y
Label Name: ALCAN ALUMINUM CORP
Label Street: 100 ERIEVIEW PLAZA
Label City: CLEVELAND
Label State: OH
Label Zip Code: 44114
Label Country: US
Label Emergency Number: 216-523-6860

ANZON -- ANTIMONY OXIDE TNS-P - FLAME RETARDENT
MATERIAL SAFETY DATA SHEET
NSN: 681000F051886
Manufacturer's CAGE: ANZON
Part No. Indicator: A
Part Number/Trade Name: ANTIMONY OXIDE TNS-P

General Information

Item Name: FLAME RETARDENT
Company's Name: ANZON INC
Company's Street: 2545 ARAMINGO AVE
Company's City: PHILADELPHIA
Company's State: PA
Company's Country: US
Company's Zip Code: 19125-5000
Company's Emerg Ph #: 215-427-3000
Company's Info Ph #: 215-427-3000
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SE
Date MSDS Prepared: 18SEP92
Safety Data Review Date: 01NOV96
Preparer's Company: ANZON INC
Preparer's St Or P. O. Box: 2545 ARAMINGO AVE
Preparer's City: PHILADELPHIA
Preparer's State: PA
Preparer's Zip Code: 19125-5000
MSDS Serial Number: CCFXP

Ingredients/Identity Information

Proprietary: NO
Ingredient: ANTIMONY TRIOXIDE, ANTIMONY OXIDE (SUSP CARCINOGEN BY ACGIH,
ANIMAL CARCINOGEN IARC - GROUP 2B) *96-3*
Ingredient Sequence Number: 01
NIOSH (RTECS) Number: CC5650000
CAS Number: 1309-64-4
ACGIH TLV: 0.5 MG/CUM (A2)

Proprietary: NO
Ingredient: ARSENIC, ARSENICALS (HUMAN & ANIMAL CARCINOGEN BY IARC, IARC
GROUP 1; CONFIRMED CARCINOGEN BY NTP & OSHA) *96-3*
Ingredient Sequence Number: 02
NIOSH (RTECS) Number: CG0525000
CAS Number: 7440-38-2
OSHA PEL: 0.5 MG/CUM
ACGIH TLV: 0.2 MG/CUM

Physical/Chemical Characteristics

Appearance And Odor: WHITE POWDER W/NO ODOR
Specific Gravity: 5.5

Fire and Explosion Hazard Data

Special Fire Fighting Proc: NONE

Reactivity Data

Stability: YES
Materials To Avoid: STRONG ACIDS/BASES.
Hazardous Decomp Products: DOESN'T OCCUR.

Hazardous Poly Occur: NO
Conditions To Avoid (Poly): EXTREME HUMIDITY.

=====
Health Hazard Data
=====

Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: MAY CAUSE SKIN IRRITATION, ABSORPTION.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NONE
Signs/Symptoms Of Overexp: IRRITATION, GASTROINTESTINAL UPSET, NERVOUS COMPLAINTS, INFLAMMATION OF THE MUCOUS MEMBRANE, METALLIC TASTE & STOMATITIS.
Emergency/First Aid Proc: INGESTION: INDUCE VOMITING BY GIVING 1 OZ OF SYRUP OF IPECAC FOLLOWED BY 8 OZ OF WATER. SKIN: REMOVE BY WASHING W/SOAP & WATER. EYES: FLUSH W/COPIOUS AMOUNTS OF WATER. OBTAIN MEDICAL ATTENTION IN ALL CASES.

=====
Precautions for Safe Handling and Use
=====

Waste Disposal Method: DISPOSE OF IAW/FEDERAL, STATE & LOCAL REGULATIONS.
Precautions-Handling/Storing: BE SURE CONTAINERS ARE LABELED & SEALED.
HANDLE ONLY W/ADEQUATE VENTILATION UTILIZING PERSONAL PROTECTIVE EQUIPMENT.

=====
Control Measures
=====

Respiratory Protection: USE NIOSH APPROVED RESPIRATOR.
Protective Gloves: RECOMMENDED
Eye Protection: GOGGLES

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Transportation Data
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Disposal Data
=====

=====
Label Data
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HACH -- 14571, ARSENIC REFERENCE STANDARD SOLUTION (SUP - ARSENIC, STANDARD SOLUT
MATERIAL SAFETY DATA SHEET
NSN: 6810013521490
Manufacturer's CAGE: 4T252
Part No. Indicator: A
Part Number/Trade Name: 14571, ARSENIC REFERENCE STANDARD SOLUTION (SUP
DAT)

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General Information
=====

Item Name: ARSENIC, STANDARD SOLUTION
Company's Name: HACH CO
Company's P. O. Box: 907
Company's City: AMES
Company's State: IA
Company's Country: US
Company's Zip Code: 50010
Company's Emerg Ph #: 303-623-5716
Company's Info Ph #: 800-227-4224
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SMJ
Date MSDS Prepared: 12SEP93
Safety Data Review Date: 02OCT95
MSDS Serial Number: BZQZS

=====
Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: ARSENIC TRIOXIDE (SARA 302/313) (CERCLA)
Ingredient Sequence Number: 01
Percent: <0.5
NIOSH (RTECS) Number: CG3325000
CAS Number: 1327-53-3
OSHA PEL: 0.01 MG/M3 (MFR)
ACGIH TLV: 0.01 MG/M3, A1

Proprietary: NO
Ingredient: SODIUM HYDROXIDE (CERCLA)
Ingredient Sequence Number: 02
Percent: <1
NIOSH (RTECS) Number: WB4900000
CAS Number: 1310-73-2
OSHA PEL: 2 MG/M3
ACGIH TLV: C 2 MG/M3

Proprietary: NO
Ingredient: WATER; (DEMINERALIZED)
Ingredient Sequence Number: 03
Percent: <100
NIOSH (RTECS) Number: ZC0110000
CAS Number: 7732-18-5
OSHA PEL: N/K (FP N)
ACGIH TLV: N/K (FP N)

=====
Physical/Chemical Characteristics
=====

Appearance And Odor: CLEAR, COLORLESS LIQUID, NO ODOR
Boiling Point: 212F,100C
Melting Point: N/A
Specific Gravity: 0.997
Evaporation Rate And Ref: 1.053
Solubility In Water: MISCIBLE

pH: 5-7

=====
Fire and Explosion Hazard Data
=====

Flash Point: N/A
Lower Explosive Limit: N/A
Upper Explosive Limit: N/A
Extinguishing Media: USE MEDIA SUITABLE FOR SURROUNDING FIRE (FP N).
Special Fire Fighting Proc: WEAR NIOSH/MSHA APPROVED SCBA & FULL
PROTECTIVE EQUIPMENT (FP N).
Unusual Fire And Expl Hazrds: NONE SPECIFIED BY MANUFACTURER.

=====
Reactivity Data
=====

Stability: YES
Cond To Avoid (Stability): HEAT, EXCESS EXPOSURE TO AIR.
Materials To Avoid: NONE SPECIFIED BY MANUFACTURER.
Hazardous Decomp Products: MAY EMIT TOXIC FUMES OF ARSENIC IN FIRE.
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NOT RELEVANT.

=====
Health Hazard Data
=====

LD50-LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: ACUTE: ARSENIC TRIOXIDE EXTREMELY TOXIC.
SODIUM HYDROXIDE CORROSIVE, VERY TOXIC. MAY BE IRRITATING TO EYES AND SKIN.
NAUSEA, JAUNDICE, SKIN IRRITATION, NERVOUS SYSTEM DISTURBANCES. TARGET
ORGANS: DIGESTIVE TRACT, CENTRAL NERVOUS SYSTEM, SKIN, BLOOD, LUNGS, LIVER.
Carcinogenicity - NTP: YES
Carcinogenicity - IARC: YES
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: ARSENIC TRIOXIDE: IARC MONOGRAPHS,
SUPPLEMENT, VOL 7, PG 100, 1987: GROUP 1. NTP 7TH ANNUAL REPORT ON (SUP
DAT)
Signs/Symptoms Of Overexp: SEE HEALTH HAZARDS.
Med Cond Aggravated By Exp: NONE REPORTED.
Emergency/First Aid Proc: EYES/SKIN: FLUSH WITH PLENTY OF WATER FOR AT
LEAST 15 MINUTES. INGESTION: INDUCE VOMITING BY STICKING FINGER DOWN
THROAT. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. CALL MD.
INHALATION: REMOVE TO FRESH AIR.

=====
Precautions for Safe Handling and Use
=====

Steps If Matl Released/Spill: SCOOP UP MATERIAL. DECONTAMINATE SITE.
DISPOSE OF THE MATERIAL IN AN EPA APPROVED HAZARDOUS WASTE SITE.
Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.
Waste Disposal Method: DISPOSE OF IN ACCORDANCE W/ALL LOCAL, STATE &
FEDERAL REGULATIONS.
Precautions-Handling/Storing: STORE TIGHTLY CLOSED. AVOID CONTACT WITH
EYES, SKIN AND CLOTHING.
Other Precautions: NONE SPECIFIED BY MANUFACTURER.

=====
Control Measures
=====

Respiratory Protection: USE NIOSH/MSHA APPROVED RESPIRATOR APPROPRIATE FOR
EXPOSURE OF CONCERN (FP N).
Ventilation: ADEQUATE VENTILATION.
Protective Gloves: DISPOSABLE LATEX GLOVES.
Eye Protection: ANSI APPROVED CHEMICAL WORKERS (SUP DAT)
Other Protective Equipment: EMERGENCY EYEWASH & DELUGE SHOWER MEETING ANSI
DESIGN CRITERIA (FP N).

Work Hygienic Practices: WASH THOROUGHLY AFTER HANDLING.
Suppl. Safety & Health Data: TRADE NAME/PART #: 1000 + 10 MG/L AS AS+3.
CARCIN EXPLAN: CARCINOGENS, 1994: KNOWN TO BE CARCINOGENIC. ANIMAL: LUNG
TUMORS. EYE PROT: GOGGLES AND FULL LENGTH FACESHIELD (FP N).

=====
Transportation Data
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Trans Data Review Date: 96197
DOT PSN Code: ZZZ
DOT Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION
IMO PSN Code: ZZZ
IMO Proper Shipping Name: NOT REGULATED FOR THIS MODE OF TRANSPORTATION
IATA PSN Code: ZZZ
IATA Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION
AFI PSN Code: ZZZ
AFI Prop. Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION
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Disposal Data
=====

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Label Data
=====

Label Required: YES
Technical Review Date: 02OCT95
Label Date: 02OCT95
Label Status: G
Common Name: 14571, ARSENIC REFERENCE STANDARD SOLUTION (SUP
DAT)
Chronic Hazard: YES
Signal Word: WARNING!
Acute Health Hazard-Moderate: X
Contact Hazard-Moderate: X
Fire Hazard-None: X
Reactivity Hazard-None: X
Special Hazard Precautions: CORROSIVE. ACUTE: ARSENIC TRIOXIDE IS
EXTREMELY TOXIC. SODIUM HYDROXIDE IS CORROSIVE, VERY TOXIC. MAY BE
IRRITATING TO EYES AND SKIN. NAUSEA, JAUNDICE, SKIN IRRITATION, NERVOUS
SYSTEM DISTURBANCES. TARGET ORGANS: DIGESTIVE TRACT, CENTRAL NERVOUS
SYSTEM, SKIN, BLOOD, LUNGS, LIVER. CHRONIC: CANCER HAZARD. CONTAINS ARSENIC
TRIOXIDE WHICH IS LISTED AS AN ANIMAL LUNG CARCINOGEN (FP N).
Protect Eye: Y
Protect Skin: Y
Protect Respiratory: Y
Label Name: HACH CO
Label P.O. Box: 907
Label City: AMES
Label State: IA
Label Zip Code: 50010
Label Country: US
Label Emergency Number: 303-623-5716

ENVIRONMENTAL RESOURCE ASSOCIATES --- 1000 PPM BARIUM - LABORATORY STANDARD
MATERIAL SAFETY DATA SHEET
NSN: 655000F037416
Manufacturer's CAGE: 1R664
Part No. Indicator: A
Part Number/Trade Name: 1000 PPM BARIUM

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General Information
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Item Name: LABORATORY STANDARD
Company's Name: ENVIRONMENTAL RESOURCE ASSOCIATES
Company's Street: 5540 MARSHALL ST
Company's City: ARVADA
Company's State: CO
Company's Country: US
Company's Zip Code: 80002-3108
Company's Emerg Ph #: 303-431-8454
Company's Info Ph #: 303-431-8454
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SE
Date MSDS Prepared: 05MAR92
Safety Data Review Date: 22NOV94
MSDS Preparer's Name: DANIEL A GOLDSTEIN
Preparer's Company: ENVIRONMENTAL RESOURCE ASSOCIATES
Preparer's St Or P. O. Box: 5540 MARSHALL ST
Preparer's City: ARVADA
Preparer's State: CO
Preparer's Zip Code: 80002-3108
MSDS Serial Number: BWHZQ

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Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: NITRIC ACID, HYDROGEN NITRATE
Ingredient Sequence Number: 01
Percent: <5
NIOSH (RTECS) Number: QU5775000
CAS Number: 7697-37-2
OSHA PEL: 2 PPM
ACGIH TLV: 5.2 MG/CUM

Proprietary: NO
Ingredient: BARIUM NITRATE
Ingredient Sequence Number: 02
Percent: <1
NIOSH (RTECS) Number: CQ9625000
CAS Number: 10022-31-8
OSHA PEL: 0.5 MG/CUM
ACGIH TLV: 0.5 MG/CUM

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Physical/Chemical Characteristics
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Appearance And Odor: CLEAR LIQUID W/NO ODOR
Boiling Point: (SEE SUPP)
Vapor Pressure (MM Hg/70 F): 28
Vapor Density (Air=1): >1
Specific Gravity: 1
Evaporation Rate And Ref: (WATER =1): 1
Solubility In Water: COMPLETE
pH: <1

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Fire and Explosion Hazard Data
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=====
Extinguishing Media: NONE
Special Fire Fighting Proc: NONE
Unusual Fire And Expl Hazrds: NONE
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Reactivity Data

=====
Stability: YES
Cond To Avoid (Stability): FREEZING
Materials To Avoid: METALS
Hazardous Decomp Products: HYDROGEN
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NONE
=====

Health Hazard Data

=====
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: POISON & CORROSIVE TO SKIN, EYES, MUCUS
MEMBRANES/LUNGS. MAY BURN ANY TISSUE & CAUSE BLINDNESS. MAY CAUSE GI TRACT
PERFORATION, PULMONARY EDEMA, DEATH. BARIUM NITRATE MAY CAUSE
CARDIOVASCULAR COLLAPSE & DEATH.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NONE
Signs/Symptoms Of Overexp: IRRITATION, BURNING, REDNESS, COUGH, SHORTNESS
OF BREATH, PAIN, VOMITING, DIARRHEA, SALIVATION, DILATED PUPILS, IRREGULAR
HEARTBEAT, METHEMOGLOBINEMIA. BARIUM NITRATE: SEVERE VOMITING/ DIARRHEA &
ELECTROLYTE DISTURBANCES.
Med Cond Aggravated By Exp: ASTHMA.
Emergency/First Aid Proc: EYES/SKIN: FLUSH W/COPIOUS AMOUNTS OF WATER.
INHALATION: GIVE MOIST OXYGEN. INGESTION: GIVE WATER/MILK. OBTAIN MEDICAL
ATTENTION IN ALL CASES.
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Precautions for Safe Handling and Use

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Steps If Matl Released/Spill: NEUTRALIZE & FLUSH W/WATER/NETURALIZE &
ABSORB. VENTILATE AREA.
Neutralizing Agent: BAKING SODA.
Waste Disposal Method: DISPOSE OF AS NON-HAZARDOUS WASTE IAW/FEDERAL,
STATE & LOCAL REGULATIONS.
Precautions-Handling/Storing: AVOID FREEZING/ROUGH HANDLING/BREAKAGE.
Other Precautions: AVOID INHALATION/DIRECT CONTACT W/DRIED RESIDUE. AVOID
MIST/AEROSOL FORMATION.
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Control Measures

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Respiratory Protection: WEAR ACID GAS TYPE DUST/MIST RESPIRATOR IF MIST
PRODUCTION OCCURS.
Ventilation: MECHANICAL/LOCAL EXHAUST: USE IN HOOD.
Protective Gloves: ACID PROOF
Eye Protection: SPLASH GOGGLES
Other Protective Equipment: ACID PROOF APRON W/SLEEVES, LAB COAT, CLOSED
SHOES, SAFETY SHOWER, EYE WASH.
Suppl. Safety & Health Data: BOILING POINT (0-5% ACID): 212-212.72F.
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Transportation Data

Disposal Data

Label Data

=====
Label Required: YES
Label Status: G
Common Name: 1000 PPM BARIUM
Special Hazard Precautions: POISON & CORROSIVE TO SKIN, EYES, MUCUS
MEMBRANES/LUNGS. MAY BURN ANY TISSUE & CAUSE BLINDNESS. MAY CAUSE GI TRACT
PERFORATION, PULMONARY EDEMA, DEATH. BARIUM NITRATE MAY CAUSE
CARDIOVASCULAR COLLAPSE & DEATH. IRRITATION, BURNING, REDNESS, COUGH,
SHORTNESS OF BREATH, PAIN, VOMITING, DIARRHEA, SALIVATION, DILATED PUPILS,
IRREGULAR HEARTBEAT, METHEMOGLOBINEMIA. BARIUM NITRATE: SEVERE
VOMITING/DIARRHEA & ELECTROLYTE DISTURBANCES.
Label Name: ENVIRONMENTAL RESOURCE ASSOCIATES
Label Street: 5540 MARSHALL ST
Label City: ARVADA
Label State: CO
Label Zip Code: 80002-3108
Label Country: US
Label Emergency Number: 303-431-8454

ENVIRONMENTAL RESOURCE ASSOCIATES -- 1000 PPM BERYLLIUM - LABORATORY STANDARD
MATERIAL SAFETY DATA SHEET
NSN: 655000F037417
Manufacturer's CAGE: 1R664
Part No. Indicator: A
Part Number/Trade Name: 1000 PPM BERYLLIUM

=====
General Information
=====

Item Name: LABORATORY STANDARD
Company's Name: ENVIRONMENTAL RESOURCE ASSOCIATES
Company's Street: 5540 MARSHALL ST
Company's City: ARVADA
Company's State: CO
Company's Country: US
Company's Zip Code: 80002-3108
Company's Emerg Ph #: 303-431-8454
Company's Info Ph #: 303-431-8454
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SE
Date MSDS Prepared: 05MAR92
Safety Data Review Date: 22NOV94
MSDS Preparer's Name: DANIEL A GOLDSTEIN
Preparer's Company: ENVIRONMENTAL RESOURCE ASSOCIATES
Preparer's St Or P. O. Box: 5540 MARSHALL ST
Preparer's City: ARVADA
Preparer's State: CO
Preparer's Zip Code: 80002-3108
MSDS Serial Number: BWHZR

=====
Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: NITRIC ACID, HYDROGEN NITRATE
Ingredient Sequence Number: 01
Percent: <5
NIOSH (RTECS) Number: QU5775000
CAS Number: 7697-37-2
OSHA PEL: 2 PPM
ACGIH TLV: 5.2 MG/CUM

Proprietary: NO
Ingredient: BERYLLIUM NITRATE (SUSPECTED HUMAN CARCINOGEN BY ACGIH, IARC -
GROUP 1) *94-3*
Ingredient Sequence Number: 02
Percent: <1
NIOSH (RTECS) Number: DS3675000
CAS Number: 13597-99-4
OSHA PEL: 0.002 MG/CUM

=====
Physical/Chemical Characteristics
=====

Appearance And Odor: CLEAR LIQUID W/NO ODOR
Boiling Point: (SEE SUPP)
Vapor Pressure (MM Hg/70 F): 28
Vapor Density (Air=1): >1
Specific Gravity: 1
Evaporation Rate And Ref: (WATER =1): 1
Solubility In Water: COMPLETE
pH: <1

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Fire and Explosion Hazard Data
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=====
Extinguishing Media: NONE
Special Fire Fighting Proc: NONE
Unusual Fire And Expl Hazrds: NONE
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Reactivity Data

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Stability: YES
Cond To Avoid (Stability): FREEZING
Materials To Avoid: METALS
Hazardous Decomp Products: HYDROGEN
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NONE
=====

Health Hazard Data

=====
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: POISON & CORROSIVE TO SKIN, EYES, MUCUS
MEMBRANES/LUNGS. MAY BURN ANY TISSUE & CAUSE BLINDNESS. MAY CAUSE GI TRACT
PERFORATION, PULMONARY EDEMA. INHALATION OF BERYLLIUM CAN PRODUCE CHRONIC
LUNG DISEASE & SENSITIZATION.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: YES
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: SEE INGREDIENTS
Signs/Symptoms Of Overexp: IRRITATION, BURNING, REDNESS, COUGH, SHORTNESS
OF BREATH, PAIN, VOMITING, CYANOSIS, MEHEMOGLOBINEMIA.
Med Cond Aggravated By Exp: ASTHMA.
Emergency/First Aid Proc: EYES/SKIN: FLUSH W/COPIOUS AMOUNTS OF WATER.
INHALATION: GIVE MOIST OXYGEN. INGESTION: GIVE WATER/MILK. OBTAIN MEDICAL
ATTENTION IN ALL CASES.
=====

Precautions for Safe Handling and Use

=====
Steps If Matl Released/Spill: NEUTRALIZE & FLUSH W/WATER/NETURALIZE &
ABSORB. VENTILATE AREA.
Neutralizing Agent: BAKING SODA.
Waste Disposal Method: DISPOSE OF AS NON-HAZARDOUS WASTE IAW/FEDERAL,
STATE & LOCAL REGULATIONS.
Precautions-Handling/Storing: AVOID FREEZING/ROUGH HANDLING/BREAKAGE.
Other Precautions: AVOID INHALATION/DIRECT CONTACT W/DRIED RESIDUE. AVOID
MIST/AEROSOL FORMATION. AVOID HEATING OF DRIED RESIDUE.
=====

Control Measures

=====
Respiratory Protection: WEAR ACID GAS TYPE DUST/MIST RESPIRATOR IF MIST
PRODUCTION OCCURS.
Ventilation: MECHANICAL/LOCAL EXHAUST: USE IN HOOD.
Protective Gloves: ACID PROOF
Eye Protection: SPLASH GOGGLES
Other Protective Equipment: ACID PROOF APRON W/SLEEVES, LAB COAT, CLOSED
SHOES, SAFETY SHOWER, EYE WASH.
Suppl. Safety & Health Data: BOILING POINT (0-5% ACID): 212-212.72F.
=====

Transportation Data

Disposal Data

Label Data

=====

Label Required: YES

Label Status: G

Common Name: 1000 PPM BERYLLIUM

Special Hazard Precautions: POISON & CORROSIVE TO SKIN, EYES, MUCUS
MEMBRANES/LUNGS. MAY BURN ANY TISSUE & CAUSE BLINDNESS. MAY CAUSE GI TRACT
PERFORATION, PULMONARY EDEMA. INHALATION OF BERYLLIUM CAN PRODUCE CHRONIC
LUNG DISEASE & SENSITIZATION. IRRITATION, BURNING, REDNESS, COUGH,
SHORTNESS OF BREATH, PAIN, VOMITING, CYANOSIS, MEHEMOGLOBINEMIA.

Label Name: ENVIRONMENTAL RESOURCE ASSOCIATES

Label Street: 5540 MARSHALL ST

Label City: ARVADA

Label State: CO

Label Zip Code: 80002-3108

Label Country: US

Label Emergency Number: 303-431-8454

GFS CHEMICALS -- CADMIUM, 1147
MATERIAL SAFETY DATA SHEET
NSN: 535000N058818
Manufacturer's CAGE: OTNMO
Part No. Indicator: A
Part Number/Trade Name: CADMIUM, 1147

General Information

Company's Name: GFS CHEMICALS INC
Company's P. O. Box: 245
Company's City: POWELL
Company's State: OH
Company's Country: US
Company's Zip Code: 43065
Company's Emerg Ph #: 800-858-9682
Company's Info Ph #: 800-858-9682
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SMJ
Date MSDS Prepared: 24AUG92
Safety Data Review Date: 05MAY95
MSDS Preparer's Name: L M
Preparer's Company: SAME
MSDS Serial Number: BXGGX

Ingredients/Identity Information

Proprietary: NO
Ingredient: CADMIUM (SARA 313) (CERCLA)
Ingredient Sequence Number: 01
NIOSH (RTECS) Number: EU9800000
CAS Number: 7440-43-9
OSHA PEL: 0.2 MG/M3 DUST; Z-2
ACGIH TLV: 0.01 MG/M3 DUST; 9495

Physical/Chemical Characteristics

Appearance And Odor: SILVERY METALLIC GRANULES OR SHOT. ODORLESS.
Boiling Point: 1413F, 767C
Melting Point: 610F, 321C
Vapor Pressure (MM Hg/70 F): 394C
Specific Gravity: 1.04 (FP N)

Fire and Explosion Hazard Data

Flash Point: NOT APPLICABLE
Lower Explosive Limit: N/A
Upper Explosive Limit: N/A
Extinguishing Media: MEDIA SUITABLE FOR SURROUNDING FIRE (FP N). FIGHT SURROUNDING FIRE.
Special Fire Fighting Proc: USE NIOSH/MSHA APPROVED SCBA AND FULL PROTECTIVE EQUIPMENT (FP N).
Unusual Fire And Expl Hazrds: NOT COMBUSTIBLE. CADMIUM VAPOR MAY FORM IN GENERAL FIRE. AVOID INHALATION OF FUMES.

Reactivity Data

Stability: YES
Cond To Avoid (Stability): NONE SPECIFIED BY MANUFACTURER.
Materials To Avoid: NONE SPECIFIED BY MANUFACTURER.

Health Hazard Data

=====

Precautions for Safe Handling and Use

=====

Control Measures

=====

Transportation Data

=====

Disposal Data

=====

Label Data

Label Required: YES
Technical Review Date: 04MAY95
Label Date: 04MAY95
Label Status: G
Common Name: CADMIUM, 1147
Chronic Hazard: YES
Signal Word: CAUTION!
Acute Health Hazard-Slight: X
Contact Hazard-Slight: X
Fire Hazard-None: X
Reactivity Hazard-None: X
Special Hazard Precautions: ACUTE: VAPOR HAZARDOUS IF INHALED. MUST BE HEATED STRONGLY TO PRODUCE VAPOR. INHALATION OF DUSTS OR VAPORS MAY LEAD TO PROBLEMS IN RESPIRATORY TRACT KIDNEYS. SOLUBLE COMPOUNDS CONSIDERED MUCH MORE HAZARDOUS THAN METAL PIECES. CHRONIC: CANCER HAZARD. CONTAINS CADMIUM WHICH IS LISTED AS A GENITO-URINARY TRACT CARCINOGEN (FP N).
Protect Eye: Y
Protect Skin: Y
Protect Respiratory: Y
Label Name: GFS CHEMICALS INC
Label P.O. Box: 245
Label City: POWELL
Label State: OH
Label Zip Code: 43065
Label Country: US
Label Emergency Number: 800-858-9682

WYETH-AYERST LABORATORIES -- 04525 LEUCOVORIN CALCIUM TABLETS 10 MG
MATERIAL SAFETY DATA SHEET
NSN: 650500F039360
Manufacturer's CAGE: OHMG4
Part No. Indicator: A
Part Number/Trade Name: 04525 LEUCOVORIN CALCIUM TABLETS 10 MG

=====
General Information
=====

Item Name: TETRAHYDRÓFOLATE DERIVATIVE/ANTIDOTE-FOLIC ACID DERIVATIVES
Company's Name: WYETH-AYERST LABORATORIES
Company's P. O. Box: 8299
Company's City: PHILADELPHIA
Company's State: PA
Company's Country: US
Company's Zip Code: 19101-5000
Company's Emerg Ph #: 610-902-5171
Company's Info Ph #: 610-902-5171
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SE
Date MSDS Prepared: 01MAY91
Safety Data Review Date: 11APR95
Preparer's Company: WYETH-AYERST LABORATORIES
Preparer's City: PHILADELPHIA
Preparer's State: PA
Preparer's Zip Code: 19101-5000
MSDS Serial Number: BWYPK

=====
Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: LEUCOVORIN CALCIUM *95-1*
Ingredient Sequence Number: 01
Percent: 2-7
NIOSH (RTECS) Number: MA0600500
CAS Number: 1492-18-8

=====
Physical/Chemical Characteristics
=====

Appearance And Odor: YELLOWISH-WHITE TABLETS; ROUND, SQUARE/OVAL.
Decomposition Temperature: 473F
Solubility In Water: COMPLETE

=====
Fire and Explosion Hazard Data
=====

=====
Reactivity Data
=====

Stability: YES
Hazardous Decomp Products: CO/CO2/NITROGEN OXIDES/IRRITATING ALDEHYDES/
KETONES/ORGANIC ACIDS/HYDROGEN CYANIDE.
Hazardous Poly Occur: NO

=====
Health Hazard Data
=====

LD50-LC50 Mixture: ORAL LD50 (RAT): >8000 MG/KG (SEE SUPP)
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: NO
Route Of Entry - Ingestion: NO
Health Haz Acute And Chronic: CALCIUM LEUCOVORIN-LOW ORDER OF TOXICITY.
ALLERGIC REACTIONS HAVE BEEN REPORTED FOLLOWING ORAL/INTRAVENOUS
ADMINISTRATION.

Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NONE
Signs/Symptoms Of Overexp: CALCIUM LEUCOVORIN-LOW ORDER OF TOXICITY.
ALLERGIC REACTIONS HAVE BEEN REPORTED FOLLOWING ORAL/INTRAVENOUS
ADMINISTRATION.
Emergency/First Aid Proc: EYES: IMMEDIATELY FLUSH W/PLENTY OF COOL,
LOW-PRESSURE WATER FOR 20 MINS. SKIN: PROMPTLY WASH W/SOAP & COOL RUNNING
WATER. INHALATION: REMOVE TO FRESH AIR. GIVE CPR/OXYGEN IF NEEDED.
INGESTION: DON'T INDUCE VOMITING EXCEPT AS DIRECTED BY MEDICAL PERSONNEL.
DON'T INDUCE VOMITING/GIVE ANYTHING BY MOUTH IF UNCONSCIOUS. OBTAIN MEDICAL
ATTENTION IN ALL CASES.

=====
Precautions for Safe Handling and Use
=====

Steps If Matl Released/Spill: WEAR DISPOSABLE COVERALLS, RUBBER GLOVES & A
DISPOSABLE DUST MASK/APPROVED AIR-PURIFYING RESPIRATOR W/HIGH-EFFICIENCY
CARTRIDGES. CONTAIN & COLLECT.
Waste Disposal Method: DISPOSE OF IAW/FEDERAL, STATE & LOCAL REGULATIONS.
INCINERATION IS RECOMMENDED.
Precautions-Handling/Storing: KEEP CONTAINER CLOSED WHEN NOT IN USE.
MINIMIZE EXCESS HANDLING.

=====
Control Measures
=====

Respiratory Protection: WEAR AN APPROVED AIR-PURIFYING RESPIRATOR W/HIGH-
EFFICIENCY CARTRIDGES ADEQUATE TO CONTROL EXPOSURE IF PEL IS EXCEEDED.
Ventilation: CLOSED-SYSTEM HANDLING, LABORATORY BENCH HOOD/LOCAL EXHAUST
TO CONTROL DUST/MIST.
Protective Gloves: RUBBER
Eye Protection: RECOMMENDED
Work Hygienic Practices: WASH HANDS & FACE AFTER HANDLING. REMOVE/LAUNDER
CONTAMINATED CLOTHING BEFORE REUSE.
Suppl. Safety & Health Data: ORAL LD50 INFORMATION IS FOR CALCIUM
LEUCOVORIN.

=====
Transportation Data
=====

=====
Disposal Data
=====

=====
Label Data
=====

Label Required: YES
Label Status: G
Common Name: 04525 LEUCOVORIN CALCIUM TABLETS 10 MG
Special Hazard Precautions: CALCIUM LEUCOVORIN-LOW ORDER OF TOXICITY.
ALLERGIC REACTIONS HAVE BEEN REPORTED FOLLOWING ORAL/INTRAVENOUS
ADMINISTRATION. CALCIUM LEUCOVORIN-LOW ORDER OF TOXICITY. ALLERGIC
REACTIONS HAVE BEEN REPORTED FOLLOWING ORAL/INTRAVENOUS ADMINISTRATION.
Label Name: WYETH-AYERST LABORATORIES
Label P.O. Box: 8299
Label City: PHILADELPHIA
Label State: PA
Label Zip Code: 19101-5000
Label Country: US
Label Emergency Number: 610-902-5171

ENVIRONMENTAL RESOURCE ASSOCIATES -- 1000 PPM HEXAVALENT CHROMIUM - LABORATORY STA
MATERIAL SAFETY DATA SHEET
NSN: 655000F037420
Manufacturer's CAGE: 1R664
Part No. Indicator: A
Part Number/Trade Name: 1000 PPM HEXAVALENT CHROMIUM

=====
General Information
=====

Item Name: LABORATORY STANDARD
Company's Name: ENVIRONMENTAL RESOURCE ASSOCIATES
Company's Street: 5540 MARSHALL ST
Company's City: ARVADA
Company's State: CO
Company's Country: US
Company's Zip Code: 80002-3108
Company's Emerg Ph #: 303-431-8454
Company's Info Ph #: 303-431-8454
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SE
Date MSDS Prepared: 11MAY93
Safety Data Review Date: 22NOV94
MSDS Preparer's Name: DANIEL A GOLDSTEIN
Preparer's Company: ENVIRONMENTAL RESOURCE ASSOCIATES
Preparer's St Or P. O. Box: 5540 MARSHALL ST
Preparer's City: ARVADA
Preparer's State: CO
Preparer's Zip Code: 80002-3108
MSDS Serial Number: BWHZV

=====
Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: POTASSIUM BICHROMATE, POTASSIUM DICHROMATE (SUSPECTED HUMAN
CARCINOGEN BY IARC, NTP-GROUP 1) *94-3*
Ingredient Sequence Number: 01
Percent: <1
NIOSH (RTECS) Number: MX7680000
CAS Number: 7778-50-9
OSHA PEL: 0.1 MG(CR03)/CUM
ACGIH TLV: 0.05 MG(CR)/CUM

Proprietary: NO
Ingredient: WATER
Ingredient Sequence Number: 02
NIOSH (RTECS) Number: ZC0110000
CAS Number: 7732-18-5

=====
Physical/Chemical Characteristics
=====

Appearance And Odor: CLEAR ORANGE LIQUID W/NO ODOR
Boiling Point: 212F
Vapor Pressure (MM Hg/70 F): 28
Vapor Density (Air=1): >1
Specific Gravity: 1
Evaporation Rate And Ref: (WATER =1): 1
Solubility In Water: COMPLETE

=====
Fire and Explosion Hazard Data
=====

Extinguishing Media: NONE
Special Fire Fighting Proc: NONE

Unusual Fire And Expl Hazrds: NONE

=====
Reactivity Data
=====

Stability: YES
Cond To Avoid (Stability): FREEZING
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NONE

=====
Health Hazard Data
=====

Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: LIQUID PRODUCT OF DRIED RESIDUE IS A MILD IRRITANT TO EYES/MUCOUS MEMBRAN/SKIN. CHROMIUM CAUSES NON-HEALING ULERATIONS OF SKIN/MUCOUS MEMBRANES. HEXAVALENT CHROMIUM MAY CAUSE ALLERGIC SENSITIZATION. INGESTIION MAY RESULT IN ELECTROLYTE DISTURBANCES, HYPERKALEMIA N THE EVENT OF MASSIVE INGESTION.
Carcinogenicity - NTP: YES
Carcinogenicity - IARC: YES
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: SEE INGREDIENTS
Signs/Symptoms Of Overexp: IRRITATION, RASH, ELECTROLYTE DISTURBANCES.
Med Cond Aggravated By Exp: NONE
Emergency/First Aid Proc: EYES/SKIN: FLUSH W/COPIOUS AMOUNTS OF WATER. INGESTION: NO TREATMENT REQUIRED EXCEPT IN CASES OF MASSIVE INGESTION. OBTAIN MEDICAL ATTENTION IN ALL CASES.

=====
Precautions for Safe Handling and Use
=====

Steps If Matl Released/Spill: ABSORB & DISPOSE OF AS HAZARDOUS LABORATORY WASTE. VENTILATE AREA.
Waste Disposal Method: DISPOSE OF W/HAZARDOUS LABORATORY WASTE IAW/FEDERAL, STATE & LOCAL REGULATIONS.
Precautions-Handling/Storing: AVOID FREEZING/ROUGH HANDLING/BREAKAGE.
Other Precautions: AVOID INHALATION/DIRECT CONTACT W/DRIED RESIDUE. AVOID CREATION OF RESPIRABLE DUST/MIST. AVOID MIST/AEROSOL FORMATION.

=====
Control Measures
=====

Respiratory Protection: WEAR DUST/MIST RESPIRATOR IF MIST PRODUCTION OCCURS.
Ventilation: MECHANICAL/LOCAL EXHAUST: USE IN HOOD.
Protective Gloves: WATERPROOF
Eye Protection: SPLASH GOGGLES
Other Protective Equipment: WATERPROOF APRON W/SLEEVES, LAB COAT, CLOSED SHOES, SAFETY SHOWER, EYE WASH.

=====
Transportation Data
=====

=====
Disposal Data
=====

=====
Label Data
=====

Label Required: YES
Label Status: G
Common Name: 1000 PPM HEXAVALENT CHROMIUM
Special Hazard Precautions: LIQUID PRODUCT OF DRIED RESIDUE IS A MILD IRRITANT TO EYES/MUCOUS MEMBRAN/SKIN. CHROMIUM CAUSES NON-HEALING ULERATIONS OF SKIN/MUCOUS MEMBRANES. HEXAVALENT CHROMIUM MAY CAUSE ALLERGIC SENSITIZATION. INGESTIION MAY RESULT IN ELECTROLYTE DISTURBANCES,

HYPERKALEMIA N THE EVENT OF MASSIVE INGESTION. IRRITATION, RASH,
ELECTROLYTE DISTURBANCES.

Label Name: ENVIRONMENTAL RESOURCE ASSOCIATES

Label Street: 5540 MARSHALL ST

Label City: ARVADA

Label State: CO

Label Zip Code: 80002-3108

Label Country: US

Label Emergency Number: 303-431-8454

ENVIRONMENTAL RESOURCE ASSOCIATES -- 1000 PPM COBALT - LABORATORY STANDARD
MATERIAL SAFETY DATA SHEET
NSN: 655000F037421
Manufacturer's CAGE: 1R664
Part No. Indicator: A
Part Number/Trade Name: 1000 PPM COBALT

=====
General Information
=====

Item Name: LABORATORY STANDARD
Company's Name: ENVIRONMENTAL RESOURCE ASSOCIATES
Company's Street: 5540 MARSHALL ST
Company's City: ARVADA
Company's State: CO
Company's Country: US
Company's Zip Code: 80002-3108
Company's Emerg Ph #: 303-431-8454
Company's Info Ph #: 303-431-8454
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SE
Date MSDS Prepared: 05MAR92
Safety Data Review Date: 22NOV94
MSDS Preparer's Name: DANIEL A GOLDSTEIN
Preparer's Company: ENVIRONMENTAL RESOURCE ASSOCIATES
Preparer's St Or P. O. Box: 5540 MARSHALL ST
Preparer's City: ARVADA
Preparer's State: CO
Preparer's Zip Code: 80002-3108
MSDS Serial Number: BWHZW

=====
Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: NITRIC ACID, HYDROGEN NITRATE
Ingredient Sequence Number: 01
Percent: <5
NIOSH (RTECS) Number: QU5775000
CAS Number: 7697-37-2
OSHA PEL: 2 PPM
ACGIH TLV: 5.2 MG/CUM

Proprietary: NO
Ingredient: COBALT (ANIMAL CARCINOGEN BY IARC - GROUP 2B) *94-3*
Ingredient Sequence Number: 02
Percent: <1
NIOSH (RTECS) Number: GF8750000
CAS Number: 7440-48-4
OSHA PEL: 0.05 MG/CUM
ACGIH TLV: 0.05 MG/CUM
Other Recommended Limit: 0.05 PPM

=====
Physical/Chemical Characteristics
=====

Appearance And Odor: RED LIQUID W/NO ODOR
Boiling Point: (SEE SUPP)
Vapor Pressure (MM Hg/70 F): 28
Vapor Density (Air=1): >1
Specific Gravity: 1
Evaporation Rate And Ref: (WATER =1): 1
Solubility In Water: COMPLETE
pH: <1

Fire and Explosion Hazard Data

Extinguishing Media: NONE
 Special Fire Fighting Proc: NONE
 Unusual Fire And Expl Hazrds: NONE

Reactivity Data

Stability: YES
 Cond To Avoid (Stability): FREEZING
 Materials To Avoid: METALS
 Hazardous Decomp Products: HYDROGEN
 Hazardous Poly Occur: NO
 Conditions To Avoid (Poly): NONE

Health Hazard Data

Route Of Entry - Inhalation: YES
 Route Of Entry - Skin: YES
 Route Of Entry - Ingestion: YES
 Health Haz Acute And Chronic: POISON & CORROSIVE TO SKIN, EYES, MUCOUS
 MEMBRANES/LUNGS. MAY BURN ANY TISSUE & CAUSE BLINDNESS. MAY CAUSE GI TRACT
 PERFORATION, PULMONARY EDEMA. COBALT: HEART FAILURE, SEVERE
 GASTROENTERITIS.
 Carcinogenicity - NTP: NO
 Carcinogenicity - IARC: YES
 Carcinogenicity - OSHA: NO
 Explanation Carcinogenicity: SEE INGREDIENTS
 Signs/Symptoms Of Overexp: IRRITATION, BURNING, COUGH, METHEMOGLOBINEMIA,
 PAIN, ABDOMINAL PAIN, FLUSHING, DEAFNESS, RASH, GOITRE, REDNESS, SHORTNESS
 OF BREATH, VOMITING, CYANOSIS, THYROID ENLARGEMENT, ANKLE SWELLING.
 Med Cond Aggravated By Exp: ASTHMA, THYROID/HEART DISEASE.
 Emergency/First Aid Proc: EYES/SKIN: FLUSH W/COPIOUS AMOUNTS OF WATER.
 INHALATION: GIVE MOIST OXYGEN. INGESTION: GIVE WATER/MILK. OBTAIN MEDICAL
 ATTENTION IN ALL CASES.

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: NEUTRALIZE & FLUSH W/WATER/NEUTRALIZE &
 ABOSRB. VENTILATE AREA.
 Neutralizing Agent: BAKING SODA.
 Waste Disposal Method: DISPOSE OF AS NON-HAZARDOUS WASTE IAW/FEDERAL,
 STATE & LOCAL REGULATIONS.
 Precautions-Handling/Storing: AVOID FREEZING/ROUGH HANDLING/BREAKAGE.
 Other Precautions: AVOID INHALATION/DIRECT CONTACT W/DRIED RESIDUE. AVOID
 MIST/AEROSOL FORMATION. DON'T HEAT DRIED RESIDUE.

Control Measures

Respiratory Protection: WEAR ACID GAS TYPE DUST/MIST RESPIRATOR IF MIST
 PRODUCTION OCCURS.
 Ventilation: MECHANICAL/LOCAL EXHAUST: USE IN HOOD.
 Protective Gloves: ACID PROOF
 Eye Protection: SPLASH GOGGLES
 Other Protective Equipment: ACID PROOF APRON W/SLEEVES, LAB COAT, CLOSED
 SHOES, SAFETY SHOWER, EYE WASH.
 Suppl. Safety & Health Data: BOILING POINT (0-5% ACID): 212-212.72F.

Transportation Data

Disposal Data

Label Data

=====
Label Required: YES
Label Status: G
Common Name: 1000 PPM COBALT
Special Hazard Precautions: POISON & CORROSIVE TO SKIN, EYES, MUCOUS
MEMBRANES/LUNGS. MAY BURN ANY TISSUE & CAUSE BLINDNESS. MAY CAUSE GI TRACT
PERFORATION, PULMONARY EDEMA. COBALT: HEART FAILURE, SEVERE
GASTROENTERITIS. IRRITATION, BURNING, COUGH, METHEMOGLOBINEMIA, PAIN,
ABDOMINAL PAIN, FLUSHING, DEAFNESS, RASH, GOITRE, REDNESS, SHORTNESS OF
BREATH, VOMITING, CYANOSIS, THYROID ENLARGEMENT, ANKLE SWELLING.
Label Name: ENVIRONMENTAL RESOURCE ASSOCIATES
Label Street: 5540 MARSHALL ST
Label City: ARVADA
Label State: CO
Label Zip Code: 80002-3108
Label Country: US
Label Emergency Number: 303-431-8454

Copper
05430

**** SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION ****

MSDS Name: Copper

Catalog Numbers:

S72895, S72896, S79977, S79977-1, S79977-2, S79977-3, S79978, S79978-1,
S79979, S79979-1, C430 500, C430-500, C430500, C431 500, C431-500, C431500,
C434 500, C434-500, C434500, C575 500, C575-500, C575500, S4821A, S4821B,
S4821C, S4821D, S4821E, S72895ND, S799771, S799772, S799773, S799781,
S79978ND, S799791

Synonyms:

Allbri natural copper, bronze powder, copper slag-airborne

Company Identification: Fisher Scientific
1 Reagent Lane
Fairlawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

**** SECTION 2 - COMPOSITION, INFORMATION ON INGREDIENTS ****

| CAS# | Chemical Name | % | EINECS# |
|-----------|---------------|-----|-----------|
| 7440-50-8 | COPPER | 100 | 231-159-6 |

**** SECTION 3 - HAZARDS IDENTIFICATION ****

EMERGENCY OVERVIEW

Appearance: red to brown.

Warning! Causes respiratory tract irritation. May cause lung damage.

May cause liver and kidney damage. Causes eye and skin irritation.

Inhalation of fumes may cause metal-fume fever. Can be explosive when exposed to heat or flames. May cause digestive tract irritation with nausea, vomiting, and diarrhea.

Target Organs: Kidneys, liver, lungs.

Potential Health Effects

Eye:

Causes eye irritation.

Skin:

Causes skin irritation. May cause skin discoloration.

Ingestion:

Causes gastrointestinal irritation with nausea, vomiting and diarrhea. May cause liver and kidney damage.

Inhalation:

Dust is irritating to the respiratory tract. Inhalation of fumes may cause metal fume fever, which is characterized by flu-like symptoms with metallic taste, fever, chills, cough, weakness, chest pain, muscle pain and increased white blood cell count.

Chronic:

Prolonged or repeated skin contact may cause dermatitis. May cause liver and kidney damage. May cause lung damage.

**** SECTION 4 - FIRST AID MEASURES ****

Eyes:

Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin:

Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

Ingestion:

Induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical aid.

Inhalation:

Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician:

Individuals with Wilson's disease are more susceptible to chronic copper poisoning.

Antidote:

Use of a metal chelator may be of value.

**** SECTION 5 - FIRE FIGHTING MEASURES ****

General Information:

As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Material can spontaneously ignite (pyrophoric) when exposed to air at normal or slightly elevated temperatures.

Extinguishing Media:

Use extinguishing media most appropriate for the surrounding fire.

**** SECTION 6 - ACCIDENTAL RELEASE MEASURES ****

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks:

Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions.

**** SECTION 7 - HANDLING and STORAGE ****

Handling:

Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with skin and eyes. Avoid ingestion and inhalation.

Storage:

Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Do not expose to air.

**** SECTION 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION ****

Engineering Controls:

Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

| Chemical Name | ACGIH | NIOSH | OSHA - Final PELs |
|---------------|---|--|--|
| COPPER | fume: 0.2 mg/m3 ; dusts and mists, as Cu: 1 mg/m3 | as Cu: 1 mg/m3 TWA (dusts and mists); 0.1 mg/m3 TWA (fume) dusts as mists as Cu: 100 mg/m3 IDLH | fume, as Cu: 0.1 mg/m3 TWA; dusts and mists, as Cu: 1 mg/m3 TWA |

OSHA Vacated PELs:

COPPER:
fume, as Cu: 0.1 mg/m3 TWA

Personal Protective Equipment

Eyes:

Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin:

Wear appropriate gloves to prevent skin exposure.

Clothing:

Wear appropriate protective clothing to minimize contact with skin.

Respirators:

Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

**** SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES ****

Physical State: Solid
Appearance: red to brown
Odor: None reported
pH: Not available.
Vapor Pressure: 1 mm Hg @1628C
Vapor Density: Not available.
Evaporation Rate: Not applicable.
Viscosity: Not applicable.
Boiling Point: 2595 deg C
Freezing/Melting Point: 1083 deg C
Autoignition Temperature: Not applicable.
Flash Point: Not applicable.
NFPA Rating: (est.) Health: 2; Flammability: 1; Reactivity: 0
Explosion Limits, Lower: Not available.
Upper: Not available.
Decomposition Temperature: Not available.
Solubility: Insoluble in water.
Specific Gravity/Density: 8.92
Molecular Formula: Cu
Molecular Weight: 63.546

**** SECTION 10 - STABILITY AND REACTIVITY ****

Chemical Stability:

Stable at room temperature in closed containers under normal storage and handling conditions. Explosive peroxides may form on concentration.

Conditions to Avoid:

Incompatible materials, dust generation, moisture, exposure to air.

Incompatibilities with Other Materials:

Liquid copper explodes on contact with water. Reacts violently with ammonium nitrate, bromates, iodates, chlorates, ethylene oxide, hydrazoic acid, potassium oxide, dimethyl sulfoxide + trichloroacetic acid, hydrogen peroxide, sodium peroxide, sodium azide, sulfuric acid, hydrogen sulfide + air, and lead azide. Ignites on contact with chlorine, fluorine (above 121C), chlorine trifluoride, and hydrazinium nitrate (above 70C). Incompatible with 1-bromo-2-propyne, potassium dioxide, and acetylenic compounds.

Hazardous Decomposition Products:

Copper fumes.

Hazardous Polymerization: Has not been reported.

**** SECTION 11 - TOXICOLOGICAL INFORMATION ****

RTECS#:

CAS# 7440-50-8: GL5325000

LD50/LC50:

Not available.

Carcinogenicity:

COPPER -

Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.

Epidemiology:

No data available.

Teratogenicity:

Experimental studies show teratogenic effects in laboratory animals.

Reproductive Effects:

No data available.

Neurotoxicity:

No data available.

Mutagenicity:

No data available.

Other Studies:

Experimental studies show tumorigenic effects in laboratory animals.

**** SECTION 12 - ECOLOGICAL INFORMATION ****

**** SECTION 13 - DISPOSAL CONSIDERATIONS ****

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste.

US EPA guidelines for the classification determination are listed in 40 CFR Part 261. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

**** SECTION 14 - TRANSPORT INFORMATION ****

US DOT

No information available

Canadian TDG

No information available.

**** SECTION 15 - REGULATORY INFORMATION ****

US FEDERAL

TSCA

CAS# 7440-50-8 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

SARA

Section 302 (RQ)

CAS# 7440-50-8: final RQ = 5000 pounds (2270 kg) (no reporting of release)
Section 302 (TPQ)

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7440-50-8: acute, chronic, flammable.

Section 313

This material contains COPPER (CAS# 7440-50-8, 100%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 372.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

CAS# 7440-50-8 is listed as a Priority Pollutant under the Clean Water Act.

CAS# 7440-50-8 is listed as a Toxic Pollutant under the Clean Water Act.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

COPPER can be found on the following state right to know lists:

California, New Jersey, Florida, Pennsylvania, Minnesota, Massachusetts.

California No Significant Risk Level:

None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols: Not available.

Risk Phrases:

Safety Phrases:

WGK (Water Danger/Protection)

CAS# 7440-50-8: 0

United Kingdom Occupational Exposure Limits

CAS# 7440-50-8: OES-United Kingdom, TWA fume: 0.2 ppm TWA; dusts and mists, as Cu: 1 mg/m³ TWA

CAS# 7440-50-8: OES-United Kingdom, STEL dusts and mists, as Cu: 2 mg/m³ STEL

Canada

CAS# 7440-50-8 is listed on Canada's DSL/NDSL List.

This product has a WHMIS classification of D2B.

CAS# 7440-50-8 is not listed on Canada's Ingredient Disclosure List.

Exposure Limits

CAS# 7440-50-8: OEL-ARAB Republic of Egypt:TWA 0.1 mg/m³ (fume)

OEL-AUSTRALIA:TWA 0.2 mg/m³ (fume)

OEL-AUSTRALIA:TWA 1 mg/m³ (dust)

OEL-BELGIUM:TWA 0.2 mg/m³ (fume)

OEL-BELGIUM:TWA 1 mg/m³ (dust)

OEL-DENMARK:TWA 0.1 mg/m³ (fume)

OEL-DENMARK:TWA 1 mg/m³ (dust)

OEL-FINLAND:TWA 0.2 mg/m³ (fume)

OEL-FINLAND:TWA 1 mg/m³

OEL-FINLAND:TWA 1 mg/m³ (dust)

OEL-FRANCE:TWA 0.2 mg/m³ (fume)

OEL-FRANCE:TWA 1 mg/m³;STEL 2 mg/m³ (dust)

OEL-GERMANY:TWA 0.1 mg/m³ (fume)

OEL-GERMANY:TWA 1 mg/m³

OEL-GERMANY:TWA 1 mg/m³ (dust)

OEL-HUNGARY:TWA 0.2 mg/m³;STEL 0.4 mg/m³ (dust)

OEL-INDIA:TWA 0.2 mg/m³ (fume)

OEL-THE NETHERLANDS:TWA 0.2 mg/m³ (fume)

OEL-THE NETHERLANDS:TWA 1 mg/m³ (dust)

OEL-THE PHILIPPINES:TWA 1.0 mg/m³ (fume)

OEL-POLAND:TWA 0.1 mg/m³ (fume)

OEL-RUSSIA:STEL 0.5 ppm (1 mg/m³) (dust)

OEL-SWEDEN:TWA 0.2 mg/m³ (resp. dust)

OEL-SWEDEN:TWA 0.2 mg/m³ (fume)

OEL-SWEDEN:TWA 1 mg/m³ (total dust)

OEL-SWITZERLAND:TWA 0.1 mg/m³;STEL 0.2 mg/m³ (fume)

OEL-SWITZERLAND:TWA 1 mg/m³;STEL 1 mg/m³

OEL-THAILAND:TWA 0.1 mg/m³ (fume)

OEL-THAILAND:TWA 1 mg/m³

OEL-UNITED KINGDOM:TWA 0.2 mg/m³ (fume)

**** SECTION 16 - ADDITIONAL INFORMATION ****

MSDS Creation Date: 12/12/1997 Revision #1 Date: 8/02/2000

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no way shall the company be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if the company has been advised of the possibility of such damages.

SPEX INDUSTRIES -- QCS-CYN QUALITY CONTROL SAMPLES-CYANIDE
MATERIAL SAFETY DATA SHEET
NSN: 681000F031077
Manufacturer's CAGE: 07977
Part No. Indicator: A
Part Number/Trade Name: QCS-CYN QUALITY CONTROL SAMPLES-CYANIDE

=====
General Information
=====

Company's Name: SPEX INDUSTRIES INC
Company's Street: 3880 PARK AVE
Company's City: EDISON
Company's State: NJ
Company's Country: US
Company's Zip Code: 08820-3012
Company's Emerg Ph #: 800-522-7739/908-549-7144
Company's Info Ph #: 800-522-7739/201-549-7144
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SE
Date MSDS Prepared: 07OCT91
Safety Data Review Date: 05NOV93
MSDS Preparer's Name: VANAJA SIVAKUMAR
Preparer's Company: SPEX INDUSTRIES INC
Preparer's St Or P. O. Box: 3880 PARK AVE
Preparer's City: EDISON
Preparer's State: NJ
Preparer's Zip Code: 08820-3012
MSDS Serial Number: BSMNT

=====
Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: POTASSIUM CYANIDE
Ingredient Sequence Number: 01
Percent: 0.0063
NIOSH (RTECS) Number: TS8750000
CAS Number: 151-50-8
OSHA PEL: 5 MG (CN)/CUM
ACGIH TLV: 5 MG (CN)/CUM (SKIN)
Other Recommended Limit: 5 MG (CN)/CUM/10M

=====
Physical/Chemical Characteristics
=====

Appearance And Odor: TRANSPARENT SOLUTION.
Specific Gravity: 1
Solubility In Water: COMPLETE
pH: 8.4

=====
Fire and Explosion Hazard Data
=====

Flash Point: NON-COMBUSTIBLE
Extinguishing Media: APPROPRIATE TO SURROUNDING FIRE CONDITIONS.

=====
Reactivity Data
=====

Stability: YES
Materials To Avoid: ACID & STRONG OXIDIZING AGENTS
Hazardous Decomp Products: HYDROGEN CYANIDE, NITROGEN OXIDES & CO, CO2
Hazardous Poly Occur: NO

=====
Health Hazard Data
=====

LD50-LC50 Mixture: ORAL LDLO (HUMAN): 2857 UG/KG (SEE SUPP)
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: NO
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: POTASSIUM CYANIDE IS A RAPIDLY FATAL POISON
PROLONGED CONTACT WILL CAUSE IRRITATION & POSSIBLE POISONING COULD OCCUR IF
SKIN IS BROKEN. HARMFUL IF INHALED OR SWALLOWED.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NONE
REMOVE CONTAMINATED CLOTHING, THEN FLUSH W/WATER FOR AT LEAST 15 MINS.
INHALATION: REMOVE TO FRESH AIR. INGESTION: OBTAIN MEDICAL ATTENTION IN ALL
CASES.

=====

Precautions for Safe Handling and Use

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Steps If Matl Released/Spill: VENTILATE AREA. WIPE UP & PLACE IN SEALED
CONTAINER FOR PROPER DISPOSAL. WASH SPILL SITE W/WATER AFTER MATERIAL HAS
BEEN PICKED UP COMPLETELY. WEAR CHEMICAL RESISTANT GLASSES/GLOVES/CLOTHING.
WEAR OSHA/NIOSH APPROVED RESPIRATOR.
Waste Disposal Method: DISPOSE OF IN ACCORDANCE W/LOCAL, STATE, & FEDERAL
REGULATIONS.
Precautions-Handling/Storing: KEEP STORED IN TIGHTLY CLOSED CONTAINER IN A
DRY AREA. KEEP AT ROOM TEMPERATURE. AVOID INHALATION/INGESTION/CONTACT W/
SKIN & EYES.

=====

Control Measures

=====

Respiratory Protection: USE NIOSH/MSHA APPROVED RESPIRATOR.
Ventilation: CHEMICAL FUME HOOD
Protective Gloves: CHEMICAL RESISTANT
Eye Protection: CHEMICAL RESISTANT GLASSES, GOGGLES
Other Protective Equipment: CHEMICAL RESISTANT CLOTHING, EMERGENCY EYE
WASH, LAB COAT
Work Hygienic Practices: WASH CAREFULLY AFTER HANDLING.
Suppl. Safety & Health Data: 63 PPM OF POTASSIUM CYANIDE (0.0063%); 50 PPM
OF POTASSIUM FERRICYANIDE (0.005%); & 10 PPM OF POTASSIUM HYDROXIDE
(0.001%) ALL IN WATER. LDLO INFORMATION IS FOR POTASSIUM CYANIDE.

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Transportation Data

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Disposal Data

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Label Data

=====

Label Required: YES
Technical Review Date: 05NOV93
Label Date: 04NOV93
Label Status: F
Common Name: QCS-CYN QUALITY CONTROL SAMPLES-CYANIDE
Chronic Hazard: YES
Signal Word: DANGER!
Acute Health Hazard-Severe: X
Contact Hazard-Moderate: X
Fire Hazard-None: X
Reactivity Hazard-None: X
Special Hazard Precautions: POTASSIUM CYANIDE IS A RAPIDLY FATAL POISON
PROLONGED CONTACT WILL CAUSE IRRITATION & POSSIBLE POISONING COULD OCCUR IF
SKIN IS BROKEN. HARMFUL IF INHALED OR SWALLOWED. TARGET ORGANS: SKIN, EYES,
DIGESTIVE SYSTEM. EYES/SKIN: IRRITATION. INGESTION: IRRITATION,
GASTROINTESTINAL DISTURBANCES. INHALATION: IRRITATION, NARCOSIS. TARGET

ORGANS: EYES/SKIN, DIGESTIVE TRA
Protect Eye: Y
Protect Skin: Y
Protect Respiratory: Y
Label Name: SPEX INDUSTRIES INC
Label Street: 3880 PARK AVE
Label City: EDISON
Label State: NJ
Label Zip Code: 08820-3012
Label Country: US
Label Emergency Number: 800-522-7739/908-549-7144
Year Procured: UNK

WATLOW GORDON -- IRON-JPX JP
MATERIAL SAFETY DATA SHEET
NSN: 343900F053034
Manufacturer's CAGE: 93768
Part No. Indicator: A
Part Number/Trade Name: IRON-JPX JP

=====
General Information
=====

Company's Name: WATLOW GORDON
Company's Street: 5710 KENOSHA ST
Company's P. O. Box: 500
Company's City: RICHMOND
Company's State: IL
Company's Country: US
Company's Zip Code: 60071-5000
Company's Emerg Ph #: 815-678-2211
Company's Info Ph #: 815-678-2211
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SE
Date MSDS Prepared: 21MAY96
Safety Data Review Date: 25MAR97
MSDS Preparer's Name: ALAN HAMACKA
Preparer's Company: WATLOW GORDON
Preparer's St Or P. O. Box: 5710 KENOSHA ST
Preparer's City: RICHMOND
Preparer's State: IL
Preparer's Zip Code: 60071-5000
MSDS Serial Number: CDQYF

=====
Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: RED IRON OXIDE/IRON (III) OXIDE/FERRIC OXIDE/YELLOW FERRIC
OXIDE/YELLOW IRON OXIDE/IRON OXIDE PIGMENT
Ingredient Sequence Number: 01
Percent: 99
NIOSH (RTECS) Number: NO7400000
CAS Number: 1309-37-1
OSHA PEL: 10 MG/CUM
ACGIH TLV: 5 MG/CUM (FE)

=====
Physical/Chemical Characteristics
=====

=====
Fire and Explosion Hazard Data
=====

Flash Point: NONFLAMMABLE
Unusual Fire And Expl Hazrds: SPARKS FROM GRINDING/WELDING MAY IGNITE
FLAMMABLE/COMBUSTIBLE MATERIALS.

=====
Reactivity Data
=====

Stability: YES
Hazardous Decomp Products: METAL DUST/FUMES
Hazardous Poly Occur: NO

=====
Health Hazard Data
=====

Route Of Entry - Inhalation: YES
Route Of Entry - Skin: NO
Route Of Entry - Ingestion: NO

Health Haz Acute And Chronic: IRRITATION TO THE NOSE, EYES, THROAT/SKIN. CHRONIC EXPOSURE MAY CAUSE SEVERE LUNG DISEASES, LUNG FIBROSIS, PNEUMOCONIOSIS/NEUROLOGICAL DAMAGE. SKIN SENSITIVITY MAY ALSO OCCUR.

Carcinogenicity - NTP: NO

Carcinogenicity - IARC: NO

Carcinogenicity - OSHA: NO

Explanation Carcinogenicity: NONE

Signs/Symptoms Of Overexp: DISCOMFORT, IRRITATION, NAUSEA, TIGHTNESS OF CHEST, DIZZINESS, WATERING OF EYES, HEADACHES, DIFFICULTY IN BREATHING, COUGHING, CHEST PAINS.

Med Cond Aggravated By Exp: THOSE HAVING PRE-EXISTING CONDITIONS/OTHER OCCUPATIONAL ILLNESSES BECAUSE OF THE WIDE VARIATION IN INDIVIDUAL SUSCEPTIBILITES.

Emergency/First Aid Proc: INHALATION: MOVE TO FRESH AIR. SKIN: WASH W/ SOAP & WATER. EYES: IMMEDIATELY WASH W/LARGE AMOUNTS OF WATER, WASH FOR 15 MINS. OBTAIN MEDICAL ATTENTION IN ALL CASES.

Precautions for Safe Handling and Use

Waste Disposal Method: GRINDING PARTICLES/DUSTS/WELDING FUMES/CHEMICAL CLEANING SOLUTIONS MUST BE DISPOSED OF IN ACCORDANCE W/LOCAL, STATE & FEDERAL REGULATIONS.

Other Precautions: ARC/SPARK GENERATED WHEN WELDING/BURNING COULD BE A SOURCE OF IGNITION FOR COMBUSTIBLE & FLAMMABLE MATERIALS.

Control Measures

Respiratory Protection: REQUIRED WHEN EXPOSED TO LEVELS THAT EXCEED THOSE ESTABLISHED BY OSHA WHEN GRINDING/WELDING. USE NIOSH APPROVED RESPIRATORS.

Ventilation: REQUIRED.

Protective Gloves: NIOSH APPROVED

Eye Protection: FACE SHIELDS

Other Protective Equipment: PROTECTIVE CLOTHING WHEN REQUIRED.

Transportation Data

Disposal Data

Label Data

M C CANFIELD SONS -- LEAD, LEAD WOOL
MATERIAL SAFETY DATA SHEET
NSN: 343900N050884
Manufacturer's CAGE: 57191
Part No. Indicator: B
Part Number/Trade Name: LEAD, LEAD WOOL

=====
General Information
=====

Company's Name: M C CANFIELD SONS
Company's Street: 1000 BRIGHTON ST
Company's City: UNION
Company's State: NJ
Company's Country: US
Company's Zip Code: 07083
Company's Emerg Ph #: 908-688-5050
Company's Info Ph #: 908-688-5050
Record No. For Safety Entry: 002
Tot Safety Entries This Stk#: 002
Status: SMJ
Date MSDS Prepared: 02JAN92
Safety Data Review Date: 05JAN98
MSDS Serial Number: CFZLL

=====
Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: LEAD (SARA 313) (CERCLA)
Ingredient Sequence Number: 01
Percent: 100
NIOSH (RTECS) Number: OF7525000
CAS Number: 7439-92-1
OSHA PEL: SEE 1910.1025
ACGIH TLV: 0.15MG/M3 DUST

=====
Physical/Chemical Characteristics
=====

Appearance And Odor: BLUISH-GRAY SOFT METAL; ODORLESS; VARIOUS SHAPES AND SIZES
Boiling Point: 3164F,1740C
Melting Point: 621F,327C
Specific Gravity: 11.3 (H*20=1)
Solubility In Water: INSOLUBLE

=====
Fire and Explosion Hazard Data
=====

Flash Point: N/A
Lower Explosive Limit: N/A
Upper Explosive Limit: N/A
Extinguishing Media: DRY CHEMICALS OR SAND SHOULD BE USED WITH MOLTEN METALS.
Special Fire Fighting Proc: WEAR NIOSH APPROVED SCBA AND FULL PROTECTIVE EQUIPMENT (FP N).
Unusual Fire And Expl Hazrds: MODERATE IN THE FORM OF DUST WHEN EXPOSED TO HEAT/FLAME. WHEN HEATED TO HIGH TEMPERATURES LEAD EMITS HIGHLY TOXIC FUMES; CAN REACT VIGOROUSLY W/OXIDIZING MATLS.

=====
Reactivity Data
=====

Stability: YES
Cond To Avoid (Stability): LEAD CAN REACT VIGOROUSLY W/OXIDIZING MATLS. WATER MAY BECOME TRAPPED W/IN SURF CRACKS WHICH MAY CAUSE EXPLO (SUP DAT)
Materials To Avoid: STRONG OXIDIZING MATERIALS (E.G., CHLORINE)

TRIFLUORIDE, HYDROGEN PEROXIDE, SODIUM AZIDE).
Hazardous Decomp Products: NOT APPLICABLE.
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NOT RELEVANT.

Health Hazard Data

LD50-LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: CHRONIC OVEREXP TO HIGH LEVELS OF AIRBORNE/
INGESTED LEAD MAY RSLT IN ANEMIA, INSOMNIA, WEAK, CONSTIP, NAUS & ABDOM
PAIN. PRLNG OVEREXP MAY RSLT IN KIDNEY & NERV SYS INVOLVEMENT & REPRO EFTS.
LEAD APPEARS ON THE NAVY OCCUP CHEM REPRO HAZ LIST. SEEK CONSULTATION FROM
APPROP HLTH PROFESSIONALS CONCERNING (EFTS OF OVEREXP)
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NOT RELEVANT.
Signs/Symptoms Of Overexp: HLTH HAZ: LATEST HAZ LIST INFO & SAFE HANDLING
& EXPOS INFO (FP N).
Med Cond Aggravated By Exp: DISEASES OF THE BLOOD & BLOOD-FORMING ORGANS,
KIDNEYS, NERVOUS & POSSIBLY REPRODUCTIVE SYSTEMS MAY BE AGGRAVATED BY
OVEREXPOSURE TO LEAD. EXPOSURE TO LEAD MAY RESULT IN INJURY TO A DEVELOPING
FETUS.
Emergency/First Aid Proc: IT IS UNLIKELY THAT OCCUPATIONALLY RELATED
EXPOSURE TO THIS MATERIAL WOULD RESULT IN ACUTE ILLNESS. INHALATION: IF
SYMPTOMS ARE PRESENT, REMOVE FROM EXPOSURE & CONSULT MD. SKIN: FOR HOT
METAL BURNS, EXPOSURE AREA SHOULD BE COOLED W/WATER & MEDICAL ATTENTION
SOUGHT. EYES: FLUSH W/POTABLE WATER FOR AT LEAST 15 MINUTES. SEE MD (FP N).
INGESTION: CALL MD IMMEDIATELY (FP N).

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: VACUUMING OR WET-SWEPT RECOMMENDED. DRY
SWEEPING MAY RESULT IN HIGH CONCENTRATIONS OF AIRBORNE DUST. SPECIAL CARE
SHOULD BE TAKEN WHEN HANDLING MOLTEN METAL.
Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.
Waste Disposal Method: METAL TURNINGS, GRINDINGS, DRIPPINGS, OR DROSSES
SHOULD BE RECYCLED. WASTE SHOULD BE DISPOSED OF IN ACCORDANCE WITH FEDERAL,
STATE AND LOCAL REGULATIONS.
Precautions-Handling/Storing: FOOD AND DRINK SHOULD NOT BE CONSUMED OR
TOBACCO PRODUCTS USED, NOR COSMETICS APPLIED IN AREAS WHERE LEAD MAY BE
USED.
Other Precautions: AVOID INHALATION OF DUST OR FUMES IN CONCENTRATIONS
ABOVE OSHA LIMITS. MATERIAL IN STORAGE CAN BECOME WET FROM CONDENSATION. IT
MUST BE THOROUGHLY DRIED BEFORE ADDING TO MOLTEN METAL.

Control Measures

Respiratory Protection: A NIOSH APPROVED DUST/FUME RESPIRATOR SHOULD BE
WORN WHERE APPLICABLE LIMITS MAY BE EXCEEDED.
Ventilation: PROVIDE SUFFICIENT MECHANICAL (GENERAL AND/OR LOCAL EXHAUST)
VENTILATION TO MAINTAIN EXPOSURE BELOW TLV'S.
Protective Gloves: IMPERVIOUS GLOVES (FP N).
Eye Protection: ANSI APPRVD CHEM WORKERS GOGGLES (FP N).
Other Protective Equipment: ANSI APPROVED EMERGENCY EYEWASH AND DELUGE
SHOWER (FP N). WORK CLOTHES SHOULD BE WORN.
Work Hygienic Practices: ALWAYS WASH AFTER HNDLG LEAD & BEFORE EATING,
DRINKING/SMOKING. LAUNDRER WORK CLOTHES I/A/W CURRENT OSHA LEAD (SUP DAT)
Suppl. Safety & Health Data: CNDTNS TO AVOID: WHEN METAL IS MELTED.
HYGIENE PRACT: STANDARDS. INORGANIC LEAD IS NOT ABSORBED THROUGH INTACT
SKIN.

=====
Transportation Data
==========
Disposal Data
==========
Label Data
=====

Label Required: YES
Technical Review Date: 05JAN98
Label Date: 05JAN98
Label Status: G
Common Name: LEAD, LEAD WOOL
Chronic Hazard: YES
Acute Health Hazard-None: X
Contact Hazard-None: X
Fire Hazard-None: X
Reactivity Hazard-None: X
Special Hazard Precautions: ACUTE: NONE SPECIFIED BY MANUFACTURER.
CHRONIC: LEAD APPEARS ON THE NAVY OCCUPATIONAL CHEMICAL REPRODUCTIVE
HAZARDS LIST (FP N). CHRONIC OVEREXPOSURE TO HIGH LEVELS OF AIRBORNE OR
INGESTED LEAD MAY RESULT IN ANEMIA, INSOMNIA, WEAKNESS, CONSTIPATION,
NAUSEA AND ABDOMINAL PAIN. PROLONGED OVEREXPOSURE MAY RESULT IN KIDNEY AND
NERVOUS SYSTEM INVOLVEMENT AND REPRODUCTIVE EFFECTS.
Protect Eye: Y
Protect Skin: Y
Protect Respiratory: Y
Label Name: M C CANFIELD SONS
Label Street: 1000 BRIGHTON ST
Label City: UNION
Label State: NJ
Label Zip Code: 07083
Label Country: US
Label Emergency Number: 908-688-5050

READE MFG DIV MAGNESIUM ELEKTRON -- P8048 MAGNESIUM THORIUM ALLOY HK31
MATERIAL SAFETY DATA SHEET
NSN: 685000F051167
Manufacturer's CAGE: 81450
Part No. Indicator: A
Part Number/Trade Name: P8048 MAGNESIUM THORIUM ALLOY HK31

=====
General Information
=====

Company's Name: READE MFG DIVISION/MAGNESIUM ELEKTRON INC
Company's Street: 100 RIDGEWAY BLVD
Company's City: LAKEHURST
Company's State: NJ
Company's Country: US
Company's Zip Code: 08733-5000
Company's Emerg Ph #: 908-657-6451
Company's Info Ph #: 908-657-6451
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SE
Date MSDS Prepared: 01JAN95
Safety Data Review Date: 26SEP96
Preparer's Company: READE MFG DIVISION/MAGNESIUM ELEKTRON IN
Preparer's St Or P. O. Box: 100 RIDGEWAY BLVD
Preparer's City: LAKEHURST
Preparer's State: NJ
Preparer's Zip Code: 08733-5000
MSDS Serial Number: CCDRH

=====
Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: MAGNESIUM
Ingredient Sequence Number: 01
Percent: >95
NIOSH (RTECS) Number: OM2100000
CAS Number: 7439-95-4

Proprietary: NO
Ingredient: THORIUM
Ingredient Sequence Number: 02
Percent: <4
NIOSH (RTECS) Number: XO6400000
CAS Number: 7440-29-1

Proprietary: NO
Ingredient: ZIRCONIUM
Ingredient Sequence Number: 03
Percent: <1
NIOSH (RTECS) Number: ZH7070000
CAS Number: 7440-67-7
OSHA PEL: 5 MG/CUM
ACGIH TLV: 5 MG/CUM

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Physical/Chemical Characteristics
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Appearance And Odor: SILVERY-GREY MODERATELY HARD ALKALINE EARTH METAL;
ODORLESS
Boiling Point: 2012F
Melting Point: 1130-1193F
Solubility In Water: INSOLUBLE

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Fire and Explosion Hazard Data
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 Extinguishing Media: DRY AGENTS; CLASS D DRY POWDER EXTINGUISHER, FLUX, SAND/TALC (MAGNESIUM TRISILICATE) & PRESSURED EXTINGUISHERS.
 Special Fire Fighting Proc: USE SCBA. DON'T USE WATER, FOAM, HALOGENATED GAS/CO2. AVOID SUSPENSIONS/ACCUMULATIONS OF MAGNESIUM DUST/POWDER IN AIR; MAY CREATE AN EXPLOSIVE MIXTURE. (SEE SUPP
 Unusual Fire And Expl Hazrds: MAGNESIUM THORIUM ALLOYS IGNITE IF RAISED NEAR MELTING POINT/ANY SPARK/FLAME. EXPOSION HAZARD WHEN IN FINELY DIVIDED FORM.
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 Reactivity Data
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Stability: YES
 Cond To Avoid (Stability): FLAMES, SPARKS & SOURCES OF HEAT, MOISTURE.
 Materials To Avoid: WATER, ACIDS, MOLTEN ALLOYS, WATER REACTS W/MAGNESIUM RELEASING EXPLOSIVE HIGHLY FLAMMABLE HYDROGEN GAS.
 Hazardous Decomp Products: MAGNESIUM OXIDE/THORIUM OXIDE/MAGNESIUM NITRIDE/FERROUS OXIDE/SILICA/HYDROGEN GAS/AMMONIA/HYDROXIDES.
 Hazardous Poly Occur: NO
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 Health Hazard Data
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LD50-LC50 Mixture: ORAL LD50 (RAT): 230 MG/KG MAGNESIUM
 Route Of Entry - Inhalation: NO
 Route Of Entry - Skin: NO
 Route Of Entry - Ingestion: NO
 Health Haz Acute And Chronic: INHALATION: LOW TOXICITY, 98% OF THORIUM OXIDE REMAINS IN THE LUNGS AFTER 1 YEAR. EYES: MECHANICAL INJURY EXPECTED. SKIN: MAGNESIUM SLIVERS BENEATH THE SKIN TO PRODUCE GASEOUS BLEBS. INGESTION: LOW TOXICITY.
 Carcinogenicity - NTP: NO
 Carcinogenicity - IARC: NO
 Carcinogenicity - OSHA: NO
 Explanation Carcinogenicity: NONE
 Signs/Symptoms Of Overexp: INHALATION: LOW TOXICITY, 98% OF THORIUM OXIDE MAGNESIUM SLIVERS BENEATH THE SKIN TO PRODUCE GASEOUS BLEBS. INGESTION: LOW TOXICITY.
 Emergency/First Aid Proc: INHALATION: REMOVE TO FRESH AIR. SKIN: WASH OFF W/SOAP & FLOWING WATER. ANY CUTS/ABRASIONS SHOULD BE CLEANED THOROUGHLY PRIOR TO DRESSING. SPLINTERS SHOULD BE REMOVED & THE WOUND DRESSED W/ MAGNESIUM SULPHATE. EYES: WASH W/CLEAN WATER/0.9% W/STERILE SOLUTION OF SODIUM CHLORIDE. OBTAIN MEDICAL ATTENTION IN ALL CASES.
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 Precautions for Safe Handling and Use
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Steps If Matl Released/Spill: MAGNESIUM THORIUM ALLOY MAY BE COLLECTED & REUSED IF CLEAN & DRY. PARTICULATE SHOULD BE COLLECTED USING A NATURAL FIBER BRUSH & A NON-SPARKING DUST PAN. WET/CONTAMINATED MATERIAL SHOULD BE PLACED IN A WELL VENTILATED STEEL CONTAINER & STORED OUTSIDE.
 Waste Disposal Method: NON-RECYCLABLE MATERIAL SHOULD BE DISPOSED OF IN A LICENSED CHEMICAL WASTE FACILITY IAW/FEDERAL, STATE & LOCAL REGULATIONS. RADIOACTIVE MATERIAL W/LOW SPECIFIC ACTIVITY UN2912.
 Precautions-Handling/Storing: STORE IN A COOL DRY PLACE AWAY FROM OTHER MATERIALS. DESIGNATE STORAGE AREA AS A CONTROLLED RADIOACTIVE AREA. KEEP AWAY FROM FLAMES/SPARKS/HEAT.
 Other Precautions: AVOID BREATHING DUST & CONTACT W/SKIN. AVOID ACCUMULATIONS OF PARTICULATE IN AREAS WHERE THE ALLOY IS MACHINED. INGOTS MUST BE PREHEATED TO ENSURE COMPLETE ABSENCE OF MOISTURE & ELIMINATE THE RISK OF EXPLOSION. SMOKING PROHIBITED.
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 Control Measures
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Respiratory Protection: WHERE DUSTY ATMOSPHERES ARE EXPERIENCED DUST MASKS TO EN149 FFP3 AS A MINIMUM STANDARD MAY BE USED.
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Ventilation: LOCAL EXHAUST
Protective Gloves: REQUIRED
Eye Protection: SAFETY GLASSES BS2092/GOGGLES
Other Protective Equipment: FACESHIELD TO BS2092 1M, FLAME/FIREPROOFED
COTTON DRILL OVERALLS W/O EXTERNAL POCKETS/FLAPS, FOUNDRY GARMENTS, BOOTS.
Work Hygienic Practices: DON'T EAT, DRINK, SMOKE/TAKE SNUFF IN THE WORKING
AREA. SHOWER & CHANGE CLOTHES AFTER HANDLING.
Suppl. Safety & Health Data: FIRE PROC CONT'D: DON'T ALLOW MAGNESIUM
OBSERVE TREATMENTS BASED ON SIGNS & SYMPTOMS. CONSIDERATION SHOULD BE GIVEN
TO THE POSSIBILITY OF OVEREXPOSURE TO MATERIALS MAY OCCUR. EDTA MERITS
CONSIDERATION IN HELPING RID THE BODY OF THORIUM EXPOSURE.

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Transportation Data
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Disposal Data
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Label Data
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ASI INTERNATIONAL -- MANGANESE METAL & ALLOYS
MATERIAL SAFETY DATA SHEET
NSN: 343900F049414
Manufacturer's CAGE: ASSII
Part No. Indicator: A
Part Number/Trade Name: MANGANESE METAL & ALLOYS

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General Information
=====

Company's Name: ASI INTERNATIONAL
Company's Street: 4595 VAN EPPS ROAD
Company's City: CLEVELAND
Company's State: OH
Company's Country: US
Company's Zip Code: 44131-5000
Company's Emerg Ph #: 216-485-1800
Company's Info Ph #: 216-485-1800
Distributor/Vendor # 1: ELKEM METALS CO
Distributor/Vendor # 1 Cage: 7V007
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SE
Date MSDS Prepared: 01MAY94
Safety Data Review Date: 02AUG96
Preparer's Company: ASI INTERNATIONAL
Preparer's St Or P. O. Box: 4595 VAN EPPS ROAD
Preparer's City: CLEVELAND
Preparer's State: OH
Preparer's Zip Code: 44131-5000
MSDS Serial Number: BZVWF

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Ingredients/Identity Information
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Proprietary: NO
Ingredient: MANGANESE *96-2*
Ingredient Sequence Number: 01
Percent: 75-100
NIOSH (RTECS) Number: 009275000
CAS Number: 7439-96-5
OSHA PEL: 5 MG/CUM
ACGIH TLV: 5 MG/CUM (DUST)

Proprietary: NO
Ingredient: IRON *96-2*
Ingredient Sequence Number: 02
Percent: 0-15
NIOSH (RTECS) Number: NO4565500
CAS Number: 7439-89-6

Proprietary: NO
Ingredient: CHROMIUM METAL, CHROMIUM, CHROME (KNOWN CARCINOGEN BY NTP;
IARC CARC - GROUP 3) *96-2*
Ingredient Sequence Number: 03
Percent: <0.5
NIOSH (RTECS) Number: GB4200000
CAS Number: 7440-47-3
ACGIH TLV: 0.5 MG/CUM

Proprietary: NO
Ingredient: NICKEL (SUSPECTED ANIMAL/HUMAN CARCINOGEN BY IARC GROUP 2B,
SUSPECTED CARCINOGEN BY NTP) *96-2*
Ingredient Sequence Number: 04
Percent: <0.5

NIOSH (RTECS) Number: QR5950000
 CAS Number: 7440-02-0
 OSHA PEL: 1 MG/CUM
 ACGIH TLV: 0.05 MG/CUM IC
 Other Recommended Limit: 1 MG/CUM

 Proprietary: NO
 Ingredient: CARBON, ACTIVATED CARBON, GRAPHITE
 Ingredient Sequence Number: 05
 Percent: 0-7
 NIOSH (RTECS) Number: FF5250100
 CAS Number: 7440-44-0
 OSHA PEL: 10 MG/CUM
 ACGIH TLV: 10 MG/CUM

 Proprietary: NO
 Ingredient: SILICON
 Ingredient Sequence Number: 06
 Percent: 0.1-7
 NIOSH (RTECS) Number: VW0400000
 CAS Number: 7440-21-3
 ACGIH TLV: 10 MG/CUM

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Physical/Chemical Characteristics

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Appearance And Odor: SILVERY METALLIC W/BROWN TO BLACK OXIDE COATING;
 ODORLESS
 Melting Point: 1958-2273F
 Specific Gravity: 3.9-7.4
 Solubility In Water: INSOLUBLE

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Fire and Explosion Hazard Data

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Extinguishing Media: DRY POWDER, DRY SAND/CO2.
 Special Fire Fighting Proc: ALLOW FIRE TO BURN ITSELF OUT. DON'T DISTURB
 BURNING METAL WHILE EXTINGUISHING THE FIRE. NITROGEN BLANKET MAY NOT
 EXTINGUISH MANGANESE METAL & ALLOYS FIRE.
 Unusual Fire And Expl Hazrds: NON-COMBUSTIBLE. MANGANESE METAL & ALLOYS
 CAN BE READILY IGNITED, PROPAGATE FLAME & GENERATE PRESSURE/EXPLODE.
 AUTOIGNITION TEMP: MANGANESE METAL 465F.

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Reactivity Data

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Stability: YES
 Cond To Avoid (Stability): MOISTURE, SPARKS/OTHER IGNITION SOURCES
 Materials To Avoid: ACIDS, OXIDES OF CONSTITUENT ELEMENTS.
 Hazardous Decomp Products: PHOSPHINE, HYDROGEN, ARSINE, SILANES & OTHER
 TOXIC/EXPLOSIVE GASES.
 Hazardous Poly Occur: NO

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Health Hazard Data

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Route Of Entry - Inhalation: YES
 Route Of Entry - Skin: NO
 Route Of Entry - Ingestion: NO
 Health Haz Acute And Chronic: HIGH CONCENTRATIONS CAN CAUSE IRRITATION TO
 THE EYES, NOSE & THROAT. INHALATION: MAY CAUSE MANGANESE POISONING, CNS
 DISORDERS, PARKINSON DISEASE. PERMANENT INJURY MAY OCCUR IF NOT TREATED.
 MAY CAUSE MOTTILING OF THE LUNGS (SIDEROSIS), A BENIGN PNEUMOCONIOSIS.
 INGESTION: MAY CAUSE MANGANESE POISONING.
 Carcinogenicity - NTP: YES
 Carcinogenicity - IARC: YES
 Carcinogenicity - OSHA: NO
 Explanation Carcinogenicity: SEE INGREDIENTS.

Signs/Symptoms Of Overexp: IRRITATION, MANGANESE FUME FEVER, APATHY, DROWSINESS, SLEEP DISTURBANCES, MUSCULAR TWITCHING, SPASTIC GAIT, EMOTION CONTROL PROBLEMS.

Med Cond Aggravated By Exp: PRE-EXISTING CHRONIC OBSTRUCTIVE LUNG DISEASE.
Emergency/First Aid Proc: INHALATION: REMOVE TO FRESH AIR. SUPPORT BREATHING AS REQUIRED. SKIN: WASH AREA W/MILD SOAP & WATER. EYES: FLUSH W/WATER FOR 15 MINS. OBTAIN MEDICAL ATTENTION IN ALL CASES.

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: CLEANUP PERSONNEL SHOULD WEAR APPROPRIATE RESPIRATORY PROTECTIVE EQUIPMENT. AVOID THE USE OF COMPRESSED AIR TO MANEUVER LEAKS OF FINE MATERIAL. FINE MATERIAL SHOULD BE SWEEPED UP/VACUUMED. KEEP DRY MATERIAL & WET MATERIAL SEPARATED.

Waste Disposal Method: DISPOSE OF IAW/FEDERAL, STATE & LOCAL REGULATIONS. AVOID REPACKING WET MATERIAL IN SEALED CONTAINERS.

Precautions-Handling/Storing: KEEP MATERIAL DRY WHEN STORING FOR LONG PERIODS OF TIME. KEEP AWAY FROM SPARKS/OTHER IGNITION SOURCES. VENTILATE AREAS OF EXTENDED STORAGE.

Other Precautions: AVOID ADDING WET PRODUCT TO MOLTEN MATERIALS. AVOID GENERATION OF AIRBORNE DUSTS. GRINDING WET MATERIAL MAY BE HAZARDOUS DUE TO THE POSSIBLE EVOLUTION OF HYDROGEN, A HIGHLY EXPLOSIVE GAS. AVOID CONTAMINATION OF WORK CLOTHING.

Control Measures

Respiratory Protection: IN DUSTY AREAS, USE NIOSH APPROVED RESPIRATOR. IF ARSINE/PHOSPHINE PROTECTION IS NECESSARY, USE SUPPLIED AIR/ORGANIC VAPOR/ACID GAS CARTRIDGES.

Ventilation: REQUIRED

Protective Gloves: RECOMMENDED DURING HANDLING

Eye Protection: SAFETY GOGGLES

Work Hygienic Practices: THOROUGHLY CLEAN AREAS/EQUIPMENT TO MAINTAIN PRIOR DUST DISTURBING/IGNITION SOURCES ACTIVITIES.

Transportation Data

Disposal Data

Label Data

Label Required: YES

Label Status: G

Common Name: MANGANESE METAL & ALLOYS

Special Hazard Precautions: HIGH CONCENTRATIONS CAN CAUSE IRRITATION TO THE EYES, NOSE & THROAT. INHALATION: MAY CAUSE MANGANESE POISONING, CNS DISORDERS, PARKINSON DISEASE. PERMANENT INJURY MAY OCCUR IF NOT TREATED. MAY CAUSE MOTTILING OF THE LUNGS (SIDEROSIS), A BENIGN PNEUMOCONIOSIS. INGESTION: MAY CAUSE MANGANESE POISONING. IRRITATION, MANGANESE FUME FEVER, APATHY, DROWSINESS, SLEEP DISTURBANCES, MUSCULAR TWITCHING, SPASTIC GAIT, EMOTION CONTROL PROBLEMS.

Label Name: ASI INTERNATIONAL

Label Street: 4595 VAN EPPS ROAD

Label City: CLEVELAND

Label State: OH

Label Zip Code: 44131-5000

Label Country: US

Label Emergency Number: 216-485-1800

BETHLEHEM APPARATUS -- COLLOIDAL MERCURY: METALLIC MERCURY: NCI-C6 - MERCURY, ANAL
MATERIAL SAFETY DATA SHEET
NSN: 6810001283005
Manufacturer's CAGE: 89399
Part No. Indicator: A
Part Number/Trade Name: COLLOIDAL MERCURY: METALLIC MERCURY: NCI-C6

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General Information
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Item Name: MERCURY, ANALYZED REAGENT
Company's Name: BETHLEHEM APPARATUS CO
Company's Street: 890 FRONT ST
Company's P. O. Box: Y
Company's City: HELLERTOWN
Company's State: PA
Company's Country: US
Company's Zip Code: 18055-1507
Company's Emerg Ph #: 215-838-7034
Record No. For Safety Entry: 005
Tot Safety Entries This Stk#: 005
Status: SE
Date MSDS Prepared: 13JUL90
Safety Data Review Date: 08NOV91
Supply Item Manager: KX
MSDS Serial Number: BLFDJ
Hazard Characteristic Code: J8
Unit Of Issue: BT
Unit Of Issue Container Qty: 1
Type Of Container: BOTTLE
Net Unit Weight: 1 LB

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Ingredients/Identity Information
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Proprietary: NO
Ingredient: MERCURY (SARA III)
Ingredient Sequence Number: 01
Percent: 100
NIOSH (RTECS) Number: OV4550000
CAS Number: 7439-97-6
OSHA PEL: S, C, 0.1 MG/M3
ACGIH TLV: S, 0.05 MG/M3; 9192
Other Recommended Limit: NONE SPECIFIED

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Physical/Chemical Characteristics
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Appearance And Odor: ODORLESS, SILVERY LIQUID WITH A METALLIC LUSTER.
Boiling Point: 674F, 357C
Melting Point: -38F, -39C
Vapor Pressure (MM Hg/70 F): 0.002
Vapor Density (Air=1): 7.0
Specific Gravity: 13.5939
Solubility In Water: INSOLUBLE
Viscosity: 1.55
Corrosion Rate (IPY): UNKNOWN

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Fire and Explosion Hazard Data
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Extinguishing Media: USE WATER SPRAY OR FOG, HALON, CARBON DIOXIDE,
STANDARD FOAM, OR DRY CHEMICAL.
Special Fire Fighting Proc: MOVE CONTAINERS FROM FIRE IF POSSIBLE. STAY
AWAY FROM STORAGE TANK ENDS. COOL FIRE EXPOSED CONTAINERS WITH WATER SPRAY
FROM SIDE UNTIL WELL AFTER FIRE IS OUT.
Unusual Fire And Expl Hazrds: USE AGENT SUITABLE FOR TYPE OF FIRE: USE

WATER IN FLOODING AMOUNTS AS A FOG. AVOID BREATHING CORROSIVE & POISONOUS VAPORS, KEEP UPWIND.

=====
 Reactivity Data
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Stability: YES
 Cond To Avoid (Stability): NEGLIGIBLE FIRE HAZARD WHEN EXPOSED TO HEAT OR FLAMES.
 Materials To Avoid: ACETYLENE, AMMONIA, CHLORINE DIOXIDE, AZIDES, CALCIUM, SODIUM CARBIDE, LITHIUM, RUBIDIUM, COPPER, NITRIC ACID, AMINES.
 Hazardous Decomp Products: THERMAL DECOMPOSITION PRODUCTS MAY INCLUDE HIGHLY TOXIC MERCURY VAPORS AND MERCURY OXIDES.
 Hazardous Poly Occur: NO
 Conditions To Avoid (Poly): NOT APPLICABLE

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 Health Hazard Data
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LD50-LC50 Mixture: LCL0 (INHAL RABBIT) IS 129/MG/KG/5 HOURS
 Route Of Entry - Inhalation: YES
 Route Of Entry - Skin: YES
 Route Of Entry - Ingestion: YES
 Health Haz Acute And Chronic: ACUTE: SKIN:IRRITATION. ABSORBED THROUGH IMMEDIATE NECROSIS IN MOUTH, THROAT, ESOPHAGUS & STOMACH. DEATH MAY OCCURE. INHALATION:DYSPNEA, COUGH, FEVER, NAUSEA & VOMITING, DIARRHEA, STOMATITIS, SALIVATION & METALLIC TASTE. CHRONIC: CNS DISTURBANCES.
 Carcinogenicity - NTP: NO
 Carcinogenicity - IARC: NO
 Carcinogenicity - OSHA: NO
 Explanation Carcinogenicity: MERCURY IS NOT LISTED BY IARC, NTP, OR OSHA AS A CARCINOGEN.
 Signs/Symptoms Of Overexp: TREMORS, CONVULSIONS & OTHER CNS DISTURBANCES, PNEUMONITIS, CHEST PAINS, DYSPNEA, COUGHING, STOMATITIS, GINGIVITIS AND LOOSENING OF TEETH, SALIVATION, LOSS OF MEMORY, METALLIC TASTE, DIZZINESS, CLUMSINESS, SLURRED SPEECH, DIARRHEA, PAIN & NUMBNESS IN EXTREMITIES, NEPHRITIS, ANXIETY, HEADACHE, WEIGHT LOSS, AND INSOMNIA.
 Med Cond Aggravated By Exp: PERSONS CHRONIC RESPIRATORY DISEASE OR KNOWN ALLERGY TO MERCURY MAY BE AT INCREASED RISK FROM EXPOSURE.
 Emergency/First Aid Proc: INHALE-REMOVE TO FRESH AIR. IF NOT BREATHING GIVE CPR/OXYGEN. GET MEDICAL ATTENTION. EYE-IMMEDIATELY WASH WITH WATER OR SALINE FOR ATLEAST 15 MINUTES. GET MEDICAL ATTENTION. SKIN-REMOVE CONTAMINATED CLOTHING. WASH SKIN WITH SOAP & WATER. INGEST-GET IMMEDIATE MEDICAL ATTENTION. REMOVE BY GASTRIC LAVAGE OR EMESIS. MAINTAIN BLOOD PRESSURE & AIRWAY.

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 Precautions for Safe Handling and Use
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Steps If Matl Released/Spill: IF POSSIBLE, STOP LEAK. DO NOT TOUCH SPILLED MATERIAL. FOR SMALL SPILLS, TAKE UP WITH SAND OR OTHER ABSORBENT MATERIAL & PLACE INTO CONTAINER FOR DISPOSAL. A MERCURY SPILL KIT CAN ALSO BE USED.
 Neutralizing Agent: NONE
 Waste Disposal Method: OBSERVE ALL LOCAL, STATE AND FEDERAL REGULATIONS WHEN DISPOSING OF THIS SUBSTANCE. FOR ASSISTANCE CONTACT THE DISTRICT DIRECTOR OF THE ENVIRONMENTAL PROTECTION AGENCY.
 Precautions-Handling/Storing: OBDERVE ALL LOCAL, STATE AND FEDERAL REGULATIONS WHEN DISPOSING OF THIS SUBSTANCE. STORE AWAY FROM INCOMPATIBLES.
 Other Precautions: THIS CHEMICAL IS SUBJECT TO SARA SECTION 313 REPORTING. MAY BURN BUT DOES NOT IGNITE RESDILY. FLAMMABLE, POISONOUS GASES MAY ACCUMULATE IN TANKS & HOPPER CARS. MAY IGNITE COMBUSTIBLES.

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 Control Measures
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Respiratory Protection: IF VENTILATION DOES NOT MAINTAIN INHALATION EXPOSURES BELOW PEL(TLV), USE NIOSH/MSHA APPROVED RESPIRATORS AS PER

CURRENT 29 CFR 1910.134, INSTRUCTIONS/WARNINGS AND NIOSH-RESPIRATOR DECISION LOGIC-PUBLICATION NUMBER 87.108.
 Ventilation: PROVIDE LOCAL EXHAUST OR PROCESS ENCLOSURE VENTILATION TO CONTROL INHALATION EXPOSURES BELOW OSHA'S PEL.
 Protective Gloves: RUBBER
 Eye Protection: CHEMICAL SAFETY GOGGLES
 Other Protective Equipment: EMPLOYEE MUST WEAR APPROPRIATE PROTECTIVE (IMPERVIOUS) CLOTHING & EQUIPMENT TO PREVENT SKIN CONTACT.
 Work Hygienic Practices: OBSERVE GOOD PERSONAL HYGIENE PRACTICES AND RECOMMENDED PROCEDURES.
 Suppl. Safety & Health Data: DO NOT GET ON SKIN, IN EYES OR ON CLOTHING. DO NOT BREATHE VAPORS.**NOTE TO PHYSICIAN, MERCURY POISONING: GIVE DIMERCAPROL, 3 MG/KG (0.3 ML/10 KG) EVERY 4 HOURS FOR THE FIRST 2 DAYS & THEN 2 MG/KG EVERY 12 HOURS FOR A TOTAL OF 10 DAYS IF NECESSARY.**

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 Transportation Data
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Trans Data Review Date: 91312
 DOT PSN Code: IWD
 DOT Symbol: A,W
 DOT Proper Shipping Name: MERCURY
 DOT Class: 8
 DOT ID Number: UN2809
 DOT Pack Group: III
 DOT Label: CORROSIVE
 IMO PSN Code: JKJ
 IMO Proper Shipping Name: MERCURY
 IMO Regulations Page Number: 8191
 IMO UN Number: 2809
 IMO UN Class: 8
 IMO Subsidiary Risk Label: -
 IATA PSN Code: PYF
 IATA UN ID Number: 2809
 IATA Proper Shipping Name: MERCURY
 IATA UN Class: 8
 IATA Label: CORROSIVE
 AFI PSN Code: PYF
 AFI Prop. Shipping Name: MERCURY
 AFI Class: 8
 AFI ID Number: UN2809
 AFI Pack Group: I
 AFI Basic Pac Ref: 12-13
 MMAC Code: NR
 N.O.S. Shipping Name: MERCURY METALLIC

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 Disposal Data
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 Label Data
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Label Required: YES
 Technical Review Date: 08NOV91
 MFR Label Number: UNKNOWN
 Label Status: F
 QUICKSILVER
 Signal Word: DANGER!
 Acute Health Hazard-Severe: X
 Contact Hazard-Moderate: X
 Fire Hazard-None: X
 Reactivity Hazard-None: X
 Special Hazard Precautions: IF POSSIBLE, STOP LEAK. DO NOT TOUCH SPILLED MATERIAL. FOR SMALL SPILLS, TAKE UP WITH SAND OR OTHER ABSORBENT MATERIAL & PLACE INTO CONTAINER FOR DISPOSAL. A MERCURY SPILL KIT CAN ALSO BE USED.
 FIRST AID: INHALE-REMOVE TO FRESH AIR. IF NOT BREATHING GIVE CPR/OXYGEN.

GET MEDICAL ATTENTION. EYE-IMMEDIATELY WASH WITH WATER OR SALINE FOR ATLEAST 15 MINUTES. GET MEDICAL ATTENTION. SKIN-REMOVE CONTAMINATED CLOTHING. WASH SKIN WITH SOAP & WATER. INGEST-GET IMMEDIATE MEDICAL ATTENTION. REMOVE BY GASTRIC LAVAGE OR EMESIS. MAINTAIN BLOOD PRESSURE & AIRWAY.

Protect Eye: Y

Protect Skin: Y

Protect Respiratory: Y

Label Name: BETHLEHEM APPARATUS CO

Label Street: 890 FRONT ST

Label P.O. Box: Y

Label City: HELLERTOWN

Label State: PA

Label Zip Code: 18055-1507

Label Country: US

Label Emergency Number: 215-838-7034

TELEDYNE RODNEY METALS -- 200 NICKEL - NICKEL ALLOYS
MATERIAL SAFETY DATA SHEET
NSN: 343900F051678
Manufacturer's CAGE: 08318
Part No. Indicator: A
Part Number/Trade Name: 200 NICKEL

General Information

Item Name: NICKEL ALLOYS
Company's Name: TELEDYNE RODNEY METALS
Company's Street: 1357 E RODNEY FRENCH BLVD
Company's P. O. Box: 6915
Company's City: NEW BEDFORD
Company's State: MA
Company's Country: US
Company's Zip Code: 02742-0915
Company's Emerg Ph #: 800-955-7655/508-996-5691
Company's Info Ph #: 508-996-5691/800-955-7655
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SE
Date MSDS Prepared: 01MAR92
Safety Data Review Date: 14NOV96
Preparer's Company: TELEDYNE RODNEY METALS
Preparer's St Or P. O. Box: 1357 E RODNEY FRENCH BLVD
Preparer's City: NEW BEDFORD
Preparer's State: MA
Preparer's Zip Code: 02742-0915
MSDS Serial Number: CCFMX

Ingredients/Identity Information

Proprietary: NO
Ingredient: NICKEL (SUSPECTED ANIMAL/HUMAN CARCINOGEN BY IARC GROUP 2B,
SUSPECTED CARCINOGEN BY NTP) *96-3*
Ingredient Sequence Number: 01
Percent: 99
NIOSH (RTECS) Number: QR5950000
CAS Number: 7440-02-0
OSHA PEL: 1 MG/CUM
ACGIH TLV: 0.05 MG/CUM IC
Other Recommended Limit: 1 MG/CUM

Physical/Chemical Characteristics

Appearance And Odor: ODORLESS, SOLID AS SHEET & STRIP
Specific Gravity: 8

Fire and Explosion Hazard Data

Flash Point: NONE

Reactivity Data

Stability: YES
Hazardous Decomp Products: METALLIC OXIDES
Hazardous Poly Occur: NO

Health Hazard Data

Route Of Entry - Inhalation: YES
Route Of Entry - Skin: NO

Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: MAY CAUSE IRRITATION OF EYES, NOSE, THROAT & SKIN. MAY CAUSE LOSS OF CONSCIOUSNESS/DEATH DUE TO WELDING GASES/LACK OF OXYGEN.
Carcinogenicity - NTP: YES
Carcinogenicity - IARC: YES
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: SEE INGREDIENTS.
Signs/Symptoms Of Overexp: IRRITATION, METALLIC TASTE, NAUSEA, TIGHTNESS OF CHEST, FEVER, LOSS OF COORDINATION.
Med Cond Aggravated By Exp: PRE-EXISTING RESPIRATORY/ALLERGIC CONDITIONS.
Emergency/First Aid Proc: INHALATION: REMOVE TO FRESH AIR. EYES: FLUSH WELL W/RUNNING WATER TO REMOVE PARTICULATE. SKIN: BRUSH OFF EXCESS DUST. WASH WELL W/SOAP & WATER. OBTAIN MEDICAL ATTENTION IN ALL CASES.

=====

Precautions for Safe Handling and Use

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Waste Disposal Method: SOLIDS: SALE AS SCRAP FOR USE. DISPOSE OF IAW/
FEDERAL, STATE & LOCAL REGULATIONS.

=====

Control Measures

=====

Respiratory Protection: IF FUMES, MISTING/DUST CONDITION OCCURS & TLV, USE NIOSH APPROVED RESPIRATORS.
Ventilation: GENERAL: RECOMENDED TO KEEP AIRBORNE CONCENTRATION OF DUST & FUMES BELOW TLV. LOCAL: AS REQUIRED.
Protective Gloves: AS REQUIRED
Eye Protection: GLASSES/GOGGLES WHEN WORKING W/DUST.
Other Protective Equipment: AS REQUIRED

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Transportation Data

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Disposal Data

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Label Data

=====

MALLINCKRODT SCIENCE PRODUCTS DIV -- METALLIC POTASSIUM - POTASSIUM, METAL
MATERIAL SAFETY DATA SHEET
NSN: 681000D004674
Manufacturer's CAGE: 62910
Part No. Indicator: A
Part Number/Trade Name: METALLIC POTASSIUM

=====
General Information
=====

Item Name: POTASSIUM, METAL
Company's Name: MALLINCKRODT INC. SCIENCE PRODUCTS DIVISION
Company's Street: PARIS BYPASS
Company's P. O. Box: 800
Company's City: PARIS
Company's State: KY
Company's Country: US
Company's Zip Code: 40361
Company's Emerg Ph #: 800-354-2050/314-539-1600
Company's Info Ph #: 800-354-2050(PRESS 3)/314-982-5000
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SE
Date MSDS Prepared: 05APR92
Safety Data Review Date: 16APR96
Supply Item Manager: CX
MSDS Preparer's Name: UNKNOWN
MSDS Serial Number: BYSLN
Specification Number: UNKNOWN
Spec Type, Grade, Class: UNKNOWN
Hazard Characteristic Code: R2
Unit Of Issue Container Qty: UNKNOWN
Type Of Container: UNKNOWN
Net Unit Weight: UNKNOWN
NRC/State License Number: NOT RELEVANT

=====
Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: POTASSIUM, METAL
Ingredient Sequence Number: 01
Percent: UNKNOWN
NIOSH (RTECS) Number: TS6460000
CAS Number: 7440-09-7
OSHA PEL: NOT ESTABLISHED
ACGIH TLV: NOT ESTABLISHED
Other Recommended Limit: NONE RECOMMENDED

=====
Physical/Chemical Characteristics
=====

Appearance And Odor: SOFT, SILVERY GRAY METAL STICKS - ODORLESS
Boiling Point: 1410F, 766C
Melting Point: 146F, 63C
Specific Gravity: 0.856
Decomposition Temperature: UNKNOWN
Evaporation Rate And Ref: NOT RELEVANT
Solubility In Water: REACTS VIGOROUSLY
Viscosity: NOT RELEVANT
Radioactivity: NOT RELEVANT
Corrosion Rate (IPY): UNKNOWN

=====
Fire and Explosion Hazard Data
=====

Flash Point: FLAMMABLE SOLID

Lower Explosive Limit: UNKNOWN
Upper Explosive Limit: UNKNOWN
Extinguishing Media: USE DRY CHEMICAL ONLY. AVOID WATER OR FOAM.
Special Fire Fighting Proc: WEAR FULL PROTECTIVE CLOTHING AND NIOSH-APPROVED SELF-CONTAINED BREATHING APPARATUS WITH FULL FACEPIECE OPERATED IN THE POSITIVE PRESSURE MODE.
Unusual Fire And Expl Hazrds: MAY PRODUCE HYDROGEN GAS IN PRESENCE OF WATER. EXTREMELY FLAMMABLE SOLID. MAY SELF-IGNITE WHEN EXPOSED TO AIR.

=====
Reactivity Data
=====

Stability: YES
Cond To Avoid (Stability): STABLE IF PROTECTED FROM AIR AND MOISTURE.
Materials To Avoid: OXIDIZERS, ACIDS, WATER, ALCOHOLS, AMINES, OXYGEN, CARBON DIOXIDE, HALOGENS, ACETYLENE, ALUMINUM HALIDES, AMMONIUM SALTS
Hazardous Decomp Products: POTASSIUM OXIDE, POTASSIUM HYDROXIDE
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NOT RELEVANT

=====
Health Hazard Data
=====

LD50-LC50 Mixture: LD50 (ORAL, RAT) IS NOT KNOWN.
Route Of Entry - Inhalation: NO
Route Of Entry - Skin: NO
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: TARGET ORGANS:EYES, SKIN, GI TRACT. ACUTE-CORROSIVE. INHALE:NOT EXPECTED TO BE A HEALTH HAZARD. POTASSIUM VAPOR CAN IRRITATE & BURN RESPIRATORY TRACT. EYE/SKIN:CAN CAUSE SERIOUS BURNS. TISSUE DESTRUCTION CAN OCCUR. ORAL:EXTREMELY DANGEROUS. REACTS WITH WATER CAUSING BURNS, COMBUSTION, EXPLOSION. CHRONIC- UNKNOWN.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NONE
Signs/Symptoms Of Overexp: BURNS, SWELLING, PAIN, SEVERE IRRITATION, VOMITING
Med Cond Aggravated By Exp: UNKNOWN
Emergency/First Aid Proc: GET MEDICAL HELP IF SYMPTOMS PERSIST.
INHALED:REMOVE TO FRESH AIR. PROVIDE CPR/OXYGEN IF NEEDED. EYES:FLUSH WITH WATER FOR AT LEAST 15 MINUTES, HOLDING EYELIDS OPEN. SKIN:FLUSH WITH PLENTY OF WATER. WASH SKIN WITH SOAP & WATER. ORAL:IF CONSCIOUS, DRINK PLENTY OF WATER OR MILK. GET MEDICAL ATTENTION IMMEDIATELY. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

=====
Precautions for Safe Handling and Use
=====

Steps If Matl Released/Spill: WEAR PROTECTIVE EQUIPMENT. COLLECT SPILLED MATERIAL QUICKLY AND TRANSFER TO A CONTAINER OF KEROSENE/LIGHT OIL FOR RECOVERY. MINIMIZE EXPOSURE TO AIR. DO NOT USE WATER. IF IN CONTACT WITH WATER, PROCEED CAUTIOUSLY. IT MAY IGNITE AND SPATTER MOLTEN K.
Neutralizing Agent: WEAK ACID (CAUTION! HYDROGEN GAS WILL BE GENERATED).
Waste Disposal Method: DISPOSE OF IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL REGULATIONS. RECOVER METAL IF POSSIBLE.
Precautions-Handling/Storing: STORE IN COOL AND DRY PLACE. KEEP AWAY FROM INCOMPATIBLE MATERIALS.
Other Precautions: DO NOT GET IN EYES, ON SKIN OR ON CLOTHING. WASH THOROUGHLY AFTER HANDLING AND BEFORE EATING OR DRINKING. REMOVE CONTAMINATED CLOTHING PROMPTLY. LAUNDRER BEFORE REUSE. KEEP OUT OF REACH OF CHILDREN.

=====
Control Measures
=====

Respiratory Protection: NONE NORMALLY REQUIRED.
Ventilation: ADEQUATE

Protective Gloves: RUBBER
Eye Protection: SAFETY GLASSES/GOGGLES
Other Protective Equipment: SAFETY SHOWER AND EYE WASH FOUNTAIN SHOULD BE LOCATED NEARBY. WEAR APPROPRIATE PROTECTIVE CLOTHING FOR RISK OF EXPOSURE.
Work Hygienic Practices: OBSERVE GOOD INDUSTRIAL HYGIENE PRACTICES AND RECOMMENDED PROCEDURES.

=====
Transportation Data
=====

Trans Data Review Date: 96107
DOT PSN Code: LWY
DOT Proper Shipping Name: POTASSIUM
DOT Class: 4.3
DOT ID Number: UN2257
DOT Pack Group: II
DOT Label: DANGEROUS WHEN WET
DOT/DoD Exemption Number: NOT RELEVANT
IMO PSN Code: MAH
IMO Proper Shipping Name: POTASSIUM
IMO Regulations Page Number: 4356
IMO UN Number: 2257
IMO UN Class: 4.3
IMO Subsidiary Risk Label: -
IATA PSN Code: ULI
IATA UN ID Number: 2257
IATA Proper Shipping Name: POTASSIUM
IATA UN Class: 4.3
IATA Label: DANGEROUS WHEN WET
AFI PSN Code: ULI
AFI Symbols: 0
AFI Prop. Shipping Name: POTASSIUM
AFI Class: 4.3
AFI ID Number: UN2257
AFI Pack Group: I
AFI Special Prov: A19,A20,N6,N34
AFI Basic Pac Ref: A8.4

=====
Disposal Data
=====

=====
Label Data
=====

Label Required: YES
Technical Review Date: 16APR96
MFR Label Number: UNKNOWN
Label Status: F
Common Name: METALLIC POTASSIUM
Signal Word: DANGER!
Acute Health Hazard-Severe: X
Contact Hazard-Severe: X
Fire Hazard-Slight: X
Reactivity Hazard-Severe: X
Special Hazard Precautions: TARGET ORGANS:EYES, SKIN, GI TRACT. ACUTE-CORROSIVE. INHALE:VAPOR CAN IRRITATE & BURN RESPIRATORY TRACT. EYE/SKIN:CAN CAUSE SERIOUS BURNS. ORAL:EXTREMELY DANGEROUS. REACTS WITH WATER CAUSING BURNS, COMBUSTION, EXPLOSION. CHRONIC- UNKNOWN. STORE AWAY FROM AIR, MOISTURE & INCOMPATIBLES. COLLECT SPILL QUICKLY & TRANSFER TO A CONTAINER OF KEROSENE/LIGHT OIL FOR RECOVERY. FIRST AID- GET MEDICAL HELP IF SYMPTOMS FLUSH WITH WATER FOR AT LEAST 15 MINUTES. HOLD EYELIDS OPEN. SKIN:FLUSH WITH PLENTY OF WATER. ORAL:IF CONSCIOUS, DRINK WATER/MILK. GET MEDICAL ATTENTION IMMEDIATELY.
Protect Eye: Y
Protect Skin: Y
Label Name: MALLINCKRODT INC. SCIENCE PRODUCTS DIVISION

Label Street: PARIS BYPASS
Label P.O. Box: 800
Label City: PARIS
Label State: KY
Label Zip Code: 40361
Label Country: US
Label Emergency Number: 800-354-2050/314-539-1600

FLUKA AG -- SELENIUM, 84-890
MATERIAL SAFETY DATA SHEET
NSN: 681000N045490
Manufacturer's CAGE: F7006
Part No. Indicator: A
Part Number/Trade Name: SELENIUM, 84-890

=====
General Information
=====

Company's Name: FLUKA AG
Company's Street: CHEMISCHE FABRIK
Company's City: CH-9470 BUCHS, SWITZERLAND
Company's Country: US
Company's Emerg Ph #: 855 382
Company's Info Ph #: 855 382
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SMJ
Date MSDS Prepared: 02AUG93
Safety Data Review Date: 17OCT95
MSDS Serial Number: BTPRQ
Hazard Characteristic Code: F7

=====
Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: SELENIUM (SARA III)
Ingredient Sequence Number: 01
Percent: 78.96
NIOSH (RTECS) Number: VS7700000
CAS Number: 7782-49-2
OSHA PEL: 0.2 MG/M3
ACGIH TLV: 0.2 MG/M3

=====
Physical/Chemical Characteristics
=====

Appearance And Odor: SOLID.
Melting Point: 423F, 217C

=====
Fire and Explosion Hazard Data
=====

Flash Point Method: OC
Extinguishing Media: CO2, FOAM, WATER, DRY CHEMICALS.
Special Fire Fighting Proc: USE NIOSH/MSHA APPROVED SCBA & FULL PROTECTIVE EQUIPMENT (FP N).
Unusual Fire And Expl Hazrds: FLAMMABLE.

=====
Reactivity Data
=====

Stability: YES
Cond To Avoid (Stability): NONE SPECIFIED BY MANUFACTURER.
Materials To Avoid: NONE SPECIFIED BY MANUFACTURER.
Hazardous Decomp Products: NONE SPECIFIED BY MANUFACTURER.
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NOT RELEVANT

=====
Health Hazard Data
=====

LD50-LC50 Mixture: LD50: (ORAL, RAT) 6700 MG/KG.
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: NO
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: TOXIC BY INHALATION & IF SWALLOWED; DANGER

OF CUMULATIVE EFFECTS.

Carcinogenicity - NTP: NO

Carcinogenicity - IARC: NO

Carcinogenicity - OSHA: NO

Explanation Carcinogenicity: NOT RELEVANT

Signs/Symptoms Of Overexp: SEE HEALTH HAZARDS.

Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER.

Emergency/First Aid Proc: SEEK MEDICAL TREATMENT WHEN ANYONE HAS SYMPTOMS APPARENTLY DUE TO ANY ROUTE OF EXPOSURE. INHAL:REMOVE TO FRESH AIR. SUPPORT BREATHING (GIVE O2/ARTF RESP) (FP N). SKIN:FLUSH W/COPIOUS AMOUNTS OF WATER. CALL MD (FP N). CONTAMINATED CLOTHING MUST BE TAKEN OFF AS QUICKLY AS POSSIBLE. EYES:IMMEDIATELY WASH OUT W/PLENTY OF WATER FOR AT LEAST 15 MINUTES. INGEST:CALL MD IMMEDIATELY (FP N).

=====
Precautions for Safe Handling and Use
=====

Steps If Matl Released/Spill: COLLECT IN SUITABLE CONTAINERS & WASH CONTAMINATED AREA WELL W/WATER & DETERGENT.

Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.

Waste Disposal Method: COLLECT FOR RECOVERY OR DISPOSE I/A/W FEDERAL, STATE & LOCAL LAWS.

Precautions-Handling/Storing: NO SPECIFIC STORAGE REQUIREMENTS.

Other Precautions: NONE SPECIFIED BY MANUFACTURER.

=====
Control Measures
=====

Respiratory Protection: NIOSH/MSHA APPROVED MASK.

Ventilation: CONSULT LOCAL SAFETY/HEALTH AUTHORITIES IF ADDITIONAL GUIDANCE IS NECESSARY (FP N).

Protective Gloves: IMPERVIOUS GLOVES (FP N).

Eye Protection: ANSI APPROVED SAFETY GLASSES (FP N).

Other Protective Equipment: NONE SPECIFIED BY MANUFACTURER.

Work Hygienic Practices: NONE SPECIFIED BY MANUFACTURER.

Suppl. Safety & Health Data: NONE SPECIFIED BY MANUFACTURER.

=====
Transportation Data
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=====
Disposal Data
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Label Data
=====

Label Required: YES

Technical Review Date: 01DEC93

Label Date: 29NOV93

Label Status: G

Common Name: SELENIUM, 84-890

Chronic Hazard: YES

Signal Word: CAUTION!

Acute Health Hazard-Slight: X

Contact Hazard-Slight: X

Fire Hazard-None: X

Reactivity Hazard-None: X

Special Hazard Precautions: FLAMMABLE! ACUTE:TOXIC BY INHALATION & IF SWALLOWED; DANGER OF CUMULATIVE EFFECTS. CHRONIC:NONE LISTED BY MANUFACTURER. FATIGUE, IRRITABILITY, GARLIC BREATH ODOR, ALLERGIC EYE REACTION, GASTROINTESTINAL DISTRESS (FP N).

Protect Eye: Y

Protect Skin: Y

Protect Respiratory: Y

Label Name: FLUKA AG

Label Street: CHEMISCHE FABRIK

Label City: CH-9470 BUCHS, SWITZERLAND

Label Emergency Number: 855 382

Silver
20770

**** SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION ****

MSDS Name: Silver
 Catalog Numbers:
 S80162, S163 10, S163-10, S16310, ZZS166C17
 Synonyms:
 Argentum.
 Company Identification: Fisher Scientific
 1 Reagent Lane
 Fairlawn, NJ 07410
 For information, call: 201-796-7100
 Emergency Number: 201-796-7100
 For CHEMTREC assistance, call: 800-424-9300
 For International CHEMTREC assistance, call: 703-527-3887

**** SECTION 2 - COMPOSITION, INFORMATION ON INGREDIENTS ****

| CAS# | Chemical Name | % | EINECS# |
|-----------|---------------|-----|-----------|
| 7440-22-4 | Silver | 100 | 231-131-3 |

Risk Phrases: 33

**** SECTION 3 - HAZARDS IDENTIFICATION ****

EMERGENCY OVERVIEW

Appearance: white.
 Caution! May cause eye and skin irritation. May cause respiratory and digestive tract irritation. Danger of cumulative effects.
 Target Organs: Kidneys.

Potential Health Effects

Eye:

May cause eye irritation.

Skin:

May cause skin irritation. May cause skin discoloration.

Ingestion:

May cause irritation of the digestive tract. Effects may be cumulative. Ingestion of silver compounds may cause abdominal pain, rigidity, convulsions and shock.

Inhalation:

May cause respiratory tract irritation. Inhalation of fumes may cause metal fume fever, which is characterized by flu-like symptoms with metallic taste, fever, chills, cough, weakness, chest pain, muscle pain and increased white blood cell count.

Chronic:

Chronic inhalation or ingestion may cause argyria characterized by blue-gray discoloration of the eyes, skin and mucous membranes. Chronic skin contact may cause permanent discoloration of the skin.

**** SECTION 4 - FIRST AID MEASURES ****

Eyes:

Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If irritation develops, get medical aid.

Skin:

Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

Ingestion:

Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water. Wash mouth out with water. Get medical aid if irritation or symptoms occur.

Inhalation:

Remove from exposure to fresh air immediately. If not breathing,

give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician:

Treat symptomatically and

**** SECTION 5 - FIRE FIGHTING MEASURES ****

General Information:

As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes.

Extinguishing Media:

Substance is noncombustible; use agent most appropriate to extinguish surrounding fire. In case of fire use water spray, dry chemical, carbon dioxide, or appropriate foam.

**** SECTION 6 - ACCIDENTAL RELEASE MEASURES ****

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks:

Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

**** SECTION 7 - HANDLING and STORAGE ****

Handling:

Wash thoroughly after handling. Wash hands before eating. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation. Use with adequate ventilation.

Storage:

Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. No special precautions indicated.

**** SECTION 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION ****

Engineering Controls:

Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

| Chemical Name | ACGIH | NIOSH | OSHA - Final PELs |
|---------------|------------------|--|-------------------|
| Silver | metal: 0.1 mg/m3 | as Ag: 0.01 mg/m3 TWA as Ag: 10 mg/m3 IDLH | 0.01 mg/m3 TWA |

OSHA Vacated PELs:

Silver:
as Ag: 0.01 mg/m3 TWA

Personal Protective Equipment

Eyes:

Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin:

Wear appropriate protective gloves to prevent skin exposure.

Clothing:

Wear appropriate protective clothing to minimize contact with skin.

Respirators:

A respiratory protection program that meets OSHA's 29 CFR '1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.

**** SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES ****

Physical State: Solid
Appearance: white
Odor: None reported
pH: Not available.
Vapor Pressure: 100 mm Hg @ 1865 C
Vapor Density: Not available.
Evaporation Rate: Not applicable.
Viscosity: Not available.
Boiling Point: 2212 deg C
Freezing/Melting Point: 961 deg C
Autoignition Temperature: Not applicable.
Flash Point: Not applicable.
NFPA Rating: (est.) Health: 1; Flammability: 0; Reactivity: 0
Explosion Limits, Lower: Not available.
Upper: Not available.
Decomposition Temperature: Not available.
Solubility: Insoluble in water.
Specific Gravity/Density: 10.5
Molecular Formula: Ag
Molecular Weight: 107.8682

**** SECTION 10 - STABILITY AND REACTIVITY ****

Chemical Stability:

Stable under normal temperatures and pressures.

Conditions to Avoid:

Incompatible materials, exposure to air.

Incompatibilities with Other Materials:

Strong acids, strong bases, ethyleneimine.

Hazardous Decomposition Products:

Irritating and toxic fumes and gases, silver fumes.

Hazardous Polymerization: Has not been reported.

**** SECTION 11 - TOXICOLOGICAL INFORMATION ****

RTECS#:

CAS# 7440-22-4: VW3500000

LD50/LC50:

Not available.

Carcinogenicity:

Silver -

Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.

Epidemiology:

No data available.

Teratogenicity:

No data available.

Reproductive Effects:

No data available.

Neurotoxicity:

No data available.

Mutagenicity:

No data available.

Other Studies:

See actual entry in RTECS for complete information.

**** SECTION 12 - ECOLOGICAL INFORMATION ****

Other

For more information, see "HANDBOOK OF ENVIRONMENTAL FATE AND EXPOSURE DATA."

**** SECTION 13 - DISPOSAL CONSIDERATIONS ****

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste.

US EPA guidelines for the classification determination are listed in 40 CFR Part 261. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

**** SECTION 14 - TRANSPORT INFORMATION ****

US DOT

No information available

Canadian TDG

No information available.

**** SECTION 15 - REGULATORY INFORMATION ****

US FEDERAL

TSCA

CAS# 7440-22-4 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

SARA

Section 302 (RQ)

CAS# 7440-22-4: final RQ = 1000 pounds (454 kg) (no reporting of release)

Section 302 (TPQ)

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 7440-22-4: chronic, flammable.

Section 313

This material contains Silver (CAS# 7440-22-4, 100%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 372.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

CAS# 7440-22-4 is listed as a Priority Pollutant under the Clean Water Act.

CAS# 7440-22-4 is listed as a Toxic Pollutant under the Clean Water Act.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

Silver can be found on the following state right to know lists: California, New Jersey, Florida, Pennsylvania, Minnesota, Massachusetts.

California No Significant Risk Level:

None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols: Not available.

Risk Phrases:

R 33 Danger of cumulative effects.

Safety Phrases:

S 28A After contact with skin, wash immediately with plenty of water.

S 37 Wear suitable gloves.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

WGK (Water Danger/Protection)

CAS# 7440-22-4: 0

United Kingdom Occupational Exposure Limits

CAS# 7440-22-4: OES-United Kingdom, TWA 0.1 mg/m3 TWA

Canada

CAS# 7440-22-4 is listed on Canada's DSL/NDSL List.

This product has a WHMIS classification of D2A.

CAS# 7440-22-4 is not listed on Canada's Ingredient Disclosure List.

Exposure Limits

CAS# 7440-22-4: OEL-AUSTRALIA:TWA 0.1 mg/m3

OEL-BELGIUM:TWA 0.1 mg/m3

OEL-DENMARK:TWA 0.01 mg/m3

OEL-FINLAND:TWA 0.1 mg/m3

OEL-FRANCE:TWA 0.1 mg/m3

OEL-GERMANY:TWA 0.01 mg/m3

OEL-RUSSIA:STEL 1 mg/m3

OEL-SWITZERLAND:TWA 0.01 mg/m3

OEL-UNITED KINGDOM:TWA 0.1 mg/m3

OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA check ACGIH TLV

OEL IN NEW ZEALAND, SINGAPORE, VIETNAM check ACGI TLV

**** SECTION 16 - ADDITIONAL INFORMATION ****

MSDS Creation Date: 12/12/1997 Revision #5 Date: 8/02/2000

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no way shall the company be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if the company has been advised of the possibility of such damages.

FOSECO -- NAPAC - SODIUM METAL (NATRIUM)
MATERIAL SAFETY DATA SHEET
NSN: 681000F025680
Manufacturer's CAGE: 2W462
Part No. Indicator: A
Part Number/Trade Name: NAPAC

=====
General Information
=====

Item Name: SODIUM METAL (NATRIUM)
Company's Name: FOSECO INC
Company's Street: 20200 SHELDON RD
Company's City: BROOK PARK
Company's State: OH
Company's Country: US
Company's Zip Code: 44142-1315
Company's Emerg Ph #: 216-826-4548
Company's Info Ph #: 216-826-4548
Distributor/Vendor # 1: INDUSTRIAL & FOUNDRY SUPPLY CO
Distributor/Vendor # 1 Cage: 6L984
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SE
Date MSDS Prepared: 20MAR90
Safety Data Review Date: 09DEC92
MSDS Preparer's Name: TREVOR HARDY
Preparer's Company: FOSECO INC
Preparer's St Or P. O. Box: 20200 SHELDON RD
Preparer's City: BROOK PARK
Preparer's State: OH
Preparer's Zip Code: 44142-1315
MSDS Serial Number: BPSNG

=====
Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: SODIUM METAL (NATRIUM)
Ingredient Sequence Number: 01
Percent: 100%
NIOSH (RTECS) Number: VY0686000
CAS Number: 7440-23-5

=====
Physical/Chemical Characteristics
=====

Appearance And Odor: SILVER WHITE METAL, NO ODOR.
Boiling Point: 1637F
Vapor Pressure (MM Hg/70 F): 1.2

=====
Fire and Explosion Hazard Data
=====

Extinguishing Media: SODA ASH/DRY SODIUM CHLORIDE/GRAPHITE. DON'T USE
WATER/CO2/CALCIUM CHLORIDE/SODA ACID/CONVENTIONAL DRY POWDER.
Unusual Fire And Expl Hazrds: DANGEROUS WHEN EXPOSED TO HEAT/FLAME/BY
CHEMICAL REACTION W/WATER/OXIDIZING AGENTS. HEATED SODIUM IS SPONTANEOUSLY
FLAMMABLE. AUTOIGNITION TEMP: 239F.

=====
Reactivity Data
=====

Stability: YES
Cond To Avoid (Stability): HEAT, OPEN FLAME, MOISTURE
Materials To Avoid: WATER, OXIDIZING MATERIALS, HALOGENS, ACIDS, &
HALOGENATED HYDROCARBONS
Hazardous Decomp Products: IN USE AS SODIUM MODIFIER FOR ALUMINUM WILL

EVOLVE SODIUM OXIDE, HYDROGEN, & HEAT

Hazardous Poly Occur: NO

=====
Health Hazard Data
=====

Route Of Entry - Inhalation: NO

Route Of Entry - Skin: NO

Route Of Entry - Ingestion: NO

Health Haz Acute And Chronic: SKIN/EYES: THERMAL & CHEMICAL BURNS.

Carcinogenicity - NTP: NO

Carcinogenicity - IARC: NO

Carcinogenicity - OSHA: NO

Explanation Carcinogenicity: NONE

Emergency/First Aid Proc: SKIN: REMOVE ALL UNREACTED SODIUM. WASH IMMEDIATELY W/WATER. EYES: REMOVE ALL UNREACTED SODIUM. FLUSH IMMEDIATELY W/WATER FOR AT LEAST 15 MINS. SEE EYE DOCTOR. OBTAIN MEDICAL ATTENTION IN ALL CASES.

=====
Precautions for Safe Handling and Use
=====

Steps If Matl Released/Spill: FOR DAMAGED CANS: PLACE IN AIR TIGHT METAL CONTAINER FILLED W/KEROSENE.

Waste Disposal Method: DISPOSE OF IN ACCORDANCE W/LOCAL, STATE, & FEDERAL REGULATIONS. THIS IS A HAZARDOUS MATERIAL. FLAMMABLE SOLID.

Precautions-Handling/Storing: STORE IN COOL, DRY, FIRE-PROOF AREA AWAY FROM OPEN FLAMES, HEAT, & WATER OR WATER VAPOR.

=====
Control Measures
=====

Respiratory Protection: NONE REQUIRED IN NORMAL USE.

Protective Gloves: INSULATING

Eye Protection: SAFETY GLASSES

Suppl. Safety & Health Data: THE SODIUM METAL IS SUPPLIED IN A VACUUM PACKED ALUMINUM CAN WHICH IS SAFE TO HANDLE PROVIDING THE CAN IS KEPT IN TACT.

=====
Transportation Data
=====

=====
Disposal Data
=====

=====
Label Data
=====

Label Required: YES

Technical Review Date: 09DEC92

Label Date: 19NOV92

Label Status: F

Common Name: NAPAC SODIUM METAL (NATRIUM)

Chronic Hazard: NO

Signal Word: WARNING!

Acute Health Hazard-Moderate: X

Contact Hazard-Moderate: X

Fire Hazard-Slight: X

Reactivity Hazard-Slight: X

Special Hazard Precautions: SKIN/EYES: THERMAL & CHEMICAL BURNS. TARGET ORGANS: LIVER, KIDNEY, CENTRAL NERVOUS SYSTEM, & LUNGS.

Protect Eye: Y

Protect Skin: Y

Label Name: FOSECO INC

Label Street: 20200 SHELDON RD

Label City: BROOK PARK

Label State: OH

Label Zip Code: 44142-1315

Label Country: US
Label Emergency Number: 216-826-4548
Year Procured: UNK

INORGANIC VENTURES -- THALLIUM 1000 UG-ML (0.1% W-V)
MATERIAL SAFETY DATA SHEET
NSN: 663000N052089
Manufacturer's CAGE: 0EK28
Part No. Indicator: A
Part Number/Trade Name: THALLIUM 1000 UG/ML (0.1% W/V)

=====
General Information
=====

Company's Name: INORGANIC VENTURES INC
Company's Street: 195 LEHIGH AVE SUITE 4
Company's City: LAKEWOOD
Company's State: NJ
Company's Country: US
Company's Zip Code: 08071
Company's Emerg Ph #: 800-424-9300 (CHEMTREC)
Company's Info Ph #: 800-669-6799
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SMJ
Date MSDS Prepared: 01MAR91
Safety Data Review Date: 09AUG94
MSDS Serial Number: BVLQQ
Hazard Characteristic Code: NK

=====
Ingredients/Identity Information
=====

=====
Physical/Chemical Characteristics
=====

Appearance And Odor: CLEAR, COLORLESS SOLUTION WITH SLIGHT ODOR.
Boiling Point: 212F,100C
Specific Gravity: 1 (H*20=1)
Solubility In Water: COMPLETE

=====
Fire and Explosion Hazard Data
=====

Flash Point: N/A
Extinguishing Media: USE APPROPRIATE FOR SURROUNDING FIRE.
Special Fire Fighting Proc: USE NIOSH/MSHA APPROVED SCBA AND FULL
PROTECTIVE EQUIPMENT (FP N).
Unusual Fire And Expl Hazrds: NOT APPLICABLE.

=====
Reactivity Data
=====

Stability: YES
Cond To Avoid (Stability): NOT APPLICABLE.
Materials To Avoid: ORGANIC MATERIALS, STRONG REDUCING AGENTS.

=====
Health Hazard Data
=====

=====
Precautions for Safe Handling and Use
=====

=====
Control Measures
=====

=====
Transportation Data
=====

=====
Disposal Data
=====

=====
Label Data
=====

Label Required: YES
Technical Review Date: 09AUG94
Label Date: 08AUG94
Label Status: G
Common Name: THALLIUM 1000 UG/ML (0.1% W/V)
Chronic Hazard: NO
Signal Word: DANGER!
Acute Health Hazard-Severe: X
Contact Hazard-Severe: X
Fire Hazard-None: X
Reactivity Hazard-None: X
Special Hazard Precautions: ACUTE: SEVERE IRRITATION OR BURNS OF
RESPIRATORY SYSTEM, COUGHING, DIFFICULT BREATHING, CHEST PAINS, PULMONARY
EDEMA, LUNG INFLAMMATION, UNCONSCIOUSNESS AND MAY BE FATAL. SEVERE
IRRITATION OR BURNS TO SKIN AND YES. INGESTION CAN CAUSE NAUSEA, VOMITING,
SEVERE BURNS, ULCERATION TO MOUTH, THROAT, STOMACH. CHRONIC: NONE LISTED BY
MANUFACTURER.
Protect Eye: Y
Protect Skin: Y
Protect Respiratory: Y
Label Name: INORGANIC VENTURES INC
Label Street: 195 LEHIGH AVE SUITE 4
Label City: LAKEWOOD
Label State: NJ
Label Zip Code: 08071
Label Country: US
Label Emergency Number: 800-424-9300 (CHEMTREC)

ENVIRONMENTAL RESOURCE ASSOCIATES -- 1000 PPM VANADIUM - LABORATORY STANDARD
MATERIAL SAFETY DATA SHEET
NSN: 655000F037435
Manufacturer's CAGE: 1R664
Part No. Indicator: A
Part Number/Trade Name: 1000 PPM VANADIUM

=====
General Information
=====

Item Name: LABORATORY STANDARD
Company's Name: ENVIRONMENTAL RESOURCE ASSOCIATES
Company's Street: 5540 MARSHALL ST
Company's City: ARVADA
Company's State: CO
Company's Country: US
Company's Zip Code: 80002-3108
Company's Emerg Ph #: 303-431-8454
Company's Info Ph #: 303-431-8454
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SE
Date MSDS Prepared: 05MAR92
Safety Data Review Date: 29NOV94
MSDS Preparer's Name: DANIEL A GOLDSTEIN
Preparer's Company: ENVIRONMENTAL RESOURCE ASSOCIATES
Preparer's St Or P. O. Box: 5540 MARSHALL ST
Preparer's City: ARVADA
Preparer's State: CO
Preparer's Zip Code: 80002-3108
MSDS Serial Number: BWJBN

=====
Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: NITRIC ACID, HYDROGEN NITRATE
Ingredient Sequence Number: 01
Percent: <5
NIOSH (RTECS) Number: QU5775000
CAS Number: 7697-37-2
OSHA PEL: 2 PPM
ACGIH TLV: 5.2 MG/CUM

Proprietary: NO
Ingredient: VANADIUM OXIDE, VANADIUM TRIOXIDE
Ingredient Sequence Number: 02
Percent: <1
NIOSH (RTECS) Number: YW3050000
CAS Number: 1314-34-7
OSHA PEL: 0.05 MG/CUM
ACGIH TLV: 0.05 MG/CUM
Other Recommended Limit: 0.05 MG/CUM NIOSH

=====
Physical/Chemical Characteristics
=====

Appearance And Odor: CLEAR LIQUID W/NO ODOR
Boiling Point: (SEE SUPP)
Vapor Pressure (MM Hg/70 F): 28
Vapor Density (Air=1): >1
Specific Gravity: 1
Evaporation Rate And Ref: (WATER =1): 1
Solubility In Water: COMPLETE
pH: <1
=====

Fire and Explosion Hazard Data

=====
Extinguishing Media: NONE
Special Fire Fighting Proc: NONE
Unusual Fire And Expl Hazrds: NONE
=====

Reactivity Data

=====
Stability: YES
Cond To Avoid (Stability): FREEZING
Materials To Avoid: METALS
Hazardous Decomp Products: HYDROGEN
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NONE
=====

Health Hazard Data

=====
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: POISON & CORROSIVE TO SKIN, EYES, MUCOUS
MEMBRANES/LUNGS. MAY BURN ANY TISSUE & CAUSE BLINDNESS. MAY CAUSE GI TRACT
PERFORATION, PULMONARY EDEMA. VANADIUM: SYSTEMIC INTOXICATION IS UNLIKELY.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NONE
Signs/Symptoms Of Overexp: IRRITATION, BURNING, COUGH, METHEMOGLOBINEMIA,
VOMITING & DIARRHEA.
Med Cond Aggravated By Exp: ASTHMA.
Emergency/First Aid Proc: EYES/SKIN: FLUSH W/COPIOUS AMOUNTS OF WATER.
INHALATION: GIVE MOIST OXYGEN. INGESTION: GIVE WATER/MILK. OBTAIN MEDICAL
ATTENTION IN ALL CASES.
=====

Precautions for Safe Handling and Use

=====
Steps If Matl Released/Spill: NEUTRALIZE & FLUSH W/WATER/NEUTRALIZE &
ABSORB. VENTILATE AREA.
Neutralizing Agent: BAKING SODA.
Waste Disposal Method: DISPOSE OF AS NON-HAZARDOUS WASTE IAW/FEDERAL,
STATE & LOCAL REGULATIONS.
Precautions-Handling/Storing: AVOID FREEZING/ROUGH HANDLING/BREAKAGE.
Other Precautions: AVOID INHALATION/DIRECT CONTACT W/DRIED RESIDUE. AVOID
MIST/AEROSOL FORMATION. AVOID SKIN CONTACT DUE TO POSSIBLE SENSITIZING.
=====

Control Measures

=====
Respiratory Protection: WEAR ACID GAS TYPE DUST/MIST RESPIRATOR IF MIST
PRODUCTION OCCURS.
Ventilation: MECHANICAL/LOCAL EXHAUST: USE IN HOOD.
Protective Gloves: ACID PROOF
Eye Protection: SPLASH GOGGLES
Other Protective Equipment: ACID PROOF APRON W/SLEEVES, LAB COAT, CLOSED
SHOES, SAFETY SHOWER, EYE WASH.
Suppl. Safety & Health Data: BOILING POINT (0-5% ACID): 212-212.72F.
=====

Transportation Data

Disposal Data

Label Data

Label Required: YES
Label Status: G
Common Name: 1000 PPM VANADIUM
Special Hazard Precautions: POISON & CORROSIVE TO SKIN, EYES, MUCOUS
MEMBRANES/LUNGS. MAY BURN ANY TISSUE & CAUSE BLINDNESS. MAY CAUSE GI TRACT
PERFORATION, PULMONARY EDEMA. VANADIUM: SYSTEMIC INTOXICATION IS UNLIKELY.
IRRITATION, BURNING, COUGH, METHEMOGLOBINEMIA, REDNESS, SHORT BREATH, PAIN,
VOMITING, DIARRHEA, CYANOSIS. VANADIUM SALTS: VOMITING & DIARRHEA.
Label Name: ENVIRONMENTAL RESOURCE ASSOCIATES
Label Street: 5540 MARSHALL ST
Label City: ARVADA
Label State: CO
Label Zip Code: 80002-3108
Label Country: US
Label Emergency Number: 303-431-8454

Vanadium, Powder, -325 Mesh, 99.5%
ACROS99091

**** SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION ****

MSDS Name: Vanadium, Powder, -325 Mesh, 99.5%

Catalog Numbers:

AC318010000, AC318010100

Synonyms:

None.

Company Identification (Europe): Acros Organics N.V.
Janssen Pharmaceuticaaan 3a
2440 Geel, Belgium

Company Identification (USA): Acros Organics
One Reagent Lane
Fairlawn, NJ 07410

For information in North America, call: 800-ACROS-01

For information in Europe, call: 0032(0) 14575211

For emergencies in the US, call CHEMTREC: 800-424-9300

For emergencies in Europe, call: 0032(0) 14575299

**** SECTION 2 - COMPOSITION, INFORMATION ON INGREDIENTS ****

| CAS# | Chemical Name | % | EINECS# |
|-----------|---------------|------|-----------|
| 7440-62-2 | Vanadium | 99.5 | 231-171-1 |

Hazard Symbols: XI

Risk Phrases: 36/37/38

**** SECTION 3 - HAZARDS IDENTIFICATION ****

EMERGENCY OVERVIEW

Appearance: light gray-white.

Warning! Causes respiratory tract irritation. May cause digestive tract irritation. The toxicological properties of this material have not been fully investigated. Causes eye and skin irritation.

Target Organs: None known.

Potential Health Effects

Eye:

Causes severe eye irritation.

Skin:

Causes skin irritation.

Ingestion:

May cause gastrointestinal irritation with nausea, vomiting and diarrhea. The toxicological properties of this substance have not been fully investigated.

Inhalation:

The toxicological properties of this substance have not been fully investigated. Causes severe respiratory tract irritation.

Chronic:

No information found.

**** SECTION 4 - FIRST AID MEASURES ****

Eyes:

Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin:

Get medical aid. Immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion:

Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation:

Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Get medical aid.

Notes to Physician:

Treat symptomatically and supportively. Green coloration of the tongue, resulting from the deposition of vanadium salts is an indicator of exposure; however, may be absent even in prolonged exposure..

Antidote:

None reported.

**** SECTION 5 - FIRE FIGHTING MEASURES ****

General Information:

As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Flammable in dust form from heat, flame or sparks.

Extinguishing Media:

Use agent most appropriate to extinguish fire. In case of fire use water spray, dry chemical, carbon dioxide, or appropriate foam.

**** SECTION 6 - ACCIDENTAL RELEASE MEASURES ****

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks:

Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions. Provide ventilation.

**** SECTION 7 - HANDLING and STORAGE ****

Handling:

Wash thoroughly after handling. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation. Use with adequate ventilation. Wash clothing before reuse.

Storage:

Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

**** SECTION 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION ****

Engineering Controls:

Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

| Chemical Name | ACGIH | NIOSH | OSHA - Final PELs |
|---------------|-------------|-------------|--|
| Vanadium | none listed | none listed | respirable dust, as V2O5: C 0.5 mg/m3; fume, as V2O5: C 0.1 mg/m3 (Note: OSHA lists this as 1314-62-1) |

OSHA Vacated PELs:

Vanadium:

No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes:

Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European

Skin: Standard EN166:
Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR §1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.

**** SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES ****

Physical State: Lusturous powder
Appearance: light gray-white
Odor: Not available.
pH: Not available.
Vapor Pressure: Not available.
Vapor Density: Not available.
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: 3380 deg C
Freezing/Melting Point: 1917 deg C
Autoignition Temperature: Not available.
Flash Point: Not available.
NFPA Rating: (est.) Health: 2; Flammability: 1; Reactivity: 0
Explosion Limits, Lower: Not available.
Upper: Not available.
Decomposition Temperature:
Solubility: Insoluble.
Specific Gravity/Density: 6.11 @ 18.7C
Molecular Formula: V
Molecular Weight: 50.94

**** SECTION 10 - STABILITY AND REACTIVITY ****

Chemical Stability:
Stable at room temperature in closed containers under normal storage and handling conditions. Oxidizes readily above 600C.

Conditions to Avoid:
Incompatible materials, dust generation, excess heat.

Incompatibilities with Other Materials:
Violent reaction with BrF₃, Cl₂, lithium, nitryl fluoride, oxidants..

Hazardous Decomposition Products:
Irritating and toxic fumes and gases, vanadium oxide (VO_x) gases.

Hazardous Polymerization: Has not been reported

**** SECTION 11 - TOXICOLOGICAL INFORMATION ****

RTECS#:
CAS# 7440-62-2: YW1355000
LD50/LC50:
Not available.

Carcinogenicity:
Vanadium -
Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.

Epidemiology:
No information available.

Teratogenicity:
No information available.

Reproductive Effects:
No information available.

Neurotoxicity:
No information available.

Mutagenicity:
No information available.

Other Studies:
See actual entry in RTECS for complete information.

**** SECTION 12 - ECOLOGICAL INFORMATION ****

**** SECTION 13 - DISPOSAL CONSIDERATIONS ****

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste.

US EPA guidelines for the classification determination are listed in 40 CFR Part 171. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

**** SECTION 14 - TRANSPORT INFORMATION ****

US DOT

No information available

Canadian TDG

No information available.

**** SECTION 15 - REGULATORY INFORMATION ****

US FEDERAL

TSCA

CAS# 7440-62-2 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

SARA

Section 302 (RQ)

None of the chemicals in this material have an RQ.

Section 302 (TPQ)

None of the chemicals in this product have a TPQ.

Section 313

This material contains Vanadium (CAS# 7440-62-2, 99.5%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 372.

Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

Vanadium can be found on the following state right to know lists:

California, New Jersey, Pennsylvania, Massachusetts.

California No Significant Risk Level:

None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols: XI

Risk Phrases:

R 36/37/38 Irritating to eyes, respiratory system and skin.

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

S 28A After contact with skin, wash immediately with

plenty of water.

S 37 Wear suitable gloves.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

WGK (Water Danger/Protection)

CAS# 7440-62-2: No information available.

United Kingdom Occupational Exposure Limits

Canada

CAS# 7440-62-2 is listed on Canada's DSL/NDSL List.

This product has a WHMIS classification of D2B.

CAS# 7440-62-2 is not listed on Canada's Ingredient Disclosure List.

Exposure Limits.

CAS# 7440-62-2: OEL-CZECHOSLOVAKIA:TWA 0.5 mg/m³;STEL 1.5 mg/m³

**** SECTION 16 - ADDITIONAL INFORMATION ****

MSDS Creation Date: 5/05/1999 Revision #2 Date: 8/02/2000

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no way shall the company be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if the company has been advised of the possibility of such damages.

ZINC OF AMERICA -- ZINC POWDER 1221
MATERIAL SAFETY DATA SHEET
NSN: 685000N033994
Manufacturer's CAGE: OGMG6
Part No. Indicator: A
Part Number/Trade Name: ZINC POWDER 1221

=====
General Information
=====

Company's Name: ZINC CORP OF AMERICA
Company's Street: 300 FRANKFORT RD
Company's City: MONACA
Company's State: PA
Company's Country: US
Company's Zip Code: 15061-2295
Company's Emerg Ph #: 412-774-1020;800-424-9300 (CHEMTREC)
Company's Info Ph #: 412-774-1020
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SMJ
Date MSDS Prepared: 29JUL91
Safety Data Review Date: 01SEP92
MSDS Serial Number: BPTPG
Hazard Characteristic Code: R2

=====
Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: ZINC (SARA III)
Ingredient Sequence Number: 01
Percent: 98
NIOSH (RTECS) Number: ZG8600000
CAS Number: 7440-66-6
OSHA PEL: 10 MG ZNO/M3
ACGIH TLV: 10 MG ZNO/M3

Proprietary: NO
Ingredient: LEAD (SARA III)
Ingredient Sequence Number: 02
Percent: 0.50
NIOSH (RTECS) Number: OF7525000
CAS Number: 7439-92-1
OSHA PEL: 0.05 MG/M3
ACGIH TLV: 0.15 MG/M3

Proprietary: NO
Ingredient: SUPP DATA:OF THE SYMPS OF SHORT-TERM EXPOS & MAY ALSO CAUSE
CNS DMG, GI DISTURBANCES, ANEMIA, & WEIGHT DROP. (ING 4)
Ingredient Sequence Number: 03
NIOSH (RTECS) Number: 9999999ZZ
OSHA PEL: NOT APPLICABLE
ACGIH TLV: NOT APPLICABLE

Proprietary: NO
Ingredient: ING 3:SYMPS OF CNS DMG INCL FATIGUE, HDCH, TREMORS,
HYPERTENSION, HALLUCINATIONS, CONVULSIONS, & DELIRIUM. (ING 5)
Ingredient Sequence Number: 04
NIOSH (RTECS) Number: 9999999ZZ
OSHA PEL: NOT APPLICABLE
ACGIH TLV: NOT APPLICABLE

Proprietary: NO
Ingredient: ING 4:KIDNEY DYSFUNCTION & POSS INJURY HAS ALSO BEEN ASSOC W/

CHRONIC LEAD POISONING. NOTE:LEAD (CAS#7439-92-1) (ING 6)
Ingredient Sequence Number: 05
NIOSH (RTECS) Number: 9999999ZZ
OSHA PEL: NOT APPLICABLE
ACGIH TLV: NOT APPLICABLE

Proprietary: NO
Ingredient: ING 5:APPEARS ON THE NAVY LISTING OF OCCUPATIONAL REPRODUCTIVE
HAZARDS. SEEK CONSULTATION FROM APPROPRIATE HEALTH(ING 7)
Ingredient Sequence Number: 06
NIOSH (RTECS) Number: 9999999ZZ
OSHA PEL: NOT APPLICABLE
ACGIH TLV: NOT APPLICABLE

Proprietary: NO
Ingredient: ING 6:PROFESSIONALS CONCERNING LATEST HAZARD LIST INFORMATION
& SAFE HANDLING & EXPOSURE RECOMMENDATIONS (FP N).
Ingredient Sequence Number: 07
NIOSH (RTECS) Number: 9999999ZZ
OSHA PEL: NOT APPLICABLE
ACGIH TLV: NOT APPLICABLE
=====

Physical/Chemical Characteristics
=====

Appearance And Odor: GRAY GRANULAR METALLIC PARTICLES WITH NO ODOR
Boiling Point: 1665F, 907C
Melting Point: 788F, 420C
Vapor Pressure (MM Hg/70 F): N/A
Vapor Density (Air=1): N/A
Specific Gravity: 7.12
Evaporation Rate And Ref: NOT APPLICABLE
Solubility In Water: INSOLUBLE
Percent Volatiles By Volume: N/A
=====

Fire and Explosion Hazard Data
=====

Extinguishing Media: SMOTHER & COOL W/SUITABLE DRY EXTINGUISHING AGENT
(CLASS D FIRES) SUCH AS DRY POWDER, ZINC OXIDE OR DRY SAND. NO WATER.
Special Fire Fighting Proc: WEAR NIOSH/MSHA APPROVED SCBA & FULL PROT
EQUIPMENT (FP N). DO NOT SPREAD BURNING MATL. SMOTHER & ALLOW FIRE TO GO
OUT. DRY ZINC DUST WILL NOT IGNITE (SUPDAT)
Unusual Fire And Expl Hazrds: BULK DUST IN CONTACT WITH WATER OR DAMP AIR
EVOLVES HYDROGEN. THE HEAT PRODUCED DURING THIS RXN COULD IGNITE HYDROGEN.
AN EXPLO CNDTN MAY EXIST IF THIS (SUPDAT)
=====

Reactivity Data
=====

Stability: YES
Cond To Avoid (Stability): HYDROGEN MAY EVOLVE WHEN IN CONTACT WITH WATER
OR DAMP AIR.
Materials To Avoid: AVOID CONTACT WITH ACIDS, ALKALIS, AND WATER.
Hazardous Decomp Products: NONE.
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NOT RELEVANT.
=====

Health Hazard Data
=====

LD50-LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: NO
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: ZINC/ZINC OXIDE:INHAL OF HIGH LEVELS MAY
RESULT IN TIGHTNESS OF CHEST, METALLIC TASTE, COUGH, DIZZINESS, FEVER,
CHILLS, HEADACHE, NAUSEA AND DRY THROAT. OVEREXPOSURE MAY PRODUCE SYMPTOMS

KNOWN AS METAL FUME FEVER OR "ZINC SHAKES", AN ACUTE, SELF-LIMITING CNDTN W/OUT RECOGNIZED COMPLICATIONS. SYMPS(EFTS OF OVEREXPOSURE)

Carcinogenicity - NTP: NO

Carcinogenicity - IARC: NO

Carcinogenicity - OSHA: NO

Explanation Carcinogenicity: NOT RELEVANT

Signs/Symptoms Of Overexp: HLTH HAZ:OF METAL FUME FEVER INCLUDE:CHILLS, FEVER, MUSCULAR PAIN, NAUSEA & VOMITING. LEAD:EXPOSURE TO HIGH CONCENTRATIONS OF LEAD MAY CAUSE HEADACHE, NAUSEA, VOMITING, ABDOMINAL SPASMA, FATIGUE, SLEEP DISTURBANCES, WEIGHT LOSS, ANEMIA, & PAIN IN LEGS, ARMS & JOINTS. CHRONIC:ZINC:MAY CAUSE RESP TRACT IRRIT (SUPDAT)

Med Cond Aggravated By Exp: INHALATION OF DUST MAY BE AN IRRITANT TO PRE-EXISTING RESPIRATORY CONDITIONS.

Emergency/First Aid Proc: CALL MD IN ALL CASES. INHAL:SYMPTOMATIC TREATMENT, SUCH AS BED REST AND POSSIBLY ASPRIN IS RECOMMENDED TO PROVIDE RELIEF FROM FEVER & CHILLS. EYE:FLUSH WITH COPIOUS AMOUNTS OF WATER FOR AT LEAST 15 MINUTES. SKIN:FLUSH WITH COPIOUS AMOUNTS OF WATER. CALL MD (FP N). INGEST:CALL MD IMMEDIATELY (FP N).

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Precautions for Safe Handling and Use

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Steps If Matl Released/Spill: PROHIBIT SMOKING, AVIOD ALL IGNITION SOURCES, AND AVOID DUSTING. METAL SHOULD BE CONTAINED FOR RECYCLING.

Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.

Waste Disposal Method: CONTAIN IN A DRY CLOSED CONTAINER. MATERIAL MAY BE RECYCLED OR DISPOSED OF IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL ENVIRONMENTAL REGULATIONS.

Precautions-Handling/Storing: STORE IN A COOL, DRY, WELL VENTILATED SPACE, SEPARATE FROM ACIDS AND ALKALIS. PROTECT FROM PHYSICAL DAMAGE.

Other Precautions: NONE SPECIFIED BY MANUFACTURER.

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Control Measures

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Respiratory Protection: USE A NIOSH/MSHA APPROVED RESPIRATOR FOR DUSTING CONDITIONS OR IN THE PRESENCE OF ZINC VAPOR.

Ventilation: LOCAL EXHAUST OR OTHER VENTILATION THAT WILL REDUCE DUST CONCENTRATIONS TO LESS THAN PERMISSIBLE EXPOSURE LIMITS.

Protective Gloves: IMPERVIOUS GLOVES (FP N).

Eye Protection: CHEMICAL WORKERS GOGGLES (FP N).

Other Protective Equipment: BARRIER CREAMS.

Work Hygienic Practices: PRACTICE GOOD PERSONAL HYGIENE WHEN WORKING IN AREAS WHERE THIS MATERIAL IS USED.

Suppl. Safety & Health Data: FIRE FIGHT PROC:SPONTANEOUSLY, BUT ONCE IGNITED, MAY BURN READILY IN AIR. EXPLO HAZ:HAPPENS IN A CONFINED SPACE. DRY DUST MAY FORM A DUST EXPLOSIVE MIXTURE IN AIR. ZINC OXIDE FUME MAY RESULT FROM COMBUSTION OF ZINC DUST. EFTS OF OVEREXP:W/NASOPHARYNGITIS & LARYNGITIS. LEAD:PRLNGD EXPOS TO LEAD MAY PRODUCE MANY (ING 3)

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Transportation Data

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Trans Data Review Date: 93022

DOT PSN Code: QBP

DOT Proper Shipping Name: ZINC POWDER OR ZINC DUST

DOT Class: 4.3

DOT ID Number: UN1436

DOT Pack Group: III

DOT Label: DANGEROUS WHEN WET, SPONTANEOUSLY COMB

IMO PSN Code: PTG

IMO Proper Shipping Name: ZINC POWDER

IMO Regulations Page Number: 4373

IMO UN Number: 1436

IMO UN Class: 4.3

IMO Subsidiary Risk Label: SPONTANEOUSLY COMBUSTIBLE

IATA PSN Code: ZTV

IATA UN ID Number: 1436
IATA Proper Shipping Name: ZINC POWDER
IATA UN Class: 4.3
IATA Subsidiary Risk Class: 4.2
IATA Label: DANG WHEN WET & SPONT COMBUST
AFI PSN Code: ZTV
AFI Prop. Shipping Name: ZINC POWDER OR ZINC DUST
AFI Class: 4.3
AFI ID Number: UN1436
AFI Pack Group: III
AFI Label: 4.2
AFI Basic Pac Ref: 8-7

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Disposal Data
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Label Data
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Label Required: YES
Technical Review Date: 01SEP92
Label Date: 01SEP92
Label Status: G
Common Name: ZINC POWDER 1221
Chronic Hazard: YES
Signal Word: CAUTION!
Acute Health Hazard-Slight: X
Contact Hazard-None: X
Fire Hazard-None: X
Reactivity Hazard-None: X
Special Hazard Precautions: ACUTE: INHALATION OF ZINC OXIDE MAY CAUSE
TIGHTNESS OF CHEST, METALLIC TASTE, COUGH, DIZZINESS, FEVER, CHILLS,
HEADACHE, NAUSEA, AND DRY THROAT. MAY CAUSE MUSCULAR PAIN AND VOMITING.
INHALATION OF LEAD MAY CAUSE HEADACHE, NAUSEA, VOMITING, STOMACH SPASMS,
FATIGUE, SLEEP DISTURBANCES, WEIGHT LOSS, ANEMIA, AND PAIN IN LEGS, ARMS
AND JOINTS. CONTACT HAZARDS: NONE LISTED BY MANUFACTURER. CHRONIC: CHRONIC
EXPOSURE TO ZINC MAY CAUSE RESPIRATORY TRACT IRRITATION WITH
NASOPHARYNGITIS AND LARYNGITIS. MAY CAUSE KIDNEY DYSFUNCTION. LEAD APPEARS
ON THE NAVY REPRODUCTIVE HAZARDS LIST (FP N).
Protect Eye: Y
Protect Skin: Y
Protect Respiratory: Y
Label Name: ZINC CORP OF AMERICA
Label Street: 300 FRANKFORT RD
Label City: MONACA
Label State: PA
Label Zip Code: 15061-2295
Label Country: US
Label Emergency Number: 412-774-1020; 800-424-9300 (CHEMTREC)