

Material Safety Data Sheet

conoco

Emergency Medical Telephone (800) 441-3637

CP 024

JET A, JET A-FSII, JET FUEL

I. MATERIAL IDENTIFICATION

Name

Jet A, Jet A-FSII, Jet Fuel

CAS Registry Number

Mixture; See Section XI

Synonyms

Jet A Jet Fuel

Product Code

4305/4306

Chemical Family

Mixed Petroleum Hydrocarbons

Transportation Emergency Phone

1-(800) 424-9300 (Chemtrec)

II. OSHA HAZARD DETERMINATION

The material is hazardous as defined by OSHA's Hazard Communication Standard, 29 CFR 1910.1200. Refer to Section XI of this MSDS for other federal and state regulatory information.

Hazardous Ingredients

Hydrocarbons (Aromatic & Paraffinic)

Naphthalene

CAS Registry Number

Mixture

91-20-3

Concentration

>90%

≤3%

Hazardous Physical Properties

Class II Combustible Liquid - NFPA 30-1987.

III. PHYSICAL DATA

Appearance and Odor

Clear liquid;

Paraffinic odor

Specific Gravity (H₂O = 1)

0.81

Boiling Point/Range

330° - 572°F

% Volatiles (by volume)

Nil

Vapor Pressure (mmHg) @ 68°F

2

Solubility in Water

Insoluble

IV. REACTIVITY DATA

Stable: X Unstable:

Hazardous Decomposition Materials: Incomplete combustion may produce carbon monoxide.

Conditions to Avoid: Oxidizing materials, heat, flame.

Hazardous Polymerization: Will not occur.

CP 024

V. FIRE AND EXPLOSION HAZARD DATA

LEL: 0.5 UEL: 6

Flash Point (Method used): 100°F (TCC)

Autolignition Temperature: 475° - 500°F

Handle and store in accordance with NFPA procedure for Class II Combustible Liquid.

Extinguishing Media: Use water spray, dry chemical, CO₂, foam.

Special Fire Fighting Procedures: Use water to keep fire-exposed containers cool. If leak or spill has not ignited, use water spray to disperse the vapors and to provide protection for personnel attempting to stop a leak. Water spray may be used to flush spills away from exposures.

Unusual Fire and Explosion Hazards: Products of combustion may contain carbon monoxide, carbon dioxide and other toxic materials. Do not enter enclosed or confined space without proper protective equipment including respiratory protection.

National Fire Protection Association (NFPA) Classification
Health 0 Fire 2 Reactivity 0

HAZARD RATING
Least-0 Slight-1 Moderate-2
High-3 Extreme-4

VI. TRANSPORTATION AND STORAGE

Storage Conditions: Store in accordance with National Fire Protection Association regulations.

Shipping Information:

DOT:

Proper Shipping Name: Fuel, Aviation, Turbine Engine

Hazard Class: Combustible Liquid

UN/NA No.: UN 1863

DOT Label(s): None

DOT Placard: Combustible

IATA/IMO:

Proper Shipping Name: Fuel, Aviation, Turbine Engine

Hazard Class: 3 (IMO 3.2)

UN No.: UN 1863

IMO/ICAO Label: Flammable Liquid

Special Information: Not Restricted Over 140°F

Packaging Group: III

VII. HEALTH HAZARD INFORMATION

Exposure Limits for Jet A, Jet A-FSII, Jet Fuel

PEL: None Established

TLV: None Established

Exposure Limits for Petroleum Distillates

PEL: 400 ppm; 1600 mg/m³

Exposure Limits for Naphthalene

PEL: 10 ppm, 50 mg/m³

TLV: 10 ppm, 50 mg/m³

STEL 15 ppm, 75 mg/m³

STEL 15 ppm, 75 mg/m³

Du Pont AEL: None Established

Primary Routes of Exposure/Entry: Skin, Inhalation.

Signs and Symptoms of Exposure/Medical Conditions Aggravated by Exposure:

Studies with mice or rats have shown that some petroleum distillates have caused either damage or tumors of the kidneys or tumors of the liver. However, kidney effects were not seen in similar studies involving guinea pigs, dogs or monkeys. Also, the significance of the liver tumors in rodents is highly speculative.

Mouse skin painting studies have shown that petroleum middle distillates (boiling range of 100°-700°F; naphtha, jet fuel, diesel fuel, kerosene, etc.) can cause skin cancer when repeatedly applied and never washed from the animal's skin. The relative significance of this to human health is uncertain since the petroleum distillates were not washed from the skin and resulting skin effects (irritation, cell damage, etc.) may play a role in the tumorigenic response. A few studies have shown that washing the animal's skin with soap and water between treatments greatly reduces the carcinogenic effect of some petroleum oils.

The product contains petroleum hydrocarbons, and as with many petroleum products, it may cause irritation to the eyes, lungs or skin after prolonged or repeated exposure. Extreme exposure or aspiration into the lungs may cause pneumonia. Overexposure may cause weakness, headache, nausea, confusion, blurred vision, drowsiness and other nervous system effects; greater exposure may cause dizziness, slurred speech, flushed face, unconsciousness or convulsions.

Naphthalene is a potential irritant to eyes, skin and lungs and may damage the blood, eyes and kidney after prolonged or repeated exposure.

Carcinogenicity:

This material is not known to contain any chemical listed as a carcinogen or suspected carcinogen by OSHA, IARC, or NTP at a concentration greater than 0.1%.

VIII. EMERGENCY AND FIRST AID INFORMATION

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

Skin: In case of contact, immediately wash skin with soap and plenty of water. If irritation develops, consult a physician.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

Ingestion: If swallowed, do not induce vomiting. Give large quantities of water. Never give anything by mouth to an unconscious person. Call a physician.

Notes to Physician: Gastric lavage by qualified medical personnel may be considered, depending on quantity of material ingested.

IX. SPILL, LEAK AND DISPOSAL INFORMATION

In Case of Spill or Leak: This material is combustible. Contain spill immediately in smallest possible area. Recover as much of the product as possible by such methods as vacuuming, followed by recovering residual fluids by using absorbent materials. Nonrecoverable product, contaminated soil, debris and other materials should be placed in proper containers for ultimate disposal. Avoid washing, draining or directing material to storm or sanitary sewers.

NOTE: Review FIRE AND EXPLOSION HAZARDS before proceeding with clean up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean up.

Waste Disposal Method: Recycle as much of the recoverable product as possible. Treatment, storage, transportation and disposal must be in accordance with applicable Federal, State/Provincial, and Local regulations.

X. PRECAUTIONARY MEASURES

Respiratory Protection: Select appropriate NIOSH-approved respiratory protection where necessary to maintain exposures below the acceptable limits in Section VII. Proper respirator selection should be determined by adequately trained personnel and based on the contaminant(s), the degree of potential exposure and published respiratory protection factors.

Ventilation: Normal ventilation.

Protective Gloves: Should be worn when any potential exists for skin contact. NBR or neoprene recommended.

Eye Protection: Chemical goggles or face shield required when exposed to oil sprays and mists.

Other Protective Equipment: Coveralls if splashing is probable.

Safety Precautions: Avoid contact with eyes, skin, or clothing.

XI. REGULATORY INFORMATION

FEDERAL REGULATIONS

CERCLA, 40 CFR 302

Not Applicable

**SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986, TITLE III
SECTIONS 302, 304, 311, 312, 313**

SECTION 302/304 - Extremely Hazardous Substances (40 CFR 355)

The material does not contain extremely hazardous substances at greater than 1.0% concentration; however, it is possible that this material may contain extremely hazardous substances at a lower concentration so that a large enough spill could warrant an Emergency Release Report under Section 304.

SECTION 311/312 - MSDS and Chemical Inventory Reporting Requirements (40 CFR 370)

The material should be reported under the following EPA hazard categories:

☒ Immediate (Acute) Health Hazard	☐ Sudden Release of Pressure
☒ Delayed (Chronic) Health Hazard	☐ Reactive
☒ Fire	☐ Not Applicable

NOTE: See Section II for the concentration of any ingredients classified as hazardous by OSHA.

SECTION 313 - List of Toxic Chemicals (40 CFR 372)

The material contains the following chemical(s) at a level of 1.0% or greater (0.1% for carcinogens) on the list of Toxic Chemicals and is subject to toxic chemical release reporting requirements.

<u>Toxic Chemical</u>	<u>CAS Registry Number</u>	<u>Approx. Concentration (Upper Bound)</u>
Naphthalene	91-20-3	3.0%

TOXIC SUBSTANCES CONTROL ACT (TSCA), 40 CFR 710

This material is a mixture as defined by TSCA. The chemical ingredients in this material are in Section 8(b) Chemical Substance Inventory and/or are otherwise in compliance with TSCA. In the case of ingredients obtained from other manufacturers, Conoco relies on the assurance of responsible third parties in providing this statement.

RESOURCE CONSERVATION AND RECOVERY ACT (RCRA), 40 CFR 261, SUBPART C AND D
 The material, when discarded or disposed of, is not specifically listed as a hazardous waste in Federal regulations; however, it could be considered hazardous if it meets criteria for being toxic, corrosive, ignitable or reactive according to U.S. EPA definitions (40 CFR 261). Additionally, it could be designated as hazardous according to state regulations. This material could also become a hazardous waste if it is mixed with or comes in contact with a listed hazardous waste. If such contact or mixing occurs, check 40 CFR 261 to determine whether it is a hazardous waste. If it is a hazardous waste, Regulations 40 CFR 262, 263, 264 and 268 may apply.

FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT, 40 CFR 116, SECTION 311

The material contains the following ingredient(s) which is considered hazardous if spilled in navigable waters.

<u>Ingredient</u>	<u>Reportable Quantity</u>
Petroleum Hydrocarbon	Film or sheen upon or discoloration of the water surface or adjoining shoreline

HAZARDOUS MATERIALS TRANSPORTATION REGULATIONS, 49 CFR 171-178
 Not Applicable

FOREIGN REGULATIONS

CANADIAN HAZARDOUS PRODUCTS ACT (WHMIS)
 The material is a WHMIS Controlled Product, and a Canadian MSDS is available.

STATE REGULATIONS

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT OF 1986 ("PROPOSITION 65")
 The material does not contain ingredient(s) subject to the Act.

Ingredient
 None

PENNSYLVANIA WORKER AND COMMUNITY RIGHT TO KNOW ACT

The material contains the following hazardous substances:

Categories: H = Hazardous Substance ($\geq 1.0\%$)
 S = Special Hazardous Substance ($\geq 0.01\%$)
 E = Environmental Hazard ($\geq 1.0\%$)

<u>Ingredient</u>	<u>CAS Registry Number</u>	<u>Category</u>
Aromatic and Paraffinic		
Hydrocarbons	Mixture	H
Naphthalene	91-20-3	E

Nonhazardous ingredient(s) information is withheld as trade secret in accordance with Section 11 of Pennsylvania Worker and Community Right to Know Act.

MSDS Code: GASC0170

REVISION TO SECTION XI

DATE OF LATEST REVISION/REVIEW:

DEPARTMENT RESPONSIBLE FOR MSDS:

PRODUCT INFORMATION CONTACT:

10/89 - Replaces MSDS dated 6/89

Safety, Occupational Health & Environmental Affairs

Hazard Communication Analyst

Conoco Inc.

(713) 293-5550

CP-024

The above data are based on tests, experience, and other information which Conoco believes reliable and are supplied for informational purposes only. However, some ingredients may have been purchased or obtained from third-party manufacturers. In these instances, Conoco, in good faith relies on information provided by those third parties. Since conditions of use are outside our control, CONOCO DISCLAIMS ANY LIABILITY FOR DAMAGE OR INJURY WHICH RESULTS FROM THE USE OF THE ABOVE DATA. NOTHING CONTAINED HEREIN SHALL CONSTITUTE A GUARANTEE, WARRANTY (INCLUDING WARRANTY OF MERCHANTABILITY) OR REPRESENTATION (INCLUDING FREEDOM FROM PATENT LIABILITY) BY CONOCO WITH RESPECT TO THE DATA, THE MATERIAL DESCRIBED, OR ITS USE FOR ANY SPECIFIC PURPOSE, EVEN IF THAT PURPOSE IS KNOWN TO CONOCO.



Material Safety Data Sheet



Emergency Medical Telephone (800) 441-3637

UNLEADED GASOLINE

C P 0 2 2

I. MATERIAL IDENTIFICATION

Name
Unleaded Gasoline

CAS Registry Number
Mixture; See Section XI

Synonyms
Automotive Unleaded Regular Gasoline,
Gasoline, Unleaded Regular,
Regular Unleaded Gasoline

Product Code
1104/1410

Chemical Family
Mixed Petroleum Hydrocarbons

Transportation Emergency Phone
1-(800) 424-9300 (Chemtrec)

II. OSHA HAZARD DETERMINATION

The material is hazardous as defined by OSHA's Hazard Communication Standard, 29 CFR 1910.1200. Refer to Section XI of this MSDS for federal and state regulatory information.

Hazardous Ingredients	CAS Registry Number	Concentration
Gasoline	Mixture	100%
including		
Benzene	71-43-2	0.1-4.9 wt %
Ethyl Benzene	100-41-4	Approx. 2%
Cumene	98-82-8	Approx. 1%
Pseudocumene	95-63-6	Approx. 2%
MTBE	1634-04-4	< 15%
Toluene	108-88-3	Approx. 15%
Xylenes	1330-20-7	Approx. 12%

Hazardous Physical Properties
Class 1A Flammable Liquid per NFPA Code No. 30-1987.

III. PHYSICAL DATA

Appearance and Odor
Water white to straw yellow liquid;
Gasoline odor

Specific Gravity ($H_2O = 1$)
0.70 - 0.77

Boiling Point/Range
85° - 437°F

% Volatiles (by volume)
100%

Vapor Pressure (mmHg) @ 68°F
275 - 475

Solubility in Water
May be slightly soluble

Vapor Density (Air = 1.0)
> 1

01022

IV. REACTIVITY DATA

Stable: X Unstable:

Hazardous Decomposition Materials: Carbon monoxide may be formed from incomplete combustion.

Conditions to Avoid: Undue exposure to air, oxidizing materials, heat, flame.

Hazardous Polymerization: Will not occur.

V. FIRE AND EXPLOSION HAZARD DATA

LEL: <1 UEL: 8

Flash Point (Method used): As low as -50°F (TCC)

Autolgnition Temperature: 536° - 853°F

Handle and store in accordance with NFPA procedure for Class IA Flammable Liquid.

Extinguishing Media: Use dry chemical, CO₂ foam.

Special Fire Fighting Procedures: Water may be ineffective to extinguish, but water should be used to keep fire-exposed containers cool. If a leak or spill has not ignited, use water spray to disperse the vapors and to protect personnel attempting to stop a leak. Water spray may be used to flush spills away from areas of potential exposure.

Unusual Fire and Explosion Hazards: Highly flammable. Products of combustion may contain carbon monoxide, carbon dioxide and other toxic materials. Do not enter enclosed or confined space without proper protective equipment including respiratory protection.

National Fire Protection Association (NFPA) Classification

Health 1 Fire 3 Reactivity 0

HAZARD RATING

Least-0 Slight-1 Moderate-2
High-3 Extreme-4

VI. TRANSPORTATION AND STORAGE

Storage Conditions: Store in accordance with National Fire Protection Association regulations.

Shipping Information:

DOT:

Proper Shipping Name: Gasoline
Hazard Class: Flammable Liquid
UN/NA No.: UN 1203
DOT Label(s): Flammable Liquid
DOT Placard: Flammable

IATA/IMO:

Proper Shipping Name: Gasoline or Motor Spirit
Hazard Class: 3 (IMO 3.1)
UN No.: UN 1203
IMO/ICAO Label: Flammable Liquid
Packaging Group: II

VII. HEALTH HAZARD INFORMATION

Exposure Limits for Unleaded Gasoline

PEL: 300 ppm, 900 mg/m³ (Gasoline)
STEL 500 ppm, 1500 mg/m³ (Gasoline)

TLV: TWA 300 ppm, 890 mg/m³ (Gasoline)
STEL 500 ppm, 1480 mg/m³ (Gasoline)

Exposure Limits for Benzene

PEL: 1 ppm - 8 Hr. TWA
5 ppm - (Short-Term Exposure Limit)
0.5 ppm - Action Level

TLV: 10 ppm, 32 mg/m³
Du Pont AEL: 1 ppm - 8 & 12 Hr. TWA
5 ppm - 15 Min. TWA

Exposure Limits for Ethyl Benzene

PEL: 100 ppm, 435 mg/m³
STEL 125 ppm, 545 mg/m³
Du Pont AEL: None Established

TLV: 100 ppm, 434 mg/m³
STEL 125 ppm, 543 mg/m³

Exposure Limits for Cumene

PEL: 50 ppm, 245 mg/m³, skin
TLV: 50 ppm, 246 mg/m³, skin

Du Pont AEL: None Established

Exposure Limits for Pseudocumene

PEL: 25 ppm, 125 mg/m³
TLV: 25 ppm, 123 mg/m³

Du Pont AEL: None Established

Exposure Limits for Toluene

PEL: 100 ppm, 375 mg/m³
STEL 150 ppm, 560 mg/m³
Du Pont AEL: 100 ppm - 8 & 12 Hr. TWA

TLV: 100 ppm, 377 mg/m³
STEL 150 ppm, 565 mg/m³

Exposure Limits for Xylenes

PEL: 100 ppm, 435 mg/m³
STEL 150 ppm, 655 mg/m³
Du Pont AEL: 100 ppm - 8 Hr. TWA
150 ppm - 15 Min. TWA

TLV: 100 ppm, 434 mg/m³
STEL 150 ppm, 651 mg/m³

Primary Routes of Exposure/Entry: Skin, Inhalation.

Signs and Symptoms of Exposure/Medical Conditions Aggravated by Exposure:

A few studies have indicated that workers exposed many years to high concentrations of benzene have a slightly higher incidence of leukemia. Benzene can also be toxic to the blood and blood-forming tissues.

Studies with mice or rats have shown that some petroleum distillates have caused either damage or tumors of the kidneys or tumors of the liver. However, kidney effects were not seen in similar studies involving guinea pigs, dogs or monkeys. Also, the significance of the liver tumors in rodents is highly speculative.

Mouse skin painting studies have shown that petroleum middle distillates (boiling range of 100°-700°F; naphtha, jet fuel, diesel fuel, kerosene, etc.) can cause skin cancer when repeatedly applied and never washed from the animal's skin. The relative significance of this to human health is uncertain since the petroleum distillates were not washed from the skin and resulting skin effects (irritation, cell damage, etc.) may play a role in the tumorigenic response. A few studies have shown that washing the animal's skin with soap and water between treatments greatly reduces the carcinogenic effect of some petroleum oils.

The product contains petroleum hydrocarbons, and as with many petroleum products, it may cause irritation to the eyes, skin and lungs after prolonged or repeated exposure. Overexposure may cause weakness, headache, nausea, confusion, blurred vision, drowsiness and other nervous system effects; greater exposure may cause dizziness, slurred speech, flushed face, unconsciousness or convulsions.

Listed as Carcinogen or Potential Carcinogen by:

	<u>NTP</u>	<u>IARC</u>	<u>OSHA</u>	<u>ACGIH</u>
Benzene	Yes	Category 1	Yes	Yes
Gasoline	No	Category 2B	No	No

VIII. EMERGENCY AND FIRST AID INFORMATION

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

Skin: In case of contact, immediately wash skin with soap and plenty of water. If irritation develops, consult a physician.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

Ingestion: If swallowed, do not induce vomiting. Give large quantities of water. Never give anything by mouth to an unconscious person. Call a physician.

Notes to Physician: Gastric lavage by qualified medical personnel may be considered, depending on quantity of material ingested.

IX. SPILL, LEAK AND DISPOSAL INFORMATION

In Case of Spill or Leak: This material is flammable. Contain spill immediately in smallest possible area. Recover as much of the product as possible by such methods as vacuuming, followed by recovering residual fluids by using absorbent materials. Nonrecoverable product, contaminated soil, debris and other materials should be placed in proper containers for ultimate disposal. Avoid washing, draining or directing material to storm or sanitary sewers.

NOTE: Review FIRE AND EXPLOSION HAZARDS before proceeding with clean up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean up.

Waste Disposal Method: Recycle as much of the recoverable product as possible. Treatment, storage, transportation and disposal must be in accordance with applicable Federal, State/Provincial, and Local regulations.

X. PRECAUTIONARY MEASURES

Respiratory Protection: Select appropriate NIOSH-approved respiratory protection where necessary to maintain exposures below the acceptable limits in Section VII. Proper respirator selection should be determined by adequately trained personnel and based on the contaminant(s), the degree of potential exposure and published respiratory protection factors.

Ventilation: Use sufficient ventilation to maintain atmospheric concentrations below permissible exposure limits. Avoid sparking and explosive mixtures.

Protective Gloves: Should be worn when the potential exists for prolonged or repeated skin exposure. NBR or neoprene recommended.

Eye Protection: Goggles or face shield for spray/mists or if splashing is probable.

Other Protective Equipment: Sufficient protective clothing to minimize skin exposure. Launder contaminated clothing before reuse.

Safety Precautions: Avoid contact with eyes, skin, or clothing.

XI. REGULATORY INFORMATION**FEDERAL REGULATIONS****CERCLA, 40 CFR 302**

Not Applicable

**SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986, TITLE III
SECTIONS 302, 304, 311, 312, 313****SECTION 302/304 - Extremely Hazardous Substances (40 CFR 355)**

The material does not contain extremely hazardous substances at greater than 1.0% concentration; however, it is possible that this material may contain extremely hazardous substances at a lower concentration so that a large enough spill could warrant an Emergency Release Report under Section 304.

SECTION 311/312 - MSDS and Chemical Inventory Reporting Requirements (40 CFR 370)

The material should be reported under the following EPA hazard categories:

☒ Immediate (Acute) Health Hazard	☐ Sudden Release of Pressure
☒ Delayed (Chronic) Health Hazard	☐ Reactive
☒ Fire	☐ Not Applicable

NOTE: See Section II for the concentration of any ingredients classified as hazardous by OSHA.

SECTION 313 - List of Toxic Chemicals (40 CFR 372)

The material contains the following chemical(s) at a level of 1.0% or greater (0.1% for carcinogens) on the list of Toxic Chemicals and is subject to toxic chemical release reporting requirements.

<u>Toxic Chemical</u>	<u>CAS Registry Number</u>	<u>Approx. Concentration (Upper Bound)</u>
Benzene	71-43-2	4.9%
Ethyl Benzene	100-41-4	2%
Cumene	98-82-8	1%
Pseudocumene	95-63-6	2%
MTBE	1634-04-4	15%
Toluene	108-88-3	15%
Xylenes	1330-20-7	12%

TOXIC SUBSTANCES CONTROL ACT (TSCA), 40 CFR 710

This material is a mixture as defined by TSCA. The chemical ingredients in this material are in Section 8(b) Chemical Substance Inventory and/or are otherwise in compliance with TSCA. In the case of ingredients obtained from other manufacturers, Conoco relies on the assurance of responsible third parties in providing this statement.

RESOURCE CONSERVATION AND RECOVERY ACT (RCRA), 40 CFR 261, SUBPART C AND D

The material, when discarded or disposed of, is not specifically listed as a hazardous waste in Federal regulations; however, it could be considered hazardous if it meets criteria for being toxic, corrosive, ignitable or reactive according to U.S. EPA definitions (40 CFR 261). Additionally, it could be designated as hazardous according to state regulations. This material could also become a hazardous waste if it is mixed with or comes in contact with a listed hazardous waste. If such contact or mixing occurs, check 40 CFR 261 to determine whether it is a hazardous waste. If it is a hazardous waste, Regulations 40 CFR 262, 263, 264 and 268 may apply.

CP022

FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT, 40 CFR 116.4A, SECTION 311

The material contains the following ingredient(s) which is considered hazardous if spilled in navigable waters.

<u>Ingredient</u>	<u>Reportable Quantity</u>
Petroleum Hydrocarbon	Film or sheen upon or discoloration of the water surface or adjoining shoreline

HAZARDOUS MATERIALS TRANSPORTATION REGULATIONS, 49 CFR 171-178
Not Applicable

FOREIGN REGULATION

CANADIAN HAZARDOUS PRODUCTS ACT (WHMIS)

The material is a WHMIS Controlled Product and a Canadian MSDS is available.

STATE REGULATIONS

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT OF 1986 (PROPOSITION 65)

The material contains ingredient(s) known to the State of California to cause cancer, birth defects or other reproductive harm. Read and follow label directions and use care when handling or using all petroleum products.

<u>Ingredient</u>
Benzene
Unleaded Gasoline (Wholly Vaporized)

PENNSYLVANIA WORKER AND COMMUNITY RIGHT TO KNOW ACT

The material contains the following hazardous substances:

Categories: H = Hazardous Substance ($\geq 1.0\%$)
S = Special Hazardous Substance ($\geq 0.01\%$)
E = Environmental Hazard ($\geq 1.0\%$)

<u>Ingredient</u>	<u>CAS Registry Number</u>	<u>Category</u>
Gasoline	Mixture	H
Benzene	71-43-2	E,S
Ethyl Benzene	100-41-4	E
Cumene	98-82-8	H,E
Pseudocumene	95-63-6	E
MTBE	1634-04-4	E

Nonhazardous ingredient(s) information is withheld as trade secret in accordance with Section 11 of Pennsylvania Worker and Community Right to Know Act.

MSDS Code: GASC0140

DATE OF LATEST REVISION/REVIEW:

DEPARTMENT RESPONSIBLE FOR MSDS:

PRODUCT INFORMATION CONTACT:

1/90 - Replaces MSDS dated 3/89
Safety, Occupational Health & Environmental Affairs
Hazard Communication Analyst
Conoco Inc.
(713) 293-5550

The above data are based on tests, experience, and other information which Conoco believes reliable and are supplied for informational purposes only. However, some ingredients may have been purchased or obtained from third-party manufacturers. In these instances, Conoco, in good faith relies on information provided by those third parties. Since conditions of use are outside our control, CONOCO DISCLAIMS ANY LIABILITY FOR DAMAGE OR INJURY WHICH RESULTS FROM THE USE OF THE ABOVE DATA. NOTHING CONTAINED HEREIN SHALL CONSTITUTE A GUARANTEE, WARRANTY (INCLUDING WARRANTY OF MERCHANTABILITY) OR REPRESENTATION (INCLUDING FREEDOM FROM PATENT LIABILITY) BY CONOCO WITH RESPECT TO THE DATA, THE MATERIAL DESCRIBED, OR ITS USE FOR ANY SPECIFIC PURPOSE, EVEN IF THAT PURPOSE IS KNOWN TO CONOCO.



Material Safety Data Sheet

conoco

Emergency Medical Telephone (800) 441-3637

COKER GAS OIL - HEAVY PREMIUM/INTERMEDIATE/LOW SULFUR RESID

I. MATERIAL IDENTIFICATION

Name Coker Gas Oil - Heavy Premium/ Intermediate/Low Sulfur Resid	CAS Registry Number 64741-81-7	Transportation Emergency Phone 1-(800) 424-9300 (Chemtrec)
Chemical Family Thermally Cracked Petroleum Hydrocarbon	Product Code 0542/0543/0544	

II. OSHA HAZARD DETERMINATION

The material is hazardous as defined by OSHA's Hazard Communication Standard, 29 CFR 1910.1200. Refer to Section XI of this MSDS for other federal and state regulatory information.

Hazardous Ingredients Polynuclear Aromatic Hydrocarbons, i.e., benzo(a)pyrene	CAS Registry Number Mixture	Concentration 5 - 50%
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Hazardous Physical Properties
None

III. PHYSICAL DATA

Appearance and Odor Brownish-green liquid; Cracked hydrocarbon odor	Specific Gravity 1.1
Boiling Point 500° - 1000°F	% Volatiles (by volume) 0
Vapor Pressure Nil	Solubility in Water Insoluble
Vapor Density > 1	

IV. REACTIVITY DATA

Stable: X Unstable: _____

Hazardous Decomposition Materials: Normal combustion forms carbon dioxide; incomplete combustion may form carbon monoxide.

Conditions to Avoid: Strong oxidizing materials, heat, flame.

Hazardous Polymerization: Will not occur.

CP 017

V. FIRE AND EXPLOSION HAZARD DATA

Flash Point (Method used): > 200°F (TCC)

Handle and store in accordance with NFPA procedure for Class IIIB Combustible Liquid.

Extinguishing Media: Use water spray, dry chemical, CO₂, foam.

Special Fire Fighting Procedures: Water or foam may cause frothing. Use water to keep fire-exposed containers cool. Water spray may be used to flush spills away from exposures.

Unusual Fire and Explosion Hazards: Products of combustion may contain carbon monoxide, carbon dioxide and other toxic materials. Do not enter enclosed or confined space without proper protective equipment including respiratory protection.

National Fire Protection Association (NFPA) Classification

Health 0 Fire 1 Reactivity 0

HAZARD RATING

Least-0 Slight-1 Moderate-2
High-3 Extreme-4

VI. TRANSPORTATION AND STORAGE

Storage Conditions: Store in accordance with National Fire Protection Association regulations.

Shipping Information:

DOT: Not Regulated

IATA/IMO: Not Restricted

VII. HEALTH HAZARD INFORMATION

Exposure Limits for Material

PEL: None Established*

TLV: None Established*

Du Pont AEL: None Established

Ceiling Value: None Established

*Refer to Coal Tar Pitch Volatiles; 0.2 mg/m³

Primary Routes of Exposure/Entry: Skin, Inhalation.

Signs and Symptoms of Exposure/Medical Conditions Aggravated by Exposure:

Mouse skin painting studies have shown that nonsolvent-refined petroleum distillates having a distillation end-point above 700°F, and which are similar to ingredients in this product, caused skin tumors. This animal data should be interpreted cautiously since these studies involved repeated exposure of shaved skin which was never washed free of test material; the resulting skin effects (irritation, cell damage, etc.) may play a role in the tumorigenic response. Also, limited studies of carcinogenic oils have shown that washing the animals' skin with soap and water between applications greatly reduces tumor formation. These studies demonstrate the effectiveness of cleansing the skin after contact. The product may contain polynuclear aromatic hydrocarbons (PNAs) which have caused cancer involving skin and internal organs in laboratory animals. The product may produce a phototoxic reaction when contaminated skin is exposed to sunlight. The effect is similar in appearance to an exaggerated sunburn and is temporary in duration.

The product contains petroleum hydrocarbons, and as with many petroleum products, it may cause irritation to the eyes, lungs or skin after prolonged or repeated exposure. Extreme exposure or aspiration into the lungs may cause pneumonia. Overexposure may cause weakness, headache, nausea, confusion, blurred vision, drowsiness and other nervous system effects; greater exposure may cause dizziness, slurred speech, flushed face, unconsciousness or convulsions.

Listed as Carcinogen or Potential Carcinogen by:

Polynuclear Aromatic Hydrocarbons, i.e.,
benzo(a)pyrene

NTP
Yes

IARC
Category 2B

OSHA
No

VIII. EMERGENCY AND FIRST AID INFORMATION

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

Skin: In case of contact, immediately wash skin with soap and plenty of water. If irritation develops, consult a physician.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

Ingestion: If swallowed, do not induce vomiting. Give large quantities of water. Never give anything by mouth to an unconscious person. Call a physician.

Notes to Physician: Gastric lavage by qualified medical personnel may be considered, depending on quantity of material ingested.

IX. SPILL, LEAK AND DISPOSAL INFORMATION

In Case of Spill or Leak: All sparks, flames and ignition sources must be restricted from the area. Contain spill immediately in smallest possible area. Recover as much of the product as possible by such methods as vacuuming, followed by recovering residual fluids by using absorbent materials. Nonrecoverable product, contaminated soil, debris and other materials should be placed in proper containers for ultimate disposal. Avoid washing, draining or directing material to storm or sanitary sewers.

NOTE: Review FIRE AND EXPLOSION HAZARDS before proceeding with clean up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean up.

Waste Disposal Method: Recycle as much of the recoverable product as possible. Treatment, storage, transportation and disposal must be in accordance with applicable Federal, State/Provincial, and Local regulations.

X. PRECAUTIONARY MEASURES

Respiratory Protection: Select appropriate NIOSH-approved respiratory protection where necessary to maintain exposures below the acceptable limits in Section VII. Proper respirator selection should be determined by adequately trained personnel and based on the contaminant(s), the degree of potential exposure and published respiratory protection factors.

Ventilation: Normal ventilation.

Protective Gloves: Should be worn when any potential exists for skin contact. Use insulated gloves where material is being handled hot. NBR or neoprene recommended.

Eye Protection: Chemical goggles required when exposed to sprays and mists or if splashing is probable. Face shield is recommended where splashing can occur.

Other Precautions: Skin contact should be minimized. Complete protective clothing if material is being handled hot. Launder or discard contaminated clothing. Discard extremely contaminated leather material.

XI. REGULATORY INFORMATION

FEDERAL REGULATIONS

CERCLA, 40 CFR 302

Not Applicable

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986, TITLE III SECTIONS 302, 304, 311, 312, 313

SECTION 302/304 - Extremely Hazardous Substances (40 CFR 355)

The material does not contain extremely hazardous substances at greater than 1.0% concentration; however, it is possible that this material may contain extremely hazardous substances at a lower concentration so that a large enough spill could warrant an Emergency Release Report under Section 304.

SECTION 311/312 - MSDS and Chemical Inventory Reporting Requirements (40 CFR 370)

The material should be reported under the following EPA hazard categories:

☐ Immediate (Acute) Health Hazard	☐ Sudden Release of Pressure
☒ Delayed (Chronic) Health Hazard	☐ Reactive
☐ Fire	☐ Not Applicable

NOTE: See Section II for the concentration of any ingredients classified as hazardous by OSHA.

SECTION 313 - List of Toxic Chemicals (40 CFR 372)

The material is not known to contain chemical(s) at a level of 1.0% or greater (0.1% for carcinogens) on the list of Toxic Chemicals and subject to toxic chemical release reporting requirements.

TOXIC SUBSTANCES CONTROL ACT (TSCA), 40 CFR 710

This material is in the TSCA Inventory of Chemical Substances and/or is otherwise in compliance with TSCA.

RESOURCE CONSERVATION AND RECOVERY ACT (RCRA), 40 CFR 261, SUBPART C AND D

The material, when discarded or disposed of, is not specifically listed as a hazardous waste in Federal regulations; however, it could be considered hazardous if it meets criteria for being toxic, corrosive, ignitable or reactive according to the U.S. EPA definitions (40 CFR 261). Additionally, it could be designated as hazardous according to state regulations. This material could also become a hazardous waste if it is mixed with or comes in contact with a listed hazardous waste. If such contact or mixing occurs, check 40 CFR 261 to determine whether it is a hazardous waste. If it is a hazardous waste, regulations 40 CFR 262, 263, 264 and 268 may apply.

FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT, 40 CFR 116.4A, SECTION 311

The material contains the following ingredient(s) which is considered hazardous if spilled in navigable waters.

Ingredient

Petroleum Hydrocarbon

Reportable Quantity

Film or sheen upon or discoloration of the water surface or adjoining shoreline

CP 017

HAZARDOUS MATERIALS TRANSPORTATION REGULATIONS, 49 CFR 171-178
Not Applicable

STATE REGULATIONS

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT OF 1986
("PROPOSITION 65")

The material contains ingredient(s) known to the State of California to cause cancer, birth defects or other reproductive harm. Read and follow label directions and use care when handling or using all petroleum products.

Ingredient

Polynuclear Aromatic Hydrocarbons, i.e., Benzo(a)pyrene

PENNSYLVANIA WORKER AND COMMUNITY RIGHT TO KNOW ACT

To the best of our knowledge the material is not sold or produced in Pennsylvania. Please notify us at the telephone number noted below if the material results in Pennsylvania commerce.

MSDS Code: GASC0156

SECTIONS OF MSDS REVISED:

DATE OF LATEST REVISION/REVIEW:

DEPARTMENT RESPONSIBLE FOR MSDS:

PRODUCT INFORMATION CONTACT:

II, VII

1/90 - Replaces MSDS dated 3/89

Environmental and Occupational Health Services

MSDS Analyst

Conoco Inc.

(713) 293-5550

The above data are based on tests, experience, and other information which Conoco believes reliable and are supplied for informational purposes only. However, some ingredients may have been purchased or obtained from third-party manufacturers. In these instances, Conoco, in good faith relies on information provided by those third parties. Since conditions of use are outside our control, CONOCO DISCLAIMS ANY LIABILITY FOR DAMAGE OR INJURY WHICH RESULTS FROM THE USE OF THE ABOVE DATA. NOTHING CONTAINED HEREIN SHALL CONSTITUTE A GUARANTEE, WARRANTY (INCLUDING WARRANTY OF MERCHANTABILITY) OR REPRESENTATION (INCLUDING FREEDOM FROM PATENT LIABILITY) BY CONOCO WITH RESPECT TO THE DATA, THE MATERIAL DESCRIBED, OR ITS USE FOR ANY SPECIFIC PURPOSE, EVEN IF THAT PURPOSE IS KNOWN TO CONOCO.

Material Safety Data Sheet

conoco

Emergency Medical Telephone (800) 441-3637

CP 013

NO. 6 FUEL OIL/HEAVY RAILROAD FUEL/ BUNKER "C" FUEL/FUEL OIL BLEND STOCK

I. MATERIAL IDENTIFICATION

Name
No. 6 Fuel Oil/Heavy Railroad Fuel/
Bunker "C" Fuel/Fuel Oil Blend Stock

CAS Registry Number
Mixture; See Section XI

Synonyms
Residual Fuel/Resid Low Sulfur Fuel Oil

Product Code
0525/0563/0572/0576/0577/0581/0583/0593

Chemical Family
Petroleum Hydrocarbon

Transportation Emergency Phone
1-(800) 424-9300 (Chemtrec)

II. OSHA HAZARD DETERMINATION

The material is hazardous as defined by OSHA's Hazard Communication Standard, 29 CFR 1910.1200. Refer to Section XI of this MSDS for federal and state regulatory information.

Hazardous Ingredients	CAS Registry Number	Concentration
Clarified Oil	64741-62-4	5 - 50%
Hydrogen Sulfide	7783-06-4	< 1%*

*Hydrogen sulfide is not normally present in the material, but if the material is heated to high temperatures, hydrogen sulfide may exist in headspace of storage vessel.

Hazardous Physical Properties
Class II Combustible Liquid - NFPA 30-1987.

III. PHYSICAL DATA

Appearance and Odor
Brown to black liquid;
Petroleum odor

Specific Gravity ($H_2O = 1$)
0.9 - 1.1

Boiling Point/Range
>350°F

% Volatiles (by volume)
Nil

Vapor Pressure
Nil

Solubility in Water
Insoluble

Vapor Density (Air = 1.0)
>1

IV. REACTIVITY DATA

Stable: X Unstable: _____

Hazardous Decomposition Materials: Incomplete combustion may produce carbon monoxide.

Conditions to Avoid: Ignition sources, high temperatures.

Hazardous Polymerization: Will not occur.

GASCO240/November 1989

1 SAL 000006788

V. FIRE AND EXPLOSION HAZARD DATA**Flash Point (Method used):** 130°F (TCC)**Handle and store in accordance with NFPA procedure for Class II Combustible Liquid.****Extinguishing Media:** Use water spray, dry chemical, CO₂ foam.**Special Fire Fighting Procedures:** Use water to keep fire-exposed containers cool. If leak or spill has not ignited, use water spray to disperse the vapors and to provide protection for personnel attempting to stop a leak. Water spray may be used to flush spills away from exposures.**Unusual Fire and Explosion Hazards:** Products of combustion may contain carbon monoxide, carbon dioxide and other toxic materials. Do not enter enclosed or confined space without proper protective equipment including respiratory protection.**National Fire Protection Association (NFPA) Classification**Health 0 Fire 2 Reactivity 0**HAZARD RATING**Least-0 Slight-1 Moderate-2
High-3 Extreme-4**VI. TRANSPORTATION AND STORAGE****Storage Conditions:**

Store in accordance with National Fire Protection Association regulations.

Shipping Information:**DOT:**Proper Shipping Name: Fuel Oil or Fuel Oil No. 6
Hazard Class: Combustible Liquid
UN/NA No.: NA 1993
DOT Label(s): None
DOT Placard: Combustible**IATA/IMO:**Proper Shipping Name: Gas Oil
Hazard Class: 3
UN No.: UN 1202
IMO/ICAO Label: Flammable Liquid
Packaging Group: III**VII. HEALTH HAZARD INFORMATION****Exposure Limits for No. 6 Fuel Oil/Heavy Railroad Fuel/Bunker "C" Fuel****PEL:** None Established***Du Pont AEL:** None Established**TLV:** None Established***Ceiling Value:** None Established*Refer to Coal Tar Pitch Volatiles; 0.2 mg/m³**Exposure Limits for Hydrogen Sulfide****PEL:** 10 ppm, 14 mg/m³**TLV:** 10 ppm, 14 mg/m³STEL 15 ppm, 21 mg/m³STEL 15 ppm, 21 mg/m³**Du Pont AEL:** 10 ppm - 8 & 12 Hr. TWA**Primary Routes of Exposure/Entry:** Skin, Inhalation.**Signs and Symptoms of Exposure/Medical Conditions Aggravated by Exposure:**

Mouse skin painting studies have shown that petroleum distillates having a distillation end-point above 700°F, and which are similar to ingredients in this product, caused skin tumors. This animal data should be interpreted cautiously since these studies involved repeated exposure of shaved skin which was never washed free of test material; the resulting skin effects (irritation, cell damage, etc.) may play a role in the tumorigenic response. Also, limited studies of carcinogenic oils have shown that washing the animals' skin

with soap and water between applications greatly reduces tumor formation. These studies demonstrate the effectiveness of cleansing the skin after contact. The product may contain polynuclear aromatic hydrocarbons (PNAs) which have caused cancer involving skin and internal organs in laboratory animals. The product may product a phototoxic reaction when contaminated skin is exposed to sunlight. The effect is similar in appearance to an exaggerated sunburn and is temporary in duration.

Rat skin painting 90-day studies have shown a clarified slurry oil to cause liver damage and death at doses as low as 8 mg/kg/day. Carbazole derivatives are thought to be the chemical component causing the liver damage.

Hydrogen sulfide is not normally present in the product but can be generated and accumulate in the container headspace if the asphalt is heated at high temperatures for an extended period of time. Hydrogen sulfide can be irritating at low concentrations to the eyes, skin, and respiratory tract. At higher concentrations, loss of ability to smell hydrogen sulfide, respiratory paralysis, and death may occur.

The product contains petroleum hydrocarbons, and as with many petroleum products, it may cause irritation to the eyes, lungs or skin after prolonged or repeated exposure. Extreme exposure or aspiration into the lungs may cause pneumonia. Overexposure may cause weakness, headache, nausea, confusion, blurred vision, drowsiness and other nervous system effects; greater exposure may cause dizziness, slurred speech, flushed face, unconsciousness or convulsions.

Listed as Carcinogen or Potential Carcinogen by:

	<u>NTP</u>	<u>IARC</u>	<u>OSHA</u>
Heavy Fuel Oil	No	Category 2B	No

VIII. EMERGENCY AND FIRST AID INFORMATION

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

Skin: In case of contact, immediately wash skin with soap and plenty of water. If irritation develops, consult a physician.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

Ingestion: If swallowed, do not induce vomiting. Give large quantities of water. Never give anything by mouth to an unconscious person. Call a physician.

Notes to Physician: Gastric lavage by qualified medical personnel may be considered, depending on quantity of material ingested.

IX. SPILL, LEAK AND DISPOSAL INFORMATION

In Case of Spill or Leak: This material is combustible. Contain spill immediately in smallest possible area. Recover as much product as possible by such methods as vacuuming, followed by recovering residual fluids by using absorbent materials. Nonrecoverable product, contaminated soil, debris and other materials should be placed in proper containers for ultimate disposal. Avoid washing, draining or directing material to storm or sanitary sewers.

NOTE: Review FIRE AND EXPLOSION HAZARDS before proceeding with clean up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean up.

Waste Disposal Method: Recycle as much of the recoverable product as possible. Treatment, storage, transportation and disposal must be in accordance with applicable Federal, State/Provincial, and Local regulations.

X. PRECAUTIONARY MEASURES

Respiratory Protection: Select appropriate NIOSH-approved respiratory protective equipment when exposed to sprays or mists. Proper respirator selection should be determined by adequately trained personnel and based on the contaminant(s), the degree of potential exposure, and published respiratory protection factors.

In situations where the material is exposed to high temperatures for extended periods of time, hydrogen sulfide may build up in unventilated storage vessel headspace. NIOSH-approved full face air-supplied respirator or self-contained breathing equipment should be used when first opening these storage vessels.

Ventilation: Normal ventilation.

Protective Gloves: Should be worn when any potential exists for skin contact. Use insulated gloves where material is being handled hot. NBR or neoprene recommended.

Eye Protection: Chemical goggles required when exposed to sprays or mists or if splashing is probable. Face shield is recommended where splashing can occur.

Other Precautions: Skin contact should be minimized. Complete protective clothing if material is being handled hot. Launder or discard contaminated clothing. Discard extremely contaminated leather material.

XI. REGULATORY INFORMATION

FEDERAL REGULATIONS

CERCLA, 40 CFR 302

Not Applicable

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986, TITLE III

SECTIONS 302, 304, 311, 312, 313

SECTION 302/304 - Extremely Hazardous Substances (40 CFR 355)

The material does not contain extremely hazardous substances at greater than 1.0% concentration; however, it is possible that this material may contain extremely hazardous substances at a lower concentration so that a large enough spill could warrant an Emergency Release Report under Section 304.

SECTION 311/312 - MSDS and Chemical Inventory Reporting Requirements (40 CFR 370)

The material should be reported under the following EPA hazard categories:

☒ Immediate (Acute) Health Hazard

☐ Sudden Release of Pressure

☒ Delayed (Chronic) Health Hazard

☐ Reactive

☒ Fire

☐ Not Applicable

NOTE: See Section II for the concentration of any ingredients classified as hazardous by OSHA.

SECTION 313 - List of Toxic Chemicals (40 CFR 372)

The material does not contain chemical(s) at a level of 1.0% or greater (0.1% for carcinogens) on the list of Toxic Chemicals and subject to toxic chemical release reporting requirements.

TOXIC SUBSTANCES CONTROL ACT (TSCA), 40 CFR 710

This material is a mixture as defined by TSCA. The chemical ingredients in this material are in Section 8(b) Chemical Substance Inventory and/or are otherwise in compliance with TSCA. In the case of ingredients obtained from other manufacturers, Conoco relies on the assurance of responsible third parties in providing this statement.

ALL INFORMATION CONTAINED HEREIN IS UNCLASSIFIED EXCEPT WHERE SHOWN OTHERWISE



HALDOR TOPSOE, INC.

01-55
7-5-89

TK-10
OS 0 1 0

REVISED: May 1989

MATERIAL SAFETY DATA SHEET

EMERGENCY HAZARD RATING

4 - EXTREME
3 - HIGH
2 - MODERATE
1 - SLIGHT
0 - INSIGNIFICANT



CA 020

Page 1 of 2

1. GENERAL INFORMATION

Trade name and synonym: TK-10 (R7H) Inert Topping Material

Chemical family: Spinel

Major chemical constituents (CAS No.): $\text{Hg}(\text{AlO}_2)_2$ (1302-67-6)

All components of the catalyst appear on the TSCA inventory.

Manufacturer's or importer's name & address:

HALDOR TOPSOE, INC.
17629 El Camino Real
Houston, TX 77058

Telephone No.: (713) 480-2600

Emergency Telephone No.: (713) 474-3261

2. HAZARDOUS INGREDIENTS

	concentration wt %	TLV/TWA* ₃ mg/m
$\text{Hg}(\text{AlO}_2)_2$	100	10 (nuisance dust)

*As adopted by ACGIH

Aluminum oxide, molybdenum trioxide, and all compounds containing chromium, cobalt, nickel, copper or zinc are subject to Chemical Release Reporting requirements of SARA Section 313, as codified in 40 CFR Part 372.

3. PHYSICAL DATA

Appearance & odor: White 7 holed tablet shape, odorless

Bulk density: 51 lbs/cuft

Melting point: >2000 °F

Vapor pressure:

Not relevant

Solubility in water: Negligible

4. FIRE & EXPLOSION HAZARD DATA

Flash Point: Not relevant

Special Fire Fighting Procedures:
Not relevant, Noncombustible

Flammable Limits: Not relevant

Extinguishing Media: Not relevant

Unusual Fire & Explosion Hazard: None

SAL 000006793

CA 020

HAZARD TOPSOE INC.

TK-10

Page 2 of 2

6. HEALTH HAZARD DATA

Effects of overexposure: Spinel is not considered a health hazard. Exposure to large concentrations of dust may irritate the eyes and the respiratory tract.

Emergency & First Aid Procedures: Remove from exposed area.

Listed as a carcinogen: Yes _____ No X
by OSHA _____ IARC _____ NTP _____

6. REACTIVITY DATA

Stability: Stable X Unstable _____
Incompatibility (Materials to avoid): N/A
Hazardous decomposition products: N/A
Hazardous polymerization: may occur _____ will not occur X

7. SPILL AND WASTE DISPOSAL PROCEDURES

Steps to be taken if material is spilled: Collect all spilled material by mechanical means and place in a container. Avoid dust generation. Label container.

Waste Disposal Method: In accordance with Federal, state, & local regulations.

8. PERSONAL PROTECTION INFORMATION

Respiratory protection: Dust mask recommended.

Eye protection: Normally not required. Ventilation of work place: Outside: Natural
Inside reactor: Mechanical

Hand protection: Gloves Other protection: Safety shoes recommended when handling drums.

9. SPECIAL PRECAUTIONS

During storage: Keep containers dry and tightly closed.

When handling containers: Adhere to standard safety procedures. Use mechanical assistance to avoid strain.

During loading: Adhere to standard safety procedures. Minimize free fall of material to avoid breakage.

During unloading: Adhere to standard safety procedures. Spent catalyst may be pyrophoric in the presence of air.

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MATERIAL SAFETY DATA SHEET

CONQUEST

PAGE : 01

1078100-0348P -E0018293-4216

DATE OF ISSUE
09/01/89SUPERSEDES
09/18/87

SECTION I - GENERAL INFORMATION

CHEMICAL NAME & SYNONYMS

TRADE NAME & SYNONYMS

N/A

CONQUEST

CHEMICAL FAMILY

FORMULA

TANNIC-LATEX MIXTURE

X<--MIXTURE

MANUFACTURERS NAME

NATIONAL CHEMSEARCH DIV. OF NCH CORP.

ADDRESS (NUMBER, STREET, CITY, STATE & ZIP CODE)

BOX 152170

IRVING, TEXAS 75015

PREPARED BY:

RICHARD STOLLEY/T.S. CHEM.

PRODUCT CODE NUMBER

4216

EMERGENCY TELEPHONE NUMBER

214-438-1381

SECTION II - HAZARDOUS INGREDIENTS

THE HAZARDS PRESENTED BELOW ARE THOSE OF THE INDIVIDUAL
COMPONENTS AS THE PRODUCT MIXTURE HAS NOT BEEN TESTED
AS A WHOLE

CHEMICAL NAME (INGREDIENTS)	HAZARD	TLV*	PEL*	CAS#
TANNIC ACID	IRRITANT	NOT EST.	NOT EST.	1401-55-4
OXALIC ACID	TOX/IRR	1MG/M3	1MG/M3	144-62-7

SECTION IIIA - NON-HAZARDOUS INGREDIENTS

NON-HAZARDOUS INGREDIENT NAMES AND CAS NUMBERS ARE PROTECTED UNDER NJ TRADE
SECRET REGISTRY # 409363-5027P

CONQUEST

SECTION III - PHYSICAL DATA

PAGE : 02

BOILING PT. (FAHRENHEIT)	215	SPEC GRAVITY (H2O=1)	1.180
VAPOR PRESSURE (MM HG)	18	COLOR	TAN
VAPOR DENSITY (AIR=1)	0.6	ODOR	LATEX
PH @ 100%	1-2	CLARITY	OPAQUE
PERCENT VOLATILE BY VOLUME (%)	42	EVAPORATION RATE (BU AC = 1)	0.10
SOLUBILITY IN WATER	COMPLETE		
VISCOSITY	SLIGHT-VISCOUS		

SECTION IV - FIRE AND EXPLOSION HAZARD

FLASH POINT (METHOD USED)	FLAMMABLE LIMITS	LEL	UEL
NON-FLAM		N/A	N/A
EXTINGUISHING MEDIA "ALCOHOL"	DRY	WATER	
X<--FOAM	X<--FOAM	X<--CHEMICAL	X<--SPRAY
	X<--CO2		X<--OTHER

SPECIAL FIRE FIGHTING PROCEDURES
ALTHOUGH PRODUCT IS NON-FLAMMABLE, TREAT AS ANY CHEMICAL FIRE. WEAR A SELF-
CONTAINED BREATHING AND FULL PROTECTIVE GEAR TO AVOID EXPOSURE TO POSSIBLE
HAZARDOUS COMBUSTION PRODUCTS.

UNUSUAL FIRE & EXPLOSION HAZARDS

SPRAY EXPOSED CONTAINERS WITH WATER SPRAY TO AVOID STEAM PRODUCTION.

NFPA HAZARD RATING (0=INSIGNIFICANT, 1=SLIGHT, 2=MODERATE, 3=HIGH, 4=EXTREME):
1<--HEALTH 0<--FLAMMABILITY 0<--REACTIVITY <--SPECIAL

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE :

NOT ESTABLISHED FOR MIXTURE. SEE SECTION II.

EFFECTS OF OVEREXPOSURE

- ACUTE - (SHORT TERM EXPOSURE)

INHALATION - MIST SITUATION MAY CAUSE IRRITATION TO RESPIRATORY TRACT.

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PC034

CONQUEST

(CONTINUED)

SECTION V - HEALTH HAZARD DATA

PAGE : 03

MAY CAUSE COUGHING AND SNEEZING.
 SKIN CONTACT - MAY CAUSE MILD IRRITATION. CONTACT WITH OPEN WOUNDS CAN PROMOTE ABSORPTION AND SYSTEMIC EFFECTS. IN AUTOPSIED BURNED VICTIMS, OBSERVED LIVER DAMAGE WAS ATTRIBUTED TO ABSORPTION OF TANNIC ACID THROUGH BURNED SKIN.
 EYE CONTACT - MAY CAUSE REDDENING AND TEARING WITH POSSIBLE PAIN AND BLURRED VISION.
 INGESTION - TOXIC. MAY CAUSE GASTROINTESTINAL DISORDERS INCLUDING NAUSEA AND VOMITING. MASSIVE INGESTION CAN CAUSE SHOCK AND COLLAPSE.
 CHRONIC - (LONG TERM EXPOSURE)
 MARKED IRRITATION TO SKIN AND EYES. PATHOLOGICAL FINDINGS IN EXPERIMENTAL ANIMALS SHOW EVIDENCE OF GASTRITIS AND LIVER DAMAGE.
 PERSONS WITH PRE-EXISTING SKIN OR EYE DISORDERS, OR IMPAIRED KIDNEY, LIVER, AND RESPIRATORY FUNCTION MAY BE MORE SUSCEPTIBLE TO THE EFFECTS OF THE SUBSTANCE.
 SEE SECTION VI FOR MORE INFORMATION.

PRIMARY ROUTE OF ENTRY: <-- INHALATION <-- INGESTION X<-- ABSORPTION

EMERGENCY & FIRST AID PROCEDURES

INHALATION:
 GET TO FRESH AIR AND TREAT SYMPTOMATICALLY. IF BREATHING IS LABORED, GIVE OXYGEN OR ARTIFICIAL RESPIRATION. SEE A PHYSICIAN IN SYMPTOMS OCCUR.

EYE CONTACT:
 FLUSH WITH LARGE AMOUNTS OF WATER FOR 10 MINUTES LIFTING UPPER AND LOWER LIDS OCCASIONALLY. GET MEDICAL ATTENTION IMMEDIATELY. TREATMENT IS MOST EFFECTIVE WITHIN ONE MINUTE.

SKIN CONTACT:
 THOROUGHLY WASH EXPOSED AREA WITH SOAP AND WATER. REMOVE CONTAMINATED CLOTHING. LAUNDRY CONTAMINATED CLOTHING BEFORE REUSE. APPLY EMOLLIENT RICH CREAM.

INGESTION:
 GIVE TWO GLASSES OF WATER TO DILUTE CONTENTS OF STOMACH. DO NOT INDUCE VOMITING. SEE A PHYSICIAN AT ONCE.

NOTES TO PHYSICIAN:
 ADDITION OF BASIC NEUTRALIZER IS NOT RECOMMENDED DUE TO ALKALI SALTS OF OXALIC ACID ARE JUST AS TOXIC AS ACIDIC FORM.

SECTION VI - TOXICITY INFORMATION

PRODUCT CONTAINS CHEMICAL LISTED AS CARCINOGEN OR POTENTIAL CARCINOGEN BY:

IARC	<--YES	NTP	<--YES	OSHA	<--YES	ACGIH	<--YES	OTHER	<--YES
X<--NO		X<--NO		X<--NO		X<--NO		X<--NO	X<--NO

TANNIC ACID									
ORL-RAT LDLC: 200MG/KG 1								ORL-RAT LD50: 2300MG/KG 2	
ORL-RBT LD50: 5000MG/KG 1								ORL-RBT LD50: 5000MG/KG 2	

CONQUEST

(CONTINUED)

SECTION VI - TOXICITY INFORMATION

PAGE : 04

SCU-RAT TDLO: 4450MG/KG/17 W-1 1.
 TUMEROGENIC DATA CITED 2.
 OXALIC ACID
 ORL-HMN LDLC: 71MG/KG 1.
 ORL-RAT LD50: 375MG/KG 1.
 SKN-RBT 500MG/24H MDE 1.
 TANNIC ACID PRODUCED LIVER TUMORS IN RATS FOLLOWING SUBCUTANEOUS INJECTIONS OF HYDROLYZABLE TANNINS PRODUCED LIVER TUMORS. NO ADEQUATE PUBLISHED STUDIES INVOLVING ORAL STUDIES OR CASE REPORTS ON EPIDEMIOLOGICAL STUDIES WERE AVAILABLE. IARC 10, 253, 76. IARC DID NOT INCLUDE TANNIC ACID IN THE LISTING OF SUBSTANCES (MONOGRAPHS 1-29) FOR WHICH IT IS CURRENTLY CONSIDERED THAT THERE WAS SUFFICIENT EVIDENCE OF CARCINOGENICITY IN EXPERIMENTAL ANIMALS. (SUPPLEMENT 4, 1982, APPENDIX 2) SEE SECTION XII.

SECTION VII - REACTIVITY DATA

STABILITY	X<--STABLE	<--UNSTABLE	CONDITIONS TO AVOID

KEEP CONTAINER TIGHTLY CLOSED.

INCOMPATIBILITY (MATERIALS TO AVOID)
 STRONG OXIDIZERS (BLEACH), SILVER AND ALKALIS.

HAZARDOUS DECOMPOSITION PRODUCTS

CARBON MONOXIDE, ACRID SMOKE AND FUMES.

HAZARDOUS	WILL NOT	MAY	CONDITIONS TO AVOID
X <-- OCCUR	<--OCCUR		

POLYMERIZATION: N/A

SECTION VIII - SPILL OR LEAK PROCEDURES

STEPS TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
 CONTAIN LEAK AND PICK UP SPILL AND PLACE IN A LABELED CONTAINER.
 CLEAN UP RESIDUE WITH DETERGENT AND WATER.

WASTE DISPOSAL METHOD:
 DISPOSE OF IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS.

NEUTRALIZING AGENT:
 ADD CAUTIOUSLY A SOLUTION OF SLAKED LIME OR SODA ASH WHILE STIRRING UNTIL PH IS AT 7.

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REQUIRED VENTILATION
GENERAL EXHAUST IS MORE THAN ADEQUATE TO PROTECT WORKER FROM EXPOSURE
TO LEVEL ABOVE PERMISSIBLE EXPOSURE LIMITS.

RESPIRATORY PROTECTION
A RESPIRATOR IS NOT REQUIRED IN THE NORMAL USE OF THE PRODUCT. USE A NIOSH
APPROVED MASK FOR SPRAY MISTS.

PROTECTIVE GLOVES
RUBBER GLOVES IF REPEATED OR PROLONGED SKIN
CONTACT OCCURS.

EYE PROTECTION
CHEMICAL GOGGLES IF METHOD OF APPLICATION OF PRE-
SENTS THE LIKELIHOOD OF EYE CONTACT.

OTHER PROTECTION
APRON SHOULD BE WORN DEPENDING ON SEVERITY
OF EXPOSURE

SECTION X - STORAGE AND HANDLING INFORMATION

STORAGE TEMPERATURE	INDOOR	HEATED	REFRIGERATED	OUTDOOR
120 F. <-- MAX 35 F. <-- MIN	X			

PRECAUTIONS TO BE TAKEN IN HANDLING & STORING
KEEP DRUM TIGHTLY CLOSED

OTHER PRECAUTIONS
KEEP OUT OF REACH OF CHILDREN.
READ ENTIRE LABEL BEFORE USING PRODUCT.

SECTION XI - REGULATORY INFORMATION

CHEMICAL NAME	C.A.S. NUMBER	UPPER % LIMIT
N/A		

THOSE INGREDIENTS LISTED ABOVE ARE SUBJECT TO THE REPORTING REQUIREMENTS OF
313 OF TITLE III OF THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF
1986 AND 40 CFR PART 372.
IF UE (USE EXEMPTION) APPEARS UNDER UPPER % LIMIT, END USERS ARE EXEMPT
FROM NOTIFICATION BECAUSE THE PRODUCT IS USED AND LABELED FOR ROUTINE
JANITORIAL WORK OR THE PRODUCT IS USED AND LABELED FOR FACILITY GROUNDS
MAINTENANCE (SUCH AS FERTILIZERS AND HERBICIDES), OR THE PRODUCT IS USED AND
LABELED FOR MAINTAINING MOTOR VEHICLES.

CONQUEST

SECTION XII - TRANSPORTATION - (FOR FUTURE USE)

PAGE : 06

APPLICABLE REGULATIONS	<--TARIFF 6 C	<--IATA	<--MILITARY AIR (AFR 71-4)
<--49 CFR <--IMCC			

SHIPPING NAME

HAZARD CLASS

IC NUMBER | REPORT QTY

LABELS

LIMITED QTY

UNIT CONTAINER

DOT SPS CONTAINER

NET EXPLOSIVE WT.

AEROSOL PROPELLANT(S)

SECTION XIII - REFERENCES

1. DANGEROUS PROPERTIES OF INDUSTRIAL MATERIALS, 6TH EDITION,
N. IRVING SAX
2. THRESHOLD LIMIT VALUES AND BIOLOGICAL EXPOSURE INDICES, 1986-1987
3. VENDOR'S MSDS
CONTINUED FROM SECTION VI
GALLIC ACID, THE MAJOR HYDROLYTIC PRODUCT OF TANNIC ACID, DID NOT INDUCE
TUMORS WHEN GIVEN SUBCUTANEOUSLY SUGGESTING INTACT TANNIC ACID IS NEC-
ESSARY FOR ANY TUMOR-INDUCING EFFECT DATA INDICATING THAT TANNIC ACID
IS NOT ABSORBED AFTER ORAL ADMINISTRATION, BUT IS FIRST HYDROLYZED TO
GALLIC ACID. THIS MAY EXPLAIN THE NEGATIVE CARCINOGENICITY FINDINGS FOL-
LOWING ORAL OR DERMAL EXPOSURE.

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED
ACCURATE IN LIGHT OF CURRENT FORMULATION. HOWEVER, NO WARRANTY
IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THIS DATA
OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

NATIONAL CHEMSEARCH DIV. OF NCH CORP. ASSUMES NO RESPONSIBILITY
FOR PERSONAL INJURY OR PROPERTY DAMAGE CAUSED BY THE USE, STORAGE
OR DISPOSAL OF THE PRODUCT IN A MANNER NOT RECOMMENDED ON THE
PRODUCT LABEL. USERS ASSUME ALL RISKS ASSOCIATED WITH SUCH
UNRECOMMENDED USE, STORAGE, OR DISPOSAL OF THE PRODUCT.

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(078101-0349P -E0016293-5974)

DATE OF ISSUE
11/11/87SUPERSEDES
11/12/86

SECTION I - GENERAL INFORMATION

CHEMICAL NAME & SYNONYMS N/A	TRADE NAME & SYNONYMS M/M QUICK CURE
CHEMICAL FAMILY EPOXY STICK	FORMULA X<--MIXTURE
MANUFACTURERS NAME: NATIONAL CHEMSEARCH DIV. OF NCH CORP.	
ADDRESS (NUMBER, STREET, CITY, STATE & ZIP CODE) BOX 152170 IRVING, TEXAS 75015	
PREPARED BY: MARK COHEN/T.S.CHEMIST	PRODUCT CODE NUMBER 5974
EMERGENCY TELEPHONE NUMBER 214-438-1381	

SECTION II- HAZARDOUS INGREDIENTS

THE HAZARDS PRESENTED BELOW ARE THOSE OF THE INDIVIDUAL COMPONENTS AS THE PRODUCT MIXTURE HAS NOT BEEN TESTED AS A WHOLE.

CHEMICAL NAME (INGREDIENTS)	HAZARD	TLV*	PEL*	CAS#
BASE: DIGLYCIDIAL ETHER OF BIS	IRRITANT	5 MG/M3 2.	N/A	25085-89-8
PHENOL A				
2,4,6 TRI(DIMETHYLAMINO				
METHYL PHENOL) *	IRRITANT	SPPM 3.	NOT EST.	90-72-2

SECTION IIA - NON-HAZARDOUS INGREDIENTS

NON-HAZARDOUS INGREDIENT NAMES AND CAS NUMBERS ARE PROTECTED UNDER NJ TRADE

M/M QUICK CURE

(CONTINUED)

SECTION IIA - NON-HAZARDOUS INGREDIENTS

PAGE : 02

SECRET REGISTRY # 409363-5043P

SECTION III - PHYSICAL DATA

BOILING PT. (FAHRENHEIT)	B:>250 F	SPEC GRAVITY (H2O=1)	>1
VAPOR PRESSURE (MM HG).	N/A	COLOR	A:LT.GRAY B:DRK GRAY
VAPOR DENSITY (AIR=1)	>1	ODOR	MERCAPTAN LIKE
PH @ 100%	N/A	CLARITY	PUTTY
PERCENT VOLATILE BY VOLUME (%)	NIL	EVAPORATION RATE (BU AC = 1)	N/A
SOLUBILITY IN WATER	N/A		
VISCOSITY	N/A		

SECTION IV - FIRE AND EXPLOSION HAZARD

FLASH POINT (METHOD USED) A:>250 FCLOSED CUP	FLAMMABLE LIMITS	LEL N/A	UEL N/A
EXTINGUISHING MEDIA "ALCOHOL" X<--FOAM X<--FOAM X<--CO2 X<--CHEMICAL <--WATER <--OTHER			
SPECIAL FIRE FIGHTING PROCEDURES WEAR NIOSH/MSHA APPROVED RESPIRATOR WHEN FIGHTING FIRES IN CONFINED AREAS TO PROTECT FROM ACID SMOKE, FUMES AND HAZARDOUS DECOMPOSITION PRODUCTS.			

UNUSUAL FIRE & EXPLOSION HAZARDS
NONE KNOWNNFPA HAZARD RATING (0=INSIGNIFICANT;1=SLIGHT;2=MODERATE;3=HIGH;4=EXTREME):
2 <--HEALTH 1 <--FLAMMABILITY 0 <--REACTIVITY <--SPECIAL

SECTION V - HEALTH HAZARD DATA

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M/M QUICK CURE

(CONTINUED)

SECTION V - HEALTH HAZARD DATA

PAGE : 03

THRESHOLD LIMIT VALUE :

NOT ESTABLISHED FOR MIXTURE SEE SECTION II

EFFECTS OF OVEREXPOSURE

- ACUTE - (SHORT TERM EXPOSURE)
PROLONGED OR REPEATED EXPOSURE MAY CAUSE SKIN SENSITIZATION. IN SENSITIVE INDIVIDUALS CONTACT MAY CAUSE SKIN IRRITATION. THIS PRODUCT IS BOTH MECHANICALLY IRRITATING AND CHEMICALLY IRRITATING TO THE EYES. INHALATION IS NOT A HAZARD IN NORMAL USE HOWEVER THIS PRODUCT GIVES OFF TOXIC FUMES WHEN BURNED OR WELDED. INGESTION MAY LEAD TO GASTRIC IRRITATION WITH NAUSEA AND VOMITING.

- CHRONIC - (LONG TERM EXPOSURE)
NO EFFECTS OTHER THAN THOSE NOTED UPON ACUTE EXPOSURE.

PRIMARY ROUTE OF ENTRY: <-- INHALATION <-- INGESTION <-- ABSORPTION

EMERGENCY & FIRST AID PROCEDURES

INHALATION:
GENERALLY NOT A HAZARD. MOVE TO FRESH AIR AND TREAT SYMPTOMATICALLY. GIVE OXYGEN IF BREATHING IS DIFFICULT AND ARTIFICIAL RESPIRATION IF BREATHING HAS STOPPED. GET MEDICAL ATTENTION.

EYE CONTACT:
FLUSH WITH LARGE AMOUNTS OF WATER FOR 10 MINUTES. LIFTING UPPER AND LOWER LIDS OCCASIONALLY. GET MEDICAL IRRITATION IF IRRITATION PERSISTS. TREATMENT IS MOST EFFECTIVE WITHIN ONE MINUTE.

SKIN CONTACT:
WASH WITH SOAP AND WATER. SENSITIVE INDIVIDUALS SHOULD APPLY AN EMOLLIENT RICH CREAM AND SHOULD SEE A PHYSICIAN IF IRRITATION PERSISTS.

INGESTION:
DO NOT INDUCE VOMITING. GIVE ONE OR TWO GLASSES OF WATER AND CALL PHYSICIAN. ASPIRATION OF MATERIAL INTO THE LUNGS DUE TO VOMITING CAN CAUSE CHEMICAL PNEUMONITIS WHICH CAN BE FATAL.

NOTES TO PHYSICIAN:
GASTRIC LAVAGE IS INDICATED. DO NOT INDUCE VOMITING.

SECTION VI - TOXICITY INFORMATION

PRODUCT CONTAINS CHEMICAL LISTED AS CARCINOGEN OR POTENTIAL CARCINOGEN BY:

IARC	<--YES	NTP	<--YES	OSHA	<--YES	ACGIH	<--YES	OTHER	<--YES
	X<--NO		X<--NO		X<--NO		X<--NO		X<--NO

2,4,6 TRI(DIMETHYLAMINO METHYL PHENOL)	
ORL-RAT LD50: 2.5 G/KG 1.	SKN-RAT LD50: 1280 MG/ KG 1.
SKN-RBT LD50: 1.2G/KG 1.	SKN-RBT 500MG/24H SEVERE 1.
DIGLYCDIAL ETHER OF BISPHENOL A	EYE-RBT 500MG/24H/SEVERE 1.
SKN-RBT 500 MG OPEN MILD 1.	

M/M QUICK CURE

(CONTINUED)

SECTION VI - TOXICITY INFORMATION

PAGE : 04

EYE-RBT 2 MG/24 H SEVERE 1.
ORL-RAT LD50: 11 G/KG 1.

SECTION VII - REACTIVITY DATA

STABILITY	X<--STABLE	<--UNSTABLE	CONDITIONS TO AVOID
			OPEN FLAMES, LONG-TERM EXPOSURE TO HIGH TEMPERATURES.

INCOMPATIBILITY (MATERIALS TO AVOID)
STRONG OXIDIZING AGENTS OR STRONG BASES OR MINERAL ACIDS

HAZARDOUS DECOMPOSITION PRODUCTS
OXIDES OF CARBON, NITROGEN, AMMONIA AND ACRID SMOKE AND FUMES.

HAZARDOUS	WILL NOT	MAY	CONDITIONS TO AVOID
	X<--OCCUR	<--OCCUR	
POLYMERIZATION	N/A		

SECTION VIII - SPILL OR LEAK PROCEDURES

STEPS TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
DUE TO THE NATURE OF THE PACKAGING OF THIS PRODUCT A SPILL IS UNLIKELY

WASTE DISPOSAL METHOD
PER ALL LOCAL, STATE AND FEDERAL REGULATIONS CONCERNING HEALTH AND POLLUTION FOR DISPOSAL PROCEDURES.

NEUTRALIZING AGENT
N/A

SECTION IX - SPECIAL PROTECTION INFORMATION

REQUIRED VENTILATION
LOCAL EXHAUST RECOMMENDED TO CONTROL VAPOR LEVELS IF BURNED OR WELDED. GENERAL EXHAUST IS MORE THAN ADEQUATE TO PROTECT WORKER FROM EXPOSURE TO LEVELS ABOVE PERMISSIBLE EXPOSURE LIMITS.

RESPIRATORY PROTECTION
WEAR NIOSH APPROVED RESPIRATOR TO PROVIDE ADEQUATE VENTILATION WHEN BURNING, WELDING OR MACHINING (GRINDING).

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(CONTINUED)

SECTION IX - SPECIAL PROTECTION INFORMATION PAGE : 05

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PROTECTIVE GLOVES
RUBBER GLOVES SHOULD BE WORN BY SENSITIVE
INDIVIDUAL DEPENDING ON SEVERITY OF EXPOSURE.

EYE PROTECTION
SAFETY GOGGLES SHOULD BE WORN DEPENDING ON
SEVERITY OF EXPOSURE.

OTHER PROTECTION
CLEAN, PROTECTIVE CLOTHING SHOULD BE WORN.

SECTION X - STORAGE AND HANDLING INFORMATION

STORAGE TEMPERATURE	INDOOR	HEATED	REFRIGERATED	OUTDOOR
100 F <--MAX 30 F <--MIN	X		X	

PRECAUTIONS TO BE TAKEN IN HANDLING & STORING
AVOID CONTACT WITH EYES, SKIN AND CLOTHING.

OTHER PRECAUTIONS
WASH THOROUGHLY AFTER HANDLING. KEEP OUT OF REACH
OF CHILDREN. AVOID CONTACT WITH EYES, SKIN AND
CLOTHING.

SECTION XI - REGULATORY INFORMATION

CHEMICAL NAME	C.A.S. NUMBER	UPPER % LIMIT
N/A		

N/A

THOSE INGREDIENTS LISTED ABOVE ARE SUBJECT TO THE REPORTING REQUIREMENTS OF
313 OF TITLE III OF THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF
1986 AND 40 CFR PART 372.

IF USE (USE EXEMPTION) APPEARS UNDER UPPER % LIMIT, END USERS ARE EXEMPT
FROM NOTIFICATION BECAUSE THE PRODUCT IS USED AND LABELED FOR ROUTINE
JANITORIAL WORK, OR THE PRODUCT IS USED AND LABELED FOR FACILITY GROUNDS
MAINTENANCE (SUCH AS FERTILIZERS AND HERBICIDES), OR THE PRODUCT IS USED AND
LABELED FOR MAINTAINING MOTOR VEHICLES.

SECTION XII - TRANSPORTATION * (FOR FUTURE USE)

APPLICABLE REGULATIONS				
<--49 CFR	<--IMCO	<--TARIFF 6 D	<--IATA	<--MILITARY AIR (AFR 71-4)

M/M QUICK CURE

(CONTINUED)

SECTION XII - TRANSPORTATION * (FOR FUTURE USE)

PAGE : 06

SHIPPING NAME

HAZARD CLASS

ID NUMBER | REPORT QTY

LABELS

LIMITED QTY

UNIT CONTAINER

DOT SPS CONTAINER

NET EXPLOSIVE WT.

AEROSOL PROPELLANT(S)

SECTION XIII - REFERENCES

1. DANGEROUS PROPERTIES OF INDUSTRIAL MATERIALS, 6TH EDITION,
N. IRVING SAX.
 2. THRESHOLD LIMIT VALUE FOR CHEMICAL SUBSTANCES IN THE
WORK ENVIRONMENT, 2ND EDITION, ACGIH, 1985.
 3. VENDOR'S MSDS.
- * INGREDIENT PERCENTAGE IS A TRADE SECRET;
MASS TRADE SECRET NUMBER 99-127-002

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED
ACCURATE IN LIGHT OF CURRENT FORMULATION. HOWEVER, NO WARRANTY
IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THIS DATA
OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

NATIONAL CHEMSEARCH DIV. OF NCH CORP. ASSUMES NO RESPONSIBILITY
FOR PERSONAL INJURY OR PROPERTY DAMAGE CAUSED BY THE USE, STORAGE
OR DISPOSAL OF THE PRODUCT IN A MANNER NOT RECOMMENDED ON THE
PRODUCT LABEL. USERS ASSUME ALL RISKS ASSOCIATED WITH SUCH
UNRECOMMENDED USE, STORAGE, OR DISPOSAL OF THE PRODUCT.

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MATERIAL SAFETY DATA SHEET

PRODUCT SOLUTION S0260 SPECIAL INDICAT

CS605

Emergency Telephone Number

Medical (312) 920-1510 (24 hours)*

*Effective November 11, 1989, the area code will be changed to 708

SECTION 1 PRODUCT IDENTIFICATION

TRADE NAME: SOLUTION S0260 SPECIAL INDICAT

DESCRIPTION: Special indicator, (M) indicator - brom cresol green and methyl red dissolved in isopropanol

NFPA 704M/HMIS RATING: 1/1 HEALTH 3/3 FLAMMABILITY 0/0 REACTIVITY 0 OTHER
0=Insignificant 1=Slight 2=Moderate 3=High 4=Extreme

SECTION 2 HAZARDOUS INGREDIENTS

Our hazard evaluation has identified the following chemical ingredient(s) as hazardous under OSHA's Hazard Communication Rule, 29 CFR 1910.1200. Consult Section 14 for the nature of the hazard(s).

INGREDIENT(S)	CAS #	APPROX. %
Isopropanol	67-63-0	99+

SECTION 3 PRECAUTIONARY LABEL INFORMATION

WARNING: FLAMMABLE. Keep away from heat, sparks and flame. May cause irritation to skin and eyes. Avoid contact with skin, eyes and clothing. Avoid breathing vapors. Do not take internally. Keep container closed when not in use.

Empty containers may contain residual product. Do not reuse container unless properly reconditioned.

SECTION 4 FIRST AID INFORMATION

EYES: Flush with water for 15 minutes. Call a physician.
SKIN: Flush with water for 15 minutes.
INGESTION: Do not induce vomiting. Give water. Call a physician.

NOTE TO PHYSICIAN: No specific antidote is known. Based on the individual reactions of the patient, the physician's judgment should be used to control symptoms and clinical condition.

CAUTION: If unconscious, having trouble breathing or in convulsions, do not induce vomiting or give water.

SECTION 5 HEALTH EFFECTS INFORMATION

PRIMARY ROUTE(S) OF EXPOSURE: Eye, Skin, Inhalation



MATERIAL SAFETY DATA SHEET

68605

PRODUCT SOLUTION S0260 SPECIAL INDICA

Emergency Telephone Number

Medical (312) 920-1510 (24 hours)*

*Effective November 11, 1989, the area code will be changed to 708

SECTION 5 HEALTH EFFECTS INFORMATION

(CONTINUED)

EYE CONTACT: Can cause moderate irritation.
SKIN CONTACT: Can cause moderate irritation.
INHALATION: Prolonged inhalation of mist or vapor may cause nausea, dizziness, light-headedness, vomiting or unconsciousness depending on the length of exposure and the first aid action given.

SYMPTOMS OF EXPOSURE: A review of available data does not identify any symptoms from exposure.

AGGRAVATION OF EXISTING CONDITIONS: A review of available data does not identify any worsening of existing conditions.

SECTION 6 TOXICOLOGY INFORMATION

ACUTE TOXICITY STUDIES: Acute toxicity studies have not been conducted on this product, but toxicity studies of the ingredient(s) in Section 2 have been reviewed. The results are shown below.

ACUTE ORAL TOXICITY (ALBINO RATS): $LD_{50} = 5,000$ mg/kg

ACUTE DERMAL TOXICITY (ALBINO RABBITS): $LD_{50} = 13$ gm/kg

ACUTE INHALATION TOXICITY (ALBINO RATS): $LC_{50} = 16,000$ ppm (8-hours)

SECTION 7 PHYSICAL AND CHEMICAL PROPERTIES

COLOR: Clear amber to orange	FORM: Liquid	ODOR: Isopropanol
SOLUBILITY IN WATER: Completely		
SPECIFIC GRAVITY: 0.79 @ 60 Degrees F		ASTM D-1298
BOILING POINT: 180 Degrees F @ 760 mm Hg		ASTM D-86
FLASH POINT: 56 Degrees F (TCC)		ASTM D-56
PERCENT VOLATILE BY WEIGHT: Greater than 99%		

NOTE: These physical properties are typical values for this product.

SECTION 8 FIRE AND EXPLOSION INFORMATION

FLASH POINT: 54 Degrees F (TCC) ASTM D-56

AUTOIGNITION TEMPERATURE: 860 Degrees F (ASTM D2155-66)

UEL 12.0% LEL 2.0%



GS605

MATERIAL SAFETY DATA SHEET

PRODUCT SOLUTION S0260 SPECIAL INDICA

Emergency Telephone Number

Medical (312) 920-1510 (24 hours)*

*Effective November 11, 1989, the area code will be changed to 708

SECTION 8 FIRE AND EXPLOSION INFORMATION

(CONTINUED)

EXTINGUISHING MEDIA: Based on the NFPA guide, use dry chemical, alcohol foam, carbon dioxide or other extinguishing agent suitable for Class B fires. Use water to cool containers exposed to fire. For large fires, use water spray or fog, thoroughly drenching the burning material.

UNUSUAL FIRE AND EXPLOSION HAZARD: Not applicable

SECTION 9 REACTIVITY INFORMATION

INCOMPATIBILITY: Avoid contact with strong oxidizers (eg. chlorine, peroxides, chromates, nitric acid, perchlorates, concentrated oxygen, permanganates) which can generate heat, fires, explosions and the release of toxic fumes.

SECTION 10 PERSONAL PROTECTION EQUIPMENT

RESPIRATORY PROTECTION: If it is possible to generate significant levels of vapors or mists, a NIOSH approved or equivalent organic vapor cartridge respirator is recommended.

For large spills, entry into large tanks, vessels or enclosed small spaces with inadequate ventilation, a pressure-demand, self-contained breathing apparatus is recommended.

VENTILATION: General ventilation is recommended.

PROTECTIVE EQUIPMENT: Use impermeable gloves and chemical splash goggles (ANSI Z 87.1 requirements and selection of gloves, goggles, shoes, etc.) when attaching feeding equipment or doing maintenance.

If clothing is contaminated, remove clothing and thoroughly wash the affected area. Launder contaminated clothing before reuse.

SECTION 11 SPILL AND DISPOSAL INFORMATION

IN CASE OF TRANSPORTATION ACCIDENTS, CALL THE FOLLOWING 24-HOUR TELEPHONE NUMBER (708-920-1510)

SPILL CONTROL AND RECOVERY:

Small liquid spills: Contain with absorbent material, such as clay, soil or any commercially available absorbent. Shovel reclaimed liquid and absorbent into recovery or salvage drums for disposal. Refer to CERCLA in Section 14.

Keep the spill away from heat, sparks, flames and welding operations.

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PRODUCT SOLUTION S0260 SPECIAL INDICAT

Medical (312) 920-1510 (24 hours)*

*Effective November 11, 1989, the area code will be changed to 708.

(CONTINUED)



GS605

MATERIAL SAFETY DATA SHEET

PRODUCT SOLUTION S0260 SPECIAL INDICATOR

Emergency Telephone Number

Medical (312) 920-1510 (24 hours)*

*Effective November 11, 1989, the area code will be changed to 708

SECTION 14 REGULATORY INFORMATION

(CONTINUED)

(TITLE III) - SECTIONS 302, 311, 312 AND 313:

SECTION 302 - EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355):

This product does not contain ingredients listed in Appendix A and B as an Extremely Hazardous Substance.

SECTIONS 311 and 312 - MATERIAL SAFETY DATA SHEET REQUIREMENTS (40 CFR 370):

Our hazard evaluation has found this product to be hazardous. The product should be reported under the following EPA hazard categories:

- XX Immediate (acute) health hazard
- Delayed (chronic) health hazard
- XX Fire hazard
- Sudden release of pressure hazard
- Reactive hazard

Under Section 311, submittal of MSDS's or a list of product names to the local emergency planning commission, state emergency response commission and local fire department is required after October 17, 1987 if you have:

- 10,000 pounds or more of a hazardous substance, or
- 500 pounds or the threshold planning quantity, whichever is less, of an extremely hazardous substance.

After October 17, 1989, MSDS(s), or a list of product names for all hazardous substances between zero (0) and 10,000 pounds, not previously reported, must be submitted.

SECTION 313 - LIST OF TOXIC CHEMICALS (40 CFR 372):

This product does not contain ingredients (at a level of 1% or greater) on the List of Toxic Chemicals.

TOXIC SUBSTANCES CONTROL ACT (TSCA):

The chemical ingredients in this product are on the 8(b) Inventory List (40 CFR 710).

RESOURCE CONSERVATION AND RECOVERY ACT (RCRA), 40 CFR 261 SUBPART C & D:

If this product becomes a waste, it does meet the criteria of a hazardous waste as defined under RCRA 40 CFR 261 (consult Section 11).

FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT, 40 CFR 401.15 (formerly Sec. 307), 40 CFR 116 (formerly Sec. 311):



G8608

MATERIAL SAFETY DATA SHEET

PRODUCT SOLUTION S0260 SPECIAL INDICA

Emergency Telephone Number

Medical (312) 920-1510 (24 hours)*

*Effective November 11, 1989, the area code will be changed to 708

SECTION 14 REGULATORY INFORMATION

(CONTINUED)

None of the ingredients are specifically listed.

CLEAN AIR ACT, 40 CFR 60, SECTION 111, 40 CFR 61, SECTION 112:

This product contains the following ingredients covered by the Clean Air Act:

Isopropanol - Section 111

STATE REGULATIONS:

CALIFORNIA PROPOSITION 65:

None of the chemicals on the current Proposition 65 list are known to be present in this product.

MICHIGAN CRITICAL MATERIALS:

This product does not contain ingredients listed on the Michigan Critical Materials Register.

STATE RIGHT TO KNOW LAWS:

Regulated in those states using the TLV for isopropanol as a criteria for listing.

SECTION 15 ADDITIONAL INFORMATION

None

SECTION 16 USER'S RESPONSIBILITY

This product material safety data sheet provides health and safety information. The product is to be used in applications consistent with our product literature. Individuals handling this product should be informed of the recommended safety precautions and should have access to this information. For any other uses, exposures should be evaluated so that appropriate handling practices and training programs can be established to ensure safe workplace operations. Please consult your local sales representative for any further information.

SECTION 17 BIBLIOGRAPHY

ANNUAL REPORT ON CARCINOGENS, U.S. Department of Health and Human Services, Public Health Service, PB 33-135855, 1983.

CASARETT AND DOULL'S TOXICOLOGY, THE BASIC SCIENCE OF POISONS, Doull, J., Klaassen, C. D., and Admur, M. O., eds., Macmillian Publishing Company, Inc., N. Y., 2nd edition, 1980.



GS605

MATERIAL SAFETY DATA SHEET

PRODUCT SOLUTION S0260 SPECIAL INDICA

Emergency Telephone Number

Medical (312) 920-1510 (24 hours)*

*Effective November 11, 1989 the area code will be changed to 708

SECTION 17 BIBLIOGRAPHY

(CONTINUED)

CHEMICAL HAZARDS OF THE WORKPLACE, Proctor, N. H., and Hughes, J. P., eds., J. P. Lipincott Company, N.Y., 1981.

DANGEROUS PROPERTIES OF INDUSTRIAL MATERIALS, Sax, N. Irving, ed., Van Nostrand Reinhold Company, N.Y., 6th edition, 1984.

IARC MONOGRAPHS ON THE EVALUATION OF THE CARCINOGENIC RISK OF CHEMICALS TO MAN, Geneva: World Health Organization, International Agency for Research on Cancer, 1972-1977.

PATTY'S INDUSTRIAL HYGIENE AND TOXICOLOGY, Clayton, G. D., Clayton, F. E., eds., John Wiley and Sons, N. Y., 3rd edition, Vol. 2 A-C, 1981.

REGISTRY OF TOXIC EFFECTS ON CHEMICAL SUBSTANCES, U.S. Department of Health and Human Services, Public Health Service, Center for Disease Control, National Institute for Occupational Safety and Health, 1983 supplement of 1981-1982 edition, Vol. 1-3, OH, 1984.

Title 29 Code of Federal Regulations Part 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration (OSHA).

THRESHOLD LIMIT VALUES FOR CHEMICAL SUBSTANCES AND PHYSICAL AGENTS IN THE WORKROOM ENVIRONMENT WITH INTENDED CHANGES, American Conference of Governmental Industrial Hygienists, OH.

PREPARED BY: John J. Kasper, MSc., Manager Product Safety

DATE CHANGED: 05/23/89

DATE PRINTED: 12/02/89



MATERIAL SAFETY DATA SHEET

PRODUCT

Emergency Telephone Number

Medical (312) 920-1510 (24 hours)*

**Effective November 11, 1989, the area code will be changed to 708*

SAL 000006809

MATERIAL SAFETY DATA SHEET : BREX CONCENTRATE PAGE : 01
 (081242-0345 -E0016293-1B18) DATE OF ISSUE 09/01/89 SUPERSEDES 05/26/89

SECTION I - GENERAL INFORMATION

CHEMICAL NAME & SYNONYMS N/A TRADE NAME & SYNONYMS BREX CONCENTRATE
 CHEMICAL FAMILY AQUEOUS ACID DESCALER FORMULA X<--MIXTURE
 MANUFACTURERS NAME NATIONAL CHEMSEARCH DIV. OF NCM CORP.
 ADDRESS (NUMBER, STREET, CITY, STATE & ZIP CODE) BOX 152170 IRVING, TEXAS 75015
 PREPARED BY KEVIN UHL/T.S. CHEMIST PRODUCT CODE NUMBER 1818 EMERGENCY TELEPHONE NUMBER 214-438-1381

GS604

SECTION II- HAZARDOUS INGREDIENTS

THE HAZARDS PRESENTED BELOW ARE THOSE OF THE INDIVIDUAL COMPONENTS AS THE PRODUCT MIXTURE HAS NOT BEEN TESTED AS A WHOLE.

CHEMICAL NAME (INGREDIENTS)	HAZARD	TLV*	PEL*	CAS#
HYDROCHLORIC ACID	CORROSIVE	5PPM-(C)	5PPM-(C)	7647-01-0

SECTION IIA - NON-HAZARDOUS INGREDIENTS

NON-HAZARDOUS INGREDIENT NAMES AND CAS NUMBERS ARE PROTECTED UNDER NJ TRADE SECRET REGISTRY # 409363-5028P

SECTION III - PHYSICAL DATA

(CONTINUED) SECTION III - PHYSICAL DATA BREX CONCENTRATE PAGE : 02

BOILING PT (FAHRENHEIT)	220.00	SPEC GRAVITY (H2O=1)	1.09
VAPOR PRESSURE (MM HG)	20.00	COLOR	LIGHT AMBER
VAPOR DENSITY (AIR=1)	0.80	ODOR	PUNGENT ACID
PH @ 100%	1.00	CLARITY	TRANSPARENT
PERCENT VOLATILE BY VOLUME (%)	99.00	EVAPORATION RATE (BU AC = 1)	0.10
SOLUBILITY IN WATER	COMPLETE		
VISCOSITY	NON-VISCOUS		

SECTION IV - FIRE AND EXPLOSION HAZARD

FLASH POINT (METHOD USED)	FLAMMABLE LIMITS	LEL	UEL
NON-FLAM	N/A	N/A	N/A
EXTINGUISHING MEDIA "ALCOHOL" X<--FOAM X<--CD2 X<--CHEMICAL X<--WATER SPRAY X<--OTHER			

SPECIAL FIRE FIGHTING PROCEDURES: PRESSURE DEMAND SELF-CONTAINED RESPIRATORY EQUIPMENT. HYDROCHLORIC ACID ITSELF IS NON-FLAMMABLE.

UNUSUAL FIRE & EXPLOSION HAZARDS: A LATENT FIRE OR EXPLOSION HAZARD WHEN IN CONTACT WITH METALS DUE TO THE GENERATION OF HYDROGEN GAS.

NFPA HAZARD RATING (0=INSIGNIFICANT, 1=SLIGHT, 2=MODERATE, 3=HIGH, 4=EXTREME):
 3<--HEALTH 0<--FLAMMABILITY 0<--REACTIVITY <--SPECIAL

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE :
 NOT ESTABLISHED FOR MIXTURE. SEE SECTION II.
 EFFECTS OF OVEREXPOSURE : ACUTE - (SHORT TERM EXPOSURE)
 INGESTION CAUSES SEVERE BURNS OF THE MUCCUS MEMBRANES OF THE MOUTH.

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GS604

BREX CONCENTRATE

(CONTINUED)

SECTION V - HEALTH HAZARD DATA

PAGE : 03

ESOPHAGUS AND STOMACH. PAIN IN THE THROAT AND STOMACH WITH DIFFICULTY IN SWALLOWING. INTENSE THIRST, NAUSEA AND VOMITING FOLLOWED BY DIARRHEA. ARE COMMON. IN SEVERE CASES THIS IS FOLLOWED BY COLLAPSE AND UNCONSCIOUSNESS. EYE CONTACT CAUSES SEVERE IRRITATION AND PAINFUL BURNS OF THE EYES AND EYELIDS. SKIN CONTACT WITH CONCENTRATE CAUSES DESTRUCTION OF CLOTHING AND SEVERE BURNS UNLESS PROMPTLY WASHED OFF. REPEATED SKIN CONTACT WITH DILUTED PRODUCT MAY LEAD TO THE DEVELOPMENT OF DERMATITIS. INHALATION OF EXCESSIVE CONCENTRATION OF VAPORS PRODUCES SEVERE IRRITATION OF THE UPPER RESPIRATORY TRACT WITH COUGHING, BURNING OF THE THROAT AND A CHOKING SENSATION.

CHRONIC INGESTION MAY PRODUCE FATAL EFFECTS FROM ESOPHAGEAL OR GASTRIC NECROSIS. DENTAL DISCOLORATION AND EROSION OF EXPOSED INCISORS OCCUR ON PROLONGED EXPOSURE TO LOW CONCENTRATIONS OF HYDROCHLORIC ACID VAPORS. EYE EXPOSURES MAY RESULT IN PROLONGED OR PERMANENT VISUAL IMPAIRMENT OR TOTAL LOSS OF SIGHT. CHRONIC SKIN EXPOSURES CAN YIELD ULCERATION AND SUBSEQUENT SCARRING. THE IRRITANT EFFECT OF VAPORS ON THE RESPIRATORY TRACT MAY PRODUCE LARYNGITIS, GLOTTAL EDEMA, BRONCHITIS, PULMONARY EDEMA, AND DEATH.

PRIMARY ROUTE OF ENTRY: <-- INHALATION <-- INGESTION X<-- ABSORPTION

EMERGENCY & FIRST AID PROCEDURES

INHALATION: GET PERSON OUT OF CONTAMINATED AREA TO FRESH AIR. IF BREATHING HAS STOPPED ARTIFICIAL RESPIRATION SHOULD BE STARTED. OXYGEN MAY BE ADMINISTERED IF READILY AVAILABLE. SEEK MEDICAL ATTENTION IMMEDIATELY.

EYE CONTACT: IMMEDIATELY FLUSH EYES WITH LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINUTES HOLDING EYELIDS APART TO ENSURE FLUSHING OF THE ENTIRE EYE SURFACE. WASHING EYES WITHIN 1 MINUTE IS ESSENTIAL TO ACHIEVE MAXIMUM EFFECTIVENESS. SEEK MEDICAL ATTENTION IMMEDIATELY.

SKIN CONTACT: IMMEDIATELY WASH CONTAMINATED SKIN WITH PLENTY OF WATER. THIS MAY BE FOLLOWED WITH A RINSE WITH SODIUM BICARBONATE (3% SOLUTION) IF AVAILABLE. REMOVE CONTAMINATED CLOTHING AND FOOTWEAR AND WASH CLOTHING BEFORE REUSE. SEEK MEDICAL ATTENTION IF IRRITATION PERSISTS.

INGESTION: IF SWALLOWED, DO NOT INDUCE VOMITING. GIVE LARGE QUANTITIES OF WATER IF AVAILABLE. GIVE SEVERAL GLASSES OF MILK. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. SEEK MEDICAL ATTENTION IMMEDIATELY.

NOTES TO PHYSICIAN:

N/A

SECTION VI - TOXICITY INFORMATION

PRODUCT CONTAINS CHEMICAL LISTED AS CARCINOGEN OR POTENTIAL CARCINOGEN BY:

IARC <--YES NTP <--YES OSHA <--YES ACGIH <--YES OTHER <--YES
X<--NO X<--NO X<--NO X<--NO X<--NO X<--NO

BREX CONCENTRATE

(CONTINUED)

SECTION VI - TOXICITY INFORMATION

PAGE : 04

HYDROCHLORIC ACID:

TXDS

INH-HMN LC50: 1300PPH/30M 4.

UNK-MAN LD50: 81MG/KG 4.

ORL-RBT LD50: 900MG/KG 4.

MTDS

CYT-GRH-PAR: 0.02ML 4.

SECTION VII - REACTIVITY DATA

STABILITY: X<--STABLE <--UNSTABLE CONDITIONS TO AVOID
HCL GAS IS SLOWLY RELEASED FROM UNCONFINED ACID. CONTACT WITH METALS MAY CAUSE GENERATION OF EXPLOSIVE OR FLAMMABLE HYDROGEN.

INCOMPATIBILITY (MATERIALS TO AVOID):
STRONG ALKALIS, ALKALI METALS AND CORROSIVE MATERIALS. OXIDIZING MATERIALS MAY OXIDIZE TO CHLORINE. METALS: AL, TIN, ZN.

HAZARDOUS DECOMPOSITION PRODUCTS

N/A

HAZARDOUS: WILL NOT MAY
X <--OCCUR <--OCCUR CONDITIONS TO AVOID

POLYMERIZATION: N/A

SECTION VIII - SPILL OR LEAK PROCEDURES

STEPS TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:
SMALL QUANTITIES MAY BE FLUSHED WITH COPIOUS QUANTITIES OF WATER. IN CASE OF LARGER AMOUNTS, CONTAIN LIQUID. USE LIMESTONE, LIME OR SODA ASH TO CAUTIOUSLY NEUTRALIZE.

WASTE DISPOSAL METHOD:
DISPOSE OF IN ACCORDANCE WITH ALL FEDERAL, STATE AND LOCAL REGULATIONS CONCERNING HEALTH AND POLLUTION. DISPOSE OF VIA APPROVED CHEMICAL WASTE DISPOSAL METHODS, IF REGULATIONS PERMIT.

NEUTRALIZING AGENT:
SODA ASH - SLAKED LIME IS ADDED SLOWLY WHILE STIRRING. FLUSH TO DRAIN WITH LARGE VOLUMES OF WATER.

SECTION IX - SPECIAL PROTECTION INFORMATION

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BREX CONCENTRATE

(CONTINUED)

SECTION IX - SPECIAL PROTECTION INFORMATION PAGE : 05

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REQUIRED VENTILATION
GOOD INDUSTRIAL HYGIENE PRACTICE DICTATES THAT THE WORK AREA SHOULD BE ISOLATED AND CONTAINED AND PROVIDED WITH ADEQUATE LOCAL EXHAUST VENTILATION OR OTHER CONTROLS TO MAINTAIN THE AIR CONCENTRATION OF HYDROGEN CHLORIDE BELOW 7MG/M3 (5 PPM) AS REQUIRED BY OSHA.

RESPIRATORY PROTECTION
NIOSH APPROVED RESPIRATORY PROTECTION REQUIRED IN THE ABSENCE OF PROPER ENVIRONMENTAL CONTROL. FOR EMERGENCIES, A SELF-CONTAINED BREATHING APPARATUS OR A FULL FACE RESPIRATOR AS APPROVED BY NIOSH IS RECOMMENDED. THE IDLH LEVEL IS 100 PPM. RECOMMENDED RESPIRATOR SELECTIONS: FOR EXPOSURES <50 PPM - CCRAG/SA/SCBA; <100 PPM - CCRABF/GMAG/SAF/SCBAF

PROTECTIVE GLOVES
RUBBER, SYNTHETIC ELASTOMERS, PVC OR OTHER PLASTIC SHOULD BE WORN.

EYE PROTECTION
CHEMICAL GOGGLES IF METHOD OF USE PRESENTS THE LIKELIHOOD OF EYE CONTACT.

OTHER PROTECTION
PROTECTIVE CLOTHING TO PREVENT SKIN CONTACT.

SECTION X - STORAGE AND HANDLING INFORMATION

STORAGE TEMPERATURE 120 F<--MAX 32 F<--MIN INDOOR HEATED REFRIGERATED OUTDOOR

PRECAUTIONS TO BE TAKEN IN HANDLING & STORING
PREVENT ALL CONTACT WITH EYES AND SKIN. AVOID BREATHING IRRITATING VAPORS.

OTHER PRECAUTIONS
STORE IN A COOL DRY PLACE. FOLLOW LABEL DIRECTIONS. KEEP OUT OF REACH OF CHILDREN.

SECTION XI - REGULATORY INFORMATION

CHEMICAL NAME	C.A.S. NUMBER	UPPER % LIMIT
HYDROCHLORIC ACID	7647-01-0	20

THOSE INGREDIENTS LISTED ABOVE ARE SUBJECT TO THE REPORTING REQUIREMENTS OF 313 OF TITLE III OF THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 AND 40 CFR PART 372.
IF UE (USE EXEMPTION) APPEARS UNDER UPPER % LIMIT, END USERS ARE EXEMPT

BREX CONCENTRATE

(CONTINUED)

SECTION XI - REGULATORY INFORMATION

PAGE : 06

FROM NOTIFICATION BECAUSE THE PRODUCT IS USED AND LABELED FOR ROUTINE JANITORIAL WORK, OR THE PRODUCT IS USED AND LABELED FOR FACILITY GROUNDS MAINTENANCE (SUCH AS FERTILIZERS AND HERBICIDES), OR THE PRODUCT IS USED AND LABELED FOR MAINTAINING MOTOR VEHICLES

SECTION XII - TRANSPORTATION - (FOR FUTURE USE)

APPLICABLE REGULATIONS
<--49 CFR <--IMCO <--TARIFF 6 D <--IATA <--MILITARY AIR (AFR 71-4)
SHIPPING NAME

HAZARD CLASS ID NUMBER REPORT QTY

LABELS LIMITED QTY

UNIT CONTAINER

DOT SPS CONTAINER NET EXPLOSIVE WT

AEROSOL PROPELLANT(S)

SECTION XIII - REFERENCES

1. NIOSH DOCKET GUIDE TO CHEMICAL HAZARDS, 1978
2. HANDBOOK OF TOXIC AND HAZARDOUS CHEMICALS AND CARCINOGENS, 2ND EDITION, MARSHALL SITTIG, 1981
3. NIOSH REGISTRY OF TOXIC EFFECTS OF CHEMICAL SUBSTANCES, 1982
4. DANGEROUS PROPERTIES OF INDUSTRIAL MATERIALS, 6TH EDITION, N. IRVING SAX

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GS604

BREX CONCENTRATE

(CONTINUED)

SECTION XIII - REFERENCES

PAGE : 07

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED ACCURATE IN LIGHT OF CURRENT FORMULATION. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THIS DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

NATIONAL CHEMSEARCH DIV. OF NCH CORP. ASSUMES NO RESPONSIBILITY FOR PERSONAL INJURY OR PROPERTY DAMAGE CAUSED BY THE USE, STORAGE OR DISPOSAL OF THE PRODUCT IN A MANNER NOT RECOMMENDED ON THE PRODUCT LABEL. USERS ASSUME ALL RISKS ASSOCIATED WITH SUCH UNRECOMMENDED USE, STORAGE, OR DISPOSAL OF THE PRODUCT.

SAL 000006813

LINCOLN BIG THREE, INC.

P.O. BOX 3274

BATON ROUGE, LOUISIANA 70821

G S 2 6 4

MATERIAL SAFETY DATA SHEET



I — GENERAL INFORMATION

PRODUCT NAME NITROGEN, Refrigerated Liquid	
EMERGENCY TELEPHONE NO. (504) 357-4331	
MANUFACTURERS NAME Big Three Industries, Inc.	TRADE NAME AND SYNONYMS Nitrogen (LIN)
	CHEMICAL NAME AND SYNONYMS Nitrogen
ISSUE DATE APRIL 1, 1984	PRODUCT ID. NO. UN-1977
	FORMULA N₂
	CHEMICAL FAMILY Inert Gas
	GAS NUMBER 007 727 379

II — HAZARDOUS INGREDIENTS

HAZARDOUS MIXTURES OF LIQUIDS AND GASES	%	TLV
None		

III — PHYSICAL DATA

BOILING POINT - 320.4°F (- 195.8°C) @ 1 ATM	SPECIFIC GRAVITY (H ₂ O = 1) 0.8083 at 1 ATM and Boiling Point
VAPOR PRESSURE N/A	PERCENT. VOLATILE BY VOLUME (%) N/A
DENSITY At boiling point and 1 ATM 50.49 lb/cu ft	EVAPORATION RATE N/A
SOLUBILITY IN WATER N/A	MATERIAL AT NORMAL CONDITION ☒ LIQUID ☐ SOLID ☐ GAS
EXPANSION RATIO (LIQUID TO GAS) 1 : 696.5	
APPEARANCE AND ODOR Colorless, Odorless Liquid	

IV — FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (METHOD USED) N/A ☐ CLOSED CUP ☐ OPEN CUP	FLAMMABILITY LIMITS IN AIR (% OF VOL.) LOWER N/A UPPER N/A
EXTINGUISHING MEDIA None. Nitrogen neither burns or supports combustion. Use media appropriate for the surrounding fire.	
SPECIAL FIRE FIGHTING PROCEDURES Nitrogen will act as a simple asphyxiant if it displaces oxygen. Liquid nitrogen when spilled will vaporize rapidly causing a vapor cloud that will create an oxygen-deficient atmosphere. Evacuate the area of this vapor cloud unless wearing self-contained breathing apparatus.	
UNUSUAL FIRE AND EXPLOSION HAZARD Contact with refrigerated liquid nitrogen may cause frostbite	

SAL 000006814

GS 264

V. HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE None Established	UNUSUAL CHRONIC TOXICITY None	ROUTES OF EXPOSURE Inhalation & Skin Contact
EFFECTS OF OVEREXPOSURE Nitrogen is nontoxic, but may produce suffocation by displacing the oxygen in the air. Oxygen-deficient atmospheres may cause dizziness, nausea, vomiting, diminished mental alertness, loss of consciousness and death. Contact with liquid nitrogen can cause severe frostbite and freeze burn. Prolonged breathing of very cold atmospheres can cause lung damage and hypothermia.		
EMERGENCY AND FIRST AID PROCEDURES Persons suffering from lack of oxygen should be moved into fresh air. Assisted respiration and supplemental oxygen should be given if the victim is not breathing. Rescue workers may require self-contained breathing apparatus. If contact with cryogenic liquid has caused frostbite, contact a physician. Do not rub affected areas, as tissue damage may occur.		

VI — REACTIVITY DATA

STABILITY ☐ UNSTABLE ☒ STABLE	CONDITIONS TO AVOID None
INCOMPATIBILITY (MATERIALS TO AVOID) None	
HAZARDOUS DECOMPOSITION PRODUCTS None	
HAZARDOUS POLYMERIZATION ☐ MAY OCCUR ☒ WILL NOT OCCUR	CONDITIONS TO AVOID None

VII — SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED Shut off nitrogen source if possible. Avoid contact with liquid nitrogen or its cold boil-off gas. To increase rate of evaporation spray with large amounts of water. Self-contained breathing apparatus will be required in oxygen-deficient areas such as nitrogen vapor clouds.
WASTE DISPOSAL METHOD Allow liquid nitrogen to evaporate in a well-ventilated outdoor location.

VIII — SPECIAL PROTECTIVE INFORMATION

RESPIRATORY PROTECTION (SPECIFY TYPE) Use self-contained breathing apparatus in oxygen-deficient atmospheres. Respirators will not function!		
VENTILATION	LOCAL EXHAUST	SPECIAL
Natural or mechanical where gas is present	—	—
	MECHANICAL	OTHER Vents sufficient to avoid high concentrations of nitrogen.
PROTECTIVE GLOVES Thermal Insulated		EYE PROTECTION Full face shield and safety glasses
OTHER PROTECTIVE EQUIPMENT Long Sleeve Shirt		

IX — SPECIAL PRECAUTIONS

PRECAUTIONS TO BE OBSERVED IN HANDLING AND STORING Store liquid nitrogen in well-ventilated areas. Follow general safety procedures for handling cryogenic liquids found in CGA Pamphlet P-12.	
DOT LABELING Green Label	VALVE CONNECTION NUMBER CGA 580 FOR GAS
OTHER PRECAUTIONS Liquid nitrogen expands at a ratio of 696.5 to 1, and if trapped in a container or pipe it will produce enormous pressures which will rupture the container. Any area where liquid could be trapped must be protected by a pressure relief device. Piping must be designed for extreme cold. Many materials, such as carbon steel, will become brittle and may fracture when extremely cold.	

SAL 000006815



HALDOR TOPSOE, INC.

TK-710
CA046

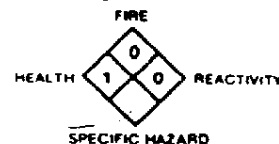
REVISED:

May 1989

MATERIAL SAFETY DATA SHEET

EMERGENCY HAZARD RATING

4 - EXTREME
3 - HIGH
2 - MODERATE
1 - SLIGHT
0 - INSIGNIFICANT



1. GENERAL INFORMATION

Page 1 of 2

Trade name and synonym: Hydroprocessing Catalyst, TK-710

Chemical family: Oxides of Cobalt, Molybdenum, Aluminum

Major chemical constituents (CAS No.): CoO (1307-96-6)

MoO₃ (1313-27-5)

Al₂O₃ (1344-28-1)

All components of the catalyst appear on the TSCA inventory.

Manufacturer's or importer's name & address:

HALDOR TOPSOE, INC.
17629 El Camino Real
Houston, TX 77058

Telephone No.: (713) 480-2600

Emergency Telephone No.: (713) 474-3261

2. HAZARDOUS INGREDIENTS

	concentration wt %	TLV/TWA mg/m ³
CoO	2	0.05
MoO ₃	6	5 (Mo)
Al ₂ O ₃	92	10 (Nuisance Dust)

*As adopted by ACGIH

Aluminum oxide, molybdenum trioxide, and all compounds containing chromium, cobalt, nickel, copper or zinc are subject to Chemical Release Reporting requirements of SARA Section 313, as codified in 40 CFR Part 372.

3. PHYSICAL DATA

Appearance & odor: Blue rings or cylinders, odorless

Bulk density: 31 lbs/cuft (rings) Vapor pressure: Not relevant
38 lbs/cuft (cylinders)

Melting point: >1470 °F

Solubility in water: Negligible

4. FIRE & EXPLOSION HAZARD DATA

Flash Point: Not relevant

Special Fire Fighting Procedures:

Not relevant, Noncombustible

Flammable Limits: Not relevant

Unusual Fire & Explosion Hazard: None

Extinguishing Media: Not relevant

SAL 000006816

5. HEALTH HAZARD DATA

Effects of overexposure: Inhalation of dust may cause irritation of the respiratory tract. Can cause allergic dermatitis, diarrhea, and difficulty in breathing.

Emergency & first aid procedures: In case of significant inhalation, seek medical attention. Wash off the skin with soap and water. Irrigate eyes with water.

Listed as a carcinogen: Yes _____ No X
by OSHA _____ IARC _____ NTP _____

6. REACTIVITY DATA

Stability: Stable X Unstable _____
Incompatibility (Materials to avoid): Water damages catalytic properties.
Hazardous decomposition products: N/A
Hazardous polymerization: may occur _____ will not occur X

7. SPILL AND WASTE DISPOSAL PROCEDURES

Steps to be taken if material is spilled: Collect all spilled material by mechanical means and place in a container. Avoid dust generation. Label container.

Waste Disposal Method: In accordance with Federal, state, & local regulations.

8. PERSONAL PROTECTION INFORMATION

Respiratory protection: Use approved respirator in confined space.

Eye protection: Goggles Ventilation of work place: Outside: Natural
Inside reactor: Mechanical

Hand protection: Gloves Other protection: Safety shoes recommended
when handling drums.

9. SPECIAL PRECAUTIONS

During storage: Keep containers dry and tightly closed.

When handling containers: Adhere to standard safety procedures. Use mechanical assistance to avoid strain.

During loading: Adhere to standard safety procedures. Minimize free fall of material to avoid breakage.

During unloading: Adhere to standard safety procedures. Spent catalyst may be pyrophoric in the presence of air.

SAL 000006817



MATERIAL SAFETY DATA SHEET

GS551**254486**

UOP
25 East Algonquin Road
Des Plaines, Illinois 60017-5017
Telephone 312-391-2000
FAX 312-391-2253
Telex 253-285

Emergency Assistance

24 Hour Emergency Telephone Numbers:
USA: UOP 312/391-2123
Chemtrec 800/424-9300
Canada: Canutec 613/896-6666
Outside USA: Chemtrec 202/483-7616

PRODUCT NAME

UOP[®] FIA Reagent

Page 1 of 4

INGREDIENTS

<u>MATERIAL</u>	<u>(CAS NO.)</u>	<u>WT(%)</u>	<u>1988-89 ACGIH TLV-TWA (OSHA PEL)</u>
Silica gel	(63231-67-4)	>99	10 mg/m ³ (6 mg/m ³)
Proprietary oil soluble dyes		<1	None established

Governmental Inventory Status: All components registered in accordance with TSCA.

TRANSPORTATION CLASSIFICATION

DOT Hazard Class: Not regulated
IMO Hazard Class: Not regulated

PHYSICAL DATA

Apparent Bulk Density, lbs./cu. ft.: 0.65 Appearance: Light brown powder
Solubility in Water: Insoluble Odor: Slight pungent
pH of 5% slurry in H₂O: 6.5

FIRE AND EXPLOSION DATA

Flash Point, °F (°C): Not applicable
Method: Not applicable
Extinguishing Media: Product is not combustible. However, if located in a fire area, CO₂, dry chemical and foam extinguishing methods are acceptable.

REACTIVITY DATA

Stability: Stable
Conditions to Avoid: Reacts with hydrofluoric acid
Hazardous Decomposition Products: None known
Hazardous Polymerization: Will not occur
Incompatible Materials: Hydrofluoric acid

SPILL OR LEAK PROCEDURE

Isolate the affected area. Wear proper protective equipment, especially eye protection. Sweep, shovel or vacuum up the spilled material and place into appropriate container(s). Dispose of spilled material in accordance with federal, state and local waste disposal regulations. See WASTE DISPOSAL section.

SAL 000006818

WASTE DISPOSAL

General Waste: Waste material and materials from spill clean-up procedures, must be handled in accordance with federal, state and local regulations. Product and its components are not listed by generic name or trademark name in the U.S. EPA's Resource Conservation and Recovery Act (RCRA) Hazardous Waste Management Regulations and do not possess one of the four identifying characteristics of hazardous waste. Recommended disposal methods include incineration for liquid waste and contaminated solids.

Container Disposal: Containers should be drained as completely as possible before reuse. Dispose of containers in accordance with federal, state and local regulations.

HEALTH HAZARD DATA

Primary Routes of Exposure: Contact with skin. Product ingestion is unlikely but may occur if proper safety/hygiene procedures are not followed. Exposure may also occur via eye contact, inhalation or ingestion if product dust is generated during handling and/or processing. In order to minimize exposure to product, proper protective equipment should be used and proper safety/hygiene procedures should be followed.

Acute Oral LD₅₀: No data for product. Oral LD₅₀ for silica gel is greater than 5 g/kg (rat).

Inhalation LC₅₀: No data for product. Repeated or prolonged inhalation of reagent dust may cause irritation of the upper respiratory tract.

Dermal LD₅₀: No data for product. Dermal LD₅₀ for silica gel is greater than 2 g/kg (rabbit).

Primary Eye Irritation: No data for product. Not considered to be a primary eye irritant; however, reagent dust may be irritating to the eyes.

Primary Dermal Irritation: No data for product. Not considered to be a primary skin irritant. However, silica gel can have a drying affect on the skin and may cause irritation upon repeated or prolonged exposure.

Toxicology Summary: Based on the toxicological properties of its components, product is considered to be slightly toxic to non-toxic by dermal, oral and inhalation routes. Repeated or prolonged skin contact or inhalation of reagent dust may be irritating. Reagent dust may be irritating to the eyes.

FIRST AID

- Skin:** Wash contaminated skin thoroughly with soap and water. Rinse and repeat. Contaminated clothing should be removed and laundered before reuse. If irritation develops, obtain professional medical attention.
- Eyes:** Flush affected eye with large amounts of water for a minimum of 15 minutes. Obtain immediate professional medical attention.
- Inhalation:** Remove affected person to fresh air. If respiratory problems develop, obtain prompt professional medical attention.
- Ingestion:** Drink plenty of water immediately. Obtain immediate professional medical attention.

Note To Physician:

- Eyes:** Rinse affected eye with water for a minimum of 15 minutes. Stain to check for corneal damage in severe cases.
- Skin:** Treat minor cases as contact dermatitis; for severe burns, treat as any thermal burn.

PROTECTIVE EQUIPMENT

- Respiratory:** Where natural ventilation is inadequate, use mechanical ventilation, other engineering controls or a NIOSH-approved toxic dust respirator to prevent inhalation of reagent dust.
- Skin:** Gloves and work uniform as necessary to prevent repeated or prolonged skin contact.
- Eye:** Safety glasses or chemical goggles as necessary to prevent eye contact.

SPECIAL PRECAUTIONS

Store in tightly closed, properly labeled containers. Avoid repeated or prolonged contact with skin. Avoid contact with eyes and inhalation of dust.

NOTE: If further details are required, please address inquiries to:
Dennis R. Sullivan
Product Stewardship Coordinator
Environmental Sciences Group
UOP, 25 East Algonquin Road Des Plaines, IL 60017-5017
(312) 391-3189

24 Hour EMERGENCY Telephone Number: (312) 391-2123

NOTE: 312 Area Code Changes To 708
Effective 11-11-89

SAL 000006820

The data and recommendations presented in this data sheet concerning the use of our product and the materials contained therein are believed to be accurate and are based on information which is considered reliable as of the date hereof. However, the customer should determine the suitability of such materials for his purpose before adopting them on a commercial scale. Since the use of our products by others is beyond our control, no guarantee, express or implied, is made and no responsibility assumed for the use of this material or the results to be obtained therefrom. Information on this form is furnished for the purpose of compliance with Government Health and Safety Regulations and shall not be used for any other purposes. Moreover, the recommendations contained in this data sheet are not to be construed as a license to operate under, or a recommendation to infringe, any existing patents, nor should they be confused with state, municipal or insurance requirements, or with national safety codes.

UOP

Date: January 1989

Revision: 2

Supersedes: April 1986

MATERIAL SAFETY DATA SHEET

PAGE 1 OF 3

PREMIER INDUSTRIAL CORPORATION
4500 EUCLID AVENUE
CLEVELAND, OHIO 44103

EMERGENCY/INFORMATION TELEPHONE
216/391-8300

FORMULA 47866 DATE 03/21/86
MSDS EFFECTIVE: 08/28/89 BY: TG
SUPERSEDES MSDS OF: 05/09/86

COF: 552202
INVOICE: 533003
SDS KEY: 0746998

MAIL TO:
CONOCO REFINERY WHSE
OLD SPANISH TRAIL
WESTLAKE LA 70669

DEAR CUSTOMER:

IN COMPLIANCE WITH THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT (SARA TITLE III, SECTION 313), FEDERAL HAZARD COMMUNICATIONS REGULATIONS (WHMIS AND OSHA 29 CFR 1910.1200) AND IN THE INTEREST OF INFORMED USE OF OUR PRODUCT, WE ARE PROVIDING YOU WITH THIS MATERIAL SAFETY DATA SHEET (MSDS).

THIS MSDS WILL BE UPDATED REGULARLY TO REFLECT THE MOST RECENT INFORMATION IN OUR POSSESSION. PLEASE ENSURE THAT OBSOLETE MSDS SHEETS IN YOUR FILES FOR THIS PART NUMBER ARE DISCARDED.

WE THANK YOU FOR YOUR CONTINUED PATRONAGE AND LOOK FORWARD TO PROVIDING YOU WITH ADDITIONAL QUALITY PRODUCTS AND SERVICES.

SECTION I - PRODUCT IDENTIFICATION

PART NUMBER: 92180
PRODUCT NAME: PREMIER ETP CUTTING FLUID AERO
TRADE NAME/SYNONYMS: ETP CUTTING FLUID
CHEMICAL FAMILY: AEROSOL, LUBRICANT

SECTION II - HAZARDOUS INGREDIENTS

INGREDIENT	CAS NO.	WT %	TWA	UNITS	LC50, PPM	LD50, MG/KG
PETROLEUM OIL	64742-63-8	80-90	5	MG/M3	N/A	RAT13000 RAB12000
ISOBUTANE	00075-28-6	5	1000	PPM	MLD10000	N/A
PROPANE	00074-98-6	5	1000	PPM	MLD10000	N/A

INGREDIENTS TOTAL WT % ARE BELOW 100% ONLY IF ALL OTHERS UNLISTED ARE NOT CONSIDERED HAZARDOUS BY ANY FEDERAL (OSHA, WHMIS, SARA), ANY STATE OR PROVINCE, OR LOCAL RIGHT-TO-KNOW REGULATIONS

SYMBOLS, ABBREVIATIONS AND NOTATIONS:

N/A=NOT AVAILABLE OR APPLICABLE, C=CEILING LIMIT, S=SKIN DESIGNATION
#-LISTED IN SARA TITLE III SECTION 313, *-IF FOUND AS DUST, MIST OR FUME
M=HUMAN, RAB=RABBITS, GPG=GUINEA PIGS, MIC=MICE
I=INGESTION, A=SKIN ABSORPTION, LD=LITTLE OBSERVABLE EFFECT, NO=NO EFFECT
PEL=OSHA PERMISSIBLE EXPOSURE LIMIT, TLV=ACGIH THRESHOLD LIMIT VALUE
STEL=SHORT TERM EXPOSURE LIMIT

SAL 000006822

PART: 92180 PRODUCT NAME: PREMIER ETP CUTTING FLUID AERO PAGE 2 OF 2

***** SECTION III - PHYSICAL DATA *****

ILING PT DEG F/C: -44F / -42C SPECIFIC GRAVITY: 0.93
 VAPOR PRESSURE(MM HG): 4.7 ATM %VOLATILE VOLUME: 10
 VAPOR DENSITY(AIR=1): 1.6 EVAPORATION RATE: (WATER=1) 0.1
 SOLUBILITY IN WATER: NIL WATER/OIL DIST COEFF: 0
 APPEARANCE AND ODOR: TAN LIQUID, PETROLEUM ODOR.
 PHYSICAL STATE: LIQUID, AEROSOL
 FREEZE PT DEG F/C: N/A THRESHOLD ODOR, PPM: N/A
 OTHER: N/A PH: N/A

***** SECTION IV - FIRE AND EXPLOSION HAZARD DATA *****

CLASSIFICATION: FLAMMABLE AEROSOL NFPA RATING: 1, 4, 0
 COMBUSTION PRODUCTS: CO, CO2
 FLASH POINT DEG F/C: -40F / -40C LEL%: 1.8 UEL%: 9.5
 EXTINGUISHING MEDIA: CO2, DRY CHEMICAL FOAM.
 UN/NA/PIN#: UN1954 SPECIAL FIRE FIGHTING PROCEDURES:
 FIREFIGHTERS SHOULD WEAR SELF-CONTAINED BREATHING EQUIPMENT.
 AUTO IGN. TEMP DEG F/C: 700F / 371C UNUSUAL FIRE AND EXPLOSION HAZARDS:
 EXPOSURE TO FIRE, HEAT OR PROLONGED SUNLIGHT MAY CAUSE BURSTING.
 IF USED IN CONFINED SPACES, HAZARDOUS VAPORS MAY SPREAD OR BUILD UP IN LOW AREAS.

EXPLOSIVE POWER: HIGH IMPACT SENSITIVE: NO
 BURNING RATE: HIGH STATIC SENSITIVE: NO

***** SECTION V - HEALTH HAZARD DATA *****

PRODUCT GUIDE: TLV 5 MG/M3 - OIL MIST STEL: 5 MG/M3
 ROUTES OF ENTRY: EYE, INHALATION
 EFFECTS OF OVEREXPOSURE: ACUTE: YES EYE IRRITATION CHRONIC: YES LUNG CONGESTION
 CAUSES EYE IRRITATION. VAPORS IN HIGH CONCENTRATION ARE ANESTHETIC AND
 IRRITATE UPPER RESPIRATORY SYSTEM. EXCESS INHALATION MAY CAUSE DIZZINESS,
 GIDDINESS, AND NAUSEA. MISUSE OR DELIBERATE INHALATION MAY BE HARMFUL OR
 FATAL. PROLONGED AND REPEATED INHALATION MAY BE HARMFUL TO RESPIRATORY
 SYSTEM

LISTED AS A SUSPECTED CARCINOGEN: NO

EMERGENCY AND FIRST AID PROCEDURES:

EYE: IMMEDIATELY FLUSH WITH PLENTY OF WATER FOR 15 MIN. & CALL PHYSICIAN.
 SKIN: WASH THOROUGHLY WITH PLENTY OF WATER & SOAP.
 INHALATION: IF AFFECTED, REMOVE TO FRESH AIR. INGESTION: SEEK PHYSICIAN
 IMMEDIATELY, SHOW MSDS OR LABEL, DO NOT INDUCE VOMITING.

***** SECTION VI - REACTIVITY DATA *****

STABLE: YES CONDITIONS TO AVOID:
 KEEP AWAY FROM HEAT, SPARKS, FLAMES, OR SOURCES OF IGNITION.
 INCOMPATIBILITY(MATERIALS TO AVOID): YES STRONG OXIDIZING AGENTS.
 HAZARDOUS DECOMPOSITION PRODUCTS: YES CO, PYROLYSIS PRODUCTS
 HAZARDOUS POLYMERIZATION: NO CONDITIONS TO AVOID:
 N/A

***** SECTION VII - SPILL OR LEAK PROCEDURES *****

LISTED IN: SARA TITLE III, #302: NO #304, CERCLA: NO #313: NO
 STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:
 IN CASE OF SPILL: REMOVE ALL SOURCES OF IGNITION. VENTILATE THE AREA.
 CLEAN UP WITH ABSORBENT MATERIAL. CONTAIN AND PICK-UP WASTE MATERIALS.
 PUT IN A SEALED APPROVED CONTAINER.

REPORT QUANTITY, LB: N/A KG: N/A TPQ, LB: N/A
 REGULATIONS: WHMIS, RCRA OTHER: N/A
 HAZARD WASTE: FLAMMABLE, AEROSOL

NO.: D001 DISPOSAL METHOD:
 DISPOSE OF WASTES IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS.
 DO NOT PUNCTURE, INCINERATE (OR BURN) CONTAINERS.

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PART: 92180 PRODUCT NAME: PREMIER ETP CUTTING FLUID AERO PAGE 3 OF 2

***** SECTION VIII - SAFE HANDLING AND PROTECTION INFORMATION *****
RESPIRATORY PROTECTION: USE ONLY IN WELL VENTILATED AREAS.

VENTILATION-LOCAL: RECOMMENDED
MECHANICAL: REQUIRED

SPECIAL: N/A
OTHER: N/A

PROTECTIVE GLOVES: SOLVENT RESISTANT GLOVES EYE PROTECTION: SAFETY GOGGLES
OTHER PROTECTIVE EQUIPMENT

IF VENTILATION IS INADEQUATE, WEAR APPROVED RESPIRATORY EQUIPMENT.
ESTIMATED LD50, MG/KG: YES ORAL (RAT) 13000, ABSORPTION (RABBIT) 2000.
ESTIMATED LC50, PPM: NO
SENSITIZATION: NO
IRRITANT: NO

SYNERGISTIC AGENTS: NO

***** SECTION IX - SPECIAL PRECAUTIONS *****
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING:

KEEP IN A COOL PLACE. KEEP AWAY FROM HEAT, SPARKS, FLAMES, OR SOURCES OF
IGNITION. AVOID PROLONGED OR REPEATED BREATHING OF GAS, FUMES, VAPOR OR
SPRAY MIST. AVOID PROLONGED OR REPEATED CONTACT WITH SKIN. WASH THOROUGHLY
AFTER USING.

OTHER PRECAUTIONS:

DO NOT PUNCTURE, INCINERATE (OR BURN) CONTAINERS. KEEP OUT OF REACH OF
CHILDREN. ALWAYS READ AND FOLLOW DIRECTIONS ON PRODUCT LABEL. IN CASE OF
ACCIDENT OR ILLNESS, SEEK PHYSICIAN IMMEDIATELY, SHOW LABEL OR MSDS.
ADDITIONAL TECHNICAL DATA SHEETS AND/OR MATERIAL SAFETY DATA SHEETS (MSDS)
ARE AVAILABLE UPON REQUEST. FOR PROFESSIONAL AND INDUSTRIAL USE ONLY.

ALL INFORMATION AND RECOMMENDATIONS PROVIDED HEREIN ARE BELIEVED TO BE ACCURATE
AS OF THE DATE HEREOF. HOWEVER, SUCH INFORMATION AND RECOMMENDATIONS ARE
PROVIDED WITHOUT WARRANTY OF ANY KIND AND PREMIER INDUSTRIAL CORPORATION
DISCLAIMS ANY AND ALL LIABILITY OR LEGAL RESPONSIBILITY FOR USE OR RELIANCE
UPON SAME.

SAL 000006824

REV
MAY 18 1990
Material Safety Data Sheet
may be used to comply with
OSHA's Hazard Communication Standard,
29 CFR 1910.1200. Standard must be
consulted for specific requirements.

CA055

U.S. Department of Labor
Occupational Safety and Health Administration
(Non-Mandatory Form)
Form Approved
OMB No. 1218-0072



IDENTITY (As Used on Label and List)
COP-850 & 550 & 375

Note: Blank spaces are not permitted. If any item is not applicable, or no information is available, the space must be marked to indicate that.

Section I

Manufacturer's Name INTERCAT INCORPORATED	Emergency Telephone Number (201) 688-0303
Address (Number, Street, City, State, and ZIP Code) P.O. BOX 412	Telephone Number for Information (201) 688-0303
SEA GIRT, NEW JERSEY 08750	Date Prepared May 15, 1990
USA	Signature of Preparer (optional)

Section II — Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity; Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	% (optional)
ALUMINA HYDROXIDE	10mg/m ³ dust			99.5
	5mg/m ³ respirable dust			
non-soluble platinum salt		less than		0.5
CAS Registry Numbers for: Alumina Silicate - 1335-30-4				
Platinum - 7440-06-4				

Section III — Physical/Chemical Characteristics

Boiling Point	N/A	Specific Gravity (H ₂ O = 1)	1.0
Vapor Pressure (mm Hg.)	N/A	Melting Point	N/A
Vapor Density (AIR = 1)	N/A	Evaporation Rate (Butyl Acetate = 1)	N/A
Solubility in Water	NIL		
Appearance and Odor	white powder, odorless		

Section IV — Fire and Explosion Hazard Data

Flash Point (Method Used) non-flammable material	Flammable Limits N/A	LEL N/A	UEL N/A
Extinguishing Media non-flammable material			
Special Fire Fighting Procedures non-flammable material			

SAL 000006825

Unusual Fire and Explosion Hazards
NOT APPLICABLE. THIS IS AN INERT MATERIAL AND
WILL NOT PRODUCE A DUST EXPLOSION.

CA055

Section V — Reactivity Data

Stability	Unstable		Conditions to Avoid	N/A
	Stable	XX		

Incompatibility (Materials to Avoid) N/A

Hazardous Decomposition or Byproducts N/A

Hazardous Polymerization	May Occur		Conditions to Avoid	N/A
	Will Not Occur	XX		

Section VI — Health Hazard Data

Route(s) of Entry: Inhalation? YES Skin? NO Ingestion? YES

Health Hazards (Acute and Chronic)

EFFECTS OF OVEREXPOSURE: Physical irritation. No known long-term effects.
SKIN: May cause physical irritation if exposed to large amounts of dust.
SKIN: No hazard under normal circumstances. **INHALATION:** May cause physical irritation to upper respiratory tract. This material is classified a nuisance dust and as such does not produce significant organic disease or toxic effect with reasonable exposures. **INGESTION:** No hazard under normal circumstances.

Carcinogenicity: NTP? IARC Monographs? OSHA Regulated?

Signs and Symptoms of Exposure

EYES: physical irritation. INHALATION: coughing

Medical Conditions

Generally Aggravated by Exposure

ANY LUNG DISORDER

Emergency and First Aid Procedures

EMERGENCY AND FIRST AID PROCEDURES: EYES: Flush with large amounts of water for at least 15 minutes. If irritation occurs, seek medical aid. SKIN: Flush with water. INHALATION: If exposed to excessive amounts, remove to fresh air. INGESTION: Seek Medical Aid.

Section VII — Precautions for Safe Handling and Use

Steps to Be Taken in Case Material Is Released or Spilled

MATERIAL SHOULD BE PICKED UP AND PLACED IN DRUMS, BINS, OR OTHER APPROPRIATE CONTAINERS.

Waste Disposal Method

MAY BE DISPOSED OF IN A LANDFILL ACCORDING TO LOCAL, STATE AND FEDERAL REGULATIONS.

Precautions to Be Taken in Handling and Storing

NO SPECIAL PRECAUTIONS NECESSARY
N/A

Other Precautions

Section VIII — Control Measures

Respiratory Protection (Specify Type)

NIOSH approved air-purifying dust respirator

Ventilation	Local Exhaust	Special	N/A
	Mechanical (General)	MECHANICAL VENTILATION SHOULD BE USED TO CONTROL DUST LEVELS IN ENCLOSED AREAS.	

Protective Gloves

NOT NEEDED

Eye Protection

CHEMICAL GOGGLES

Other Protective Clothing or Equipment

NOT NEEDED

Work/Hygienic Practices

NO SPECIAL PRECAUTIONS NEEDED.

SAL 000006826

127
1 8 1990
Material Safety Data Sheet
to be used to comply with
OSHA's Hazard Communication Standard,
29 CFR 1910.1200. Standard must be
consulted for specific requirements.

CA 055

U.S. Department of Labor
Occupational Safety and Health Administration
(Non-Mandatory Form)
Form Approved
OMB No. 1218-0072



IDENTITY (As Used on Label and List)
COP-850 & 550 & 375

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Section I

Manufacturer's Name INTERCAT INCORPORATED	Emergency Telephone Number (201) 688-0303
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SEA GIRT, NEW JERSEY 08750	Date Prepared May 15, 1990
USA	Signature of Preparer (optional)

Section II — Hazardous Ingredients/Identify Information

Hazardous Components (Specific Chemical Identity; Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	% (optional)
ALUMINA HYDROXIDE	10mg/m ³ dust			99.5
	5mg/m ³ respirable dust			
non-soluble platinum salt		less than		0.5
CAS Registry Numbers for: Alumina Silicate - 1335-30-4				
Platinum - 7440-06-4				

Section III — Physical/Chemical Characteristics

Boiling Point	N/A	Specific Gravity (H ₂ O = 1)	1.0
Vapor Pressure (mm Hg.)	N/A	Melting Point	N/A
Vapor Density (AIR = 1)	N/A	Evaporation Rate (Butyl Acetate = 1)	N/A
Solubility in Water	NIL		
Appearance and Odor	white powder, odorless		

Section IV — Fire and Explosion Hazard Data

Flash Point (Method Used) non-flammable material	Flammable Limits N/A	LEL N/A	UEL N/A
Extinguishing Media non-flammable material			
Special Fire Fighting Procedures non-flammable material			

Unusual Fire and Explosion Hazards

NOT APPLICABLE. THIS IS AN INERT MATERIAL AND
WILL NOT PRODUCE A DUST EXPLOSION.

SAL 000006827

CA055

Section V — Reactivity Data

Stability	Unstable		Conditions to Avoid	N/A
	Stable	XX		
Incompatibility (Materials to Avoid)			N/A	
Hazardous Decomposition or Byproducts			N/A	
Hazardous Polymerization	May Occur		Conditions to Avoid	N/A
	Will Not Occur	XX		

Section VI — Health Hazard Data

Route(s) of Entry:	Inhalation?	YES	Skin?	NO	Ingestion?	YES
Health Hazards (Acute and Chronic)						
EFFECTS of OVEREXPOSURE: Physical irritation; No known long-term effects. EYES: May cause physical irritation if exposed to large amounts of dust. SKIN: No hazard under normal circumstances. DECONTAMINATION: May cause physical irritation to upper respiratory tract. This material is classified a nuisance dust and as such does not produce significant organic disease or toxic effect with reasonable exposures. INGESTION: No hazard under normal circumstances.						
Carcinogenicity:	NTP?		IARC Monographs?		OSHA Regulated?	

Signs and Symptoms of Exposure

EYES: physical irritation. INHALATION: coughing

Medical Conditions

Generally Aggravated by Exposure

ANY LUNG DISORDER

Emergency and First Aid Procedures

EMERGENCY AND FIRST AID PROCEDURES: EYES: Flush with large amounts of water for at least 15 minutes. If irritation occurs, seek medical aid. SKIN: Flush with water. INHALATION: If exposed to excessive amounts, remove to fresh air. INGESTION: Seek Medical Aid.

Section VII — Precautions for Safe Handling and Use

Steps to Be Taken in Case Material is Released or Spilled

MATERIAL SHOULD BE PICKED UP AND PLACED IN DRUMS, BINS, OR OTHER APPROPRIATE CONTAINERS.

Waste Disposal Method

MAY BE DISPOSED OF IN A LANDFILL ACCORDING TO LOCAL, STATE AND FEDERAL REGULATIONS.

Precautions to Be Taken in Handling and Storing

NO SPECIAL PRECAUTIONS NECESSARY

N/A

Other Precautions

Section VIII — Control Measures

Respiratory Protection (Specify Type)

NIOSH approved air-purifying dust respirator

Ventilation

Local Exhaust

Special

N/A

Mechanical (General) MECHANICAL VENTILATION SHOULD BE USED TO CONTROL DUST LEVELS IN ENCLOSED AREAS.

Protective Gloves

NOT NEEDED

Eye Protection

CHEMICAL GOGGLES

Other Protective Clothing or Equipment

NOT NEEDED

Work/Hygienic Practices

NO SPECIAL PRECAUTIONS NEEDED.

SAL 000006828



MATERIAL SAFETY DATA SHEET

MSDS NUMBER : 6145-04
REVIEW DATE : November 14, 1989

24 HOUR EMERGENCY ASSISTANCE		GENERAL MSDS ASSISTANCE
CRITERION: 800-777-6076 (IN USA)	CHENTREC: 800-426-9300 (IN USA)	CRITERION: 713-874-2600
CRITERION: 713-863-3942 (GLOBAL)	CANUTEC: 613-996-6666 (CANADA)	

HEALTH *	FIRE	REACTIVITY	HAZARD RATING :
2	0	0	LEAST-0 MODERATE-2 EXTREME-4

CA056

* For acute and chronic health effects refer to Section IV

SECTION I	NAME
-----------	------

PRODUCT CRITERION 344 CATALYST

CHEMICAL NAME C-344

CHEMICAL FAMILY METAL OXIDE

CRITERION PRODUCT CODE 55096 55095 55101
CRITERION FILE NUMBER 40706145 40706146 40706144

PRODUCT USE REFINERY PROCESSING

SECTION II-A		PRODUCT/INGREDIENT	
NO.	COMPOSITION	CAS NUMBER	PERCENT
P	CRITERION 344 CATALYST	MIXTURE	100
1	ALUMINUM OXIDE (ALUMINA) - Al_2O_3	1344-28-1	BALANCE
2	MOLYBDENUM OXIDE - MoO_3	1313-27-5	15
3	COBALT OXIDE - CoO	1307-96-6	3
4	PHOSPHOROUS OXIDE - P_2O_5	1314-56-3	5

SECTION II-B SARA TITLE III AND CERCLA INFORMATION					
NO.	SARA III EHS RQ (lbs) (*1)	SARA III EHS TPQ (lbs) (*2)	SARA III 311/312 CATEGORIES (*3)	SARA III SECTION 313 (*4)	CERCLA RQ (lbs) (*5)
1	Al_2O_3		H-1	YES	
2	MoO_3		H-1	YES	
3	CoO		H-1, H-2	YES, COBALT COMPOUNDS	
4	P_2O_5	1			

SPENT C-344 H-1, H-2, P-3

FOOTNOTES

- *1 REPORTABLE QUANTITY OF EXTREMELY HAZARDOUS SUBSTANCE UNDER SECTION 302
- *2 THRESHOLD PLANNING QUANTITY OF EXTREMELY HAZARDOUS SUBSTANCE UNDER SECTION 302
- *3 HAZARD CATEGORY FOR SECTION 311/312 REPORTING:
HEALTH H-1 = IMMEDIATE (ACUTE) HEALTH HAZARD H-2 = DELAYED (CHRONIC) HEALTH HAZARD
PHYSICAL P-3 = FIRE HAZARD P-4 = SUDDEN RELEASE OF PRESSURE HAZARD P-5 = REACTIVE HAZARD
- *4 TOXIC CHEMICAL UNDER SECTION 313, CATEGORY AS REQUIRED UNDER SECTION 313 (40 CFR 372.42).
- *5 REPORTABLE QUANTITY OF HAZARDOUS SUBSTANCE UNDER CERCLA

CA056

PRODUCT NAME: CRITERION 344 CATALYST
MSDS NO. 6145-04

SECTION II-C		ACUTE TOXICITY DATA		
NO.		ACUTE ORAL LD50 (mg/kg)	ACUTE DERMAL LD50 (mg/kg)	ACUTE INHALATION LC50 (mg/M3)
P	C-344	>5000 (RAT)	>1000 (RAT)	>748 (RAT - 4 HR)
	SPENT C-344	>5000 (RAT)	>1000 (RAT)	>748 (RAT - 4 HR)

SECTION III		WHMIS INFORMATION	
ACCORDING TO CRITERION'S UNDERSTANDING, THIS PRODUCT (C-344) IS CLASSIFIED UNDER THE CANADIAN WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS) AS:			
		POISONOUS AND INFECTIOUS CLASS D DIVISION 2, SUBDIVISION B.	
FOR SPENT CRITERION 344 CATALYST, THE WHMIS CLASSIFICATION IS:			
		POISONOUS AND INFECTIOUS CLASS D DIVISION 2, SUBDIVISION B.	
		FLAMMABLE AND COMBUSTIBLE CLASS B, DIVISION 6.	

SECTION IV		HEALTH INFORMATION		
THE HEALTH EFFECTS NOTED BELOW ARE CONSISTENT WITH REQUIREMENTS UNDER THE OSHA HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200).				

EYE CONTACT

PRODUCT MAY BE MILDLY IRRITATING TO THE EYES.

SKIN CONTACT

PRODUCT MAY BE MILDLY IRRITATING TO THE SKIN.

INHALATION

THIS PRODUCT MAY CAUSE IRRITATION TO THE NOSE, THROAT AND RESPIRATORY TRACT. MAY PRODUCE LUNG DAMAGE AND/OR SENSITIZATION BASED ON COMPONENT 3 (COBALT OXIDE).

INGESTION

GENERALLY CONSIDERED TO HAVE A LOW ORDER OF ACUTE ORAL TOXICITY.

SIGNS AND SYMPTOMS

IRRITATION AS NOTED ABOVE. LUNG DAMAGE MAY BE EVIDENCED BY SHORTNESS OF BREATH, ESPECIALLY ON EXERTION, AND MAY BE ACCOMPANIED BY CHRONIC COUGH. LUNG SENSITIZATION (E.G. ALLERGY, ASTHMA) MAY BE EVIDENCED BY WHEEZING WITH SHORTNESS OF BREATH AND COUGH.

AGGRAVATED MEDICAL CONDITIONS

PREEXISTING EYE, SKIN AND RESPIRATORY DISORDERS MAY BE AGGRAVATED BY EXPOSURE TO THIS PRODUCT. IMPAIRED LUNG FUNCTION(S) FROM PREEXISTING DISORDERS MAY BE AGGRAVATED BY EXPOSURE TO THIS PRODUCT. PREEXISTING SKIN OR LUNG ALLERGIES MAY INCREASE THE CHANCE OF DEVELOPING INCREASED ALLERGY SYMPTOMS FROM EXPOSURE TO THIS PRODUCT.

OTHER HEALTH EFFECTS

NO REPORTS OF HEART TOXICITY HAVE BEEN ASSOCIATED WITH THIS PRODUCT, HOWEVER, COBALT IS KNOWN TO CAUSE HEART TOXICITY (MYOCARDIOPATHY), WHICH MAY BE EVIDENCED BY EDEMA (SWELLING OF THE FEET) AND SHORTNESS OF BREATH ON EXERTION OR WHEN LYING SUPINE (ON THE BACK, WITH FACE UPWARD).

SECTION V		OCCUPATIONAL EXPOSURE LIMITS				
NO.		OSHA		ACGIH		OTHER
		TRANSITIONAL	FINAL RULE	TLV/TWA	TLV/STEL	
		LIMIT/PEL (mg/M3)	LIMIT/TWA (mg/M3)	(mg/M3)	(mg/M3)	
1	Al ₂ O ₃	15	10	10		TOTAL DUST
		5	5			RESPIRABLE FRACTION
2	MnO ₃	15	10	10		INSOLUBLE COMPOUNDS, TOTAL DUST
		5	5			INSOLUBLE COMPOUNDS, RESPIRABLE FRACTION
3	CoO	0.1	0.05	0.05		AS Co

- COMPLIANCE WITH TRANSITIONAL LIMITS REQUIRED BY ADMINISTRATIVE OR ENGINEERING CONTROLS ONLY, UNTIL 12/31/92.
- COMPLIANCE WITH FINAL RULE LIMITS BY ANY COMBINATION OF ENGINEERING CONTROLS, WORK PRACTICES AND PERSONAL PROTECTIVE EQUIPMENT UNTIL 12/31/92. STARTING 1/1/93, THE FINAL RULE LIMITS MUST BE MET BY ADMINISTRATIVE OR ENGINEERING CONTROLS ONLY.

CA056PRODUCT NAME: CRITERION 344 CATALYST
MSDS NO. 6145-04

SECTION VI EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT

FLUSH EYES WITH PLENTY OF WATER FOR 15 MINUTES WHILE HOLDING EYELIDS OPEN. GET MEDICAL ATTENTION.

SKIN CONTACT

REMOVE CONTAMINATED CLOTHING/SHOES AND WIPE EXCESS FROM SKIN. FLUSH SKIN WITH WATER. FOLLOW BY WASHING WITH SOAP AND WATER. IF IRRITATION OCCURS, GET MEDICAL ATTENTION. DO NOT REUSE CLOTHING UNTIL CLEANED.

INHALATION

REMOVE VICTIM TO FRESH AIR AND PROVIDE OXYGEN IF BREATHING IS DIFFICULT. GET MEDICAL ATTENTION.

INGESTION

DO NOT INDUCE VOMITING. DO NOT GIVE LIQUIDS IF VICTIM IS UNCONSCIOUS OR VERY DROWSY. OTHERWISE, GIVE LARGE QUANTITY OF WATER. IF VOMITTING OCCURS, REPEAT LIQUID ADMINISTRATION. GET MEDICAL ATTENTION IMMEDIATELY.

SECTION VII SUPPLEMENTAL HEALTH INFORMATION

IN ONE LIFETIME INHALATION STUDY, COBALT-EXPOSED HAMSTERS DEVELOPED PNEUMOCONIOSIS; ADDITIONALLY, THERE WERE NO INCREASES IN TUMORS.

STUDIES CONDUCTED ON GUINEA PIGS HAVE DETERMINED THAT SIMILAR CRITERION CATALYSTS TO C-344 ARE NOT SKIN SENSITIZERS. HOWEVER, SOME INDIVIDUALS MAY BE SUSCEPTIBLE TO COBALT SENSITIZATION.

SECTION VIII PHYSICAL DATA

BOILING POINT: APPROX. 4000
(DEG F)

SPECIFIC GRAVITY: NOT APPLICABLE
(H2O=1)

VAPOR PRESSURE: NOT SIGNIFICANT
(MM HG)

MELTING POINT: APPROX. 3700
(DEG F)

SOLUBILITY: APPROX. 5%
(IN WATER)

VAPOR DENSITY: NOT APPLICABLE
(AIR=1)

EVAPORATION RATE (N-BUTYL ACETATE = 1): NOT SIGNIFICANT

BULK DENSITY = 0.70 G/CC

APPEARANCE AND ODOR: BLUE-GREY, CYLINDER-SHAPED EXTRUDATES. NO ODOR.

SECTION IX FIRE AND EXPLOSION HAZARDS

FLASH POINT METHOD:

WILL NOT BURN. (SEE BELOW)

FLAMMABLE LIMITS % VOLUME IN AIR

LOWER: N/AP UPPER: N/AP

EXTINGUISHING MEDIA

AS PRODUCED, WILL NOT BURN. IF REDUCED (SPENT) CATALYST IS INVOLVED IN A FIRE, USE WATER FOG, FOAM, DRY CHEMICAL OR CO₂.

SPECIAL FIRE FIGHTING PROCEDURES AND PRECAUTIONS

WILL NOT BURN. WEAR FULL PROTECTIVE CLOTHING AND A NIOSH APPROVED SELF-CONTAINED BREATHING APPARATUS IF CATALYST IS IN FIRE AREA.

UNUSUAL FIRE AND EXPLOSION HAZARDS

AS PRODUCED, THE CATALYST WILL NOT BURN. HOWEVER, IN USE, THE CATALYST IS REDUCED AND SULFIDED. THE REDUCED FORM, ESPECIALLY WHEN WARM, REACTS WITH OXYGEN ON CONTACT WITH AIR. ENOUGH HEAT CAN BE PRODUCED TO BURN COKE OR RESIDUAL ORGANIC MATERIAL LEFT ON THE CATALYST, AND COULD IGNITE FLAMMABLE MIXTURES WHICH IT MAY CONTACT. TO PROTECT AGAINST THIS POSSIBILITY, SPENT CATALYST SHOULD BE OXIDIZED AND COOLED BEFORE REMOVING IT FROM THE REACTOR. OTHER MEASURES, SUCH AS COOLING AND BLANKETING WITH NITROGEN OR WATER WETTING THE CATALYST MAY ALSO BE USED TO RETARD OXIDATION.

SAL 000006831

CA 056

PRODUCT NAME: CRITERION 344 CATALYST
MSDS NO. 6145-06

SECTION X

REACTIVITY

STABILITY: STABLE

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

SECTION XI

EMPLOYEE PROTECTION

RESPIRATORY PROTECTION

USE A NIOSH-APPROVED RESPIRATOR TO PREVENT OVEREXPOSURE. IN ACCORD WITH 29 CFR 1910.134, USE EITHER AN ATMOSPHERE-SUPPLYING RESPIRATOR OR AN AIR-PURIFYING RESPIRATOR FOR PARTICULATES.

PROTECTIVE CLOTHING

AVOID PROLONGED OR REPEATED CONTACT WITH SKIN. WEAR GLOVES AND OTHER CLOTHING AS REQUIRED TO MINIMIZE CONTACT.

ADDITIONAL PROTECTIVE MEASURES

USE EXPLOSION-PROOF VENTILATION AS REQUIRED TO CONTROL PARTICULATE CONCENTRATIONS.

SECTION XII

ENVIRONMENTAL PROTECTION

SPILL OR LEAK PROCEDURES

WEAR NIOSH APPROVED RESPIRATOR WHEN DUST LEVELS EXCEED OCCUPATIONAL EXPOSURE LIMITS. WEAR GLOVES, GOGGLES AND PROTECTIVE CLOTHING TO CONTROL EXPOSURE TO BODY SURFACES. DO NOT DRY SWEEP OR USE METHODS WHICH INCREASE DUSTING. USE VACUUMING OR SWEEPING COMPOUND FOR CLEAN-UP. DO NOT WASH SPILLS INTO SEWERS OR OTHER PUBLIC WATER SYSTEMS.

WASTE DISPOSAL

UNDER EPA - RCRA (40 CFR 261.21), SPENT UNREGENERATED CATALYST IS A WASTE MATERIAL, IT COULD BE AN IGNITABLE HAZARDOUS WASTE, HAZARDOUS WASTE NUMBER D001. REFER TO LATEST EPA OR STATE REGULATIONS REGARDING PROPER DISPOSAL.

ENVIRONMENTAL HAZARDS

DO NOT WASH SPILLS INTO SEWERS OR OTHER PUBLIC WATER SYSTEMS.

SECTION XIII

SPECIAL PRECAUTIONS

DO NOT EAT, DRINK OR SMOKE IN AREAS WHERE CATALYST IS PRESENT. WASH HANDS THOROUGHLY AFTER HANDLING. KEEP CONTAINERS CLOSED WHEN NOT IN USE. NOTIFY AUTHORITIES IF MATERIAL THREATENS TO ENTER OR ENTERS INTO SEWER OR PUBLIC WATER SYSTEM. ALL PRECAUTIONS GIVEN FOR FRESH CATALYST SHOULD BE OBSERVED FOR SPENT CATALYST AND WASHINGS.

SECTION XIV

TRANSPORTATION REQUIREMENTS

DEPARTMENT OF TRANSPORTATION CLASSIFICATION: FRESH CATALYST NOT HAZARDOUS BY DOT REG*

OTHER REQUIREMENTS:

* SPENT CATALYST ONLY - FLAMMABLE SOLID N.O.S. UN1325.

SAL 000006832

CA 056

PRODUCT NAME: CRITERION 344 CATALYST
MSDS NO. 6145-04

SECTION XV

OTHER REGULATORY CONTROLS

THE COMPONENTS OF THIS PRODUCT ARE LISTED ON THE EPA/TSCA INVENTORY OF CHEMICAL SUBSTANCES.

THE INFORMATION CONTAINED HEREIN IS BASED ON THE DATA AVAILABLE TO US AND IS BELIEVED TO BE CORRECT. HOWEVER, CRITERION MAKES NO WARRANTY, EXPRESSED OR IMPLIED, REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF. CRITERION ASSUMES NO RESPONSIBILITY FOR INJURY FROM THE USE OF THE PRODUCT DESCRIBED HEREIN.

SECTION XVI

SUMMARY OF REVISIONS

MSDS NUMBER	DATE	NATURE OF REVISION(S)
6145-01	JANUARY 18, 1989	ORIGINAL ISSUE
6145-02	MAY 15, 1989	ADD NEW OSHA TRANSITIONAL AND FINAL RULE EXPOSURE LIMITS. ADD SECTION XVI - SUMMARY OF REVISIONS. ADD REVIEW DATE TO TOP OF PAGE 1. CORRECT TYPO IN CAS NUMBER FOR COBALT OXIDE TO 1307-96-6.
6145-03	JUNE 23, 1989	ADD PRODUCT CODE NUMBERS TO MSDS.
6145-04	November 14, 1989	ADD CERCLA INFORMATION TO SECTIONS IIB AND XII WHERE APPROPRIATE. CHANGE PRODUCT CODE NUMBERS (DROP 93's AND -'s).

REVIEW DATE: November 14, 1989

Donald C. McCulloch

DONALD C. MCCULLOCH
TECHNICAL DIRECTOR
CRITERION CATALYST COMPANY L.P.

SAL 000006833



MATERIAL SAFETY DATA SHEET

MSDS NUMBER : 6165-05
REVIEW DATE : February 24, 1990

24 HOUR EMERGENCY ASSISTANCE		GENERAL MSDS ASSISTANCE
CRITERION: 800-777-6076 (IN USA)	CHEMTREC: 800-424-9300 (IN USA)	CRITERION: 713-874-2600
CRITERION: 713-863-3942 (GLOBAL)	CANUTEC: 613-996-6666 (CANADA)	

HEALTH *	FIRE	REACTIVITY	HAZARD RATING :
2	0	0	LEAST-0 MODERATE-2 EXTREME-4

CA057

* For acute and chronic health effects refer to Section IV

SECTION I NAME

PRODUCT CRITERION TRILOBE® 447 CATALYST
CHEMICAL NAME C-447
CHEMICAL FAMILY METAL OXIDE
CRITERION PRODUCT CODE 55450 55460 55470 55455
CRITERION FILE NUMBER 40706213 40706165 40706212
PRODUCT USE REFINERY PROCESSING

SECTION II-A PRODUCT/INGREDIENT

NO.	COMPOSITION	CAS NUMBER	PERCENT
P	CRITERION TRILOBE® 447 CATALYST	MIXTURE	100
1	ALUMINUM OXIDE (ALUMINA) - Al_2O_3	1344-28-1	BALANCE
2	MOLYBDENUM OXIDE - MoO_3	1313-27-5	15.5
3	COBALT OXIDE - CoO	1307-96-6	4.5

SECTION II-B SARA TITLE III AND CERCLA INFORMATION

NO.	SARA III EHS RQ (lbs) (*1)	SARA III EHS TPQ (lbs) (*2)	SARA III 311/312 CATEGORIES (*3)	SARA III SECTION 313 (*4)	CERCLA RQ (lbs) (*5)
1	Al_2O_3		H-1		
2	MoO_3		H-1	YES	
3	CoO		H-1, H-2	YES, COBALT COMPOUNDS	

SPENT C-447

H-1, H-2, P-3

FOOTNOTES

- *1 REPORTABLE QUANTITY OF EXTREMELY HAZARDOUS SUBSTANCE UNDER SECTION 302
- *2 THRESHOLD PLANNING QUANTITY OF EXTREMELY HAZARDOUS SUBSTANCE UNDER SECTION 302
- *3 HAZARD CATEGORY FOR SECTION 311/312 REPORTING:
HEALTH H-1 = IMMEDIATE (ACUTE) HEALTH HAZARD H-2 = DELAYED (CHRONIC) HEALTH HAZARD
PHYSICAL P-3 = FIRE HAZARD P-4 = SUDDEN RELEASE OF PRESSURE HAZARD P-5 = REACTIVE HAZARD
- *4 TOXIC CHEMICAL UNDER SECTION 313, CATEGORY AS REQUIRED UNDER SECTION 313 (40 CFR 372.42).
- *5 REPORTABLE QUANTITY OF HAZARDOUS SUBSTANCE UNDER CERCLA

CA 057

PRODUCT NAME: CRITERION TRILOBE® 447 CATALYST
MSDS NO. 6165-05**SECTION II-C ACUTE TOXICITY DATA**

NO.	ACUTE ORAL LD50 (mg/kg)	ACUTE DERMAL LD50 (mg/kg)	ACUTE INHALATION LC50 (mg/M3)
P C-447	>5000 (RAT) ^a	>1000 (RAT) ^a	>748 (RAT - 4 HR) ^a

^a BASED ON SIMILAR PRODUCT TESTING.**SECTION III WHMIS INFORMATION**

ACCORDING TO CRITERION'S UNDERSTANDING, THIS PRODUCT (C-447) IS CLASSIFIED UNDER THE CANADIAN WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS) AS:

POISONOUS AND INFECTIOUS CLASS D DIVISION 2, SUBDIVISION B.

FOR SPENT CRITERION TRILOBE® 447 CATALYST, THE WHMIS CLASSIFICATION IS:

POISONOUS AND INFECTIOUS CLASS D DIVISION 2, SUBDIVISION B.

FLAMMABLE AND COMBUSTIBLE CLASS B, DIVISION 6.

SECTION IV HEALTH INFORMATION

THE HEALTH EFFECTS NOTED BELOW ARE CONSISTENT WITH REQUIREMENTS UNDER THE OSHA HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200).

EYE CONTACT

PRODUCT MAY BE MILDLY IRRITATING TO THE EYES.

SKIN CONTACT

PRODUCT MAY BE MILDLY IRRITATING TO THE SKIN.

INHALATION

THIS PRODUCT MAY CAUSE IRRITATION TO THE NOSE, THROAT AND RESPIRATORY TRACT. MAY PRODUCE LUNG DAMAGE AND/OR SENSITIZATION BASED ON COMPONENT 3 (COBALT OXIDE).

INGESTION

GENERALLY CONSIDERED TO HAVE A LOW ORDER OF ACUTE ORAL TOXICITY.

SIGNS AND SYMPTOMS

IRRITATION AS NOTED ABOVE. LUNG DAMAGE MAY BE EVIDENCED BY SHORTNESS OF BREATH, ESPECIALLY ON EXERTION, AND MAY BE ACCOMPANIED BY CHRONIC COUGH. LUNG SENSITIZATION (E.G. ALLERGY, ASTHMA) MAY BE EVIDENCED BY WHEEZING WITH SHORTNESS OF BREATH AND COUGH.

AGGRAVATED MEDICAL CONDITIONS

PREEXISTING EYE, SKIN AND RESPIRATORY DISORDERS MAY BE AGGRAVATED BY EXPOSURE TO THIS PRODUCT. IMPAIRED LUNG FUNCTION(S) FROM PREEXISTING DISORDERS MAY BE AGGRAVATED BY EXPOSURE TO THIS PRODUCT. PREEXISTING SKIN OR LUNG ALLERGIES MAY INCREASE THE CHANCE OF DEVELOPING INCREASED ALLERGY SYMPTOMS FROM EXPOSURE TO THIS PRODUCT.

OTHER HEALTH EFFECTS

NO REPORTS OF HEART TOXICITY HAVE BEEN ASSOCIATED WITH THIS PRODUCT, HOWEVER, COBALT IS KNOWN TO CAUSE HEART TOXICITY (MYOCARDIOPATHY), WHICH MAY BE EVIDENCED BY EDEMA (SWELLING OF THE FEET) AND SHORTNESS OF BREATH ON EXERTION OR WHEN LYING SUPINE (ON THE BACK, WITH FACE UPWARD).

SECTION V OCCUPATIONAL EXPOSURE LIMITS

NO.		OSHA		ACGIH		OTHER
		TRANSITIONAL LIMIT/PEL (mg/M3)	FINAL RULE LIMIT/TWA (mg/M3)	TLV/TWA (mg/M3)	TLV/STEL (mg/M3)	
1	Al ₂ O ₃	15	10	10		TOTAL DUST
		5	5			RESPIRABLE FRACTION
2	MnO ₃	15	10	10		INSOLUBLE COMPOUNDS, TOTAL DUST
		5	5			INSOLUBLE COMPOUNDS, RESPIRABLE FRACTION
3	CoO	0.1	0.05	0.05		AS Co

^a COMPLIANCE WITH TRANSITIONAL LIMITS REQUIRED BY ADMINISTRATIVE OR ENGINEERING CONTROLS ONLY, UNTIL 12/31/92.^{**} COMPLIANCE WITH FINAL RULE LIMITS BY ANY COMBINATION OF ENGINEERING CONTROLS, WORK PRACTICES AND PERSONAL PROTECTIVE EQUIPMENT UNTIL 12/31/92. STARTING 1/1/93, THE FINAL RULE LIMITS MUST BE MET BY ADMINISTRATIVE OR ENGINEERING CONTROLS ONLY.

CA057

PRODUCT NAME: CRITERION TRILOBE® 447 CATALYST
NEDS NO. 6165-05

SECTION VI EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT

FLUSH EYES WITH PLENTY OF WATER FOR 15 MINUTES WHILE HOLDING EYELIDS OPEN. GET MEDICAL ATTENTION.

SKIN CONTACT

REMOVE CONTAMINATED CLOTHING/SHOES AND WIPE EXCESS FROM SKIN. FLUSH SKIN WITH WATER. FOLLOW BY WASHING WITH SOAP AND WATER. IF IRRITATION OCCURS, GET MEDICAL ATTENTION. DO NOT REUSE CLOTHING UNTIL CLEANED.

INHALATION

REMOVE VICTIM TO FRESH AIR AND PROVIDE OXYGEN IF BREATHING IS DIFFICULT. GET MEDICAL ATTENTION.

INGESTION

DO NOT INDUCE VOMITING. DO NOT GIVE LIQUIDS IF VICTIM IS UNCONSCIOUS OR VERY DROWSY. OTHERWISE, GIVE LARGE QUANTITY OF WATER. IF VOMITTING OCCURS, REPEAT LIQUID ADMINISTRATION. GET MEDICAL ATTENTION IMMEDIATELY.

SECTION VII SUPPLEMENTAL HEALTH INFORMATION

IN ONE LIFETIME INHALATION STUDY, COBALT-EXPOSED HAMSTERS DEVELOPED PNEUMOCONIOSIS; ADDITIONALLY, THERE WERE NO INCREASES IN TUMORS.

STUDIES CONDUCTED ON GUINEA PIGS HAVE DETERMINED THAT SIMILAR CRITERION CATALYSTS TO C-447 ARE NOT SKIN SENSITIZERS. HOWEVER, SOME INDIVIDUALS MAY BE SUSCEPTIBLE TO COBALT SENSITIZATION.

SECTION VIII PHYSICAL DATA

BOILING POINT: APPROX. 4000
(DEG F)

SPECIFIC GRAVITY: NOT APPLICABLE
(H₂O=1)

VAPOR PRESSURE: NOT SIGNIFICANT
(MM HG)

MELTING POINT: APPROX. 3700
(DEG F)

SOLUBILITY: APPROX. 5X
(IN WATER)

VAPOR DENSITY: NOT APPLICABLE
(AIR=1)

EVAPORATION RATE (N-BUTYL ACETATE = 1): NOT SIGNIFICANT

BULK DENSITY = 0.74 G/CC

APPEARANCE AND ODOR: BLuish-GREY, TRILOBE®-SHAPED EXTRUDATES. NO ODOR.

SECTION IX FIRE AND EXPLOSION HAZARDS

FLASH POINT METHOD:

WILL NOT BURN. (SEE BELOW)

FLAMMABLE LIMITS % VOLUME IN AIR

LOWER: N/AP UPPER: N/AP

EXTINGUISHING MEDIA

AS PRODUCED, WILL NOT BURN. IF REDUCED (SPENT) CATALYST IS INVOLVED IN A FIRE, USE WATER FOG, FOAM, DRY CHEMICAL OR CO₂.

SPECIAL FIRE FIGHTING PROCEDURES AND PRECAUTIONS

WILL NOT BURN. WEAR FULL PROTECTIVE CLOTHING AND A WIDSH APPROVED SELF-CONTAINED BREATHING APPARATUS IF CATALYST IS IN FIRE AREA.

UNUSUAL FIRE AND EXPLOSION HAZARDS

AS PRODUCED, THE CATALYST WILL NOT BURN. HOWEVER, IN USE, THE CATALYST IS REDUCED AND SULFIDED. THE REDUCED FORM, ESPECIALLY WHEN WARM, REACTS WITH OXYGEN ON CONTACT WITH AIR. ENOUGH HEAT CAN BE PRODUCED TO BURN COKE OR RESIDUAL ORGANIC MATERIAL LEFT ON THE CATALYST, AND COULD IGNITE FLAMMABLE MIXTURES WHICH IT MAY CONTACT. TO PROTECT AGAINST THIS POSSIBILITY, SPENT CATALYST SHOULD BE OXIDIZED AND COOLED BEFORE REMOVING IT FROM THE REACTOR. OTHER MEASURES, SUCH AS COOLING AND BLANKETING WITH NITROGEN OR WATER WETTING THE CATALYST MAY ALSO BE USED TO RETARD OXIDATION.

SAL 000006836

CA057

PRODUCT NAME: CRITERION TRILOBE® 447 CATALYST
MSDS NO. 6165-05

SECTION X REACTIVITY

STABILITY: STABLE

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

SECTION XI EMPLOYEE PROTECTION

RESPIRATORY PROTECTION

USE A NIOSH-APPROVED RESPIRATOR TO PREVENT OVEREXPOSURE. IN ACCORD WITH 29 CFR 1910.134, USE EITHER AN ATMOSPHERE-SUPPLYING RESPIRATOR OR AN AIR-PURIFYING RESPIRATOR FOR PARTICULATES.

PROTECTIVE CLOTHING

AVOID PROLONGED OR REPEATED CONTACT WITH SKIN. WEAR GLOVES AND OTHER CLOTHING AS REQUIRED TO MINIMIZE CONTACT.

ADDITIONAL PROTECTIVE MEASURES

USE EXPLOSION-PROOF VENTILATION AS REQUIRED TO CONTROL PARTICULATE CONCENTRATIONS.

SECTION XII ENVIRONMENTAL PROTECTION

SPILL OR LEAK PROCEDURES

WEAR NIOSH APPROVED RESPIRATOR WHEN DUST LEVELS EXCEED OCCUPATIONAL EXPOSURE LIMITS. WEAR GLOVES, GOGGLES AND PROTECTIVE CLOTHING TO CONTROL EXPOSURE TO BODY SURFACES. DO NOT DRY SWEEP OR USE METHODS WHICH INCREASE DUSTING. USE VACUUMING OR SWEEPING COMPOUND FOR CLEAN-UP. DO NOT WASH SPILLS INTO SEWERS OR OTHER PUBLIC WATER SYSTEMS.

WASTE DISPOSAL

UNDER EPA - RCRA (40 CFR 261.21), SPENT UNREGENERATED CATALYST IS A WASTE MATERIAL, IT COULD BE AN IGNITABLE HAZARDOUS WASTE, HAZARDOUS WASTE NUMBER D001. REFER TO LATEST EPA OR STATE REGULATIONS REGARDING PROPER DISPOSAL.

ENVIRONMENTAL HAZARDS

DO NOT WASH SPILLS INTO SEWERS OR OTHER PUBLIC WATER SYSTEMS.

SECTION XIII SPECIAL PRECAUTIONS

DO NOT EAT, DRINK OR SMOKE IN AREAS WHERE CATALYST IS PRESENT. WASH HANDS THOROUGHLY AFTER HANDLING. KEEP CONTAINERS CLOSED WHEN NOT IN USE. NOTIFY AUTHORITIES IF MATERIAL THREATENS TO ENTER OR ENTERS INTO SEWER OR PUBLIC WATER SYSTEM. ALL PRECAUTIONS GIVEN FOR FRESH CATALYST SHOULD BE OBSERVED FOR SPENT CATALYST AND WASHINGS.

SECTION XIV TRANSPORTATION REQUIREMENTS

DEPARTMENT OF TRANSPORTATION CLASSIFICATION: FRESH CATALYST NOT HAZARDOUS BY DOT REG^{*}

OTHER REQUIREMENTS:

^{*} SPENT CATALYST ONLY - FLAMMABLE SOLID H.O.S. UN1325.

SAL 000006837

CA 057

PRODUCT NAME: CRITERION TRILOBE® 447 CATALYST
MSDS NO. 6165-05**SECTION XV OTHER REGULATORY CONTROLS**

THE COMPONENTS OF THIS PRODUCT ARE LISTED ON THE EPA/TSCA INVENTORY OF CHEMICAL SUBSTANCES.

THE INFORMATION CONTAINED HEREIN IS BASED ON THE DATA AVAILABLE TO US AND IS BELIEVED TO BE CORRECT. HOWEVER, CRITERION MAKES NO WARRANTY, EXPRESSED OR IMPLIED, REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF. CRITERION ASSUMES NO RESPONSIBILITY FOR INJURY FROM THE USE OF THE PRODUCT DESCRIBED HEREIN.

SECTION XVI SUMMARY OF REVISIONS

MSDS NUMBER	DATE	NATURE OF REVISION(S)
6165-01	DECEMBER 28, 1988	ORIGINAL ISSUE
6165-02	MAY 14, 1989	ADD NEW OSHA TRANSITIONAL AND FINAL RULE EXPOSURE LIMITS. ADD SECTION XVI - SUMMARY OF REVISIONS. ADD REVIEW DATE TO TOP OF PAGE 1. CORRECT TYPO IN CAS NUMBER FOR COBALT OXIDE TO 1307-96-6.
6165-03	JUNE 23, 1989	ADD PRODUCT CODE 93552-05 TO MSDS.
6165-04	November 14, 1989	ADD CERCLA INFORMATION TO SECTIONS IIB AND XII WHERE APPROPRIATE. CORRECT PRODUCT CODE 93552-05 TO 93554-55. CHANGE PRODUCT CODE NUMBERS (DROP 93's AND -'s).
6165-05	February 24, 1990	MODIFY MSDS TO REFLECT OFFICIAL DELISTING ON FEBRUARY 14, 1990 OF NON-FIBROUS ALUMINUM OXIDE FROM SARA III SECTION 313 REPORTING LIST.

REVIEW DATE: February 24, 1990

Donald C. McCulloch

DONALD C. MCCULLOCH
TECHNICAL DIRECTOR
CRITERION CATALYST COMPANY L.P.

SAL 000006838



CRITERION
CATALYSTS

MATERIAL SAFETY DATA SHEET

MSDS NUMBER : 6169-05

REVIEW DATE : February 24, 1990

24 HOUR EMERGENCY ASSISTANCE		GENERAL MSDS ASSISTANCE
CRITERION: 800-777-6076 (IN USA)	CHEMTREC: 800-424-9300 (IN USA)	CRITERION: 713-874-2600
CRITERION: 713-863-3942 (GLOBAL)	CANUTEC: 613-996-6666 (CANADA)	

HEALTH *	FIRE	REACTIVITY	LEAST-0
2	0	0	HAZARD RATING : MODERATE-2 EXTREME-4

CA058

* For acute and chronic health effects refer to Section IV

SECTION I PRODUCT NAME

PRODUCT CRITERION 544 CATALYST
CHEMICAL NAME C-544
CHEMICAL FAMILY METAL OXIDE
CRITERION PRODUCT CODE 55240 55250
CRITERION FILE NUMBER 40706170 40706169
PRODUCT USE REFINERY PROCESSING

SECTION II-A PRODUCT/INGREDIENT

NO.	COMPOSITION	CAS NUMBER	PERCENT
P	CRITERION 544 CATALYST	MIXTURE	100
1	ALUMINUM OXIDE (ALUMINA) - Al_2O_3	1344-28-1	BALANCE
2	MOLYBDENUM OXIDE - MoO_3	1313-27-5	8
3	COBALT OXIDE - CoO	1307-96-6	2.2

SECTION II-B SARA TITLE III AND CERCLA INFORMATION

NO.	SARA III EHS RQ (lbs) (*1)	SARA III EHS TPQ (lbs) (*2)	SARA III 311/312 CATEGORIES (*3)	SARA III SECTION 313 (*4)	CERCLA RQ (lbs) (*5)
1	Al_2O_3		H-1		
2	MoO_3		H-1	YES	
3	CoO		H-1, H-2	YES, COBALT COMPOUNDS	

SPENT C-544

H-1, H-2, P-3

FOOTNOTES

- *1 REPORTABLE QUANTITY OF EXTREMELY HAZARDOUS SUBSTANCE UNDER SECTION 302
- *2 THRESHOLD PLANNING QUANTITY OF EXTREMELY HAZARDOUS SUBSTANCE UNDER SECTION 302
- *3 HAZARD CATEGORY FOR SECTION 311/312 REPORTING:
HEALTH H-1 = IMMEDIATE (ACUTE) HEALTH HAZARD H-2 = DELAYED (CHRONIC) HEALTH HAZARD
PHYSICAL P-3 = FIRE HAZARD P-4 = SUDDEN RELEASE OF PRESSURE HAZARD P-5 = REACTIVE HAZARD
- *4 TOXIC CHEMICAL UNDER SECTION 313, CATEGORY AS REQUIRED UNDER SECTION 313 (40 CFR 372.42).
- *5 REPORTABLE QUANTITY OF HAZARDOUS SUBSTANCE UNDER CERCLA

SECTION II-C ACUTE TOXICITY DATA			
NO.	ACUTE ORAL LD50 (mg/kg)	ACUTE DERMAL LD50 (mg/kg)	ACUTE INHALATION LC50 (mg/K3)
P C-544	>5000 (RAT)*	>1000 (RAT)*	>748 (RAT - 4 HR)*

* BASED ON SIMILAR PRODUCT TESTING.

SECTION III WHMIS INFORMATION	
ACCORDING TO CRITERION'S UNDERSTANDING, THIS PRODUCT (C-544) IS CLASSIFIED UNDER THE CANADIAN WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS) AS:	
POISONOUS AND INFECTIOUS CLASS D DIVISION 2, SUBDIVISION B.	

FOR SPENT CRITERION 544 CATALYST, THE WHMIS CLASSIFICATION IS:
POISONOUS AND INFECTIOUS CLASS D DIVISION 2, SUBDIVISION B.
FLAMMABLE AND COMBUSTIBLE CLASS B, DIVISION 6.

SECTION IV HEALTH INFORMATION	
THE HEALTH EFFECTS NOTED BELOW ARE CONSISTENT WITH REQUIREMENTS UNDER THE OSHA HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200).	

EYE CONTACT
PRODUCT MAY BE MILDLY IRRITATING TO THE EYES.

SKIN CONTACT
PRODUCT MAY BE MILDLY IRRITATING TO THE SKIN.

INHALATION
THIS PRODUCT MAY CAUSE IRRITATION TO THE NOSE, THROAT AND RESPIRATORY TRACT. MAY PRODUCE LUNG DAMAGE AND/OR SENSITIZATION BASED ON COMPONENT 3 (COBALT OXIDE).

INGESTION
GENERALLY CONSIDERED TO HAVE A LOW ORDER OF ACUTE ORAL TOXICITY.

SIGNS AND SYMPTOMS
IRRITATION AS NOTED ABOVE. LUNG DAMAGE MAY BE EVIDENCED BY SHORTNESS OF BREATH, ESPECIALLY ON EXERTION, AND MAY BE ACCOMPANIED BY CHRONIC COUGH. LUNG SENSITIZATION (E.G. ALLERGY, ASTHMA) MAY BE EVIDENCED BY WHEEZING WITH SHORTNESS OF BREATH AND COUGH.

AGGRAVATED MEDICAL CONDITIONS
PREEXISTING EYE, SKIN AND RESPIRATORY DISORDERS MAY BE AGGRAVATED BY EXPOSURE TO THIS PRODUCT. IMPAIRED LUNG FUNCTION(S) FROM PREEXISTING DISORDERS MAY BE AGGRAVATED BY EXPOSURE TO THIS PRODUCT. PREEXISTING SKIN OR LUNG ALLERGIES MAY INCREASE THE CHANCE OF DEVELOPING INCREASED ALLERGY SYMPTOMS FROM EXPOSURE TO THIS PRODUCT.

OTHER HEALTH EFFECTS
NO REPORTS OF HEART TOXICITY HAVE BEEN ASSOCIATED WITH THIS PRODUCT, HOWEVER, COBALT IS KNOWN TO CAUSE HEART TOXICITY (MYOCARDIOPATHY), WHICH MAY BE EVIDENCED BY EDEMA (SWELLING OF THE FEET) AND SHORTNESS OF BREATH ON EXERTION OR WHEN LYING SUPINE (ON THE BACK, WITH FACE UPWARD).

SECTION V OCCUPATIONAL EXPOSURE LIMITS						
NO.		OSHA		ACGIH		OTHER
		TRANSITIONAL LIMIT/PEL (mg/M3)	FINAL RULE LIMIT/TWA (mg/M3)	TLV/TWA (mg/M3)	TLV/STEL (mg/M3)	
1	Al ₂ O ₃	15 5	10 5	10		TOTAL DUST RESPIRABLE FRACTION
2	MoO ₃	15 5	10 5	10		INSOLUBLE COMPOUNDS, TOTAL DUST INSOLUBLE COMPOUNDS, RESPIRABLE FRACTION
3	CoO	0.1	0.05	0.05		AS Co

* COMPLIANCE WITH TRANSITIONAL LIMITS REQUIRED BY ADMINISTRATIVE OR ENGINEERING CONTROLS ONLY, UNTIL 12/31/92.
** COMPLIANCE WITH FINAL RULE LIMITS BY ANY COMBINATION OF ENGINEERING CONTROLS, WORK PRACTICES AND PERSONAL PROTECTIVE EQUIPMENT UNTIL 12/31/92. STARTING 1/1/93, THE FINAL RULE LIMITS MUST BE MET BY ADMINISTRATIVE OR ENGINEERING CONTROLS ONLY.

CA 058

PRODUCT NAME: CRITERION 544 CATALYST
MSDS NO. 6169-05

SECTION VI EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT

FLUSH EYES WITH PLENTY OF WATER FOR 15 MINUTES WHILE HOLDING EYELIDS OPEN. GET MEDICAL ATTENTION.

SKIN CONTACT

REMOVE CONTAMINATED CLOTHING/SHOES AND WIPE EXCESS FROM SKIN. FLUSH SKIN WITH WATER. FOLLOW BY WASHING WITH SOAP AND WATER. IF IRRITATION OCCURS, GET MEDICAL ATTENTION. DO NOT REUSE CLOTHING UNTIL CLEANED.

INHALATION

REMOVE VICTIM TO FRESH AIR AND PROVIDE OXYGEN IF BREATHING IS DIFFICULT. GET MEDICAL ATTENTION.

INGESTION

DO NOT INDUCE VOMITING. DO NOT GIVE LIQUIDS IF VICTIM IS UNCONSCIOUS OR VERY DROWSY. OTHERWISE, GIVE LARGE QUANTITY OF WATER. IF VOMITTING OCCURS, REPEAT LIQUID ADMINISTRATION. GET MEDICAL ATTENTION IMMEDIATELY.

SECTION VII SUPPLEMENTAL HEALTH INFORMATION

IN ONE LIFETIME INHALATION STUDY, COBALT-EXPOSED HAMSTERS DEVELOPED PNEUMOCONIOSIS; ADDITIONALLY, THERE WERE NO INCREASES IN TUMORS.

STUDIES CONDUCTED ON GUINEA PIGS HAVE DETERMINED THAT SIMILAR CRITERION CATALYSTS TO C-544 ARE NOT SKIN SENSITIZERS. HOWEVER, SOME INDIVIDUALS MAY BE SUSCEPTIBLE TO COBALT SENSITIZATION.

SECTION VIII PHYSICAL DATA

BOILING POINT: APPROX. 4000
(DEG F)

SPECIFIC GRAVITY: NOT APPLICABLE
(H₂O=1)

VAPOR PRESSURE: NOT SIGNIFICANT
(MM HG)

MELTING POINT: APPROX. 3700
(DEG F)

SOLUBILITY: APPROX. 5%
(IN WATER)

VAPOR DENSITY: NOT APPLICABLE
(AIR=1)

EVAPORATION RATE (N-BUTYL ACETATE = 1): NOT SIGNIFICANT

BULK DENSITY = 0.82 G/CC

APPEARANCE AND ODOR: BLUE SPHERES. NO ODOR.

SECTION IX FIRE AND EXPLOSION HAZARDS

FLASH POINT METHOD:

WILL NOT BURN. (SEE BELOW)

FLAMMABLE LIMITS % VOLUME IN AIR

LOWER: N/A UPPER: N/A

EXTINGUISHING MEDIA

AS PRODUCED, WILL NOT BURN. IF REDUCED (SPENT) CATALYST IS INVOLVED IN A FIRE, USE WATER FOG, FOAM, DRY CHEMICAL OR CO₂.

SPECIAL FIRE FIGHTING PROCEDURES AND PRECAUTIONS

WILL NOT BURN. WEAR FULL PROTECTIVE CLOTHING AND A NIOSH APPROVED SELF-CONTAINED BREATHING APPARATUS IF CATALYST IS IN FIRE AREA.

UNUSUAL FIRE AND EXPLOSION HAZARDS

AS PRODUCED, THE CATALYST WILL NOT BURN. HOWEVER, IN USE, THE CATALYST IS REDUCED AND SULFIDED. THE REDUCED FORM, ESPECIALLY WHEN WARM, REACTS WITH OXYGEN ON CONTACT WITH AIR. ENOUGH HEAT CAN BE PRODUCED TO BURN COKE OR RESIDUAL ORGANIC MATERIAL LEFT ON THE CATALYST, AND COULD IGNITE FLAMMABLE MIXTURES WHICH IT MAY CONTACT. TO PROTECT AGAINST THIS POSSIBILITY, SPENT CATALYST SHOULD BE OXIDIZED AND COOLED BEFORE REMOVING IT FROM THE REACTOR. OTHER MEASURES, SUCH AS COOLING AND BLANKETING WITH NITROGEN OR WATER WETTING THE CATALYST MAY ALSO BE USED TO RETARD OXIDATION.

SAL 000006841

CA058

PRODUCT NAME: CRITERION 544 CATALYST
MSDS NO. 6169-05

SECTION X

REACTIVITY

STABILITY: STABLE

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

SECTION XI

EMPLOYEE PROTECTION

RESPIRATORY PROTECTION

USE A NIOSH-APPROVED RESPIRATOR TO PREVENT OVEREXPOSURE. IN ACCORD WITH 29 CFR 1910.134, USE EITHER AN ATMOSPHERE-SUPPLYING RESPIRATOR OR AN AIR-PURIFYING RESPIRATOR FOR PARTICULATES.

PROTECTIVE CLOTHING

AVOID PROLONGED OR REPEATED CONTACT WITH SKIN. WEAR GLOVES AND OTHER CLOTHING AS REQUIRED TO MINIMIZE CONTACT.

ADDITIONAL PROTECTIVE MEASURES

USE EXPLOSION-PROOF VENTILATION AS REQUIRED TO CONTROL PARTICULATE CONCENTRATIONS.

SECTION XII

ENVIRONMENTAL PROTECTION

SPILL OR LEAK PROCEDURES

WEAR NIOSH APPROVED RESPIRATOR WHEN DUST LEVELS EXCEED OCCUPATIONAL EXPOSURE LIMITS. WEAR GLOVES, GOGGLES AND PROTECTIVE CLOTHING TO CONTROL EXPOSURE TO BODY SURFACES. DO NOT DRY SWEEP OR USE METHODS WHICH INCREASE DUSTING. USE VACUUMING OR SWEEPING COMPOUND FOR CLEAN-UP. DO NOT WASH SPILLS INTO SEWERS OR OTHER PUBLIC WATER SYSTEMS.

WASTE DISPOSAL

UNDER EPA - RCRA (40 CFR 261.21), SPENT UNREGENERATED CATALYST IS A WASTE MATERIAL, IT COULD BE AN IGNITABLE HAZARDOUS WASTE, HAZARDOUS WASTE NUMBER 0001. REFER TO LATEST EPA OR STATE REGULATIONS REGARDING PROPER DISPOSAL.

ENVIRONMENTAL HAZARDS

DO NOT WASH SPILLS INTO SEWERS OR OTHER PUBLIC WATER SYSTEMS.

SECTION XIII

SPECIAL PRECAUTIONS

DO NOT EAT, DRINK OR SMOKE IN AREAS WHERE CATALYST IS PRESENT. WASH HANDS THOROUGHLY AFTER HANDLING. KEEP CONTAINERS CLOSED WHEN NOT IN USE. NOTIFY AUTHORITIES IF MATERIAL THREATENS TO ENTER OR ENTERS INTO SEWER OR PUBLIC WATER SYSTEM. ALL PRECAUTIONS GIVEN FOR FRESH CATALYST SHOULD BE OBSERVED FOR SPENT CATALYST AND WASHINGS.

SECTION XIV

TRANSPORTATION REQUIREMENTS

DEPARTMENT OF TRANSPORTATION CLASSIFICATION: FRESH CATALYST NOT HAZARDOUS BY DOT REG^a

OTHER REQUIREMENTS:

- ^a SPENT CATALYST ONLY - FLAMMABLE SOLID N.O.S. UN1325.

SAL 000006842

CA 058

PRODUCT NAME: CRITERION 344 CATALYST
MSDS NO. 6169-05**SECTION XV OTHER REGULATORY CONTROLS**

THE COMPONENTS OF THIS PRODUCT ARE LISTED ON THE EPA/TSCA INVENTORY OF CHEMICAL SUBSTANCES.

THE INFORMATION CONTAINED HEREIN IS BASED ON THE DATA AVAILABLE TO US AND IS BELIEVED TO BE CORRECT. HOWEVER, CRITERION MAKES NO WARRANTY, EXPRESSED OR IMPLIED, REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF. CRITERION ASSUMES NO RESPONSIBILITY FOR INJURY FROM THE USE OF THE PRODUCT DESCRIBED HEREIN.

SECTION XVI SUMMARY OF REVISIONS

MSDS NUMBER	DATE	NATURE OF REVISION(S)
6159-01	DECEMBER 28, 1988	ORIGINAL ISSUE (TYPO - INCORRECT MSDS NUMBER).
6169-02	FEBRUARY 14, 1989	CORRECT MSDS NUMBER TO 6169-02.
6169-03	MAY 14, 1989	ADD NEW OSHA TRANSITIONAL AND FINAL RULE EXPOSURE LIMITS. ADD SECTION XVI - SUMMARY OF REVISIONS. ADD REVIEW DATE TO TOP OF PAGE 1. CORRECT TYPO IN CAS NUMBER FOR COBALT OXIDE TO 1307-96-6.
6169-04	November 14, 1989	ADD CERCLA INFORMATION TO SECTIONS IIB AND XII WHERE APPROPRIATE. CHANGE PRODUCT CODE NUMBERS (DROP 93's AND -'s).
6169-05	February 24, 1990	MODIFY MSDS TO REFLECT OFFICIAL DELISTING ON FEBRUARY 14, 1990 OF NON-FIBROUS ALUMINUM OXIDE FROM SARA III SECTION 313 REPORTING LIST.

REVIEW DATE: February 24, 1990

*Donald C. McCulloch*DONALD C. MCCULLOCH
TECHNICAL DIRECTOR
CRITERION CATALYST COMPANY L.P.

SAL 000006843

Petro Ware Inc. C A 0 5 9

614-982-8420

P.O. Box 220
713 Keystone Street
Crooksville, Ohio 43731
FAX # 614-982-9875

614-982-4280

MATERIAL SAFETY DATA SHEET

SECTION I, MATERIAL IDENTIFICATION

Petro Ware Ceramic Support Media contains 38% Al_2O_3 (Aluminum Oxide aka. Alumina) which is listed as a Sara Title III Section 313 chemical (CAS 1344-28-1).

SECTION II, INGREDIENTS AND HAZARDS

Inert ceramic support containing 38% Al_2O_3 and 51% SiO_2 (Silica). Current OSHA Permissible Exposure Limit for total dust is $10mg/m^3/\%$ (TWA) and $20 mg/m^3$ (STEL); respirable dust averaged over an 8 hour shift $5 mg/m^3/\%$. (Also see Section VI).

SECTION III, PHYSICAL PROPERTIES

Color: off white to tannish brown
Odor: none detectable
Density: 92 lbs/cubic foot
Crushing Strength: 1,200 psi to 1,700 psi
Size: one-half inch diameter, three-quarter inch diameter, one inch diameter
Water Absorption: 0.02%
Insoluble in water

SECTION IV, COMBUSTIBILITY AND EXPLOSIVITY

Non-combustible, non-explosive. Use extinguishing media appropriate to other area materials.

SECTION V, REACTIVITY

Stable and non-reactive under normal circumstances.

SECTION VI, HEALTH HAZARDS

Dust may cause irritation to respiratory tract if inhaled. Long term exposure (10-25 years) to dust may cause cough, chest pains, dyspnea, decreased vital capacity, and diminished chest expansion.

Treat as nuisance dust.

SECTION VII, SPILLS, LEAKS, DISPOSAL

This product contains Alumina, which is currently listed as Toxic under Section 313 of Title III of the Superfund Amendments.

Clean-up personnel need respiratory protection (in case of dust). Sweep spills and vacuum where necessary. Dispose of waste in an approved landfill in accordance with federal, state, and local laws.

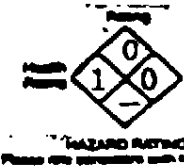
SECTION VIII, SPECIAL PROTECTION

Provide workers with NIOSH approved, disposable dust respirators, when dust is apparent. Exposure levels over 100 times PEL (see Section II) require oxygen supplied respirators. Gloves and safety goggles should be worn when exposed to excessive dust.

SECTION IX, SPECIAL PRECAUTIONS

Dust in work area should be minimized and proper ventilation provided.

SAL 000006844

NORTON**CA007****MATERIAL SAFETY DATA SHEET****SECTION I NAME AND PRODUCT**

MANUFACTURER'S NAME Norton Company		CONTACT K. Harrison
ADDRESS (STREET, CITY, STATE AND ZIP CODE) P. O. Box 350, Akron, Ohio 44309		EMERGENCY TELEPHONE NO. 216/673-5860
TRADE NAME, COMMON NAME OR SPECIFICATION Denstone® balls and pellets - all sizes		APPROVED BY L. Walte DATE 10/31/89
CHEMICAL FAMILY OR PRODUCT TYPE		

SECTION II COMPOSITION

CHEMICAL NAME		COMMON NAME	REG. (Y/N)	CAS #	OSHA PERMISSIVE EXPOSURE LIMIT	ACGIH TLV
Silicon dioxide 60-70	%	Silica	Y	14808-60-7	0.1mg/m3	
Aluminum oxide 22-28	%	Alumina	Y	1344-28-1	5mg/m3	
Titanium dioxide 8-15	%	Titania	Y	13463-67-7	5mg/m3	
Iron oxide 6-15	%	Iron oxide	Y	1309-37-1	10mg/m3	
Calcium oxide 2-10	%	Calcia	Y	1305-78-8	5mg/m3	
Magnesium oxide 3-8	%	Magnesia	Y	1309-48-4	5mg/m3	
Potassium oxide 1.0-4.0	%	Potassia	N	12136-45-7	10mg/m3	
Sodium oxide 1.0-2.0	%	Soda	N	1313-59-3	10mg/m3	
These shaped articles are not a regulated chemical as they do not release, or otherwise result in exposure to hazardous chemical under normal conditions of use.						

* Materials are regulated by OSHA 29 CFR 1910.1200, Hazard Communication Standard, and/or the Massachusetts General Law Chapter 111F, Right To Know Regulation.

SECTION III PHYSICAL AND CHEMICAL DATA

BOILING POINT n/a	MELTING POINT n/a	SPECIFIC GRAVITY 2.6
VAPOR PRESSURE n/a	PERCENT VOLATILE BY VOL. n/a	VAPOR DENSITY n/a
EVAPORATION RATE n/a	SOLUBILITY IN WATER insoluble	SOLUBILITY IN ALCOHOL insolub.
SOLUBILITY IN OTHER SOLVENT insoluble	APPEARANCE AND ODOR buff colored solid; odorless	

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT n/a	(METHOD USED) n/a	FLAMMABLE LIMITS LEL n/a
EXTINGUISHING MEDIA n/a		
SPECIAL FIRE FIGHTING PROCEDURES n/a		
EXPLOSION POTENTIAL n/a		

SECTION V HEALTH, FIRST AID AND MEDICAL DATA

PRIMARY ROUTE(S) OF ENTRY	ACUTE AND CHRONIC HEALTH EFFECTS AND EFFECTS OF OVEREXPOSURE	FIRST AID AND MEDICAL INFORMATION
INHALATION	If dust is created, there is the possibility of breathing in irritant powders. Excessive (years long) exposure to Silica can lead to Silicosis. Silica may also be a possible carcinogen.	For acute exposure, remove victim to fresh air; for medical assistance, symptoms continue.
INGESTION	n/a	n/a
SKIN CONTACT & ABSORPTION	n/a SAL 000006845	n/a
EYE	Dust may cause irritation	Irrigate eyes with water. Examine for physical presence of particles.
OTHER POTENTIAL HEALTH RISKS	Alumina is listed under section 313 of Title III of SARA, but EPA is proposing to de-list it. Most of the Silica is chemically combined as Silicates.	Minimize creation of dust.

SECTION VI CORROSIVITY AND REACTIVITY DATASTABILITY UNSTABLE ☐ STABLE ☒POLYMERIZATION MAY OCCUR ☐ WILL NOT OCCUR ☒

INCOMPATIBILITY (MATERIALS TO AVOID) Silicate products may react, although not violently, with hydrofluoric acid or active fluorides.

CA007**COMPOSITION PRODUCTS**

none

CONDITIONS TO BE AVOIDED

Active fluorides

SECTION VII STORAGE, HANDLING AND USE PROCEDURES**NORMAL STORAGE AND HANDLING**

Store in dry areas. Do not overstack to the point of deforming cartons. Suppress dust when unloading cartons, or wear respirators. Protect against sharp, broken edges.

NORMAL USE

Avoid rough handling to avert abrading or crushing the articles.

STEPS TO BE TAKEN IN CASE OF LEAKS OR SPILLS

Minimize dust. Sweep, shovel, vacuum. Watch footing if articles fall onto walking surfaces.

WASTE DISPOSAL METHOD

Landfill in accordance local, state and federal regulations. Be guided by extraneous matter to which these articles may have been exposed in the user's process.

SECTION VIII PERSONAL PROTECTION INFORMATION**RESPIRATORY PROTECTION (SPECIFY TYPE)**

NIOSH APPROVED DISPOSABLE OR OTHER DUST MASK. See OSHA CFR 1910.

VENTILATION

LOCAL

recommended

MECHANICAL
(GENERAL)

OTHER

PROTECTIVE GLOVES

recommended

EYE PROTECTION

recommended

OTHER EQUIPMENT

as customer's policies dictate

MEASURES TO BE TAKEN DURING REPAIR AND MAINTENANCE OF CONTAMINATED EQUIPMENT THAT HAS BEEN IN CONTACT WITH THIS MATERIAL

As sold, these articles are inert and non-hazardous. If customer's processing introduces hazardous (toxic) materials to the articles, be guided by their nature. Minimize dust when handling these articles.

SECTION IX SPECIAL PRECAUTIONS**PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE**

Minimize dust by careful handling. Use respirators and adequate ventilation if dust is created.

OTHER PRECAUTIONS

These articles are hard and abrasive. Minimize bodily contact with gloves, safety glasses, and adequate covering.

FOR COMPANY USE

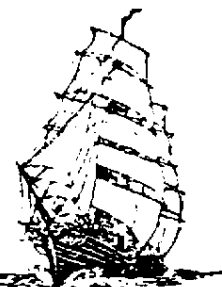
The information and recommendations set forth herein are taken from sources believed to be accurate as of the date hereof; however, Norton Company makes no warranty with respect to the accuracy of the information or the suitability of the recommendations, and assumes no liability to any user thereof.

***NAIF=NO APPLICABLE INFORMATION FOUND

***N/A=NOT APPLICABLE

SAL 000006846

Form 4981A
Rev. 5/84

**MATERIAL SAFETY DATA SHEET****CA037**

3502 RIVERVIEW - Mailing Address - P. O. BOX 977 - PORT ALLEN, LA. 70767-0977 - Phone (504) 389-9945

SECTION I. PRODUCT IDENTIFICATION:

TRADE NAME:	Activated Alumina
CHEMICAL NAME:	Aluminum Oxide
CHEMICAL FORMULA:	Al ₂ O ₃
CAS NO.:	1344-28-1
MANUFACTURER:	Discovery Chemicals, Inc.
EMERGENCY PHONE NUMBER:	504-389-9945

SECTION II.	Ingredients:	Exposure Limits
Al ₂ O ₃	90.00-95.00%	ACGIH-TLV
Na ₂ O	0.30- 2.0%	10 mg/m ³ Total Dust
SiO ₂	0.02- 0.04%	5 mg/m ³ Respirable dust
H ₂ O	5.00- 7.00%	

SECTION III. Physical Data:

APPEARANCE/ODOR:	White crystalline powder, spheres or granules/no odor
MELTING POINT:	>3000F
SOLUBILITY IN WATER:	Insoluble

SECTION IV. Fire and Explosion Hazards:

FLASH POINT (METHOD):	Nonflammable
EXTINGUISHING MEDIA:	None required
HAZARDOUS THERMAL DECOMPOSITION PRODUCTS:	None
SPECIAL FIRE FIGHTING PROCEDURES:	None
UNUSUAL FIRE & EXPLOSION HAZARDS:	None

SECTION V. Reactivity Data:

STABILITY:	Stable
CONDITIONS TO AVOID:	None
MATERIALS TO AVOID:	None
HAZARDOUS POLYMERIZATION:	Will not occur

7-02-90

SAL 000006847

CA037

SECTION VI. Health Hazards:

INHALATION:	If exposed to excessive amounts, remove to fresh air.
EYE CONTACT:	Begin immediate eye irrigation with cool water for at least 15 minutes with the eyelids held open by gently separating them with the fingers.
SKIN CONTACT:	No hazard under normal circumstances.
INGESTION:	No hazard under normal circumstances.

SECTION VII. Safe Handling & Use:

SPILLS OR LEAKS:	Shovel material into container for disposal.
DISPOSAL METHODS:	This product is not by EPA's definition a hazardous substance. It may be disposed of in a landfill in compliance with any applicable local, state and federal regulation.
STORAGE REQUIREMENTS:	Store in a dry place away from moisture.

7-02-90

SAL 000006848

MATERIAL SAFETY DATA SHEET

March 1990



An explanation of the terms used herein may be found in OSHA 29 CFR 1910.1200,
available from OSHA regional or area offices.
(Similar to U.S. Department of Labor Form OMB 1218-0072
and generally accepted in Canada for information purposes)
Do Not Duplicate This Form. Request an Original.

**CA054**

I. PRODUCT IDENTIFICATION

PRODUCT Molecular Sieve Type MRG-E**CHEMICAL NAME** Sodium Aluminosilicate**SYNONYMS** Zeolite**FORMULA** Na_2O , Al_2O_3 , SiO_2 , MgO **CHEMICAL FAMILY** Molecular Sieve**MOLECULAR WEIGHT** Not Applicable**TRADE NAME** UOP® Molecular Sieve; formerly UNION CARBIDE® Molecular Sieve

II. HAZARDOUS INGREDIENTS

A complex of elements and compounds composed of material shown below.

NOTE: In the table below, the symbol "<" means "less than."

MATERIAL (CAS/TSCA NO.)	Wt (%)	1989-1990 ACGIH TLV—TWA (OSHA-PEL)	
Sodium Oxide (1313-59-3)	< 20	None established	(None established)
Aluminum Oxide (1344-28-1)	< 40	10 mg/m ³ as Al	(10 mg/m ³ Total dust) (5 mg/m ³ Respirable fraction)
Silicon Oxide (7631-86-9)	< 60	10 mg/m ³	(6 mg/m ³)
Magnesium Oxide (1309-48-4)	< 5	10 mg/m ³ Fume	(10 mg/m ³ Total dust) (5 mg/m ³ Respirable dust)

III. PHYSICAL DATA

BOILING POINT, 760 mm. Hg Not Applicable**FREEZING POINT** Not Applicable**SPECIFIC GRAVITY (H₂O = 1)** 1.1 (piece)**VAPOR PRESSURE AT 20°C.** Not Applicable**VAPOR DENSITY (air = 1)** Not Applicable**SOLUBILITY IN WATER, % by wt.** Not Applicable**PERCENT VOLATILES BY VOLUME** Not Applicable**EVAPORATION RATE (BUTYL ACETATE = 1)** Not Applicable**APPEARANCE AND ODOR:** Product is a bead, pellet, or mesh (granules); odorless.

EMERGENCY PHONE NUMBER

IN CASES OF EMERGENCIES involving this material, further information is available at all times:

Emergency Phone No.: In USA: UOP 708-391-2123 CHEMTREC 800-424-9300

In Canada: CANUTEC 613-996-6666

From other Countries: CHEMTREC 202-483-7616

For routine information contact your local supplier

UOP urges each customer or recipient of this MSDS to study it carefully to become aware of and understand the potential hazards associated with the product. The reader should consider consulting reference works or individuals who are experts in ventilation, toxicology, and fire prevention, as necessary or appropriate to use and understand the data contained in this MSDS. To promote safe handling, each customer or recipient should: (1) notify its employees, agents, contractors and others whom it knows or believes will use this material or the information in this MSDS and any other information regarding hazards or safety; (2) furnish this same information to each of its customers for the product, and (3) request such customers to notify their employees, customers, and other users of the product of this information.

UOP ☐ MOLECULAR SIEVE ADSORBENTS
UOP CANADA, INC.

IV. HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: See Section II.

CAU54

EFFECTS OF SINGLE (ACUTE) OVEREXPOSURE:

SWALLOWING — The product gets hot as it adsorbs water. Burns to moist body tissues can result if contact is prolonged. No other evidence of adverse effects from available information.

SKIN ABSORPTION — No evidence of adverse effects from available information.

INHALATION — May cause irritation of the nose and throat, accompanied by cough and chest discomfort.

SKIN CONTACT — May cause irritation seen as local redness and/or burns.

EYE CONTACT — May cause discomfort and/or irritation seen as excess redness of the conjunctiva.

EFFECTS OF REPEATED (CHRONIC) OVEREXPOSURE: Prolonged inhalation may cause lung damage.

OTHER EFFECTS OF OVEREXPOSURE: None currently known.

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE: Breathing of dust may aggravate asthma and inflammatory or fibrotic pulmonary disease.

EMERGENCY AND FIRST AID PROCEDURES:

SWALLOWING — If ingested in large quantities, drink 2 glasses of water. Contact physician for permission to induce vomiting.

SKIN CONTACT — Wash contacted area with soap and water.

INHALATION — Remove the person to fresh air.

EYE CONTACT — Flush eyes with water for 15 minutes.

NOTES TO PHYSICIAN: *This product is a desiccant and generates heat as it adsorbs water. The used product can contain material of a hazardous nature. Identify that material and treat symptomatically.*

SAL 000006850

V. FIRE AND EXPLOSION HAZARD DATA**FLASH POINT**
(test method)

Does not burn

AUTOIGNITION
TEMPERATURE

Not Applicable

CA054**FLAMMABLE LIMITS**
IN AIR, % by volume**LOWER**

Not Applicable

UPPER

Not Applicable

EXTINGUISHING MEDIA: Unused material will not burn. Use media appropriate for surrounding fire.**SPECIAL FIRE FIGHTING PROCEDURES:** Depends on the use of the material. Used material may contain products of a hazardous nature. The user of this product must identify the hazards of the retained material and inform the fire fighters of these hazards.**UNUSUAL FIRE AND EXPLOSION HAZARDS:** In their fresh unused state, molecular sieves are not flammable. When exposed to water, however, they can get quite hot. When first wetted they can heat to the boiling point of water. Flooding will reduce the temperature to safe limits.**VI. REACTIVITY DATA****STABILITY****CONDITIONS TO AVOID:** Moisture (water) can cause rise in temperature which might result in burn.**UNSTABLE****STABLE**

X

INCOMPATIBILITY (Materials to Avoid): Sudden contact with high concentrations of chemicals having high heats of adsorption such as olefins, HCl, etc.**HAZARDOUS DECOMPOSITION PRODUCTS:** Hydrocarbons and other materials that contact the molecular sieve during normal use can be retained on the sieve. It is reasonable to expect that decomposition products will come from these retained materials of use. The molecular sieve itself does not readily decompose unless subjected to extreme temperature or chemical conditions. If such decomposition did occur the products would include the mix of oxides listed in Section II.**HAZARDOUS POLYMERIZATION****CONDITIONS TO AVOID:** None currently known.**May Occur****Will not Occur**

X

VII. SPILL OR LEAK PROCEDURES**STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:** Sweep the spill area. Collect and place the spilled material in a waste disposal container. Avoid raising dust.**WASTE DISPOSAL METHOD:** Discard any product (including any retained materials of use), disposable container or liner in an environmentally acceptable manner, in full compliance with Federal, State and local regulations.

SAL 000006851

V. FIRE AND EXPLOSION HAZARD DATA**FLASH POINT**
(test method)

Does not burn

AUTOIGNITION
TEMPERATURE

Not Applicable

CAUTION**FLAMMABLE LIMITS**
IN AIR, % by volume**LOWER**

Not Applicable

UPPER

Not Applicable

EXTINGUISHING MEDIA: Unused material will not burn. Use media appropriate for surrounding fire.**SPECIAL FIRE FIGHTING PROCEDURES:** Depends on the use of the material. Used material may contain products of a hazardous nature. The user of this product must identify the hazards of the retained material and inform the fire fighters of these hazards.**UNUSUAL FIRE AND EXPLOSION HAZARDS:** In their fresh unused state, molecular sieves are not flammable. When exposed to water, however, they can get quite hot. When first wetted they can heat to the boiling point of water. Flooding will reduce the temperature to safe limits.**VI. REACTIVITY DATA****STABILITY****CONDITIONS TO AVOID:** Moisture (water) can cause rise in temperature which might result in burn.**UNSTABLE****STABLE**

X

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X

VII. SPILL OR LEAK PROCEDURES**STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:** Sweep the spill area. Collect and place the spilled material in a waste disposal container. Avoid raising dust.**WASTE DISPOSAL METHOD:** Discard any product (including any retained materials of use), disposable container or liner in an environmentally acceptable manner, in full compliance with Federal, State and local regulations.

SAL 000006852

CENTURY PAPERS INC.
4902 GULF FREEWAY
HOUSTON, TEXAS 77023
PHONE NO. 713-928-5171

MANUFACTURER: **68696**
CARROLL COMPANY
2900 WEST KINGSLEY RD.
GARLAND, TEXAS 75041
EMERGENCY PHONE NO. 214-278-1304

MATERIAL SAFETY DATA SHEET

SECTION 1- PRODUCT IDENTIFICATION

SHEET NO. 0328

PRODUCT NAME: AMIGO HAND SOAP

PRODUCT CODE: 442

ITEM NO. 414-2373, 414-2365

SECTION 2- HAZARDOUS INGREDIENTS

NONE

SECTION 3- PHYSICAL DATA

BOILING POINT: >212F.

SPECIFIC GRAVITY: 1.016

VAPOR PRESSURE: 23.8 @ 250 C

PRODUCT PH: 8.6.

SOLUBILITY IN WATER: COMPLETE

MELTING POINT: UNDETERMINED

APPEARANCE AND ODOR: LIGHT ORANGE COLOR, ORANGE FRAGRANCE.

SECTION 4- FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: > 212 F,

EXTINGUISHING MEDIA: WATER, CO2, FOAM OR DRY CHEMICAL

SPECIAL FIRE FIGHTING PROCEDURES: NONE

UNUSUAL FIRE AND EXPLOSION HAZARDS: NONE

SECTION 5- HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: UNDETERMINED

CARCINOGEN: NO

ACUTE AND CHRONIC HEALTH EFFECTS: NONE

PRIMARY ROUTES OF ENTRY: NO PRIMARY ROUTES OF ENTRY

EFFECTS OF OVEREXPOSURE: EYES-MAY CAUSE IRRITATION. INGESTION- MAY BE HARMFUL

EMERGENCY AND FIRST AID PROCEDURES:

EYES - FLUSH WITH WATER.

INGESTION - GIVE LARGE AMOUNT OF MILK OR WATER TO DRINK. GET MEDICAL ATTENTION.

SECTION 6- REACTIVITY DATA

STABILITY: STABLE

CONDITIONS TO AVOID: NONE

INCOMPATIBILITY: NONE

SECTION 7- SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:
FLUSH WITH PLENTY OF WATER.

WASTE DISPOSAL METHOD: FOLLOW FEDERAL AND LOCAL REGULATIONS.

MATERIAL SAFETY DATA SHEET
PRODUCT NAME: AMIGO HAND SOAP
ITEM NO. 414-2373, 414-2365

PAGE 2

GS696

SECTION 8- SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: ADEQUATE VENTILATION

GLOVES: NONE

EYE PROTECTION: NONE

OTHER PROTECTIVE EQUIPMENT: NONE

SECTION 9- SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: NONE

OTHER PRECAUTIONS: NONE

BETZ PROCESS CHEMICALS, INC.
(713) 367-2442

9669 GROGANS MILL ROAD
THE WOODLANDS, TX 77380

MATERIAL SAFETY DATA SHEET
24 HOUR EMERGENCY TELEPHONE (HEALTH OR ACCIDENT) (215) 355-3300

DISTRIBUTED: MAY-24-1990

G S 6 9 7

PRODUCT : PHILMPLUS 5K8

(PAGE 1 OF 3)
EFFECTIVE DATE 05-18-89
PRINTED: 10-Apr-1990

REVISIONS TO SECTIONS: 3

PRODUCT APPLICATION : A BLEND OF FILMING AMINES IN HEAVY AROMATIC NAPHTHA.
-----SECTION 1-----HAZARDOUS INGREDIENTS-----

INFORMATION ON PHYSICAL HAZARDS, HEALTH HAZARDS, PEL'S AND TLV'S FOR SPECIFIC PRODUCT INGREDIENTS AS REQUIRED BY THE OSHA HAZARD COMMUNICATIONS STANDARD ARE LISTED. REFER TO SECTION 4 (PAGE 2) FOR OUR ASSESSMENT OF THE POTENTIAL ACUTE AND CHRONIC HAZARDS OF THIS FORMULATION.

HEAVY AROMATIC NAPHTHA;***CAS#64742-06-9;COMBUSTIBLE LIQUID;IRRITANT(EYE);
MANUFACTURERS SUGGESTED EXPOSURE LIMIT:100PPM;PEL:NONE;TLV:NONE.

TRADE SECRET INGREDIENT(076);COMBUSTIBLE;CORROSIVE;PEL/TLV:10 PPM. TSNR
125438 - 5199P

TRADE SECRET INGREDIENT(E108);IRRITANT TO SKIN;CORROSIVE TO EYES;PEL:NONE;
TLV:NONE.THIS CHEMICAL IS NOT ON ANY STATE RIGHT-TO-KNOW LIST. TSNR 125438
- 5081P

TRADE SECRET INGREDIENT(E141);CORROSIVE;PEL:NONE;TLV:NONE.THIS CHEMICAL IS
NOT ON ANY STATE RIGHT-TO-KNOW LIST. TSNR 125438 - 5102P

-----SECTION 2-----TYPICAL PHYSICAL DATA-----

PH: 5% EXTRACT (APPROX.) 5.8	ODOR: HYDROCARBON
FL.PT.(DEG.F): 142 P-M(CC)	SP.GR.(70F)OR DENSITY: 7.7LBS/GAL
VAPOR PRESSURE(mmHG): <10	VAPOR DENSITY(AIR=1): >1
VISC cps70F: 151	%SOLUBILITY(WATER): 0
EVAP.RATE: ND WATER=1	APPEARANCE: DARK AMBER
PHYSICAL STATE: LIQUID	FREEZE POINT(DEG.F): <-30

-----SECTION 3-----REACTIVITY DATA-----

STABLE.MAY REACT WITH STRONG OXIDIZERS.DO NOT CONTAMINATE.BETZ TANK
CLEAN-OUT CATEGORY 'B'

THERMAL DECOMPOSITION (DESTRUCTIVE FIRES) YIELDS ELEMENTAL OXIDES.

SAL 000006855

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MATERIAL SAFETY DATA SHEET (PAGE 2 OF 3)

PRODUCT: PHILPLUS 5K8

-----SECTION 4-----HEALTH HAZARD EFFECTS-----

ACUTE SKIN EFFECTS * PRIMARY ROUTE OF EXPOSURE**

CORROSIVE TO SKIN

ACUTE EYE EFFECTS ***

CORROSIVE TO THE EYES

ACUTE RESPIRATORY EFFECTS * PRIMARY ROUTE OF EXPOSURE**

VAPORS, GASES, MISTS AND/OR AEROSOLS CAUSE IRRITATION TO UPPER RESPIRATORY TRACT. PROLONGED EXPOSURE MAY CAUSE DIZZINESS AND HEADACHE.

CHRONIC EFFECTS OF OVEREXPOSURE***

PROLONGED OR REPEATED CONTACT MAY CAUSE TISSUE NECROSIS AND/OR DEFATTING-TYPE DERMATITIS.

MEDICAL CONDITIONS AGGRAVATED ***

NOT KNOWN

SYMPTOMS OF EXPOSURE ***

INHALATION MAY CAUSE IRRITATION OF MUCOUS MEMBRANES AND RESPIRATORY TRACT; SKIN CONTACT CAUSES SEVERE IRRITATION OR BURNS.

PRECAUTIONARY STATEMENT BASED ON TESTING RESULTS ***

MAY BE TOXIC IF ABSORBED THROUGH SKIN.

-----SECTION 5-----FIRST AID INSTRUCTIONS-----

SKIN CONTACT***

REMOVE CLOTHING. WASH AREA WITH LARGE AMOUNTS OF SOAP SOLUTION OR WATER FOR 15 MIN. IMMEDIATELY CONTACT PHYSICIAN

EYE CONTACT***

IMMEDIATELY FLUSH EYES WITH WATER FOR 15 MINUTES. IMMEDIATELY CONTACT A PHYSICIAN FOR ADDITIONAL TREATMENT

INHALATION EXPOSURE***

REMOVE VICTIM FROM CONTAMINATED AREA. APPLY NECESSARY FIRST AID TREATMENT. IMMEDIATELY CONTACT A PHYSICIAN.

INGESTION***

**DO NOT FEED ANYTHING BY MOUTH TO AN UNCONSCIOUS OR CONVULSIVE VICTIM
DO NOT INDUCE VOMITING. IMMEDIATELY CONTACT PHYSICIAN. DILUTE CONTENTS OF STOMACH USING 3-4 GLASSES MILK OR WATER**

-----SECTION 6-----SPILL, DISPOSAL AND FIRE INSTRUCTIONS-----

SPILL INSTRUCTIONS***

**VENTILATE AREA, USE SPECIFIED PROTECTIVE EQUIPMENT. CONTAIN AND ABSORB ON ABSORBENT MATERIAL. PLACE IN WASTE DISPOSAL CONTAINER. THE WASTE CHARACTERISTICS OF THE ABSORBED MATERIAL, OR ANY CONTAMINATED SOIL, SHOULD BE DETERMINED IN ACCORDANCE WITH RCRA REGULATIONS.
REMOVE IGNITION SOURCES. FLUSH AREA WITH WATER. SPREAD SAND/GRIT.**

DISPOSAL INSTRUCTIONS***

WATER CONTAMINATED WITH THIS PRODUCT MAY BE SENT TO A SANITARY SEWER TREATMENT FACILITY, IN ACCORDANCE WITH ANY LOCAL AGREEMENT, A PERMITTED WASTE TREATMENT FACILITY OR DISCHARGED UNDER A NPDES PERMIT PRODUCT (AS IS)-

INCINERATE OR BURY IN APPROVED LANDFILL

FIRE EXTINGUISHING INSTRUCTIONS***

FIREFIGHTERS SHOULD WEAR POSITIVE PRESSURE SELF-CONTAINED BREATHING APPARATUS (FULL FACE-PIECE TYPE). PROPER FIRE EXTINGUISHING MEDIA: DRY CHEMICAL, CARBON DIOXIDE, FOAM OR WATER

SAL 000006856

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6 S 6 7

PRODUCT: PHILMPLUS 5K8

-----SECTION 7-----SPECIAL PROTECTIVE EQUIPMENT-----

USE PROTECTIVE EQUIPMENT IN ACCORDANCE WITH 29CFR SECTION 1910.132-134. USE RESPIRATORS WITHIN USE LIMITATIONS OR ELSE USE SUPPLIED AIR RESPIRATORS.

VENTILATION PROTECTION***

ADEQUATE VENTILATION TO MAINTAIN AIR CONTAMINANTS BELOW EXPOSURE LIMITS
RECOMMENDED RESPIRATORY PROTECTION***

IF VENTILATION IS INADEQUATE OR SIGNIFICANT PRODUCT EXPOSURE IS LIKELY,
USE A RESPIRATOR WITH ORGANIC VAPOR CARTRIDGES.

RECOMMENDED SKIN PROTECTION***

GAUNTLET-TYPE NEOPRENE GLOVES,CHEMICAL RESISTANT APRON
WASH OFF AFTER EACH USE.REPLACE AS NECESSARY

RECOMMENDED EYE PROTECTION***

SPLASH PROOF CHEMICAL GOGGLES.FACE SHIELD

-----SECTION 8-----STORAGE AND HANDLING PRECAUTIONS-----

STORAGE INSTRUCTIONS***

KEEP DRUMS & PAILS CLOSED WHEN NOT IN USE.
KEEP AWAY FROM FLAMES OR SPARKS. BOND CONTAINERS DURING FILLING
OR DISCHARGE WHEN PERFORMED AT TEMPERATURES AT OR ABOVE THE
PRODUCT FLASH POINT.

HANDLING INSTRUCTIONS***

COMBUSTIBLE.CORROSIVE TO SKIN AND/OR EYES.

THIS MSDS COMPLIES WITH THE OSHA HAZARD COMMUNICATION STANDARD
HAROLD M. HERSH (ENVIRONMENTAL INFORMATION COORDINATOR)

APPENDIX: REGULATORY INFORMATION

THE CONTENT OF THIS APPENDIX REPRESENTS INFORMATION KNOWN TO BETZ ON THE
EFFECTIVE DATE OF THIS MSDS. THIS INFORMATION IS BELIEVED TO BE ACCURATE.
ANY CHANGES IN REGULATIONS WILL RESULT IN UPDATED VERSIONS OF THIS DOCUMENT.

...TSCA: ALL COMPONENTS OF THIS PRODUCT ARE LISTED IN THE TSCA INVENTORY

...REPORTABLE QUANTITY(RQ) FOR UNDILUTED PRODUCT:

TREAT AS OIL SPILL

...RCRA: IF THIS PRODUCT IS DISCARDED AS A WASTE,THE RCRA HAZARDOUS WASTE
IDENTIFICATION NUMBER IS: D002=CORROSIVE(SKIN)

...DOT HAZARD/UN#/ER GUIDE# IS: CORROSIVE TO SKIN.COMBUSTIBLE UN1760/#60

...THIS PRODUCT CONTAINS THESE CHEMICALS KNOWN TO THE STATE OF CALIFORNIA TO
CAUSE CANCER OR REPRODUCTIVE TOXICITY: NONE PRESENT IN SIGNIFICANT AMOUNTS

...SARA SECTION 313 CHEMICALS: NONE PRESENT IN SIGNIFICANT AMOUNTS

...SARA SECTION 312 HAZARD CLASS: IMMEDIATE(ACUTE),DELAYED(CHRONIC) AND FIRE

...MICHIGAN CRITICAL MATERIALS: NONE PRESENT IN SIGNIFICANT AMOUNTS

NFPA/HMIS : HEALTH - 3 ; FIRE - 2 ; REACTIVITY - 0 ; SPECIAL - CORR ; PE - D

10/20/87

A DIVISION OF EXXON CHEMICAL AMERICAS
P.O. Box 3335, Columbus, Georgia 31903-3635

NO.

SECTION I PRODUCT IDENTIFICATION & EMERGENCY INFORMATION**PRODUCT NAME****CALLAWAY 3330****CHEMICAL NAME**

Not Applicable: Blend

CHEMICAL FAMILY

Anionic Surfactant

PRODUCT APPEARANCE

Clear solution, alcoholic odor

EMERGENCY TELEPHONE NUMBERS: CALLAWAY CHEMICAL COMPANY 404-576-2000
CHEMTREC 800-424-9300**SECTION II HAZARDOUS COMPONENTS OF MIXTURES**

THE PRECISE COMPOSITION OF THIS MIXTURE IS PROPRIETARY INFORMATION. A MORE COMPLETE DISCLOSURE WILL BE PROVIDED TO A PHYSICIAN C
MURSE IN THE EVENT OF A MEDICAL EMERGENCY. THE FOLLOWING COMPONENTS ARE DEFINED HAZARDOUS IN ACCORDANCE WITH 29CFR1910.1200:

OSHA HAZARD	COMPONENT
Flammable	Isopropyl Alcohol
Eye and skin irritant	Isopropyl Alcohol
PEL, TLV	Isopropyl Alcohol

For additional information see Section III.

SECTION III HEALTH INFORMATION AND PROTECTION**FIRST AID & NATURE OF HAZARD****EYE CONTACT:**

Immediately flush eyes with large amounts of water for at least 15 minutes. Get prompt medical attention.

Irritating, and will injure eye tissue if not removed promptly.

INHALATION:

Using proper respiratory protection, immediately remove the affected victim from exposure. Administer artificial respiration if breathing is stopped. Keep at rest. Call for prompt medical attention.

High vapor concentrations are irritating to the eyes and the respiratory tract, may cause headaches and dizziness, are anesthetic and may have other central nervous system effects.

SKIN CONTACT:

Immediately flush with large amounts of water; use soap if available. Remove contaminated clothing, including shoes, after flushing has begun.

Get prompt medical attention.

Low order of toxicity.

Irritating.

INGESTION:

First aid is normally not required.

Minimal toxicity.

May cause vomiting.

PERMISSIBLE EXPOSURE LIMIT; OSHA REQUIRES (29CFR1910.1000):

a TWA of 400 ppm (880 mg/m3) for Isopropyl Alcohol.

SAL 000006858

THIS INFORMATION RELATES TO THE SPECIFIC MATERIAL DESIGNATED AND MAY NOT BE VALID FOR SUCH MATERIAL USED IN COMBINATION WITH ANY OTHER MATERIALS OR IN ANY PROCESS. SUCH INFORMATION IS TO THE BEST OF OUR KNOWLEDGE AND BELIEF, ACCURATE AND RELIABLE AS OF THE DATE COMPILED. HOWEVER, NO REPRESENTATION, WARRANTY OR GUARANTEE IS MADE AS TO ITS ACCURACY, RELIABILITY OR COMPLETENESS. IT IS THE USER'S RESPONSIBILITY TO SATISFY HIMSELF AS TO THE SUITABILITY AND COMPLETENESS OF SUCH INFORMATION FOR HIS OWN PARTICULAR USE. WE DO NOT ACCEPT LIABILITY FOR ANY LOSS OR DAMAGE THAT MAY OCCUR FROM THE USE OF THIS INFORMATION NOR DO WE OFFER WARRANTY AGAINST PATENT INFRINGEMENT.

10/20/87 PRODUCT NAME: CALLAWAY 3330

NO.

THRESHOLD EXPOSURE LIMIT: ACGIH RECOMMENDS:

a TWA of 400 ppm (980 mg/m³), and a STEL of 500 ppm (1225 mg/m³) for Isopropyl Alcohol.

PERSONAL PROTECTION

For open systems where contact is likely, wear long sleeves, chemical resistant gloves, and chemical goggles.
Where contact may occur, wear long sleeves and safety glasses with side shields.
Where concentrations in air may exceed the limits given in this Section and engineering, work practice or other means of exposure reduction are not adequate, NIOSH/MSHA approved respirators may be necessary to prevent overexposure by inhalation.

VENTILATION

The use of mechanical dilution ventilation is recommended whenever this product is used in a confined space, is heated above ambient temperatures, or is agitated.
Use explosion-proof ventilation equipment.

SECTION IV FIRE & EXPLOSION HAZARD

FLASHPOINT DEG. F : 91 METHOD: Setflash
FLAMMABLE LIMITS-LEL: 2.0 UEL: 12.0 NOTE: Component
AUTOIGNITION TEMPERATURE DEG. F :

GENERAL HAZARD

Flammable Liquid, can release vapors that form flammable mixtures at temperatures at or above the flashpoint.
Empty product containers may contain product residue. Do not pressurize, cut, heat, weld or expose containers to flame or other sources of ignition.

FIRE FIGHTING

Use water spray to cool fire exposed surfaces and to protect personnel.
Shut off "fuel" to fire. If a leak or spill has not ignited, use water spray to disperse the vapors.
Use alcohol type foam or dry chemical to extinguish fire.

HAZARDOUS COMBUSTION PRODUCTS

No Unusual

SECTION V SPILL CONTROL PROCEDURE**LAND SPILL**

Eliminate sources of ignition. Prevent additional discharge of material, if possible to do so without hazard. For small spills implement cleanup procedures; for large spills implement cleanup procedures and, if in public area, keep public away and advise authorities. Also, if this product is an EPA hazardous substance (See Section X, Page 4) notify the U.S. EPA if appropriate.
Prevent liquid from entering sewers, watercourses, or low areas. Contain spilled liquid with sand or earth. Do not use combustible materials such as sawdust.
Recover by pumping (use an explosion proof or hand pump) or with a suitable absorbent.
Consult an expert on disposal of recovered material and ensure

IN

MATERIAL SAFETY DATA SHEET

PAGE 3

CALS

10/20/87 PRODUCT NAME: CALLAWAY 3330

00694

NO.

conformity to local disposal regulations.

WATER SPILL

Consult an expert on disposal of recovered material and ensure conformity to local disposal regulations.

SECTION VI NOTES

No notes applicable.

SAL 000006860

EXXON 694 MATERIAL SAFETY DATA SHEET

PAGE

CHEMICALS

10/20/87 PRODUCT NAME: CALLAWAY 3330

NO.

SECTION VII TYPICAL PHYSICAL & CHEMICAL PROPERTIES

SP. GRAVITY 1.03 @ 80.0	REF. TEMP. F 80.0	VAPOR PRESSURE, mmHg @ F 34 @ 88
SOLUBILITY IN WATER, WT. % @ F Soluble	VISCOSITY OF LIQUID, cSt @ F 60 cps	
SP. GRAVITY OF VAPOR @ 1 ATM AIR=1 Not available	FREEZING MELTING POINT/RANGE F Not available	
EVAPORATION RATE, n-BU ACETATE=1 2.3	BOILING POINT/RANGE F 175	

SECTION VIII REACTIVITY DATA

STABILITY? Stable	HAZARDOUS POLYMERIZATION OCCUR? Will not occur
CONDITIONS TO AVOID INSTABILITY Not Applicable	CONDITIONS TO AVOID HAZARDOUS POLYMERIZATION Not Applicable

MATERIALS AND CONDITIONS TO AVOID INCOMPATIBILITY

Strong oxidizing agents and strong acids

HAZARDOUS DECOMPOSITION PRODUCTS

None

SECTION IX TRANSPORT AND STORAGE**ELECTROSTATIC ACCUMULATION HAZARD**

Unknown, use proper grounding procedure

STORAGE TEMPERATURE F Ambient	LOADING/UNLOADING TEMPERATURE F Ambient
STORAGE/TRANSPORT PRESSURE, mmHg Atmospheric	VISCOSITY AT LOADING/UNLOADING TEMPERATURE, cSt Not available

SECTION X HAZARD CLASSIFICATION

U.S. DOT CLASSIFICATION Flammable	EPA HAZARDOUS SUBSTANCE Not Applicable	AMOUNT LBS.
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ADDITIONAL INFORMATION

Under the provisions of Title III, Sections 311/312 of the Superfund Amendments and Reauthorization Act, this product is classified into the following hazard categories: Immediate Health, Delayed Health, Fire.

REFERENCE NUMBER HDHA-P-10205	DATE PREPARED OCTOBER 20, 1987	SUPEROIDES ISSUE DATE MARCH 31, 1987
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FOR ADDITIONAL PRODUCT INFORMATION CONTACT YOUR TECHNICAL SALES REPRESENTATIVE
FOR ADDITIONAL HEALTH/SAFETY INFORMATION CALL 713-670-6086

SAL 000006861

**MATERIAL SAFETY
DATA SHEET**



ASHLAND CHEMICAL, INC.

Subsidiary Of Ashland Oil, Inc.

P.O. BOX 2219

COLUMBUS, OHIO 43216

(614) 889-3333

**24-HOUR
Emergency
Telephone**

1(800) 274-5263 or

1(800) ASHLAND

001285

CAUSTIC SODA LIQUID 50% INDUST

Page: 1

THIS MSDS COMPLIES WITH 29 CFR 1910.1200 (THE HAZARD COMMUNICATION STANDARD)

Product Name: CAUSTIC SODA LIQUID 50% INDUST
CAS NUMBER: 1310-73-2

CONOCO/WESTLAKE
REFINERY WAREHOUSE
P. O. BOX 37
WESTLAKE

LA 70669

05 50 078 2080810-

PRODUCT: 3150000
INVOICE: 120116
INVOICE DATE: 05/27/90
TO: CONOCO/WESTLAKE
REFINERY WAREHOUSE
P. O. BOX 37
WESTLAKE

ATTN: PLANT MGR./SAFETY DIR.

Data Sheet No: 0000721-008
Prepared: 05/31/89
Supersedes: 02/08/89

SECTION I - PRODUCT IDENTIFICATION

General or Generic ID: ALKALI

DOT Hazard Classification: CORROSIVE MATERIAL (173.240)

SECTION II - COMPONENTS

IF PRESENT, IARC, NTP AND OSHA CARCINOGENS AND CHEMICALS SUBJECT TO THE REPORT-
ING REQUIREMENTS OF SARA TITLE III SECTION 313 ARE IDENTIFIED IN THIS SECTION.
SEE DEFINITION PAGE FOR CLARIFICATION

INGREDIENT	% (by WT)	PEL	TLV	Note
SODIUM HYDROXIDE CAS #: 1310-73-2	50	2 MG/M3 - CEILING	2 MG/M3 - CEILING	

SECTION III - PHYSICAL DATA

Boiling Point	for PRODUCT	(288.00 Deg F 142.22 Deg C) (760.00 mm Hg
Vapor Pressure	for PRODUCT	(3.00 mm Hg 100.00 Deg F 37.77 Deg C)
Specific Vapor Density		HEAVIER THAN AIR
Specific Gravity		(1.535 60.00 Deg F 15.55 Deg C)
Percent Volatiles		50.00%
Evaporation Rate		SLOWER THAN ETHER
pH		14.0
Appearance		CLEAR & COLORLESS
State		LIQUID
Form		HOMOG SOLN

SECTION IV - FIRE AND EXPLOSION INFORMATION

FLASH POINT NOT APPLICABLE

EXPLOSIVE LIMIT NOT APPLICABLE

EXTINGUISHING MEDIA:

HAZARDOUS DECOMPOSITION PRODUCTS: NOT APPLICABLE

FIREFIGHTING PROCEDURES: WEAR SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACEPIECE OPERATED IN THE POSITIVE
PRESSURE DEMAND MODE AND FULL BODY PROTECTION WHEN FIGHTING FIRES.

SPECIAL FIRE & EXPLOSION HAZARDS: CAN REACT WITH CHEMICALLY REACTIVE METALS SUCH AS ALUMINUM, ZINC, MAGNESIUM,
COPPER ETC. TO RELEASE HYDROGEN GAS WHICH CAN FORM EXPLOSIVE MIXTURES WITH AIR.

NFPA CODES: HEALTH- 3 FLAMMABILITY- 0 REACTIVITY- 1

SECTION V - HEALTH HAZARD DATA

PERMISSIBLE EXPOSURE LEVEL 2 MG/M3 - CEILING

THRESHOLD LIMIT VALUE 2 MG/M3 - CEILING

EFFECTS OF ACUTE OVEREXPOSURE: FOR PRODUCT

EYES - CAUSES SEVERE DAMAGE AND EVEN BLINDNESS VERY RAPIDLY.
SKIN - CAUSES BURNS, POSSIBLE DEEP ULCERATION.
BREATHING - MIST CAN CAUSE DAMAGE TO NASAL AND RESPIRATORY PASSAGES.
SWALLOWING - RESULTS IN SEVERE DAMAGE TO MUCOUS MEMBRANES AND DEEP TISSUES.

FIRST AID:

IF ON SKIN: IMMEDIATELY FLUSH EXPOSED AREA WITH WATER FOR AT LEAST 15 MINUTES. GET MEDICAL ATTENTION. REMOVE
CONTAMINATED CLOTHING. LAUNDER CONTAMINATED CLOTHING BEFORE RE-USE.

SAL 000006862

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**MATERIAL SAFETY
DATA SHEET**

Ashland

ASHLAND CHEMICAL, INC.
Subsidiary Of Ashland Oil, Inc.
P.O. BOX 2219
COLUMBUS, OHIO 43216
(614) 889-3333

24-HOUR
Emergency
Telephone
1 (800) 274-5263 or
1 (800) ASHLAND

001285

CAUSTIC SODA LIQUID 50% INDUST

Page: 2

SECTION V-HEALTH HAZARD DATA (Continued)

REMOVE CONTAMINATED SHOES PROMPTLY. DISCARD SHOES SATURATED WITH THIS PRODUCT.

IF IN EYES: IMMEDIATELY FLUSH WITH LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINUTES, LIFTING UPPER AND LOWER LIDS OCCASIONALLY. GET IMMEDIATE MEDICAL ATTENTION.

IF PHYSICIAN IS NOT IMMEDIATELY AVAILABLE, CONTINUE FLUSHING WITH WATER.

DO NOT USE CHEMICAL ANTIDOTE.

IF SWALLOWED: DO NOT INDUCE VOMITING. VOMITING WILL CAUSE FURTHER DAMAGE TO THE THROAT. DILUTE BY GIVING WATER. GIVE MILK OF MAGNESIA. KEEP WARM, QUIET. GET MEDICAL ATTENTION IMMEDIATELY.

IF BREATHED: IF AFFECTED, REMOVE INDIVIDUAL TO FRESH AIR. IF BREATHING IS DIFFICULT, ADMINISTER OXYGEN. IF BREATHING HAS STOPPED GIVE ARTIFICIAL RESPIRATION. KEEP PERSON WARM, QUIET AND GET MEDICAL ATTENTION.

PRIMARY ROUTE(S) OF ENTRY:

SKIN CONTACT, INHALATION

SECTION VI-REACTIVITY DATA

HAZARDOUS POLYMERIZATION: CANNOT OCCUR

STABILITY: STABLE

INCOMPATIBILITY: AVOID CONTACT WITH: STRONG MINERAL ACIDS., REACTIVE METALS SUCH AS ALUMINUM AND MAGNESIUM, ORGANIC MATERIALS, WATER, STRONG ORGANIC ACIDS, COPPER

SECTION VII-SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:

SMALL SPILL: NEUTRALIZE AND MOP UP SOLUTION.

LARGE SPILL: COLLECT AND ADD SLOWLY TO LARGE VOLUME OF WATER.

PERSONS NOT WEARING PROTECTIVE EQUIPMENT SHOULD BE EXCLUDED FROM AREA OF SPILL UNTIL CLEAN-UP IS COMPLETED. STOP SPILL AT SOURCE. DIKE TO PREVENT SPREADING. PUMP TO SALVAGE TANK.

WASTE DISPOSAL METHOD:

SMALL SPILL: DISPOSE OF IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL REGULATIONS.

LARGE SPILL: POUR INTO A LARGE TANK OF WATER AND NEUTRALIZE. FLUSH TO DRAIN WITH LARGE EXCESS OF WATER IN ACCORDANCE WITH APPLICABLE REGULATIONS.

SECTION VIII-PROTECTIVE EQUIPMENT TO BE USED

RESPIRATORY PROTECTION: IF WORKPLACE EXPOSURE LIMIT(S) OF PRODUCT OR ANY COMPONENT IS EXCEEDED (SEE SECTION II), A NIOSH/MSHA APPROVED AIR SUPPLIED RESPIRATOR IS ADVISED IN ABSENCE OF PROPER ENVIRONMENTAL CONTROL. OSHA REGULATIONS ALSO PERMIT OTHER NIOSH/MSHA RESPIRATORS (NEGATIVE PRESSURE TYPE) UNDER SPECIFIED CONDITIONS (SEE YOUR SAFETY EQUIPMENT SUPPLIER). ENGINEERING OR ADMINISTRATIVE CONTROLS SHOULD BE IMPLEMENTED TO REDUCE EXPOSURE.

VENTILATION: PROVIDE SUFFICIENT MECHANICAL (GENERAL AND/OR LOCAL EXHAUST) VENTILATION TO MAINTAIN EXPOSURE BELOW TLV(S).

PROTECTIVE GLOVES: WEAR RESISTANT GLOVES SUCH AS: NEOPRENE, NITRILE RUBBER, POLYVINYL CHLORIDE, POLYETHYLENE

EYE PROTECTION: CHEMICAL SPLASH GOGGLES AND FACE SHIELD (8" MIN.) IN COMPLIANCE WITH OSHA REGULATIONS ARE ADVISED; HOWEVER, OSHA REGULATIONS ALSO PERMIT OTHER TYPE SAFETY GLASSES. (CONSULT YOUR SAFETY EQUIPMENT SUPPLIER)

OTHER PROTECTIVE EQUIPMENT: TO PREVENT SKIN CONTACT, WEAR IMPERVIOUS CLOTHING AND BOOTS.

EYEWASH STATION, EMERGENCY SHOWER.

SECTION IX-SPECIAL PRECAUTIONS OR OTHER COMMENTS

CONTAINERS OF THIS MATERIAL MAY BE HAZARDOUS WHEN EMPTIED. SINCE EMPTIED CONTAINERS RETAIN PRODUCT RESIDUES (VAPOR, LIQUID, AND/OR SOLID), ALL HAZARD PRECAUTIONS GIVEN IN THE DATA SHEET MUST BE OBSERVED.

THE INFORMATION ACCUMULATED HEREIN IS BELIEVED TO BE ACCURATE BUT IS NOT WARRANTED TO BE WHETHER ORIGINATING WITH THE COMPANY OR NOT. RECIPIENTS ARE ADVISED TO CONFIRM IN ADVANCE OF NEED THAT THE INFORMATION IS CURRENT, APPLICABLE, AND SUITABLE TO THEIR CIRCUMSTANCES.

SAL 000006863

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MATERIAL SAFETY DATA SHEET

SECTION I

PRODUCT NAME OR NUMBER (AS IT APPEARS ON LABEL)	
GBR-7005 MULTI PURPOSE THINNER	
MANUFACTURER'S NAME	EMERGENCY TELEPHONE NO.
GROW GROUP, INC.	(313)-643-4600 M-P 8:00am-4:30pm
ADDRESS (NUMBER, STREET, CITY, STATE AND ZIP CODE)	
3155 W. BIG BEAVER ROAD, SUITE 200	
P.O. BOX 7026	
TROY, MICHIGAN 48007-7026	
MANUFACTURER'S D-U-N-S NO.	
00-532-0551	
HAZARDOUS MATERIALS DESCRIPTION, PROPER SHIPPING NAME, HAZARD CLASS ID NO.	
PAINT RELATED MATERIAL NA-1263	
ADDITIONAL HAZARD CLASSES (AS APPLICABLE)	
FLAMMABLE LIQUID	
CHEMICAL FAMILY	FORMULA
SOLVENT BLEND	SOLVENT BLEND

SECTION II - INGREDIENTS

CAS REGISTRY NO.	ZV	ZW	CHEMICAL NAMES	EXPOSURE LIMITS IN AIR	LISTED AS A CARCINOGEN IN NTP IARC OR
67-63-0	2-12	6.6*	ISOPROPYL ALCOHOL (ISOPROPYL ALCOHOL)*	400 400 400	NO
67-56-1	1-3	2.9*	METHANOL (METHYL ALCOHOL)*	SKIN: 200 200 200	NO

*WARNING: Hazardous according to SARA, Section 313 of Title III.
*Toxic chemical or chemicals subject to the reporting requirements of Section 313 of Title III and of 40 CFR 372.
SAL 000006864

SECTION III - PHYSICAL DATA

BOILING RANGE 138-229 XX°F	°C	SPECIFIC GRAVITY (H ₂ O=1) 0.8270
VAPOR PRESSURE 90.6		PERCENT VOLATILE BY VOLUME 100%
@ 68°F °C XX MM HG PSI		PERCENT SOLID BY WEIGHT 0%
VAPOR DENSITY (AIR=1) 2.39		EVAPORATION RATE SLOWER THAN ETHER
SOLUBILITY IN WATER 46%		pH NOT APPLICABLE
APPEARANCE AND ODOR WATER WHITE LIQUID		
IS MATERIAL: LIQUID XX	SOLID	GAS PASTE POWDER

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 14 °F	°C	T.C.C.	METHOD USED	FLAMMABLE LIMITS	LEL 1.0%	UEL 36.0%
EXTINGUISHING MEDIA CO ₂ , DRY CHEMICAL, FOAM, OR OTHER NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) APPROVED METHOD FOR TREATING A CLASS B FIRE. SPECIAL FIRE FIGHTING PROCEDURES SUMMON PROFESSIONAL FIREFIGHTERS. USE FULL PROTECTIVE EQUIPMENT INCLUDING SELF-CONTAINED BREATHING APPARATUS. WATER SPRAY MAY BE INEFFECTIVE. IF WATER IS USED, FOG NOZZLES ARE PREFERABLE. IF EXPOSED TO FIRE OR EXTREME HEAT, WATER SHOULD BE USED TO COOL CLOSED CONTAINERS AND PREVENT PRESSURE BUILD-UP OR POSSIBLE AUTO-IGNITION.						
UNUSUAL FIRE AND EXPLOSION HAZARDS KEEP CONTAINERS TIGHTLY CLOSED. ISOLATE FROM HEAT, ELECTRICAL EQUIPMENT, SPARKS AND FLAME. VAPORS MAY CAUSE FLASH FIRE. VAPORS MAY IGNITE EXPLOSIVELY. VAPORS MAY SPREAD LONG DISTANCES AND BEYOND CLOSED DOORS. DUE TO PRESSURE BUILD-UP, CLOSED CONTAINERS EXPOSED TO EXTREME HEAT MAY EXPLODE. NEVER USE A WELDING OR CUTTING TORCH ON OR NEAR CONTAINER (EVEN EMPTY) AS PRODUCT OR ITS RESIDUE MAY IGNITE. DURING EMERGENCY CONDITIONS OVEREXPOSURE TO DECOMPOSITION PRODUCTS MAY CAUSE A HEALTH HAZARD. SYMPTOMS MAY NOT BE IMMEDIATELY APPARENT. OBTAIN MEDICAL ATTENTION.						

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE 100 ppm (ACGIH)	OTHER LIMIT 100 ppm (OSHA)
PERMISSABLE EXPOSURE LIMIT 100 ppm	100 ppm (VENDOR)
EFFECT OF OVEREXPOSURE ACUTE - BREATHING - IRRITATION OF THE RESPIRATORY TRACT; HEADACHE, NAUSEA, DIZZINESS, WEAKNESS AND FATIGUE. EXTREME EXPOSURE CAN RESULT IN UNCONSCIOUSNESS AND EVEN RESPIRATORY ARREST. EYE CONTACT - SEVERE IRRITANT. SKIN CONTACT - PROLONGED AND REPEATED LIQUID CONTACT CAN CAUSE DEFATTING AND DRYING OF SKIN, WHICH MAY RESULT IN SKIN IRRITATION AND DERMATITIS. SWALLOWING - VOMITING MAY RESULT. PULMONARY ASPIRATION HAZARD IF VOMITING OCCURS. CHRONIC: REPORTS HAVE ASSOCIATED REPEATED AND PROLONGED OCCUPATIONAL OVEREXPOSURE TO SOLVENTS WITH PERMANENT BRAIN AND NERVOUS SYSTEM DAMAGE.	
PRIMARY ROUTES OF ENTRY INHALATION, SKIN CONTACT, SWALLOWING.	
EMERGENCY AND FIRST AID PROCEDURES IF BREATHED - IF YOU EXPERIENCE DIFFICULTY IN BREATHING, LEAVE THE AREA TO OBTAIN FRESH AIR. IF CONTINUED DIFFICULTY IS EXPERIENCED, SUMMON MEDICAL ASSISTANCE IMMEDIATELY. IF BREATHING CEASES, RESTORE USING APPROVED CPR TECHNIQUES AND SUMMON MEDICAL ASSISTANCE IMMEDIATELY. IF IN EYES - FLUSH IMMEDIATELY WITH LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINUTES. GET MEDICAL ASSISTANCE. IF ON SKIN - WASH AFFECTED AREAS WITH SOAP AND WATER. REMOVE SOILED CLOTHING. GET MEDICAL ASSISTANCE IF IRRITATION PERSISTS. WASH CLOTHING BEFORE REUSE. IF SWALLOWED - DO NOT INDUCE VOMITING. CONSULT A PHYSICIAN IMMEDIATELY. ASPIRATION OF VOMITUS CAN CAUSE CHEMICAL PNEUMONITIS WHICH CAN BE FATAL. MEDICAL CONDITIONS PRONE TO AGGRAVATION BY OVEREXPOSURE NONE WHEN USED IN ACCORDANCE WITH SPECIAL PROTECTION INFORMATION (SECTION VIII).	

WARNING: INTENTIONAL MISUSE BY DELIBERATELY CONCENTRATING AND INHALING THE CONTENTS MAY BE HARMFUL OR FATAL.

SECTION VI - REACTIVITY DATA

STABILITY	UNSTABLE	CONDITIONS TO AVOID	HEAT, SPARKS, FLAME.
	STABLE XX		
INCOMPATIBILITY (MATERIALS TO AVOID)	STRONG OXIDIZING AGENTS.		
HAZARDOUS DECOMPOSITION PRODUCTS	THERMAL DECOMPOSITION MAY YIELD CARBON MONOXIDE AND CARBON DIOXIDE.		
HAZARDOUS	MAY OCCUR	CONDITIONS TO AVOID	NOT APPLICABLE
POLYMERIZATION	WILL NOT OCCUR XX		

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED REMOVE ALL SOURCES OF IGNITION (FLAMES, HOT SURFACES, AND ELECTRICAL, STATIC OR FRICTIONAL SPARKS). DO NOT SMOKE. PREVENT BREATHING VAPORS. VENTILATE AREA. BEFORE ATTEMPTING CLEAN-UP, REFER TO HAZARD CAUTION INFORMATION IN OTHER SECTIONS OF THIS MATERIAL SAFETY DATA FORM. DIKE AND CONTAIN SPILLED MATERIAL AND REMOVE WITH INERT ABSORBENT AND NON-SPARKING TOOLS. STORE IN CLOSED CONTAINER UNTIL PROPERLY DISPOSED OF.

WASTE DISPOSAL METHOD DISPOSE OF IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS. INCINERATE ONLY IN APPROVED FACILITY. DO NOT INCINERATE CLOSED CONTAINERS.

CERCLA (SUPERFUND) REPORTABLE QUANTITY (IN LBS) ONE POUND OR REFER TO SECTION 311 CLEAN WATER ACT.

RCRA HAZARDOUS WASTE NO. (40 CFR 261.33) D-001 Note: Numbers apply to
F-003 solvent blend only.
F-005

VOLATILE ORGANIC COMPOUND (VOC) (AS PACKAGED, MINUS WATER) 100%

XX THEORETICAL 6.878 LB/GAL XX ANALYTICAL 6.886 LB/GAL

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION WHEN USED IN RESTRICTED VENTILATION AREAS, WEAR NIOSH/MSHA APPROVED CHEMICAL/MECHANICAL FILTERS DESIGNED TO REMOVE A COMBINATION OF PARTICULATES AND VAPOR. WHEN USED IN CONFINED AREAS, WEAR NIOSH/MSHA APPROVED AIR SUPPLY RESPIRATORS OR HOODS. FOLLOW RESPIRATOR MANUFACTURER'S DIRECTIONS FOR RESPIRATOR USE. IF RESPIRATORS ARE USED, A PROGRAM SHOULD BE ESTABLISHED TO ASSURE COMPLIANCE WITH OSHA STANDARD 29 CFR 1910.134.

VENTILATION USE ONLY WITH ADEQUATE VENTILATION. USE EITHER LOCAL EXHAUST OR MECHANICAL TO MEET TLV REQUIREMENTS. VENTILATION MUST BE SUFFICIENT TO LIMIT EMPLOYEE EXPOSURE AT, OR BELOW, APPLICABLE HEALTH AND SAFETY STANDARDS. HEAVY SOLVENT VAPORS SHOULD BE REMOVED FROM LOWER LEVELS OF WORK AREA.

PROTECTIVE GLOVES NEOPRENE OR EQUIVALENT

EYE PROTECTION SOLVENT RESISTANT SAFETY EYEWEAR WITH SPLASH GUARDS.

OTHER PROTECTIVE EQUIPMENT EYE BATH AND SAFETY SHOWER. SOLVENT IMPERMEABLE CLOTHING TO PREVENT SKIN CONTACT.

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SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE KEEP AWAY FROM HEAT, SPARKS AND FLAME. DO NOT SMOKE. EXTINGUISH ALL PILOT LIGHTS AND TURN OFF ALL SOURCES OF IGNITION INCLUDING HEATERS, FANS AND OTHER NON-EXPLOSION-PROOF ELECTRICAL EQUIPMENT, DURING USE AND UNTIL ALL VAPORS ARE GONE. VAPORS MAY IGNITE EXPLOSIVELY. VAPORS MAY SPREAD LONG DISTANCES AND BEYOND CLOSED DOORS. PREVENT BUILD-UP OF VAPORS BY MAINTAINING CONTINUOUS FLOW OF FRESH AIR. DO NOT STORE ABOVE 120°F OR NEAR FIRE OR OPEN FLAME. STORE LARGE QUANTITIES IN BUILDINGS TO COMPLY WITH OSHA 1910.106. KEEP CONTAINER CLOSED WHEN NOT IN USE. DO NOT TRANSFER CONTENTS TO BOTTLES OR OTHER UNLABELED CONTAINERS. DO NOT REUSE EMPTY CONTAINERS. KEEP OUT OF REACH OF CHILDREN.

NAME: WALTER STUECKEN

SIGNATURE *Walter Stuecken*

TITLE: LABORATORY MANAGER

DATE: September 29, 1988

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA BELIEVED BY GROW GROUP, INC., TO BE ACCURATE, BUT WE DO NOT ASSUME ANY LIABILITY FOR THE ACCURACY OF THIS INFORMATION. WE NEITHER SUGGEST NOR GUARANTEE THAT ANY HAZARDS MENTIONED ARE THE ONLY ONES WHICH EXIST. ANYONE INTENDING TO RELY ON ANY RECOMMENDATION OR TO USE ANY EQUIPMENT, TECHNIQUE OR MATERIAL MENTIONED SHOULD ALSO SATISFY HIMSELF THAT HE CAN MEET ALL APPLICABLE SAFETY AND HEALTH STANDARDS. DETERMINATION OF THE SUITABILITY OF ANY INFORMATION OR PRODUCT FOR THE USE CONTEMPLATED BY ANY USER, THE MANNER OF THAT USE AND WHETHER THERE IS ANY INFRINGEMENT OF PATENTS IS THE SOLE RESPONSIBILITY OF THE USER.

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SUPERCEDES MATERIAL SAFETY DATA SHEET DATED 6-15-87

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(037927-0429 -EOO16293-5049)

DATE OF ISSUE
07/06/88SUPERSEDES
04/14/88

APR 2 1989

SECTION I - GENERAL INFORMATION

CHEMICAL NAME & SYNONYMS N/A	TRADE NAME & SYNONYMS NATURALIZER AEROSOL
CHEMICAL FAMILY ORANGE TERPENES SOLVENT	FORMULA X<--MIXTURE
MANUFACTURERS NAME: NATIONAL CHEMSEARCH DIV. OF NCH CORP.	
ADDRESS (NUMBER, STREET, CITY, STATE & ZIP CODE) BOX 152170 IRVING, TEXAS 75015	
PREPARED BY: RICHARD STOLLEY/T.S.CHEM.	PRODUCT CODE NUMBER 5049
EMERGENCY TELEPHONE NUMBER 214-438-1381	

SECTION II- HAZARDOUS INGREDIENTS

THE HAZARDS PRESENTED BELOW ARE THOSE OF THE INDIVIDUAL COMPONENTS AS THE PRODUCT MIXTURE HAS NOT BEEN TESTED AS A WHOLE.

CHEMICAL NAME (INGREDIENTS)	HAZARD	TLV*	PEL*	CAS#
D-LIMONENE	COMB/IRR	NOT EST.	NOT EST.	5989-27-5
NONYLPHENOXYPOLYETHOXYETHANOL	IRRITANT	NOT EST.	NOT EST.	26027-83-3

SECTION III - PHYSICAL DATA

BOILING PT. (FAHRENHEIT)	375	SPEC GRAVITY (H2O=1)	0.838-0.843
VAPOR PRESSURE (MM HG)	N/A	COLOR	WATER WHITE

NATURALIZER AEROSOL

(CONTINUED)

SECTION III - PHYSICAL DATA

PAGE : 02

VAPOR DENSITY (AIR=1)	N/A	ODOR	ORANGE
PH @ 100%	8-9	CLARITY	TRANSPARENT
PERCENT. VOLATILE BY VOLUME (%)	85	EVAPORATION RATE (BU AC @ 1')	< 1
SOLUBILITY IN WATER	SLIGHT		
VISCOSITY	NON-VISCOUS		

SECTION IV - FIRE AND EXPLOSION HAZARD

FLASH POINT (METHOD USED) 116 F. T.C.C.	FLAMMABLE LIMITS	LEL	UEL
		N/A	N/A
EXTINGUISHING MEDIA "ALCOHOL" X<--FOAM	X<--CO2	X<--CHEMICAL	X<--WATER SPRAY
			X<--OTHER

SPECIAL FIRE FIGHTING PROCEDURES
WEAR NIOSH/MSHA APPROVED RESPIRATOR WHEN FIGHTING FIRES IN CONFINED AREAS
TO PREVENT EXPOSURE TO ACRID SMOKE AND HAZARDOUS DECOMPOSITION PRODUCTS.

UNUSUAL FIRE & EXPLOSION HAZARDS
SPRAY EXPOSED AEROSOL CONTAINERS WITH WATER SPRAY TO AVOID RUPTURING.

LEVEL AEROSOL (NFPA 308)

NFPA HAZARD RATING (0=INSIGNIFICANT; 1=SLIGHT; 2=MODERATE; 3=HIGH; 4=EXTREME):
1<--HEALTH 2<--FLAMMABILITY 0<--REACTIVITY <--SPECIAL

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE :

NOT ESTABLISHED FOR MIXTURE. SEE SECTION II.

EFFECTS OF OVEREXPOSURE

- ACUTE - (SHORT TERM EXPOSURE)
MAY BE IRRITATING TO EYES AND SKIN. MAY CAUSE DEFATTING OF SKIN. INGESTION OF LARGE QUANTITIES CAN CAUSE NAUSEA, CRAMPS, VOMITING AND DIARRHEA.
ASPIRATION OF MATERIAL INTO LUNGS CAN CAUSE CHEMICAL PNEUMONITIS WHICH CAN BE FATAL. EXCESSIVE BREATHING OF VAPORS OR SPRAY MIST CAN LEAD TO NASAL

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NATURALIZER AEROSOL

(CONTINUED)

SECTION V - HEALTH HAZARD DATA

PAGE : 03

AND RESPIRATORY IRRITATION.

- CHRONIC - (LONG TERM EXPOSURE)

MARKED IRRITATION TO EYES. EXCESSIVE OVEREXPOSURE TO THE SKIN CAN CAUSE

DERMATITIS AND CHAPPING.

TARGET ORGANS: EYES, SKIN, RESPIRATORY SYSTEM

PRIMARY ROUTE OF ENTRY: X-- INHALATION <-- INGESTION X-- ABSORPTION

EMERGENCY & FIRST AID PROCEDURES

INHALATION:

GENERALLY NOT A HAZARD. REMOVE VICTIM TO FRESH AIR AND PROVIDE

SUPPORTIVE MEASURES.

EYE CONTACT:

FLUSH WITH LARGE AMOUNTS OF WATER FOR 10 MINUTES, LIFTING UPPER AND LOWER LIDS OCCASIONALLY. GET MEDICAL ATTENTION IF IRRITATION PERSISTS. TREATMENT IS MOST EFFECTIVE WITHIN ONE MINUTE.

SKIN CONTACT:

THOROUGHLY WASH EXPOSED AREA WITH SOAP AND WATER. REMOVE CONTAMINATED CLOTHING. LAUNDRY CONTAMINATED CLOTHING BEFORE REUSE. APPLY EMOLLIENT RICH CREAM. IF IRRITATION DEVELOPS, SEEK MEDICAL ATTENTION.

INGESTION:

DO NOT INDUCE VOMITING. KEEP PERSON WARM, QUIET, AND GET MEDICAL ATTENTION. ASPIRATION OF MATERIAL INTO THE LUNGS DUE TO VOMITING CAN CAUSE CHEMICAL PNEUMONITIS WHICH CAN BE FATAL.

NOTES TO PHYSICIAN:

GASTRIC LAVAGE IS INDICATED. DO NOT INDUCE VOMITING.

SECTION VI - TOXICITY INFORMATION

PRODUCT CONTAINS CHEMICAL LISTED AS CARCINOGEN OR POTENTIAL CARCINOGEN BY:

IARC X--YES NTP X--NO OSHA X--YES ACGIH X--YES OTHER X--YES
X--NO X--NO X--NO X--NO X--NO

D-LIMONENE (MAJOR COMPONENT OF OIL ORANGE TERPENES CAS# 68647-72-3)

IPR-MUS TDLO: 4800MG/KG/BW 1

ORL-MUS TDLO: 67GM/KG/39W: ETA 1.

NONYLPHENOXYPOLYETHOXYETHANOL

ORL-RAT LD50: 2210MG/KG 1

SKN-RBT LD50: >2G/KG 1

EYE IRRITATION: SEVERE IRRITANT- BLOOD VESSELS GROWING ON CORNEA

OF EYE

SKIN IRRITATION PRIMARY IRRITATION SCORE: 2.1 2.

SECTION VII - REACTIVITY DATA

NATURALIZER AEROSOL

(CONTINUED)

SECTION VII - REACTIVITY DATA

PAGE : 04

STABILITY X--STABLE <--UNSTABLE CONDITIONS TO AVOID
AVOID EXPOSURE TO HEAT (TEMP >120 F.), SPARKS OR OPEN FLAME.INCOMPATIBILITY (MATERIALS TO AVOID)
STRONG OXIDIZERS SUCH AS LIQUID CHLORINE, LIQUID OXYGEN
AND SODIUM OR CALCIUM HYPOCHLORITES.HAZARDOUS DECOMPOSITION PRODUCTS
OXIDES OF CARBON AND ACRID SMOKE.HAZARDOUS WILL NOT MAY CONDITIONS TO AVOID
X <--OCCUR <--OCCUR
POLYMERIZATION: N/A

SECTION VIII - SPILL OR LEAK PROCEDURES

STEPS TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
AEROSOL PACKAGING MAKES MAJOR SPILL UNLIKELY.
ELIMINATE ALL IGNITION SOURCES. USE ABSORBANT SUCH AS PAPER, VERMICULITE,
ETC. TO CONTAIN SPILL. DO NOT FLUSH TO SEWER. PLACE INTO LABELED
CONTAINERS.WASTE DISPOSAL METHOD
DISPOSE OF IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL
REGULATIONS.
DISPOSE OF EMPTY AEROSOL CONTAINER BY WRAPPING SEVERAL LAYERS OF NEWS-
PAPER AROUND CAN AND DISCARDING IN TRASH.

NEUTRALIZING AGENT

NONE

SECTION IX - SPECIAL PROTECTION INFORMATION

REQUIRED VENTILATION
LOCAL EXHAUST VENTILATION SUFFICIENT TO MAINTAIN WORKPLACE
CONCENTRATION BELOW PERMISSIBLE EXPOSURE LIMITS.RESPIRATORY PROTECTION
TYPICAL USE OF PRODUCT DOES NOT REQUIRE THE USE OF A RESPIRATOR. IF
PRODUCT IS MISTED, USE NIOSH APPROVED MASK FOR SPRAY MISTS.PROTECTIVE GLOVES
NEOPRENE OR NITRILE RUBBER IF REPEATED OR PRO-
LONGED SKIN CONTACT OCCURS.

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(CONTINUED)

SECTION IX - SPECIAL PROTECTION INFORMATION PAGE : 05

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EYE PROTECTION
WEAR GOGGLES IF DIRECT EYE CONTACT IS LIKELY TO
OCCUR.

OTHER PROTECTION
APRON SHOULD BE WORN DEPENDING ON SEVERITY OF
EXPOSURE.

SECTION X - STORAGE AND HANDLING INFORMATION

STORAGE TEMPERATURE	INDOOR	HEATED	REFRIGERATED	OUTDOOR
120 F. <--MAX 30 F. <--MIN	X			

PRECAUTIONS TO BE TAKEN IN HANDLING & STORING
KEEP AWAY FROM IGNITION SOURCES.

OTHER PRECAUTIONS
KEEP AWAY FROM CHILDREN.
READ ENTIRE LABEL BEFORE USING PRODUCT.

SECTION XI - REGULATORY INFORMATION

CHEMICAL NAME	C.A.S. NUMBER	UPPER % LIMIT
---------------	---------------	---------------

N/A

THOSE INGREDIENTS LISTED ABOVE ARE SUBJECT TO THE REPORTING REQUIREMENTS OF
313 OF TITLE III OF THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF
1986 AND 40 CFR PART 372.

IF USE (USE EXEMPTION) APPEARS UNDER UPPER % LIMIT, END USERS ARE EXEMPT
FROM NOTIFICATION BECAUSE THE PRODUCT IS USED AND LABELED FOR ROUTINE
JANITORIAL WORK, OR THE PRODUCT IS USED AND LABELED FOR FACILITY GROUNDS
MAINTENANCE (SUCH AS FERTILIZERS AND HERBICIDES), OR THE PRODUCT IS USED AND
LABELED FOR MAINTAINING MOTOR VEHICLES.

SECTION XII - TRANSPORTATION • (FOR FUTURE USE)

APPLICABLE REGULATIONS	<--TARIFF 6 E	<--IATA	<--MILITARY AIR (AFR 71-4)
<--49 CFR <--IMCO			

SHIPPING NAME

HAZARD CLASS

| IC NUMBER | REPORT QTY

NATURALIZER AEROSOL

(CONTINUED)

SECTION XII - TRANSPORTATION • (FOR FUTURE USE)

PAGE : 06

LABELS

| LIMITED QTY

UNIT CONTAINER

DOT SPS CONTAINER

| NET EXPLOSIVE WT.

AEROSOL PROPELLANT(S)

SECTION XIII - REFERENCES

1. DANGEROUS PROPERTIES OF INDUSTRIAL MATERIALS, 6TH EDITION,
N. IRVING SAX.
2. VENDOR'S MSDS.

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NATIONAL CHEMSEARCH DIV. OF NCH CORP. ASSUMES NO RESPONSIBILITY
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OR DISPOSAL OF THE PRODUCT IN A MANNER NOT RECOMMENDED ON THE
PRODUCT LABEL. USERS ASSUME ALL RISKS ASSOCIATED WITH SUCH
UNRECOMMENDED USE, STORAGE, OR DISPOSAL OF THE PRODUCT.

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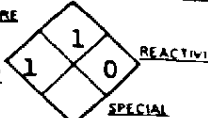
ROHM AND HAAS COMPANY

CORPORATE PRODUCT INTEGRITY DEPARTMENT
INDEPENDENCE MALL WEST
PHILADELPHIA, PA 19105EMERGENCY TELEPHONE
215-592-3000 (ROHM AND HAAS)
800-424-9300 (CHEMTREC)

HAZARD RATING

4-EXTREME
3-HIGH
2-MODERATE
1-SLIGHT
0-INSIGNIFICANT
**SEE SECTION IV

FIRE



3S231

LIST 7

MATERIAL SAFETY DATA SHEET

NOT OSHA HAZARDOUS

NOT WHMIS CONTROLLED

MATERIAL AMBERLYST® 15 WET Resin	CODE 69286	KEY 906233-7	DOT HAZARD CLASS NONREGULATED
FORMULA Not applicable	CHEMICAL NAME OR SYNONYMS Strong acid cation exchange resin (hydrogen form)		
DATE ISSUED 11/02/88			

I - COMPOSITIONAL INFORMATION

	CAS REG. NO.	APPROX WT %	TWA/TLV
Styrene/divinylbenzene cation exchange resin	NONHAZ	40-50	R&H OSHA ACGIH NE NE NE
Water	NONHAZ	50-60	NE NE NE NE = None established

II - PHYSICAL PROPERTY INFORMATION

APPEARANCE - ODOR - pH. Beads; pH (aqueous slurry) 3.0 max.		VISCOSITY NA	
MELTING OR FREEZING POINT OC/32F (water)	BOILING POINT 100C/212F (water)	VAPOR PRESSURE (mm Hg) 17 @ 20C/68F	VAPOR DENSITY (AIR=1) Less than 1
SOLUBILITY IN WATER Negligible	PERCENT VOLATILE (BY WEIGHT) 50-60 (water)	SPECIFIC GRAVITY (WATER=1) 1.1-1.4	EVAPORATION RATE (BUTYL ACETATE=1) Less than 1

III - FIRE AND EXPLOSION HAZARD INFORMATION

FLASH POINT NA	AUTO IGNITION TEMPERATURE 500C/932F (est.)	LOWER EXPLOSION LIMIT (%) NA	UPPER EXPLOSION LIMIT (%) NA
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EXTINGUISHING MEDIA

☐ FOAM ☐ "ALCOHOL" FOAM ☒ CO₂ ☒ DRY CHEMICAL ☒ WATER SPRAY ☐ OTHER

SPECIAL FIRE FIGHTING PROCEDURES

Wear self-contained breathing apparatus (pressure-demand, MSHA/NIOSH-approved or equivalent) and full protective gear.

UNUSUAL FIRE AND EXPLOSION HAZARDS

Toxic combustion products include oxides of sulfur.

IV - HEALTH HAZARD INFORMATION

ROHM AND HAAS RECOMMENDED WORK PLACE EXPOSURE LIMITS

STEL = None established

EFFECTS OF OVEREXPOSURE

Eye Contact: Product, as supplied, can cause eye irritation.

EMERGENCY AND FIRST AID PROCEDURES

Eye Contact: Flush eyes with large amounts of water for at least 15 minutes. Get prompt medical attention.

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STABILITY ☒ STABLE ☐ UNSTABLE		CONDITIONS TO AVOID Temperatures over 200C/392F.
HAZARDOUS DECOMPOSITION PRODUCTS Thermal decomposition may yield styrene monomer, divinylbenzene, and sulfur oxides.		
HAZARDOUS POLYMERIZATION ☐ MAY OCCUR ☒ WILL NOT OCCUR		CONDITIONS TO AVOID None known
INCOMPATIBILITY (MATERIALS TO AVOID) Avoid contact with concentrated nitric acid or any other strong oxidizing agents at all times.		
☐ WATER ☒ OTHER		

VI - SPILL OR LEAK PROCEDURE INFORMATION

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Floor may be slippery. Use care to avoid falls. Sweep up and transfer to containers for recovery or disposal.

WASTE DISPOSAL METHODS Unused resin may be incinerated or landfilled in facilities meeting local, state and federal regulations. For contaminated resin, the user must determine the hazard and use an appropriate disposal method.

VII - SPECIAL PROTECTION INFORMATION

VENTILATION TYPE

Normal room ventilation.

RESPIRATORY PROTECTION

None required for normal operations.

PROTECTIVE GLOVES

None required

EYE PROTECTION

Safety glasses (ANSI Z-87.1 or approved equivalent)

OTHER PROTECTIVE EQUIPMENT

Eyewash facility

VIII - STORAGE AND HANDLING INFORMATION

STORAGE TEMPERATURE	INDOOR	HEATED	REFRIGERATED	OUTDOOR
MAX. 60C/140F MIN. 0C/32F	YES	NO	NO	YES

NOTE: Store at ambient temperatures. Avoid repeated freeze-thaw cycles.

NOTE: Ground ion exchange resins should be treated as potential eye irritants. A finely ground form of a structurally related strong acid cation exchange resin produced severe rabbit eye irritation.

NOTE: The maximum operating temperature for this product is 121C/250F. Functional group destruction and loss of capacity will occur above this temperature.

IX - TOXICITY INFORMATION

No toxicity data available for this product.

X - MISCELLANEOUS INFORMATION

Caution: Do not pack column with dry ion exchange resins. Dry beads expand when wetted; this expansion can cause a glass column to shatter.

Caution: Nitric acid and other strong oxidizing agents can cause explosive-type reactions when mixed with ion exchange resins. Proper design of equipment to prevent rapid build-up of pressure is necessary if use of an oxidizing agent such as nitric acid is contemplated. Before using strong oxidizing agents in contact with ion exchange beads, consult sources knowledgeable in handling these materials.

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NA - NOT APPLICABLE C - CEILING VALUE	KEY 906233-7	DATE OF ISSUE 11/02/88	SUPERSEDES 07/31/87
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MATERIAL SAFETY DATA SHEET

M-4959-A
May 1989



An explanation of the terms used herein may be found in OSHA 29 CFR 1910.1200,
available from OSHA regional or area offices.
(Similar to U.S. Department of Labor Form OMB 1218-0072
and generally accepted in Canada for information purposes)
Do Not Duplicate This Form. Request an Original.

GA 052

PRODUCT Molecular Sieve Type MRG-C

CHEMICAL NAME Sodium/Aluminosilicate

SYNONYMS Zeolite

FORMULA Na₂O, MgO, Al₂O₃, SiO₂

CHEMICAL FAMILY Molecular Sieve

MOLECULAR WEIGHT Not Applicable

TRADE NAME UOP® Molecular Sieve formerly UNION CARBIDE® Molecular Sieve

A complex of elements and compounds composed of material shown below.
NOTE: In the table below, the symbol "<" means "less than".

MATERIAL (CAS/TSCA NO.)	Wt (%)	1988-1989 ACGIH TLV-TWA (OSHA-PEL)	
Sodium Oxide (1313-59-3)	< 30	None established	(None established)
Magnesium Oxide (1309-48-4)	< 5	10 mg/m ³ Fume	(10 mg/m ³ Fume Total) (5 mg/m ³ Respirable fraction)
Aluminum Oxide (1344-28-1)	< 30	10 mg/m ³ as Al	(10 mg/m ³ Total dust) (5 mg/m ³ Respirable fraction)
Silicon Oxide (7631-86-9)	< 50	10 mg/m ³	(6 mg/m ³)

BOILING POINT, 760 mm. Hg Not Applicable

FREEZING POINT

Not Applicable

SPECIFIC GRAVITY (H₂O = 1)

2.1

VAPOR PRESSURE AT 20°C.

Not Applicable

VAPOR DENSITY (air = 1)

Not Applicable

SOLUBILITY IN WATER, % by wt.

Not Applicable

PERCENT VOLATILES BY VOLUME

Not Applicable

EVAPORATION RATE (Butyl Acetate = 1)

Not Applicable

APPEARANCE AND ODOR Product is a tan pellet; odorless.

IN CASE OF EMERGENCIES involving this material, further information is available at all times:

In the USA (1-800-822-4357)

In Canada 514 — 640-6400

For routine information contact your local supplier

UOP urges each customer or recipient of this MSDS to study it carefully to become aware of and understand the potential hazards associated with the product. The reader should consider consulting reference works or individuals who are experts in ventilation, toxicology, and fire prevention, as necessary or appropriate to use and understand the data contained in this MSDS. To promote safe handling, each customer or recipient should: (1) notify its employees, agents, contractors and others whom it knows or believes will use this material or the information in this MSDS and any other information regarding hazards or safety; (2) furnish this same information to each of its customers for the product, and (3) request such customers to notify their employees, customers, and other users of the product of this information.

UOP ☐ MOLECULAR SIEVE DIVISION
UOP CANADA ☐ MOLECULAR SIEVE DIVISION

THRESHOLD LIMIT VALUE: See Section II.

EFFECTS OF SINGLE (ACUTE) OVEREXPOSURE:

SWALLOWING — No evidence of adverse effects from available information.

SKIN ABSORPTION — No evidence of adverse effects from available information.

INHALATION — May cause irritation of the nose and throat, accompanied by cough and chest discomfort.

SKIN CONTACT — May cause irritation seen as local redness and/or burns.

EYE CONTACT — May cause irritation seen as excess redness of the conjunctiva and/or burns.

EFFECTS OF REPEATED (CHRONIC) OVEREXPOSURE: Prolonged inhalation may cause lung damage.

OTHER EFFECTS OF OVEREXPOSURE: None currently known.

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE: Breathing of dust may aggravate asthma and inflammatory or fibrotic pulmonary disease.

EMERGENCY AND FIRST AID PROCEDURES:

SWALLOWING — If ingested in large quantities, then drink 2 glasses of water. Induce vomiting if the patient is conscious.

SKIN CONTACT — Wash the contacted area with soap and water.

INHALATION — Remove the person to fresh air.

EYE CONTACT — Immediately flush eyes with water for at least 15 minutes.

NOTES TO PHYSICIAN: *This product is a desiccant and generates heat as it adsorbs water. The used product can contain material of a hazardous nature. Identify that material and treat accordingly.*

SAL 000006874

PRODUCT: Molecular Sieve Type MRG-C

CA052

M-4959-A
May 1989

FLASH POINT (test method)		Does not burn	AUTOIGNITION TEMPERATURE	Not Applicable
FLAMMABLE LIMITS IN AIR, % by volume		LOWER	Not Applicable	UPPER Not Applicable

EXTINGUISHING MEDIA: Unused material will not burn. Use media appropriate for surrounding fire.

SPECIAL FIRE FIGHTING PROCEDURES: Depends on the use of the material. Used material may contain products of a hazardous nature. The user of this product must identify the hazards of the retained material and inform the fire fighters of these hazards.

UNUSUAL FIRE AND EXPLOSION HAZARDS: In their fresh unused state, molecular sieves are not flammable. When exposed to water, however, they can get quite hot. When first wetted they can heat to the boiling point of water. Flooding will reduce the temperature to safe limits.

STABILITY		CONDITIONS TO AVOID: The addition of moisture (water) without flooding can cause rise in temperature from heat of adsorption and contact with skin might result in burns.
UNSTABLE	STABLE	
	X	

INCOMPATIBILITY (Materials to Avoid): Sudden contact with high concentrations of chemicals having high heats of adsorption such as olefins, HCl, etc.

HAZARDOUS DECOMPOSITION PRODUCTS: Hydrocarbons and other materials that contact the molecular sieve during normal use can be retained on the sieve. It is reasonable to expect that decomposition products will come from these retained materials of use. The molecular sieve itself does not readily decompose unless subjected to extreme temperature or chemical conditions. If such decomposition did occur the products would include the mix of oxides listed in Section II.

HAZARDOUS POLYMERIZATION		CONDITIONS TO AVOID: None currently known.
May Occur	Will not Occur	
	X	

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED: Sweep the spill area. Collect and place the spilled material in a waste disposal container. Avoid raising dust.

WASTE DISPOSAL METHOD: Discard any product (including any retained materials of use), disposable container or liner in an environmentally acceptable manner, in full compliance with Federal, State and local regulations.

SAL 000006875

RESPIRATORY PROTECTION (specify type): A NIOSH/MSHA approved respirator for protection against dust, mist or vapor is recommended for operations when the permissible exposure limit might be exceeded.

VENTILATION	LOCAL EXHAUST — Local exhaust ventilation is recommended for operations where the permissible exposure limit might be exceeded.
	MECHANICAL (general) — Not applicable - See Local Exhaust.
	SPECIAL — Not applicable - See Local Exhaust.
	OTHER — Not applicable - See Local Exhaust.

PROTECTIVE GLOVES: Use gloves to avoid *PROLONGED* skin contact.

EYE PROTECTION: Safety glasses or goggles selected as per OSHA 29 CFR 1910.133.

OTHER PROTECTIVE EQUIPMENT: Select in accordance with OSHA 1910.132 and 1910.133.

LABEL:

CAUTION

DUST MAY IRRITATE EYES, NOSE, THROAT AND SKIN.

Avoid breathing dust.

Avoid contact with eyes and skin.

Open container slowly.

Use with adequate ventilation.

Do not put in mouth or pour liquid into product. Burns can result.

BEFORE HANDLING OR USING, READ AND UNDERSTAND CURRENT MATERIAL SAFETY DATA SHEET FOR THIS MATERIAL.

FIRST AID — EYE CONTACT: Immediately flush with water for at least 15 minutes. Call a physician if irritation persists. **SWALLOWING:** Give two or more glasses of water. **INHALED:** Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician. **SKIN CONTACT:** Flush with plenty of water.

24 HOUR EMERGENCY ASSISTANCE PHONES

USA 800-822-4357 CANADA 514-640-6400 USA FROM OVERSEAS 304-744-3487

OTHER HANDLING AND STORAGE CONDITIONS: pH range if in aqueous slurry 8-11.

Designers of processes and fabricators of equipment should read UOP's free booklet, *Precautions and Safe Practices for Handling Molecular Sieves in Process Units*, M-1001. Request a copy from your UOP representative.

Under the TSCA rules for chemical mixtures and naturally occurring substances the EPA defines this product to be a statutory mix; therefore, only its component oxides or metals shown in Section II of this MSDS are in the inventory. The human and the environmental hazards are, however, not the summation of the hazards of the components because the components do not separate from the product (see Section VI of this MSDS). The hazards discussed in this MSDS are based on the product as a whole.

Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III requires emergency planning based on Threshold Planning Quantities (TPQ's) and release reporting based on Reportable Quantities (RQ's) in 40 CFR 355 (used for SARA 302, 304, 311 and 312).

Components present in this product at a level which could require reporting under the statute are: *****NONE*****

Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III requires submission of annual reports of release of toxic chemicals that appear in 40 CFR 372 (for SARA 313). This information must be included in all MSDSs that are copied and distributed for this material.

Components present in this product at a level which could require reporting under the statute are: aluminum oxide.

D.O.T.: Hazard Class - Not a corrosive, flammable, irritant, or explosive material. Not a Class B poison by skin contact or acute inhalation.

PROPOSITION 65: This product contains no levels of listed substances, which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute.

This product is not classified as a controlled product under Canada's Federal Hazardous Product Act (WHMIS).

The opinions expressed herein are those of qualified experts within UOP. We believe that the information contained herein is current as of the date of this Material Safety Data Sheet. Since the use of this information and these opinions and the conditions of use of the product are not within the control of UOP, it is the user's obligation to determine the conditions of safe use of the product.

GENERAL OFFICES

IN THE USA:

UOP

Molecular Sieve Division

25 East Algonquin Road

Des Plaines, IL 60017-5017

Other offices in principal cities all over the world.

IN CANADA:

UOP Canada

Molecular Sieve Division

245 Eglinton Ave. East Suite 310

Toronto, Ontario M4P 3B7



**UNION CARBIDE
MOLECULAR
SIEVES**



Special 020A

MAY, 1990

UOP
MATERIAL SAFETY DATA SHEET

C A 053

An explanation of the terms used herein may be found in OSHA 29 CFR 1910. 1200,
available from OSHA regional or area offices.

(Similar to U.S. Department of Labor Form OMB 1218-0072
and generally accepted in Canada for information purposes).
Do not Duplicate This Form. Request an Original.

I. PRODUCT IDENTIFICATION

PRODUCT: Molecular Sieve Type MRG-D

CHEMICAL NAME: Sodium Aluminosilicate

SYNONYMS: Silicic Acid/Alumino-
silicate MixFORMULA: Na_2O , Al_2O_3 , SiO_2 CHEMICAL FAMILY: Amorphous Silico/
Aluminate

TRADE NAME: UOP® Adsorbent MRG-D,

formerly Union Carbide® Adsorbent MRG-D MOLECULAR WEIGHT: Not Applicable

II. HAZARDOUS INGREDIENTS

A complex of elements and compounds composed of material shown below.

NOTE: In the table below, the symbol "<" means "less than"

MATERIAL (CAS/TSCA NO.)	Wt. (%)	1989 - 1990 ACGIH TLV-TWA (OSHA-PEL)
Silicon Oxide (1313-59-3)		None established (None established)
Aluminum Oxide (1344-28-1)		10 mg/m ³ as Al (10 mg/m ³ Total dust)
		< 5 mg/m ³ Respirable fraction)
Silicon Oxide (7631-86-9)		10 mg/m ³ Total dust < 6 mg/m ³

III. PHYSICAL DATA

N/A = Not Applicable

BOILING POINT, 760 mm. Hg: N/A

FREEZING POINT: N/A

SPECIFIC GRAVITY (H₂O=1): 2.1 (particle)

VAPOR PRESSURE @ 20°C: N/A

VAPOR DENSITY (air=1): N/A

SOLUBILITY IN H₂O (wt %): N/A

PERCENT VOLATILES (volume): N/A

EVAPORATION RATE (Butyl Acetate=1): N/A

APPEARANCE AND ODOR: Product is in the form of pellets, odorless. SAL 000006877

For routine information contact your local supplier.

UOP urges each customer or recipient of this MSDS to study it carefully to become aware of and understand the hazards associated with the product. The reader should consider consulting reference works or individuals who are experts in ventilation, toxicology, and fire prevention, as necessary or appropriate to use and understand the data contained in this MSDS. To promote safe handling, each customer or recipient should: (1) notify its employees, agents, contractors and others whom it knows or believes will use this material or the information in this MSDS and any other information regarding hazards or safety; (2) furnish this same information to each of its customers for the product; and (3) request such customers to notify their employees, customers, and other users of the product of this information.

PRODUCT: Molecular Sieve Type MRG-D

Special 020A
MAY, 1990

A 058

EMERGENCY PHONE NUMBER

In USA: UOP 708-391-2123 CHEMTREC 800-424-9300
In Canada: CANUTEC 613-996-6666 From other Countries: CHEMTREC 202-483-7616

IV. HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: See Section II.

EFFECTS OF SINGLE (ACUTE) OVEREXPOSURE:

SWALLOWING - No evidence of adverse effects from available information.SKIN ABSORPTION - No evidence of adverse effects from available information.INHALATION - May cause irritation of the nose and throat, accompanied by cough and chest discomfort.SKIN CONTACT - May cause irritation and local reddening.EYE CONTACT - May cause eye irritation, retina diseases, and choroid atrophy.

EFFECTS OF REPEATED (CHRONIC) OVEREXPOSURE: May cause upper respiratory tract irritation with discomfort of nose and throat. If high concentrations are inhaled over a long period of time, lower respiratory tract irritation may result in coughing and production of sputum. Submicron amorphous silica does not cause pneumoconiosis in man. Lung damage may result.

OTHER EFFECTS OF OVEREXPOSURE: None currently known.

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE: A knowledge of the available toxicology information and of the physical and chemical properties of the material suggest that overexposure is unlikely to aggravate existing medical conditions.

EMERGENCY AND FIRST AID PROCEDURES:

SWALLOWING - If ingested in large quantities, then drink 2 glasses of water. Contact physician for permission to induce vomiting.SKIN CONTACT - Wash the contacted area with soap and water.INHALATION - Remove the person to fresh air. If symptoms persist, see a physician.EYE CONTACT - Flush eyes with water for 15 minutes. See a physician, preferably an ophthalmologist; immediately.

NOTES TO PHYSICIAN: This product is a desiccant and generates heat as it adsorbs water. The used product may be contaminated by material of a hazardous nature. Identify that material and treat symptomatically.

V. FIRE AND EXPLOSION HAZARD DATA

N/A - Not Applicable

FLASH POINT (Test Method): Does not burn

AUTOIGNITION TEMPERATURE: N/A

FLAMMABLE LIMITS IN AIR (vol %) LOWER: N/A

UPPER: N/A

SAL 000006878

PRODUCT: Molecular Sieve Type MRG-D

Special 020A

MAY, 1990

CA 053

EXTINGUISHING MEDIA: Unused material will not burn. Use media appropriate for surrounding fire.

SPECIAL FIRE FIGHTING PROCEDURES: Depends on the use of the material. Used material may contain products of a hazardous nature. The user of this product must identify the hazards of the retained material and inform the fire fighters of these hazards.

UNUSUAL FIRE AND EXPLOSION HAZARDS: In their fresh unused state, the adsorbent is not flammable. When exposed to water, however, it can get quite hot. When first wetted it can heat to the boiling point of water. Flooding will reduce the temperature to safe limits.

VI. REACTIVITY DATA

STABILITY

Stable X Unstable

CONDITIONS TO AVOID: Moisture (water) can cause rise in temperature which might result in burn.

COMPATIBILITY (Materials to Avoid): Sudden contact with high concentrations of chemicals having high heats of adsorption such as olefins, HCl, etc.

HAZARDOUS DECOMPOSITION PRODUCTS: Hydrocarbons and other materials that contact the adsorbent during normal use can be retained on the adsorbent. It is reasonable to expect that decomposition products will come from these retained materials of use. The adsorbent itself does not readily decompose unless subjected to extreme temperature or chemical conditions. If such decomposition did occur the products would include the mix of oxides listed in Section II.

HAZARDOUS POLYMERIZATION

May Occur Will Not Occur X

CONDITIONS TO AVOID: None currently known.

VII. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED: Sweep the spill area. Collect and place the spilled material in a waste disposal container. Avoid raising dust.

WASTE DISPOSAL METHOD: Discard any product (including any retained materials of use), disposable container or liner in an environmentally acceptable manner, in full compliance with Federal, State and local regulations.

RECRA HAZARDOUS WASTE NO.: Not Federally Regulated.

VIII. SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (specify type): A NIOSH/MSHA approved respirator for protection against dust is recommended for operations where PEL might be exceeded.

PRODUCT: Molecular Sieve Type MRG-D

Special 020A
MAY, 1990

053

VENTILATION

LOCAL EXHAUST — Local exhaust ventilation is recommended for operations where PEL might be exceeded.

MECHANICAL (general) — Not applicable

SPECIAL — Not applicable

THER — Not applicable

PROTECTIVE GLOVES: Use gloves impermeable to dust where prolonged hand contact is possible.

EYE PROTECTION: Safety glasses or goggles selected as per OSHA 29 CFR 1910.133.

OTHER PROTECTIVE EQUIPMENT: Eyewash fountain.

IX. SPECIAL PRECAUTIONS

LABEL:

CAUTION

DUST MAY IRRITATE EYES, NOSE, THROAT AND SKIN.

Avoid breathing dust.

Avoid contact with eyes and skin.

Open container slowly.

Use with adequate ventilation.

Do not put in mouth or pour liquid into product. Burns can result.

BEFORE HANDLING OR USING, READ AND UNDERSTAND CURRENT MATERIAL SAFETY

DATA SHEET FOR THIS MATERIAL AND, WHEN APPROPRIATE, ALSO READ SAFETY BOOKLET M-1001.

FIRST AID — EYE CONTACT: Immediately flush with water for at least 15 minutes. Call a physician if irritation persists. SWALLOWING: Give two or more glasses of water. INHALED: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician. SKIN CONTACT: Flush with plenty of water.

OTHER HANDLING AND STORAGE CONDITIONS: pH range if in aqueous slurry 3.5-8.0. Designers of processes and fabricators of equipment should read UOP's free booklet, "Precautions and Safe Practices for Handling Molecular Sieves in Process Units", M-1001. Request a copy from your UOP representative. Pouring dry material can cause static electricity build-up. Ground container where electric sparks must be prevented. Keep container sealed tightly to maintain product quality.

X. REGULATORY INFORMATION

Under the TSCA rules for mixtures and naturally occurring substances the EPA considers this product to be a statutory mix, therefore, only its component oxides or metals shown in Section II of this MSDS are in the inventory. The human and the environmental hazards are, however, not the summation of the hazards of the components because the components do not separate from the product (see Section VI of this MSDS). The hazards discussed in this MSDS are based on the product as a whole.

PRODUCT: Molecular Sieve Type MRG-D

Special 020A

MAY, 1990

CA053

Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III requires emergency planning based on Threshold Planning Quantities (TPQ's) and release reporting based on Reportable Quantities (RQ's) in 40 CFR 355 (used for SARA 302, 304, 311 and 312).

Components present in this product at a level which could require reporting under the statute are: *****NONE*****

Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III requires submission of annual reports of release of toxic chemicals that appear in 40 CFR 372 (for SARA 313). This information must be included in all MSDSs that are copied and distributed for this material.

Components present in this product at a level which could require reporting under the statute are: *****NONE*****.

D.O.T.: Hazard Class - Not a corrosive, flammable, irritant, or explosive material. Not a Class B poison by skin contact or acute inhalation.

PROPOSITION 65: This product contains no levels of listed substances, which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute.

This product is not classified as a controlled product under Canada's Federal Hazardous Products Act (WHMIS).

MSHA Title III: Product is in none of the Health Hazard Categories.

The opinions expressed herein are those of qualified experts within UOP. We believe that the information contained herein is current as of the date of this Material Safety Data Sheet. Since the use of this information and these opinions and the conditions of use of the product are not within the control of UOP, it is the user's obligation to determine the conditions of safe use of the product.

GENERAL OFFICES:

IN THE USA:

UOP

Molecular Sieve Division

25 East Algonquin Road

Des Plaines, IL 60017-5017

IN CANADA:

UOP Canada

Molecular Sieve Division

245 Eglinton Ave. East Suite 310

Toronto, Ontario M4P 3B7

Other offices in principal cities all over the world

UOP □ MOLECULAR SIEVE DIVISION
UOP CANADA □ MOLECULAR SIEVE DIVISION

SAL 000006881

MATERIAL SAFETY DATA SHEET

APPROVED BY U S LABOR DEPT, ESSENTIALLY SIMILAR TO FORM OSHA 174

PRODUCT IDENTITY: Four Star Lacquer Thinner

I. SUPPLIER

SOUTHWEST SOLV & CHEM
P O BOX 41065
HOUSTON, TX 77241
PHONE: 713-937-9300
CHEMTREC PHONE: 1-800-424-9300

II. HAZARDOUS INGREDIENTS

Section 313 Supplier Notification

This product contains the indicated (8) toxic chemicals subject to the reporting requirements of Section 313 of the Emergency Planning & Community Right-to-Know Act of 1986 & of 40 CFR 372. This information must be included in all MSDSs that are copied and distributed for this material.

MATERIAL	CAS #	PEL (OSHA)	TLV (ACGIH)	SARA TITLE III WT. % (REG. SECTION)
Toluene	108-88-3	100 ppm	100 ppm	52 (311,312,313,RCRA)
Acetone	67-64-1	750 ppm	750 ppm	38 (311,312,313,RCRA)
Isopropanol	67-63-0	400 ppm	400 ppm	Not Applicable
Methanol	67-56-1	200 ppm(S)	200 ppm(S)	3 (311,312,313,RCRA)
MATERIAL	CAS #	CEILING	STEL (OSHA & ACGIH)	
Toluene	108-88-3	300 ppm	150 ppm	
Acetone	67-64-1	None Known	1000 ppm	
Methanol	67-56-1	None Known	250 ppm	
MATERIAL	CAS #	LOWEST KNOWN LETHAL DOSE INFORMATION		
Methanol	67-56-1	Lowest Known LD50 (ORAL)	1600 mg/kg (Man)	
Toluene	108-88-3	Lowest Known LC50 (VAPORS)	5300 ppm (Nice)	
Toluene	108-88-3	Lowest Known LD50 (SKIN)	4800 mg/kg (Rabbits)	

HAZARD RATING
HEALTH (NFPA): 2 HEALTH (HMIS): 1 FLAMMABILITY: 3 REACTIVITY: 0

SARA SECTION 313 HAZARDS: Acute Health, Fire

DOT SHIPPING NAME: Compound Cleaning, Liquid (NA1993)
DOT DRUM LABEL: Flammable Liquid

III. PHYSICAL DATA

BOILING RANGE : 56 87 111°C / 133 189 232°F
GRAVITY @ 60°F : 38.8
*API : .831
SPECIFIC GRAVITY (Water=1) : 6.919
POUNDS/GALLON : 87.9
VAPOR PRESSURE (mm of Hg)@20 : 2.6
VAPOR DENSITY (air=1) : Appreciable
WATER ABSORPTION : Appreciable
ACID ABSORPTION (85% H₂SO₄) : 3.7
DRY TIME (Ether=1) : 100.0
% VOLATILE BY VOL : Liquid, Water-White
APPEARANCE : Ketone
ODOR :
SOLVENCY PARAMETERS:
HKB (Hydrogen Bonding) : 26.3
PKB (Polarity) : 40.6
DKB (Dispersion) : 33.1
REFRACTIVE INDEX : 1.420
MIXED ANILINE POINT (Acid Insol): 9°C / 48°F

SAL 000006882

PRODUCT IDENTITY: Four Star Lacquer Thinner

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IV. FIRE & EXPLOSION HAZARDS

LOWER FLAMMABLE LIMIT IN AIR (L by vol): 2.1

FLASH POINT (TEST METHOD): -16°C / 2°F (TCC) (Lowest Component)

FLAMMABILITY CLASSIFICATION: class I B

EXTINGUISHING : MFPA Class B extinguishers (CO₂ or foam)
MEDIA : for class I B liquid fires.

SPECIAL FIRE : Water spray may be ineffective on fire but can protect fire fighters & cool closed containers.
FIGHTING : Use fog nozzles if water is used. Do not enter confined fire-space without full
PROCEDURES : bunker gear. (Helmet with face shield, bunker coats, gloves & rubber boots).
: Use NIOSH approved positive-pressure self-contained breathing apparatus.

UNUSUAL : EXTREMELY FLAMMABLE!! Vapors can cause flash fire. Keep container tightly closed. Isolate from
EXPLOSION : oxidizers, heat, sparks, electric equipment & open flame.
AND FIRE : Closed containers may explode if exposed to extreme heat.
PROCEDURES : Applying to hot surfaces requires special precautions.
: Empty container very hazardous! Continue all label precautions!

V. HEALTH EFFECT DATA

THRESHOLD LIMIT VALUE: 190 ppm (Evaporated Blend)

PREVENTION: Use only with adequate ventilation. Avoid breathing of vapor or spray mist.
OF OVER-: Avoid contact with skin & eyes.
EXPOSURE:

ORGANIC EFFECTS: INHALING: Anesthetic. Irritates respiratory tract.
OF ACUTE: Can cause serious nervous system depression.
OVER- : Can cause damage to kidneys, blood, nerves, liver & lungs.
EXPOSURE: EYE & SKIN CONTACT: Primary irritation to skin, defatting, dermatitis.
: Primary irritation to eyes, redness, tearing, blurred vision.
: Absorption thru skin increases exposure.
: SWALLOWING: Harmful or fatal if swallowed.
: Swallowing can cause abdominal irritation, nausea, vomiting and diarrhea.

ORGANIC EFFECTS: Vapor harmful. Breathing vapor can cause irritation.
OF CHRONIC: Can cause damage to kidneys, blood, nerves, liver & lungs.
OVER- : EYE & SKIN CONTACT: Liquid can cause eye irritation.
EXPOSURE: Wash thoroughly after handling.
: Absorption thru skin may be harmful.
: Studies with laboratory animals indicate this product can cause damage to fetus.
CANCER HAZARD: This product has no carcinogens listed by IARC, NTP, NIOSH, OSHA or ACGIH,
: as of this date, greater or equal to 0.1%.
: This product may contain less than 100 ppm of Benzene.
: Not considered hazardous in such low concentrations.

CONDITIONS: Persons with severe skin, liver or kidney problems should avoid use.
AGGRAVATED:

EMERGENCY & : In case of contact with skin, flush with plenty of water. For eyes,
FIRST AID : flush with plenty of water for 15 minutes & get medical attention.
PROCEDURES : After high vapor exposure, remove to fresh air. If breathing is difficult
: give oxygen. If breathing has stopped give artificial respiration.
: If swallowed, CALL A PHYSICIAN IMMEDIATELY!
: Never give anything by mouth to an unconscious person.

PRODUCT IDENTITY: FourStar Lacquer Thinner

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VI. REACTIVITY DATA

STABILITY : Stable

CONDITIONS TO AVOID: Isolate from oxidizers, heat, sparks, electric equipment & open flame.

MATERIALS TO AVOID : Isolate from strong oxidizers such as permanganates, chromates & peroxides.

HAZARDOUS DECOMPOSITION: Carbon Monoxide, Carbon Dioxide from burning.
PRODUCTS :

VII. SAFE HANDLING & USE PRECAUTIONS

SPILL OR LEAK PROCEDURES : Stop spill at source. Dike area & contain. Pump spilled liquid & put contaminated soil in DOT approved containers for disposal. Label immediately.
: Clean up remainder with absorbent materials.

WASTE DISPOSAL METHOD : Dispose of waste by legal methods complying with local, state & Federal regulations.
: If questions exist, contact the appropriate agencies.

OTHER PRECAUTIONS : Vapors may ignite explosively & spread long distances. Prevent vapor buildup.
: Put out pilot lights & turn off ignition sources during use & until all vapors are gone.
: Do not store above 49°C/120°F.
: Store large amounts in structures made for OSHA Class I B liquids.
: Avoid free fall of liquid.
: Ground containers when transferring. Do not flame cut, saw, drill, braze or weld.
: Empty container very hazardous! Continue all label precautions!

VIII. CONTROL MEASURES

RESPIRATORY PROTECTION: Ventilate to keep air below 95 ppm. If over TLV, in accordance with 29 CFR 1910.134, (SPECIFY TYPE) : Use NIOSH approved positive-pressure self-contained breathing apparatus.
: Consult Safety Equipment Supplier. Use explosion-proof equipment.

VENTILATION : LOCAL EXHAUST : Necessary MECHANICAL (GENERAL) : Acceptable
: SPECIAL : None OTHER : None

PROTECTIVE : Wear OSHA Standard goggles or face shield. Consult Safety Equipment Supplier.
CLOTHING: Wear gloves, apron & footwear impervious to this material. Wash clothing before reuse.

NOTICE

SOUTHWEST SOLV & CHEM disclaims all expressed or implied warranties of merchantability or fitness for a particular purpose, with respect to the product or information provided herein.

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This information relates only to the product designated herein, and does not relate to its use in combination with any other material or in any other process.

DATE : MAY 22, 1990

P.C. 88

**SOUTHWEST SOLV & CHEM
P O BOX 41065
HOUSTON, TX 77241
PHONE: 713-937-9300**

**Four Star Lacquer Thinner
CONTAINS: TOLUENE, ACETONE, ISOPROPANOL, METHANOL**

**DANGER!!
EXTREMELY FLAMMABLE!!
VAPORS CAN CAUSE FLASH FIRE**
INHALING: ANESTHETIC. IRRITATES RESPIRATORY TRACT
ACUTE OVEREXPOSURE CAN CAUSE SERIOUS NERVOUS SYSTEM DEPRESSION
VAPOR HARMFUL. BREATHING VAPOR CAN CAUSE IRRITATION
ACUTE OVEREXPOSURE CAN CAUSE DAMAGE TO KIDNEYS, BLOOD, NERVES, LIVER & LUNGS
EYE & SKIN CONTACT: PRIMARY IRRITATION TO SKIN, DEFAITING, DERMATITIS
PRIMARY IRRITATION TO EYES, REDNESS, TEARING, BLURRED VISION
ABSORPTION THRU SKIN INCREASES EXPOSURE
WASH THOROUGHLY AFTER HANDLING
ABSORPTION THRU SKIN MAY BE HARMFUL
STUDIES WITH LABORATORY ANIMALS INDICATE THIS PRODUCT CAN CAUSE DAMAGE TO FETUS
SWALLOWING: HARMFUL OR FATAL IF SWALLOWED
SWALLOWING CAN CAUSE ABDOMINAL IRRITATION, NAUSEA, VOMITING AND DIARRHEA
PERSONS WITH SEVERE SKIN, LIVER OR KIDNEY PROBLEMS SHOULD AVOID USE

Isolate from oxidizers, heat, sparks, electric equipment & open flame.
Use only with adequate ventilation. Avoid breathing of vapor or spray mist.
Avoid contact with skin & eyes.
Wear OSHA Standard goggles or face shield. Consult Safety Equipment Supplier.
Wear gloves, apron & footwear impervious to this material. Wash clothing before reuse.
Vapors may ignite explosively & spread long distances. Prevent vapor buildup.
Put out pilot lights & turn off electric equipment & other
ignition sources during use & until all vapors are gone.
Keep container tightly closed & upright when not in use to prevent leakage.
Empty container very hazardous! Continue all label precautions!
Ground containers when transferring. Do not flame cut, saw, drill, braze or weld.
DISPOSAL: Recycle or dispose of observing local, state & federal health,
safety & pollution laws. If spilled, mop up & dispose of.
FIRST AID: In case of contact with skin, flush with plenty of water. For eyes,
flush with plenty of water for 15 minutes & get medical attention.
After high vapor exposure, remove to fresh air. If breathing is difficult
give oxygen. If breathing has stopped give artificial respiration.
If swallowed, CALL A PHYSICIAN IMMEDIATELY!
Never give anything by mouth to an unconscious person.
Consult MSDS for further information.
FOR INDUSTRY USE ONLY KEEP OUT OF THE REACH OF CHILDREN DATE: MAY 22, 1990

DOT SHIPPING NAME: Compound Cleaning, Liquid (NA1993)
DOT DRUM LABEL: Flammable Liquid

Legal responsibility is assumed only for the fact that
all studies reported here & opinions are those of
qualified experts. Buyer assumes all risk & liability.
He accepts & uses this material on these conditions.

ATTENTION!
THIS CONTAINER HAZARDOUS WHEN EMPTY OR
PARTIALLY EMPTY. SINCE CONTAINERS RETAIN
PRODUCT VAPOR OR LIQUID RESIDUES, ALL
HAZARD PRECAUTIONS MUST BE OBSERVED.
RESIDUAL VAPORS MAY EXPLODE ON IGNITION.
DO NOT CUT, DRILL, GRIND, OR WELD
ON OR NEAR THIS CONTAINER.

HAZARD RATING
HEALTH (NFPA): 2
HEALTH (HMIS): 1
FLAMMABILITY: 3
REACTIVITY: 0

**RED
FLAMMABLE
LABEL**

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(037927-0429 -E0016293-4913)

DATE OF ISSUE
01/26/90SUPERSEDES
01/26/90

APR 0 2 1991

SECTION I - GENERAL INFORMATION

CHEMICAL NAME & SYNONYMS N/A	TRADE NAME & SYNONYMS M/M PIPE SEALANT
CHEMICAL FAMILY DIMETHACRYLATES	FORMULA X<--MIXTURE
MANUFACTURERS NAME: NATIONAL CHEMSEARCH DIV. OF NCH CORP.	
ADDRESS (NUMBER, STREET, CITY, STATE & ZIP CODE) BOX 182170 IRVING, TEXAS 75015	
PREPARED BY: KELLY SEALS/T.S.CHEMIST	PRODUCT CODE NUMBER 4913
EMERGENCY TELEPHONE NUMBER 214-438-1381	

SECTION II- HAZARDOUS INGREDIENTS

THE HAZARDS PRESENTED BELOW ARE THOSE OF THE INDIVIDUAL COMPONENTS AS THE PRODUCT MIXTURE HAS NOT BEEN TESTED AS A WHOLE.

CHEMICAL NAME (INGREDIENTS)	HAZARD	TLV*	PEL*	CAS#
POLYTETRAFLUOROETHYLENE	IRRITANT	N/A	N/A	9002-84-0
POLYGLYCOL DIMETHACRYLATES	SKIN IRR.	N/A	N/A	25852-47-5
1-OCTANOL	TOXIC	N/A	N/A	111-87-5
BIS-PHENOL A FUMARATO RESIN	SKIN IRR.	N/A	N/A	3938225-7
SILICA (MICA)	IRRITANT	20PPM 1.	N/A	12001-26-2
CUMENE HYDRPEROXIDE	SKIN IRR.	N/A	N/A	80-15-9

M/M PIPE SEALANT

SECTION IIA - NON-HAZARDOUS INGREDIENTS

PAGE : 02

NON-HAZARDOUS INGREDIENT NAMES AND CAS NUMBERS ARE PROTECTED UNDER NJ TRADE SECRET REGISTRY # 409363-5193P

SECTION III - PHYSICAL DATA

BOILING PT. (FAHRENHEIT)	>300 F.	SPEC GRAVITY (H2O=1)	1.21
VAPOR PRESSURE (MM HG)	<10	COLOR	WHITE PASTE
VAPOR DENSITY (AIR=1)	N/A	ODOR	ALCOHOLIC
PH @ 100%	N/A	CLARITY	OPAQUE
PERCENT VOLATILE BY VOLUME (%)	<10	EVAPORATION RATE (BU AC = 1)	N/A
SOLUBILITY IN WATER	NEGLIGIBLE		
VISCOSITY	VISCOUS		

SECTION IV - FIRE AND EXPLOSION HAZARD

FLASH POINT (METHOD USED)	>300 F. T.C.C.	FLAMMABLE LIMITS	N/A	LEL	N/A	UEL
EXTINGUISHING MEDIA	"ALCOHOL" X<--FOAM	X<--CO2	DRY X<--CHEMICAL	WATER X<--SPRAY	X<--OTHER	
SPECIAL FIRE FIGHTING PROCEDURES N/A						

UNUSUAL FIRE & EXPLOSION HAZARDS

N/A

NFPA HAZARD RATING (0=INSIGNIFICANT; 1=SLIGHT; 2=MODERATE; 3=HIGH; 4=EXTREME):
2<--HEALTH 1<--FLAMMABILITY 0<--REACTIVITY <--SPECIAL

SAL 000006886

THRESHOLD LIMIT VALUE :

NOT ESTABLISHED FOR MIXTURE. SEE SECTION II.

EFFECTS OF OVEREXPOSURE

INTOXICATION, NAUSEA, HEADACHE, DIZZINESS, (SHORT TERM EXPOSURE)
PROLONGED CONTACT IN SENSITIVE INDIVIDUALS. MAY CAUSE DERMATITIS ON

INTOXICATION, NAUSEA, HEADACHE, DIZZINESS, (LONG TERM EXPOSURE)
PROLONGED CONTACT IN SENSITIVE INDIVIDUALS. MAY CAUSE DERMATITIS ON

PRIMARY ROUTE OF ENTRY: <-- INHALATION <-- INGESTION <-- ABSORPTION

EMERGENCY & FIRST AID PROCEDURES

INHALATION :
REMOVE INDIVIDUAL TO FRESH AIR. IF SYMPTOMS PERSISTS, OBTAIN MEDICAL ATTENTION.

EYE CONTACT :
FLUSH WITH WATER FOR AT LEAST 15 MINUTES. OBTAIN MEDICAL ATTENTION.

SKIN CONTACT :
FLUSH WITH WATER.

INGESTION :
DO NOT INDUCE VOMITING. KEEP INDIVIDUAL CALM. OBTAIN MEDICAL ATTENTION.

NOTES TO PHYSICIAN :

N/A

SECTION VI - TOXICITY INFORMATION

PRODUCT CONTAINS CHEMICAL LISTED AS CARCINOGEN OR POTENTIAL CARCINOGEN BY:

IARC <--YES NTP <--YES OSHA <--YES ACGIH <--YES OTHER <--YES
X<--NO X<--NO X<--NO X<--NO X<--NO

PRODUCT TOXICITY

ORL LD50: >5000MG/KG 1.
SKN LD50: >2000MG/KG 1.
THIS PRODUCT CONTAINS OTHER INGREDIENTS KNOWN AS NUISANCE DUST THEY ARE
AS FOLLOWS:
INHALATION:
SILICON DIOXIDE DUST HAS BEEN SHOWN TO CAUSE PULMONARY EFFECTS ON
TITANIUM DIOXIDE HAS BEEN SHOWN TO CAUSE TUMORS IN EXPERIMENTAL ANIMALS
WHEN INJECTED INTO THE MUSCLES.
IN LIGHT OF THE LOW CONCENTRATIONS OF THESE COMPONENTS IN THE PRODUCT,
IT IS OUR BEST TECHNICAL JUDGEMENT THAT NORMAL USE OF THIS PRODUCT
POSES NO SUCH HAZARDS.
THESE WARNINGS ARE PRESENT ONLY TO COMPLY WITH OSHA REGULATIONS.

M/M PIPE SEALANT

(CONTINUED)

SECTION VI - TOXICITY INFORMATION

PAGE : 04

SECTION VII - REACTIVITY DATA

STABILITY X<--STABLE <--UNSTABLE CONDITIONS TO AVOID

N/A

INCOMPATIBILITY (MATERIALS TO AVOID)

MAY ATTACK SOME THERMOPLASTICS.

HAZARDOUS DECOMPOSITION PRODUCTS

TOXIC FLUORIDES.

HAZARDOUS X WILL NOT OCCUR MAY OCCUR CONDITIONS TO AVOID

POLYMERIZATION N/A

SECTION VIII - SPILL OR LEAK PROCEDURES

STEPS TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
SOAK UP IN AN INERT ABSORBANT. STORE IN PARTLY FILLED CLOSED CONTAINER
UNTIL DISPOSAL.

WASTE DISPOSAL METHOD
BURY OR INCINERATE IN ACCORDANCE WITH EPA AND LOCAL REGULATIONS.

NEUTRALIZING AGENT
N/A

SECTION IX - SPECIAL PROTECTION INFORMATION

REQUIRED VENTILATION
GENERAL EXHAUST IS USUALLY ADEQUATE UNDER NORMAL CONDITIONS.

RESPIRATORY PROTECTION
LOCAL VENTILATION RECOMMENDED FOR PROLONGED USE.

PROTECTIVE GLOVES
RUBBER OR PLASTIC GLOVES RECOMMENDED.

(CONTINUED)

SECTION IX - SPECIAL PROTECTION INFORMATION PAGE : 05

EYE PROTECTION
CHEMICAL GOGGLES SHOULD BE WORN DEPENDING
UPON SEVERITY OF EXPOSURE.

OTHER PROTECTION
N/A

SECTION X - STORAGE AND HANDLING INFORMATION

STORAGE TEMPERATURE
110 F. <--MAX 32 F. <--MIN | INDOOR | HEATED | REFRIGERATED | OUTDOOR
X

PRECAUTIONS TO BE TAKEN IN HANDLING & STORING
STORE AT MODERATE TEMPERATURES.

OTHER PRECAUTIONS
KEEP OUT OF REACH OF CHILDREN.
READ ENTIRE LABEL BEFORE USING PRODUCT.

SECTION XI - REGULATORY INFORMATION

CHEMICAL NAME C.A.S. NUMBER UPPER % LIMIT
CUMENE HYDROPEROXIDE 80-15-9 5

THOSE INGREDIENTS LISTED ABOVE ARE SUBJECT TO THE REPORTING REQUIREMENTS OF
313 OF TITLE III OF THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF
1986 AND 40 CFR PART 372.

IF UE (USE EXEMPTION) APPEARS UNDER UPPER % LIMIT, END USERS ARE EXEMPT
FROM NOTIFICATION BECAUSE THE PRODUCT IS USED AND LABELED FOR ROUTINE
JANITORIAL WORK, OR THE PRODUCT IS USED AND LABELED FOR FACILITY GROUNDS
MAINTENANCE (SUCH AS FERTILIZERS AND HERBICIDES), OR THE PRODUCT IS USED AND
LABELED FOR MAINTAINING MOTOR VEHICLES.

SECTION XII - TRANSPORTATION • (FOR FUTURE USE)

APPLICABLE REGULATIONS
<--49 CFR <--IMCO <--TARIFF 6 D <--IATA <--MILITARY AIR (AFR 71-4)

SHIPPING NAME

HAZARD CLASS | ID NUMBER | REPORT QTY

M/M PIPE SEALANT

(CONTINUED)

SECTION XII - TRANSPORTATION • (FOR FUTURE USE)

PAGE : 06

LABELS | LIMITED QTY

UNIT CONTAINER

DOT SPS CONTAINER | NET EXPLOSIVE WT.

AEROSOL PROPELLANT(S)

SECTION XIII - REFERENCES

1. VENDOR'S MSDS.

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED
ACCURATE IN LIGHT OF CURRENT FORMULATION. HOWEVER, NO WARRANTY
IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THIS DATA
OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

NATIONAL CHEMSEARCH DIV. OF NCH CORP. ASSUMES NO RESPONSIBILITY
FOR PERSONAL INJURY OR PROPERTY DAMAGE CAUSED BY THE USE, STORAGE
OR DISPOSAL OF THE PRODUCT IN A MANNER NOT RECOMMENDED ON THE
PRODUCT LABEL. USERS ASSUME ALL RISKS ASSOCIATED WITH SUCH
UNRECOMMENDED USE, STORAGE, OR DISPOSAL OF THE PRODUCT.

SAL 000006888

PAGE 1 OF 3

M A T E R I A L S A F E T Y D A T A S H E E T

CONFIDENTIAL

```

*****
PREMIER INDUSTRIAL CORPORATION      * EMERGENCY/INFORMATION TELEPHONE:
4500 EUCLID AVENUE                  *
CLEVELAND, OHIO 44103                *      216/391-8300
*****
FORMULA: 36517                      DATE: 06/14/85
MSDS EFFECTIVE: 01/27/90 BY: SSL
SUPERSEDES MSDS OF: 11/09/88
*****
COF: 742394
INVOICE: 378685
*****
SDS KEY: 0746998
*****

```

MAIL TO:
 CONOCO REFINERY WHSE
 OLD SPANISH TRAIL
 WESTLAKE LA 70669

 DEAR CUSTOMER:

IN COMPLIANCE WITH THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT (SARA TITLE III, SECTION 313), FEDERAL HAZARD COMMUNICATIONS REGULATIONS (WHMIS AND OSHA 29 CFR 1910.1200) AND IN THE INTEREST OF INFORMED USE OF OUR PRODUCT, WE ARE PROVIDING YOU WITH THIS MATERIAL SAFETY DATA SHEET (MSDS).

THIS MSDS WILL BE UPDATED REGULARLY TO REFLECT THE MOST RECENT INFORMATION IN OUR POSSESSION. PLEASE ENSURE THAT OBSOLETE MSDS SHEETS IN YOUR FILES FOR THIS PART NUMBER ARE DISCARDED.

WE THANK YOU FOR YOUR CONTINUED PATRONAGE AND LOOK FORWARD TO PROVIDING YOU WITH ADDITIONAL QUALITY PRODUCTS AND SERVICES.

***** SECTION I - PRODUCT IDENTIFICATION *****

PART NUMBER: 92435
 PRODUCT NAME: CONTAX H P 16 OZ. AEROSOL
 TRADE NAME/SYNONYMS: CONTAX H P
 CHEMICAL FAMILY: AEROSOL CLEANER

***** SECTION II - HAZARDOUS INGREDIENTS *****

INGREDIENT	CAS NO.	WT %	PEL	TLV	STEL	UNITS	LC50,PPM	LD50,MG/KG
TRICHLOROTRIFLUOROETHANE	#00076-13-1	95	1000	1000	1250	PPM	RAT >87000	RAT 143000
CARBON DIOXIDE	00124-38-9	1-5	10000	5000	30000	PPM	M	>90000N/A

INGREDIENTS TOTAL WT % ARE BELOW 100% ONLY IF ALL OTHERS UNLISTED ARE NOT CONSIDERED HAZARDOUS BY ANY FEDERAL (OSHA, WHMIS, SARA), ANY STATE OR PROVINCE, OR LOCAL RIGHT-TO-KNOW REGULATIONS

SYMBOLS, ABBREVIATIONS AND NOTATIONS:
 N/A=NOT AVAILABLE OR APPLICABLE, C=CEILING LIMIT, S=SKIN DESIGNATION
 #=LISTED IN SARA TITLE III SECTION 313, *=IF FOUND AS DUST, MIST OR FUME
 M=HUMAN, RAB=RABBITS, GPC=GUINEA PIGS, MIC=MICE
 I=INGESTION, A=SKIN ABSORPTION, LO=LITTLE OBSERVABLE EFFECT, NO=NO EFFECT
 PEL=OSHA PERMISSIBLE EXPOSURE LIMIT, TLV=ACGIH THRESHOLD LIMIT VALUE
 STEL=SHORT TERM EXPOSURE LIMIT, @=AMONG 5 MOST PREDOMINANT SUBSTANCES

PART: 92435 PRODUCT NAME: CONTAX H P 16 OZ. AEROSOL PAGE 2 OF 3

***** SECTION III - PHYSICAL DATA *****
 BOILING PT DEG F/C: 114F / 45C SPECIFIC GRAVITY: 1.42
 VAPOR PRESSURE(MM HG): 284 %VOLATILE VOLUME: 100
 VAPOR DENSITY(AIR=1): 4 EVAPORATION RATE: (ETHER =1) <1
 SOLUBILITY IN WATER: NIL WATER/OIL DIST COEFF: 0
 APPEARANCE AND ODOR: CLEAR AEROSOL WITH A FLUOROCARBON ODOR.
 PHYSICAL STATE: AEROSOL
 FREEZE PT DEG F/C: 55F / 13.2C THRESHOLD ODOR,PPM: N/A
 OTHER: N/A PH: N/A

***** SECTION IV - FIRE AND EXPLOSION HAZARD DATA *****
 CLASSIFICATION: N/A NFPA RATING: N./A
 COMBUSTION PRODUCTS: CO, CO2, HCL, HF
 FLASH POINT DEG F/C: N/A LELX: N/A UELX: N/A
 EXTINGUISHING MEDIA: EXTINGUISH WITH WATER/FOG/FOAM/DRY CHEMICAL/CARBONDIOXIDE
 UN/NA/PIN#: UN1956 SPECIAL FIRE FIGHTING PROCEDURES:
 FIREFIGHTERS SHOULD WEAR SELF-CONTAINED BREATHING EQUIPMENT.
 AUTO IGN. TEMP DEG F/C: N/A UNUSUAL FIRE AND EXPLOSION HAZARDS:
 EXPOSURE TO FIRE, HEAT OR PROLONGED SUNLIGHT MAY CAUSE BURSTING.
 CONTACT WITH FLAME OR HOT SURFACES MAY PRODUCE TOXIC GASES.
 EXPLOSIVE POWER: LOW IMPACT SENSITIVE: NO
 BURNING RATE: LOW STATIC SENSITIVE: NO

***** SECTION V - HEALTH HAZARD DATA *****
 PRODUCT GUIDE: TLV (SEE SECTION II) STEL: (SEE SECTION II)
 ROUTES OF ENTRY: EYE, INHALATION
 EFFECTS OF OVEREXPOSURE: ACUTE: NO CHRONIC: NO
 MAY CAUSE EYE IRRITATION. VAPORS IN HIGH CONCENTRATION ARE ANESTHETIC AND
 IRRITATE UPPER RESPIRATORY SYSTEM. EXCESS INHALATION MAY CAUSE DIZZINESS,
 DIZZINESS, AND NAUSEA.
 LISTED AS A SUSPECTED CARCINOGEN: NO
 EMERGENCY AND FIRST AID PROCEDURES:
 EYE: IMMEDIATELY FLUSH WITH PLENTY OF WATER FOR 15 MIN. & CALL PHYSICIAN.
 SKIN: WASH THOROUGHLY WITH PLENTY OF WATER & SOAP. INHALATION: IF AFFECTED,
 REMOVE TO FRESH AIR. INGESTION: SEEK PHYSICIAN IMMEDIATELY, SHOW MSDS OR
 LABEL, INDUCE VOMITING.

***** SECTION VI - REACTIVITY DATA *****
 STABLE: YES CONDITIONS TO AVOID:
 KEEP AWAY FROM HEAT AND FLAME.
 INCOMPATIBILITY(MATERIALS TO AVOID): YES AL, BA, LI, SM, NAK ALLOY, TI
 HAZARDOUS DECOMPOSITION PRODUCTS: YES CO, CO2, HCL, HF
 HAZARDOUS POLYMERIZATION: NO CONDITIONS TO AVOID:
 N/A

***** SECTION VII - SPILL OR LEAK PROCEDURES *****
 LISTED IN: SARA TITLE III, #302: NO #304, CERCLA: NO #313: YES
 STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:
 IN CASE OF SPILL: VENTILATE THE AREA. CLEAN UP WITH ABSORBENT MATERIAL.
 CONTAIN AND PICK-UP WASTE MATERIALS. PUT IN A SEALED APPROVED CONTAINER.
 REPORT QUANTITY, LB: N/A KG: N/A TPQ, LB: N/A
 REGULATIONS: SARA, PROV/STATE, WHMIS OTHER: N/A
 HAZARD WASTE: AEROSOL, HALOGENATED SOLVENT
 NO.: N/A DISPOSAL METHOD:
 DISPOSE OF WASTES IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS.
 DO NOT PUNCTURE, INCINERATE (OR BURN) CONTAINERS.

PART: 92435 PRODUCT NAME: CONTAX H P 16 OZ. AEROSOL PAGE 3 OF 3
 ***** SECTION VIII - SAFE HANDLING AND PROTECTION INFORMATION *****
 RESPIRATORY PROTECTION: USE ONLY IN WELL VENTILATED AREAS.

VENTILATION-LOCAL: RECOMMENDED SPECIAL: N/A
 MECHANICAL: RECOMMENDED OTHER: N/A

PROTECTIVE GLOVES: SOLVENT RESISTANT GLOVES EYE PROTECTION: SAFETY GLASSES
 OTHER PROTECTIVE EQUIPMENT:
 N/A

ESTIMATED LD50, MG/KG: YES ORAL RAT 43000
 ESTIMATED LC50, PPM: YES INHALATION RAT >87000
 SENSITIZATION: NO
 IRRITANT: NO

SYNERGISTIC AGENTS: NO

***** SECTION IX - SPECIAL PRECAUTIONS *****
 PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING:
 CONTACT WITH FLAME OR HOT SURFACES MAY PRODUCE TOXIC GASES. KEEP AWAY FROM
 HEAT AND FLAME. USE ONLY WITH ADEQUATE VENTILATION. AVOID PROLONGED OR
 REPEATED BREATHING OF GAS, FUMES, VAPOR OR SPRAY MIST. AVOID PROLONGED
 OR REPEATED CONTACT WITH SKIN.

OTHER PRECAUTIONS:
 KEEP OUT OF REACH OF CHILDREN. ALWAYS READ AND FOLLOW DIRECTIONS ON
 PRODUCT LABEL. ADDITIONAL TECHNICAL DATA SHEETS AND/OR MATERIAL SAFETY
 DATA SHEETS (MSDS) ARE AVAILABLE UPON REQUEST. FOR PROFESSIONAL AND
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CENTURY PAPERS INC.
4902 GULF FREEWAY
HOUSTON, TEXAS 77023
PHONE NO. 713-928-5171

MANUFACTURER:
TECHNICAL CONCEPTS, INC.
4545 W. AUGUSTA BLVD.
CHICAGO, IL 60609
EMERGENCY PHONE NO. 312-227-3233

MATERIAL SAFETY DATA SHEET

SECTION 1- PRODUCT IDENTIFICATION

SHEET NO. 1379

PRODUCT NAME: DEOMATIC AEROSOLS
(FEMALE, ORANGE, COUNTRY GARDEN, APPLE)

PRODUCT NO. 417-4402, 417-4381, 417-4411, 417-4399

SECTION 2- HAZARDOUS INGREDIENTS

DOES PRODUCT CONTAIN HAZARDOUS INGREDIENTS? (Y,N,N/A, N/I) : YES

CHEMICAL/Common Name: CAS NO. % PEL- OSHA: TLV - ACGIH:

2-PROPANOL	67-63-0	20-30	400 PPM	400 PPM
C3-C9 ISOPARAFFIN	64742-48-9	10-20	N/A	N/A
PROPANE	74-98-6	10-20	1000 PPM	N/A
1,1,1,-TRICHLOROETHANE	71-55-6	5-10	350 PPM	350 PPM
1,1,2-TRICHLORO- 1,2,2-TRIFLUOROETHANE	76-13-1	5-10	1000 PPM	1000 PPM

DOES PRODUCT CONTAIN CARCINOGENS? (NTP IARC OSHA) (Y,N,N/A, N/I): NO

SECTION 3- HEALTH HAZARD DATA

HEALTH EFFECTS (ACUTE AND CHRONIC): EYES - MAY IRRITATE EYES.

PRIMARY ROUTES OF ENTRY: NONE

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:
UNKNOWN

EMERGENCY AND FIRST AID PROCEDURES:

QUICKLY FOLLOW DIRECTIONS BELOW AND CALL POISON CONTROL CENTER.
GET QUICK MEDICAL ATTENTION IF ANY ILL EFFECTS CONTINUE OR DEVELOP
LATER. EYES - FLUSH EYES WITH PLENTY OF WATER WHILE REMOVING ANY
CONTACT LENSES, THEN HOLD EYELIDS OPEN AND CONTINUE FLUSHING FOR
15 MINUTES.

CHEMICAL DATA (ON CONCENTRATE)

BOILING POINT: 117	SPECIFIC GRAVITY: 0.89
VAPOR PRESSURE: 49	MELTING POINT: N/A
VAPOR DENSITY: >1	EVAPORATION RATE: >1
SOLUBILITY IN WATER: NEGLIGIBLE	

APPEARANCE AND ODOR: CLEAR, YELLOW LIQUID PLEASANTLY SCENTED.

SECTION 4- PHYSICAL HAZARD DATA

FLASH POINT: 50 F FLAMMABLE LIMITS: LEL: 3 UEL: 19

EXTINGUISHING MEDIA: WATER

SPECIAL FIRE FIGHTING PROCEDURES:

KEEP CONTAINERS COOL. USE SHIELDING TO PROTECT PERSONNEL AGAINST
BURSTING, RUPTURING OR VENTING CONTAINERS.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

AT ELEVATED TEMPERATURES (OVER 120 F) CONTAINERS MAY VENT, RUPTURE
OR BURST.

SECTION 5- REACTIVITY DATA

INCOMPATIBILITY - MATERIALS TO AVOID: NONE

HAZARDOUS DECOMPOSITION PRODUCTS:

HCL, HF, OXIDES OF CARBON AND TRACES OF PHOSGENE AND CHLORINE MAY BE
FORMED UPON COMBUSTION.

WILL HAZARDOUS POLYMERIZATION OCCUR? NO

SAL 000006892

MATERIAL SAFETY DATA SHEET

PRODUCT NAME: DEOMATIC AEROSOLS (FEMALE, ORANGE, COUNTRY GARDEN,APPLE)
PRODUCT NO. 417-4402, 417-4381, 417-1411, 417-4399

SECTION 5- REACTIVITY DATA

CONTINUED.....

CONDITIONS TO AVOID/POLYMERIZATION: NONE

IS THE PRODUCT STABLE? YES

CONDITIONS TO AVOID/STABILITY:

AVOID HEATING TO ABNORMAL

SECTION 6- SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:

REMOVE SOURCES OF FLAME, SPARK OR HEAT. PROVIDE ADEQUATE VENTILATION

DISPOSAL METHOD:

REPLACE CAP AND DISCARD CONTAINER IN TRASH. DO NOT PUNCTURE OR
INCINERATE.

SECTION 7- EXPOSURE CONTROL INFORMATION

VENTILATION: LOCAL EXHAUST : NONE REQUIRED

MECHANICAL: ADEQUATE VENTILATION

RESPIRATORY PROTECTION: NONE REQUIRED

PROTECTIVE GLOVES: NONE REQUIRED

OTHER PROTECTIVE EQUIPMENT: SAFETY GLASSES

OTHER ENGINEERING CONTROLS: N/A

WORK PRACTICES: ALWAYS FOLLOW SAFE WORK PRACTICES.

HYGIENIC PRACTICES: N/A

SECTION 8- SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:

CAUTION: CONTENTS UNDER PRESSURE. KEEP OUT OF REACH OF CHILDREN.
DO NOT STORE WHERE TEMPERATURES MAY EXCEED 120 F. AVOID CONTACT
WITH EYES.

MAINTENANCE PRECAUTIONS : N/A

READ ENTIRE LABEL BEFORE USING: OTHER COMMENTS

READ AND FOLLOW LABEL DIRECTIONS AND OTHER PRODUCT SAFETY AND HEALTH
INFORMATION WHICH YOU HAVE BEEN PROVIDED WITH WHEN HANDLING AND USING OUR
PRODUCTS.

CENTURY PAPERS INC.
4902 GULF FREEWAY
HOUSTON, TEXAS 77023
PHONE NO. 713-928-5171

~~SECRET~~
MANUFACTURER:
LEHN & FINK INDUSTRIAL PROD.
DIVISION OF STEPLING DRUG INC.
MONTVALE, NEW JERSEY 07645
EMERGENCY PHONE NO. 201-573-5700

MATERIAL SAFETY DATA SHEET

SECTION 1- PRODUCT IDENTIFICATION

SHEET NO. 1368

PRODUCT NAME: INSTITUTIONAL LYSOL * BRAND DISINFECTANT SPRAY

PRODUCT NO. 406-1004

GENERIC DISCRIPTION: DISINFECTANT AND
DEODORIZING SPRAY

SECTION 2- INGREDIENTS

CAS NO.

PERCENT :

ETHYL ALCOHOL

64-17-5

79.0 %

O-PHENYLPHENOL

90-43-7

0.1%

N-ALKYL- (92% C18; 8% C16)-

61791-34-2

0.35%

MORPHOLINIUM ETHYL
SULFATES

SECTION 3- PHYSICAL DATA

BOILING POINT:

SPECIFIC GRAVITY:

VAPOR PRESSURE: 98

PERCENT VOLATILE BY VOLUME:

VAPOR DENSITY: NO

SPRAY PATTERN: CIRCULAR

EVAPORATION RATE:

PROPELLANT TYPE: CARBON DIOXIDE

PH, WITHOUT PROPELLANT @ 77F: ASTM E-70 8.2

SOLUBILITY IN WATER:

CONTENTS, FL. OZ.: 19

VISCOSITY, WITHOUT PROPELLANT, CPS @ 77 F: BROOKFIELD

SPINDLE #2 @ 30 RPM <100

USDA CATEGORY: P

SECTION 4- FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: BULK PRODUCT (PROPELLANT FREE) 70 F

TAG CLOSED CUP

FLAMMABLE LIMITS: LEL: UEL:

ASTM 3065 FLAME EXTENSION TEST - FLAMMABLE

EXPLOSIVE: PRESSURIZED CONTAINER

VOLATILE INGREDIENTS GIVEN OFF AT ROOM TEMPERATURE: ETHYL ALCOHOL - WHEN
AEROSOL CONTAINER ACTUATED.

VOLATILE INGREDIENTS GIVEN OFF WHEN HEATED DURING NORMAL USE: HEATING
NOT NORMAL TO USE.

FIRE EXTINGUISHING MEDIA:

SPECIAL FIRE FIGHTING PROCEDURES:

UNUSUAL FIRE & EXPLOSION HAZARDS: FLAMMABLE

SECTION 5- REACTIVITY DATA

STABILITY:

INCOMPATIBILITY - MATERIALS TO AVOID:

HAZARDOUS POLYMERIZATION:

CONDITONS TO AVOID:

HAZARDOUS DECOMPOSITION PRODUCTS:

SECTION 6- SPILL, LEAK AND DISPOSAL PROCEDURES

SPILL RESPONSE:

PRODUCT DISPOSAL: REPLACE CAP AND DISCARD IN TRASH. DO NOT PUNCTURE OR
INCINERATE.

SAL 000006894

MATERIAL SAFETY DATA SHEET

PAGE 2

PRODUCT NAME: INSTITUTIONAL LYSOL * BRAND DISINFECTANT SPRAY
PRODUCT NO. 406-1004

SECTION 7- HEALTH HAZARD DATA

SYMPTOMS OF OVEREXPOSURE:

SKIN CONTACT: PRACTICALLY NON-IRRITATING. THE UNDILUTED PRODUCT MAY CAUSE MILD OR SLIGHT IRRITATION (ERYTHEMA SKIN REACTION VALUES OF 0 OR 1) OF THE INTACT OR ABRADED SKIN OR RABBITS AT 72 HOURS. EPA CATEGORY 4.

EYE CONTACT: MODERATELY IRRITATING. THE UNDILUTED PRODUCT, WHEN INSTILLED INTO THE EYES OF RABBITS, PRODUCES CORNEAL INVOLVEMENT OR IRRITATION, CLEARING IN 7 DAYS OR LESS. EPA CATEGORY III.

SKIN ABSORPTION: NON-TOXIC. THE PROBABLE LETHAL DOSE OF UNDILUTED PRODUCT TO 50 % OF THE TEST ANIMALS DETERMINED FROM DERMAL TOXICITY STUDIES (LD50) IS GREATER THAN 500 MILLIGRAMS PER KILOGRAM AND LESS THAN OR EQUAL TO 5 GRAMS PER KILOGRAM OF BODY WEIGHT. EPA CATEGORY III.

INGESTION: SLIGHTLY TOXIC. THE PROBABLE LETHAL DOSE OF UNDILUTED PRODUCT TO 50 % OF THE TEST ANIMALS DETERMINED FROM INGESTION STUDIES (LD50) IS GREATER THAN 500 MILLIGRAMS PER KILOGRAM AND LESS THAN OR EQUAL TO 5 GRAMS PER KILOGRAM OF BODY WEIGHT. EPA CATEGORY III.

INHALATION: MILDLY TOXIC. THE PROBABLE LETHAL DOSE OF UNDILUTED PRODUCT TO 50 % OF THE TEST ANIMALS DETERMINED FROM INHALATION STUDIES (LC50) IS GREATER THAN 2 MILLIGRAMS AND LEAS THAN OR OR EQUAL TO 20 MILLIGRAMS PER LITER BY VOLUME WHEN INHALED CONTINUOUSLY FOR ONE HOUR OR LESS. EPA CATEGORY III.

SECTION 8- EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT: IF SPRAYED DIRECTLY INTO EYES IMMEDIATLEY FLUSH WITH PLENTY OF WATER. GET MEDICAL ATTENTION IF IRRITATION PERSISTS.

SKIN CONTACT:

INHALATION:

INGESTION: IF SWALLOWED, DRINK PROMPTLY A LARGE QUANTITY OF MILK, EGG WHITES, GELATIN SOLUTION, OR IF THESE ARE NOT AVAILABLE, DRINK LARGE QUANTITIES OF WATER. CALL A PHYSICIAN IMMEDIATELY.

NOTE TO PHYSICIAN: PROBABLB MUCOSAL DAMAGE MAY CONTRAINDICATE THE USE OF GASTRIC LAVAGE. MEASURES AGAINST CIRCULATORY SHOCK, RESPIRATORY DEPRESSION AND CONVULSION MAY BE NEEDED.

SECTION 9- SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: NOT APPLICABLE

VENTILATION: NOT APPLICABLE

OTHER PROTECTIVE CLOTHING/EQUIPMENT: NOT APPLICABLE

SECTION 10- LABELING AND ADDITIONAL PRECAUTIONS

OTHER STORAGE ANND HANDLING REQUIREMENTS: STORE IN ORIGINAL CONTAINER IN AREAS INACCESSIBLE TO SMALL CHILDREN.

LABELING (PRECAUTIONARY STATEMENTS) CAUTION: WARNING: KEEP OUT OF REACH OF CHILDREN. AVOID CONTACT WITH FOOD. AVOID DIRECT SPRAYING INTO SPARK, OR FLAME. DO NOT PUNCTURE OR INCINERATE CONTAINER. EXPOSURE TO TEMPERATURES ABOVE 130 F. MAY CAUSE BURSTING. THIS PRODUCT IS LABELED AND PACKAGED IN ACCORDANCE WITH THE REGULATIONS DEPARTMENT OF TRANSPORTATION UNDER THE FEDERAL HAZARDOUS MATERIALS TRANSPORATION ACT. ENVIRONMENTAL PROTECCION AGENCY UNDER THE FEDERAL INSECTICIDE, FUNGICIDE, AND RODENTICIDE ACT.

11/22/88

A Division of EXXON CHEMICAL AMERICAS
P.O. Box 2526, Columbus, Georgia 31902-2526

CS687

NO. 70

SECTION I PRODUCT IDENTIFICATION & EMERGENCY INFORMATION

PRODUCT NAME

JAYFLOC 810

CHEMICAL NAME

A Cationic Polyacrylamide in Water in Oil Emulsion

CHEMICAL FAMILY

Cationic Polyacrylamide

PRODUCT APPEARANCE

Milky white liquid, slight hydrocarbon odor

EMERGENCY TELEPHONE NUMBERS: CALLAWAY CHEMICAL COMPANY 404-578-2000
CHEMTREC 800-424-9300

SECTION II HAZARDOUS INGREDIENT INFORMATION

The composition of this mixture may be proprietary information. In the event of a medical emergency, compositional information will be provided to a physician or nurse. This product is hazardous as defined in 29 CFR 1910.1200, based on the following compositional information:

<u>COMPONENT</u>	<u>OSHA HAZARD</u>
Petroleum Distillate	Combustible
Petroleum Distillate	Irritant to eyes and skin
Cationic Polyacrylamide	Irritant to eyes and skin

For additional information see Section III.

SECTION III HEALTH INFORMATION AND PROTECTION

NATURE OF HAZARD

EYE CONTACT:

Irritating, and will injure eye tissue if not removed promptly.

SKIN CONTACT:

Irritating.

Low order of toxicity.

INHALATION:

Irritating to eyes and respiratory tract in high concentrations.

INGESTION:

Small amounts of the liquid aspirated into the respiratory system during ingestion, or from vomiting, may cause bronchiopneumonia or pulmonary edema.

FIRST AID

EYE CONTACT:

Immediately flush eyes with large amounts of water for at least 15 minutes. Get prompt medical attention.

SKIN CONTACT:

Flush with large amounts of water; use soap if available.

Remove grossly contaminated clothing, including shoes, and launder before reuse.

If irritation persists, seek medical attention.

INHALATION:

Using proper respiratory protection, immediately remove the affected victim from exposure. Administer artificial respiration if breathing is stopped. Keep at rest. Call for prompt medical attention.

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EXXON

VERSA

REF-02-130 MON 10:40 TIME ON CHEMICAL SALES TEL 408-504-1551

MATERIAL SAFETY DATA SHEET

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INGESTION:

If swallowed, DO NOT induce vomiting. Keep at rest. Get prompt medical attention.

WORKPLACE EXPOSURE LIMITS

EXXON RECOMMENDS THE FOLLOWING OCCUPATIONAL EXPOSURE LIMITS:

200 ppm total hydrocarbon based on composition.

PRECAUTIONS

PERSONAL PROTECTION

For open systems where contact is likely, wear long sleeves, chemical resistant gloves, and chemical goggles.
Where contact may occur, wear long sleeves and safety glasses with side shields.
Where concentrations in air may exceed the limits given in this Section and engineering, work practice or other means of exposure reduction are not adequate, NIOSH/MSHA approved respirators may be necessary to prevent overexposure by inhalation.

VENTILATION

The use of mechanical dilution ventilation is recommended whenever this product is used in a confined space, is heated above ambient temperatures, or is agitated.

SECTION IV FIRE & EXPLOSION HAZARD

FLASHPOINT: 154 DEG F METHOD: TCC

FLAMMABLE LIMITS: Not available

AUTOIGNITION TEMPERATURE: Not Available

GENERAL HAZARD

Combustible Liquid. can form combustible mixtures at temperatures at or above the flashpoint.
"Empty" containers retain product residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner, or properly disposed of.

FIRE FIGHTING

Use water to cool fire-exposed surfaces and to protect personnel. Isolate "fuel" supply from fire. Use foam, dry chemical, or water spray to extinguish fire.
Respiratory and eye protection required for fire fighting personnel.

DECOMPOSITION PRODUCTS UNDER FIRE CONDITIONS

No Unusual

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SECTION V SPILL CONTROL PROCEDURE

LAND SPILL

Eliminate sources of ignition. Prevent additional discharge of material, if possible to do so without hazard. For small spills implement cleanup procedures; for large spills implement cleanup procedures and, if in public area, keep public away and advise authorities. Also, if this product is subject to CERCLA reporting (see Section VII) notify the National Response Center.
Prevent liquid from entering sewers, watercourses, or low areas. Contain

ELIXON

MATERIAL SAFETY DATA SHEET

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Spilled liquid with sand or earth. Do not use combustible materials such as sawdust.

Recover by pumping (use an explosion proof or hand pump) or with a suitable absorbent.

If liquid is too viscous for pumping, scrape up.

Consult an expert on disposal of recovered material and ensure conformity to local disposal regulations.

WATER SPILL

Remove from surface by skimming or with suitable absorbents. Do not use dispersants. Consult an expert on disposal of recovered material, and ensure conformity to local disposal regulations.

SECTION VI NOTES

Protect from freezing.

SECTION VII REGULATORY INFORMATION

TSCA:

Components of this product are listed on the TSCA Inventory.

CERCLA:

Under the Comprehensive Response, Compensation, and Liability Act. (CERCLA), certain releases to air, land, or water may be reportable to the National Response Center at 800-424-8802. Circumstances surrounding the release and cleanup determine reportability.

This product is not subject to CERCLA reporting requirements.

SARA TITLE III:

Under the provisions of Title III, Sections 311/312 of the Superfund Amendments and Reauthorization Act, this product is classified into the following hazard categories:
Immediate health, Fire.

This product does not contain Section 313 Reportable Ingredients.

SECTION VIII TYPICAL PHYSICAL & CHEMICAL PROPERTIES

SPECIFIC GRAVITY:

0.98 to 1.12 @ 77 F

SOLUBILITY IN WATER, WT. % AT 77 F:

Soluble

SP. GRAV. OF VAPOR, at 1 ATM AIR=1:

Not available

EVAPORATION RATE, n-BU ACETATE=1:

Less than 1

VAPOR PRESSURE, mmHg at 77 F:

< 10 AT 77 F

VISCOSITY OF LIQUID, CST AT 77 F:

400 - 2000 CP AT 77 F

FREEZING/MELTING POINT, 77 F:

10 to 32 F

BOILING POINT, 77 F:

212 to 370

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EXON**MATERIAL SAFETY DATA SHEET****GENERALS**

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JAYFLOC 810

GS687**PAGE 4**
NO. PO**SECTION IX REACTIVITY DATA****STABILITY:**

Stable

CONDITIONS TO AVOID INSTABILITY:

Avoid temperatures above 200 F

Avoid temperatures below 32 F

HAZARDOUS POLYMERIZATION:

Will not occur

COND. TO AVOID HAZARDOUS POLYMERIZATION:

Not Applicable

MATERIALS AND CONDITIONS TO AVOID INCOMPATIBILITY:

Contact with water forms a gel at product solid content greater than 10%.

HAZARDOUS DECOMPOSITION PRODUCTS:

None

SECTION X TRANSPORT AND STORAGE**U.S. DOT CLASSIFICATION:**

Combustible

ELECTROSTATIC ACCUMULATION HAZARD:

Unknown, use proper grounding procedure

STORAGE TEMPERATURE, °F:

Keep from freezing

STORAGE/TRANSPORT PRESSURE, mmHg:

Atmospheric

UN NUMBER:

Not Available

LOADING/UNLOADING TEMPERATURE, °F:

Keep from freezing

VISC. AT LOADING/UNLOADING TEMP., cSt:

400 to 2000 cps

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REFERENCE NUMBER:

MOHA-P-10599

DATE PREPARED:

NOVEMBER 22, 1988

SUPERCEDES ISSUE DATE:

JUNE 16, 1988

FOR ADDITIONAL PRODUCT INFORMATION, CONTACT YOUR TECHNICAL SALES REPRESENTATIVE
FOR ADDITIONAL HEALTH/SAFETY INFORMATION, CALL 712-870-6885



**BETZ PROCESS
CHEMICALS, INC.**

**P.O. BOX 4300
The Woodlands, Texas 77387
(713) 367-2442**

NFPA/HMIS : HEALTH - MATERIAL SAFETY DATA SHEET

24 HOUR EMERGENCY TELEPHONE (HEALTH OR ACCIDENT) (215) 355-3300

48689

DISTRIBUTED: APR-17-1990

PRODUCT : SPEC-AID 8Q302

**(PAGE 1 OF 3)
EFFECTIVE DATE 12-13-89
PRINTED: 10-Apr-1990
REVISIONS TO SECTIONS: APPENDIX/9;EDIT:2**

PRODUCT APPLICATION : OIL SOLUBLE DEHAZER.

-----SECTION 1-----HAZARDOUS INGREDIENTS-----

**INFORMATION ON PHYSICAL HAZARDS, HEALTH HAZARDS, PEL'S AND TLV'S FOR SPECIFIC
PRODUCT INGREDIENTS AS REQUIRED BY THE OSHA HAZARD COMMUNICATIONS STANDARD ARE
LISTED. REFER TO SECTION 4 (PAGE 2) FOR OUR ASSESSMENT OF THE POTENTIAL ACUTE
AND CHRONIC HAZARDS OF THIS FORMULATION.**

HEAVY AROMATIC NAPHTHA;*CAS#64742-06-9;COMBUSTIBLE LIQUID;IRRITANT(EYE);
MANUFACTURERS SUGGESTED EXPOSURE LIMIT:100PPM;PEL:NONE;TLV:NONE.**

**TRADE SECRET INGREDIENT(372);POTENTIAL EYE,SKIN AND INHALATION IRRITANT ;
PEL:400 PPM;TLV:NONE. TSRN 125438 - 5252P**

**TRADE SECRET INGREDIENT(078);FLAMMABLE;POTENTIAL LIVER AND KIDNEY TOXIN;
CNS DEPRESSANT;PEL/TLV:100 PPM(150PPM-STEL). TSRN 125438 - 5200P**

**TRADE SECRET INGREDIENT(162);FLAMMABLE LIQUID;IRRITANT;CNS DEPRESSANT;
PEL/TLV:50PPM-C(SKIN). TSRN 125438 - 5224P**

-----SECTION 2-----TYPICAL PHYSICAL DATA-----

PH: 5% EMULSION (APPROX.) 10.4	ODOR: HYDROCARBON
FL.PT.(DEG.F): 113 P-M(CC)	SP.GR.(70F)OR DENSITY: 7.8 LBS/GAL
VAPOR PRESSURE(mmHG): <10	VAPOR DENSITY(AIR=1): >1
VISC cps70F: 33	%SOLUBILITY(WATER): 0
EVAP.RATE: ND WATER=1	APPEARANCE: AMBER
PHYSICAL STATE: LIQUID	FREEZE POINT(DEG.F): <-30

-----SECTION 3-----REACTIVITY DATA-----

**STABLE.MAY REACT WITH STRONG OXIDIZERS.DO NOT CONTAMINATE.BETZ TANK
CLEAN-OUT CATEGORY 'B'**

THERMAL DECOMPOSITION (DESTRUCTIVE FIRES) YIELDS ELEMENTAL OXIDES.

SAL 000006900



BETZ PROCESS
CHEMICALS, INC.

P.O. BOX 4300
The Woodlands, Texas 77387
(713) 367-2442

MATERIAL SAFETY DATA SHEET (PAGE 2 OF 3)

65689

PRODUCT: SPEC-AID 8Q302

-----SECTION 4-----HEALTH HAZARD EFFECTS-----

ACUTE SKIN EFFECTS *** PRIMARY ROUTE OF EXPOSURE

MODERATELY IRRITATING TO THE SKIN.MAY CAUSE DERMATITIS.

ACUTE EYE EFFECTS ***

SEVERE IRRITANT TO THE EYES

ACUTE RESPIRATORY EFFECTS *** PRIMARY ROUTE OF EXPOSURE

VAPORS,GASES,MISTS OR AEROSOLS MAY CAUSE IRRITATION TO UPPER RESPIRATORY TRACT.PROLONGED EXPOSURE MAY CAUSE DIZZINESS AND HEADACHE.

CHRONIC EFFECTS OF OVEREXPOSURE***

PROLONGED OR REPEATED EXPOSURES MAY CAUSE LIVER AND KIDNEY TOXICITY,MAY CAUSE CNS DEPRESSION,OR MAY CAUSE DEFATTING-TYPE DERMATITIS.

MEDICAL CONDITIONS AGGRAVATED ***

NOT KNOWN

SYMPTOMS OF EXPOSURE ***

EXCESSIVE DERMAL EXPOSURE CAUSES DEFATTING AND DRYING OF SKIN;EXCESSIVE INHALATION OF VAPORS CAUSES DIZZINESS,HEADACHE AND NAUSEA.

-----SECTION 5-----FIRST AID INSTRUCTIONS-----

SKIN CONTACT***

REMOVE CONTAMINATED CLOTHING.WASH EXPOSED AREA WITH A LARGE QUANTITY OF SOAP SOLUTION OR WATER FOR 15 MINUTES

EYE CONTACT***

IMMEDIATELY FLUSH EYES WITH WATER FOR 15 MINUTES.IMMEDIATELY CONTACT A PHYSICIAN FOR ADDITIONAL TREATMENT

INHALATION EXPOSURE***

REMOVE VICTIM FROM CONTAMINATED AREA TO FRESH AIR.APPLY APPROPRIATE FIRST AID TREATMENT AS NECESSARY

INGESTION***

DO NOT FEED ANYTHING BY MOUTH TO AN UNCONSCIOUS OR CONVULSIVE VICTIM
DO NOT INDUCE VOMITING.IMMED.CONTACT PHYSICIAN.DILUTE CONTENTS OF STOMACH USING 3-4 GLASSES MILK OR WATER

-----SECTION 6-----SPILL,DISPOSAL AND FIRE INSTRUCTIONS-----

SPILL INSTRUCTIONS***

VENTILATE AREA,USE SPECIFIED PROTECTIVE EQUIPMENT.CONTAIN AND ABSORB ON ABSORBENT MATERIAL.PLACE IN WASTE DISPOSAL CONTAINER. THE WASTE CHARACTERISTICS OF THE ABSORBED MATERIAL,OR ANY CONTAMINATED SOIL, SHOULD BE DETERMINED IN ACCORDANCE WITH RCRA REGULATIONS.
REMOVE IGNITION SOURCES.FLUSH AREA WITH WATER.SPREAD SAND/GRIT.

DISPOSAL INSTRUCTIONS***

WATER CONTAMINATED WITH THIS PRODUCT MAY BE SENT TO A SANITARY SEWER TREATMENT FACILITY,IN ACCORDANCE WITH ANY LOCAL AGREEMENT,A PERMITTED WASTE TREATMENT FACILITY OR DISCHARGED UNDER A NPDES PERMIT PRODUCT(AS IS)-

INCINERATE OR BURY IN APPROVED LANDFILL

FIRE EXTINGUISHING INSTRUCTIONS***

FIREFIGHTERS SHOULD WEAR POSITIVE PRESSURE SELF-CONTAINED BREATHING APPARATUS(FULL FACE-PIECE TYPE).PROPER FIRE EXTINGUISHING MEDIA:
DRY CHEMICAL,CARBON DIOXIDE,FOAM OR WATER

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