

SECTION 7—EMERGENCY AND FIRST AID PROCEDURES

SKIN: Wash exposed area with soap and water. If irritation or abnormalities persist, call a physician.

EYE: Immediately flush eyes with water for 15 minutes, if irritation or abnormalities persist, call a physician.

INHALATION: Remove to fresh air. If breathing becomes difficult, give oxygen and call a physician.

INGESTION: Do not induce vomiting. Call a physician immediately.

SECTION 8—HANDLING AND USE PRECTIONS

Storage requirements: keep container closed when not in use. Store in a cool dry location away from oxidizing and reducing agents.

Waste Disposal: product should be disposed of in accordance with applicable local, Provincial and Federal regulations.

Steps must be taken if product is released or spilled: clean spill areas thoroughly to avoid hazardous slippery conditions.

SECTION 9—INDUSTRIAL HYGIENE CONTROL MEASURES

Respiratory Protection: None normally required.

Ventilation: If mist and/or vapors are present, use air purifying respirator or self-contained breathing apparatus, but this is rarely required.

Eye Protection: Safety glasses, if personally preferred

Gloves: Generally not necessary. Personal preference.

SECTION 10—TOXICOLOGICAL PROPERTIES

Environmental Effects: Not known to be harmful to aquatic life at low concentrations.

Freshwater aquatic toxicity rating: 96 hour LC50 Rainbow Trout = 160 mg/L

96 hour LC50 Salmon = 160 mg/L

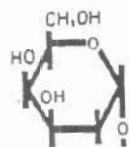
SECTION 11—DEPARTMENT OF TRANSPORTATION INFORMATION

Shipping Name: Drilling Mud

Hazard Class: Not hazardous

Hazardous Substances: None

Cautionary Labeling: None required



• Poly-Drill Drilling Systems

• 1824 - 104 Avenue, S.W.
• Calgary, Alberta, Canada
• T2W-OA8
• (403) 259-5112 FAX (403) 255-7185

MATERIAL SAFETY DATA SHEET/FICHE SIGNALÉTIQUE

Section 1—PRODUCT IDENTIFICATION

PRODUCT TRADE NAME(S): Poly Drill 133X/1330

PRODUCT DESCRIPTION: Latex
polyelectrolyte

Section 2—COMPOSITION

A liquid polymer: Evaluation of the ingredient(s) has found no ingredient(s) hazardous as per WHMIS regulations.

Section 3—PHYSICAL DATA

Boiling Point: Not available
Solubility in Water: Solubility limited by solution viscosity.
Density (g/ml): 1.08 at 25° C
Appearance and Odor: Blue. Odor slight.

Specific Gravity (@ 25 Deg.C.): 1.09
pH: 8.1 (1.0% solution)
Physical State: Liquid

Section 4—FIRE AND EXPLOSION DATA

Flash Point (method used): (PMCC) >100 C
Conditions of flammability: Intense heat, open flame.
Hazardous combustion products: Products of incomplete hydrocarbon combustion.
Upper and Lower flammable limits: Not available
Extinguishing media: Use water spray, foam, dry chemical, or carbon dioxide.

Section 5—REACTIVITY

Chemical stability: Stable under normal conditions.
Hazardous Polymerization: Will not occur
Incompatible substances: Avoid strong oxidizing and reducing agents.
Hazardous decomposition products: Carbon monoxide, carbon dioxide, and products of incomplete hydrocarbon combustion.

Section 6—HEALTH HAZARD DATA

TOXICITY RATING: Practically non-harmful.

Routes of Exposure and Effects:

SKIN: Slight irritant: prolonged contact may cause skin irritation or dermatitis in some individuals

EYE: No effects of exposure expected with the exception of possible irritation.

INHALATION: If misted, no effects of exposure are expected.

Exposure limits: TLV-TWA: Mineral oil, mist 5 mg/m³

Carcinogenicity: None of the components of this product are listed as carcinogens by IARC and ACGIH

Sensitization of product: Not suspected to be a sensitizer.

Teratogenicity: Not available.

Mutagenicity: Not available.

.....

SECTION 7—EMERGENCY AND FIRST AID PROCEDURES

SKIN: Wash exposed area with soap and water. If irritation or abnormalities persist, call a physician.
EYE: Immediately flush eyes with water for 15 minutes, if irritation or abnormalities persist, call a physician.
INHALATION: Remove to fresh air. If breathing becomes difficult, give oxygen and call a physician.
INGESTION: Do not induce vomiting. Call a physician immediately.

SECTION 8—HANDLING AND USE PRECTIONS

Storage requirements: keep container closed when no in use. Store in a cool dry location away from oxidizing and reducing agents.

Waste Disposal: product should be disposed of in accordance with applicable local, Provincial and Federal regulations. Steps must be taken if product is released or spilled: clean spill areas thoroughly to avoid hazardous slippery conditions.

SECTION 9—INDUSTRIAL HYGIENE CONTROL MEASURES

Respiratory Protection: None normally required.

Ventilation: If mist and/or vapors are present, use air purifying respirator or self-contained breathing apparatus, but this is rarely required.

Eye Protection: Safety glasses, if personally preferred

Gloves: Generally not necessary. Personal preference.

SECTION 10—TOXICOLOGICAL PROPERTIES

Environmental Effects: Not known to be harmful to aquatic life at low concentrations.

Freshwater aquatic toxicity rating: 96 hour LC50 Rainbow Trout = 160 mg/L
96 hour LC50 Salmon = 160 mg/L

SECTION 11—DEPARTMENT OF TRANSPORTATION INFORMATION

Shipping Name: Drilling Mud

Hazard Class: Not hazardous

Hazardous Substances: None

Cautionary Labeling: None required

Propane

PRODUCT : PROPANE MSDS NR : 302-00-0037 BOC VERSION : 1.02 DATE : 01 / 04 / 01 PAGE : 1/1

1 IDENTIFICATION OF THE SUBSTANCE/ PREPARATION AND OF THE COMPANY

| | |
|------------------------|-------------------------------|
| Product name | Propane |
| Chemical formula | C ₃ H ₈ |
| Company identification | See heading and/or footer |
| Emergency phone Nos | See heading and/or footer |

2 COMPOSITION/INFORMATION ON INGREDIENTS

| | |
|---------------------------|------------|
| Substance/ Preparation | Substance |
| CAS Nr | 00074-98-6 |
| EEC Nr (from EINECS) | 2008279 |
| ASHRAE Nr | R290 |

3 HAZARDS IDENTIFICATION

| | |
|------------------------|--------------------------------------|
| Hazards identification | Extremely flammable Liquefied gas |
|------------------------|--------------------------------------|

4 FIRST AID MEASURES

Inhalation

In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation. In low concentrations may cause narcotic effects. Symptoms may include dizziness, headache, nausea and loss of co-ordination. Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.

| | |
|------------------|---|
| Skin/eye contact | In case of frostbite spray with water for at least 15 minutes. Apply a sterile dressing. Immediately flush eyes thoroughly with water for at least 15 minutes. Obtain medical assistance. |
|------------------|---|

| | |
|-----------|--|
| Ingestion | Ingestion is not considered a potential route of exposure. |
|-----------|--|

5 FIRE FIGHTING MEASURES

| | |
|--|---|
| Specific hazards | Exposure to fire may cause containers to rupture/explode. |
| Hazardous combustion products | Incomplete combustion may form carbon monoxide. |
| Suitable extinguishing media | All known extinguishants can be used. |
| Specific methods | If possible, stop flow of product. Move container away or cool with water from a protected position. Do not extinguish a leaking gas flame unless absolutely necessary. Spontaneous/explosive re-ignition may occur. Extinguish any other fire. |
| Special protective equipment for fire fighters | Use self-contained breathing apparatus |

6 ACCIDENTAL RELEASE MEASURES

| | |
|---------------------------|---|
| Personal precautions | Evacuate area Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. Ensure adequate air ventilation. Eliminate ignition sources. |
| Environmental precautions | Try to stop release. Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous. |
| Clean up methods | Ventilate area. |

7 HANDLING AND STORAGE

Handling and storage

Ensure equipment is adequately earthed. Suck back of water into the container must be prevented. Purge air from system before introducing gas. Do not allow backfeed into the container. Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt. Keep away from heat and ignition sources (including static discharges). Segregate from oxidant gases and other oxidants in store. Refer to supplier's container handling instructions. Keep container below 50°C in a well ventilated place.

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

| | |
|---------------------|---|
| Personal protection | Ensure adequate ventilation. Do not smoke while handling product. |
|---------------------|---|

9 PHYSICAL AND CHEMICAL PROPERTIES

| | |
|--------------------------|--|
| Molecular weight | 44 |
| Melting point | -188°C |
| Boiling point | -42.1°C |
| Critical temperature | 97°C |
| Relative density, gas | 1.5 (air=1) |
| Relative density, liquid | 0.58 (water=1) |
| Vapour Pressure 20°C | 8.3 bar |
| Solubility mg/l water | 75 mg/l |
| Appearance/Colour | Colourless gas |
| Odour | Sweetish. Poor warning properties at low concentrations. Stenchant often added. |
| Autoignition temperature | 470°C |
| Flammability range | 2.2-9.5 vol% in air. |
| Other data | Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level. |

10 STABILITY AND REACTIVITY

| | |
|--------------------------|---|
| Stability and reactivity | Can form explosive mixture with air. May react violently with oxidants. |
|--------------------------|---|

SAFETY DATA SHEET

11 TOXICOLOGICAL INFORMATION

General No known toxicological effects from this product.

12 ECOLOGICAL INFORMATION

General No known ecological damage caused by this product.

13 DISPOSAL CONSIDERATIONS

General

Avoid discharge to atmosphere. Do not discharge into areas where there is a risk of forming an explosive mixture with air. Waste gas should be flared through a suitable burner with flash back arrestor. Do not discharge into any place where its accumulation could be dangerous. Contact supplier if guidance is required. "Empty" cylinders still contain flammable vapour. Return empty cylinders promptly to your supplier.

14 TRANSPORT INFORMATION

UN Nr 1978
Class/Div 2.1 (Flammable gases)
ADR/RID Item Nr 2.2°F
ADR/RID Hazard Nr 23
Labelling ADR Label 3: flammable gas
Other transport information Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Before transporting product containers ensure that they are firmly secured and:

- cylinder valve is closed and not leaking
- valve outlet cap nut or plug (where provided) is correctly fitted
- valve protection device (where provided) is correctly fitted
- there is adequate ventilation.
- compliance with applicable regulations.

15 REGULATORY INFORMATION

Number in Annex I of Dir 67/548 601-003-00-5.
EC Classification F+; R12, T
- Symbols F+: Extremely flammable
- R Phrases 12
- S Phrases 9-16-33
Labelling of cylinders
- Symbols Label 3: flammable gas
- Risk phrases R12 Extremely flammable.
- Safety phrases S9/16/33 Keep container in well-ventilated place, away from ignition sources, including static discharge.

16 OTHER INFORMATION

Ensure all national/local regulations are observed. Ensure operators understand the flammability hazard. The hazard of asphyxiation is often overlooked and must be stressed during operator training. Contact with liquid may cause cold burns and/or frostbite. Users of breathing apparatus must be trained. Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out. Details given in this document are believed to be correct at the time of going to press. Whilst proper care has been taken in the preparation of this document, no liability for injury or damage resulting from its use can be accepted.

CYLINDER CHARACTERISTICS

| Cylinder Size (see Note 1 & 2) | Outlet Connection (see Note 3) | Approx. Dimensions (see Note 4) (mm) | Max. Gross Weight (kg) |
|-----------------------------------|---|--|---------------------------|
| A | 5/8" BSP | 270 x 387 | 16 |
| B | Female | 320 x 540 | 32 |
| D | Left Hand | 320 x 910 | 56 |
| E | Cone Recessed | 375 x 1250 | 83 |
| F | 1 1/4" ACME | 317 x 706 | 46 |
| G | Right Hand Male 5/8" Left Hand Female | 317 x 706 | 46 |

NOTES:

1. Not all cylinder sizes are available at all locations.
2. F&G cylinders are for use with fork lift trucks. F cylinders are liquid withdrawal and G cylinders are vapour withdrawal. Cylinders A, B, D, E are vapour withdrawal.
3. For cylinders A, B, D, E this outlet connection is designed primarily to receive the gas pressure regulator. Each cylinder valve incorporates a safety valve which operates at approximately 26 bar.
4. The height includes the valve and guard.
5. Where manifolds of individual cylinders are required please contact BOC Customer Engineering Services Department for details.



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For product and safety enquiries please phone

In the United Kingdom:
0800 111 333

BOC Gases Customer Service Centre
Priestley Road, Worsley
Manchester M28 2UT
Fax: 0800 111 555

In the Republic of Ireland:
Dublin 1850 333435

BOC Gases Ireland
P.O. Box 201
Bluebell, Dublin 12
Fax: (01) 450 7054



MATERIAL SAFETY DATA SHEET

READ AND UNDERSTAND MATERIAL SAFETY DATA SHEET BEFORE HANDLING OR DISPOSING
OF PRODUCT

PRODUCT CODE AND NAME : **PGAFG PROPYLENE GLYCOL - AFG**
DATE ISSUED : **7/30/2002**
DATE PRINTED : **7/30/2002**

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATERIAL IDENTITY

PRODUCT CODE AND NAME

PGAFG PROPYLENE GLYCOL - AFG

Chemical Name and/or Family or Description:

Glycol

COMPANY INFORMATION

Huntsman Propylene Oxide Ltd.
P.O. Box 27707
Houston, TX 77227-7707

TELEPHONE NUMBERS

Transportation Emergency

Company: (800) 328-8501

CHEMTREC: (800) 424-9300

Medical Emergency: (409) 722-9673 (24 Hour)

General MSDS Assistance: (713) 235-6432

Technical Information: (512) 459-6543

2. COMPOSITION AND INFORMATION ON INGREDIENTS

THE CRITERIA FOR LISTING COMPONENTS IN THE COMPOSITION SECTION ARE AS FOLLOWS: CARCINOGENS ARE LISTED WHEN PRESENT AT 0.1 % OR GREATER; COMPONENTS WHICH ARE OTHERWISE HAZARDOUS ACCORDING TO OSHA ARE LISTED WHEN PRESENT AT 1.0 % OR GREATER; NON-HAZARDOUS COMPONENTS ARE LISTED AT 3.0 % OR GREATER. THIS IS NOT INTENDED TO BE COMPLETE COMPOSITIONAL DISCLOSURE. REFER TO SECTION 14 FOR APPLICABLE STATES' RIGHT TO KNOW AND OTHER REGULATORY INFORMATION.

Product and/or Component(s) Carcinogenic According to:

OSHA IARC NTP OTHER NONE X

Composition:

| Chemical Name | CAS Number | Exposure Limits | Range in % |
|-----------------|------------|-----------------|------------|
| 1,2-propanediol | 57-55-6 | | 100.00 |

THIS PRODUCT IS CONSIDERED NON-HAZARDOUS ACCORDING TO OSHA (1910.1200).
REFER TO SECTION 16 OF THE MSDS FOR PROHIBITED PRODUCT APPLICATIONS.

PRODUCT CODE AND NAME : PGAFG PROPYLENE GLYCOL - AFG
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COMPANY : HUNTSMAN

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW

Appearance:

Colorless mobile liquid

Odor:

Mild

WARNING STATEMENT

CAUTION!

ASPIRATION HAZARD IF SWALLOWED -
CAN ENTER LUNGS AND CAUSE DAMAGE

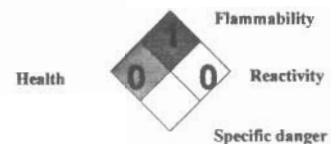
ATTENTION:

THIS PRODUCT IS NOT TO BE USED TO PRODUCE FOGS OR MISTS IN
THEATRICAL, MUSICAL OR OTHER ENTERTAINMENT PERFORMANCES

Hazardous Material
Information System
(United States)

| | |
|---------------------|---|
| Health | 0 |
| Fire | 1 |
| Reactivity | 0 |
| Personal protection | |

National Fire Protection
Association NFPA
(United States)



POTENTIAL HEALTH EFFECTS

Primary Route of Exposure

Eye X Skin X Inhalation X Ingestion

Effects of Overexposure

Acute:

Eyes:

May cause minimal irritation, experienced as temporary discomfort.

Skin:

Brief contact is not irritating. Prolonged contact, as with clothing wetted with material, may cause defatting of skin or irritation, seen as local redness with possible mild discomfort. Other than the potential skin irritation effects noted above, acute (short term) adverse effects are not expected from brief skin contact; see other effects, below, and Section 11 for information regarding potential long term effects.

Inhalation:

Vapors or mist, in excess of permissible concentrations, or in unusually high concentrations generated from spraying, heating the material or as from exposure in poorly ventilated areas or confined spaces, may cause irritation of the nose and throat, headache, nausea, and drowsiness.

Ingestion:

If more than several mouthfuls are swallowed, abdominal discomfort, nausea, and diarrhea may occur. Aspiration may occur during swallowing or vomiting resulting in lung damage.

Sensitization Properties: Unknown

Chronic:

No adverse effects have been documented in humans as a result of chronic exposure. Section 11 may contain applicable animal data.

Medical Conditions Aggravated by Exposure:

There is no evidence that this product aggravates an existing medical condition.

Other Remarks:

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None

4. FIRST AID MEASURES

Eyes:

Flush eyes with plenty of water for several minutes. Get medical attention if eye irritation persists.

Skin:

Wash skin with plenty of soap and water for several minutes. Get medical attention if skin irritation develops or persists.

Ingestion:

If person is conscious and can swallow, give two glasses of water (16 oz.), but do not induce vomiting. If vomiting occurs, give fluids again. Have medical personnel determine if evacuation of stomach or induction of vomiting is necessary. Do not give anything by mouth to an unconscious or convulsing person.

Inhalation:

If irritation, headache, nausea, or drowsiness occurs, remove to fresh air. Get medical attention if breathing becomes difficult or respiratory irritation persists.

Other Instructions:

Aspiration of this product during induced emesis may result in severe lung injury. If evacuation of stomach is necessary, use method least likely to cause aspiration, such as gastric lavage after endotracheal intubation. Contact a Poison Center for additional treatment information.

5. FIRE-FIGHTING MEASURES

Ignition Temperature - AIT (degrees C):

371.1 (700°F)

Flash Point (degrees C):

100 (212°F) (CC)

Flammable Limits % (Lower-Upper):

Lower: 2.6

Upper: 12.5

Recommended Fire Extinguishing Agents And Special Procedures:

Use water spray, dry chemical, foam, or carbon dioxide to extinguish flames. Use water spray to cool fire-exposed containers. Water or foam may cause frothing.

Unusual or Explosive Hazards:

None

Special Protective Equipment for Firefighters:

No special equipment or procedures required.

6. ACCIDENTAL RELEASE MEASURES (Transportation Spills: CHEMTREC (800)424-9300)

Procedures in Case of Accidental Release, Breakage or Leakage:

Contain spill if possible, contain with absorbent materials such as clay or soil, and shovel up. Avoid skin and eye contact.

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7. HANDLING AND STORAGE

Precautions to be Taken in

Handling:

Minimum feasible handling temperatures should be maintained.

Storage:

Periods of exposure to high temperatures should be minimized. Water contamination should be avoided.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Protective Equipment (Type)

Eye/Face Protection:

Safety glasses, chemical type goggles, or face shield recommended to prevent eye contact.

Skin Protection:

Workers should wash exposed skin several times daily with soap and water. Soiled work clothing should be laundered or dry-cleaned.

Respiratory Protection:

Airborne concentrations should be kept to lowest levels possible. If vapor, mist or dust is generated and the occupational exposure limit of the product, or any component of the product, is exceeded, use appropriate NIOSH or MSHA approved air purifying or air supplied respirator after determining the airborne concentration of the contaminant. Air supplied respirators should always be worn when airborne concentration of the contaminant or oxygen content is unknown.

Ventilation:

Local exhaust ventilation recommended if generating vapor, dust, or mist. If exhaust ventilation is not available or inadequate, use MSHA or NIOSH approved respirator as appropriate.

Exposure Limit for the Total Product:

None established for product.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:

Colorless mobile liquid

Odor:

Mild

Boiling Point (degrees C):

187.2 (369°F)

Melting/Freezing Point (degrees C):

<-60 (<-76°F)

Specific Gravity (water=1):

1.0381

pH:

6

Vapor Pressure:

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<1 mm Hg at 25°C (77°F)

Viscosity:

<20 cSt at 40°C (104°F)

VOC Content:

28% by ASTM D 2369

Vapor Density (Air=1):

2.6

Solubility in Water (%):

>10

Other:

None

10. STABILITY AND REACTIVITY

This Material Reacts Violently With:

Air Water Heat Strong Oxidizers Others None of these X

Comments:

None

Products Evolved When Subjected to Heat or Combustion:

Toxic levels of carbon monoxide, carbon dioxide, irritating aldehydes and ketones.

Hazardous Polymerizations:

DO NOT OCCUR

11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION (ANIMAL TOXICITY DATA)

Oral:

LD50 > 5.00 g/kg (rat) practically non-toxic

Dermal:

LD50 > 2.00 g/kg (rabbit) practically non-toxic

Inhalation:

Believed to be practically non-toxic

IRRITATION INDEX, ESTIMATION OF IRRITATION (SPECIES)

Eyes:

(Draize) Believed to be < 15.00 /110 (rabbit) no appreciable effect

Skin:

(Draize) Believed to be < .50 /8.0 (rabbit) no appreciable effect

Sensitization:

Not determined.

Other:

This product may contain residual (less than 5 ppm) concentrations of propylene oxide. There is evidence that propylene oxide causes tumors in laboratory animals.

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12. DISPOSAL CONSIDERATIONS:

Waste Disposal Methods:

This product has been evaluated for RCRA characteristics and does not meet the criteria of a hazardous waste if discarded in its purchased form. Under RCRA, it is the responsibility of the user of the product to determine at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because product uses, transformations, mixtures, processes, etc. may render the resulting materials hazardous.

Remarks:

None

13. TRANSPORT INFORMATION

Transportation

DOT:

Proper Shipping Name:

Not regulated

Hazard Class:

Not regulated

Identification Number:

Not regulated

Packing Group:

Not regulated

Label Required:

Not regulated

IMDG

Proper Shipping Name:

Not regulated

ICAO

Proper Shipping Name:

Not regulated

TDG

Proper Shipping Name:

Not regulated

Hazard Class:

Not regulated

Identification Number:

Not regulated

Label Required:

Not regulated

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COMPANY : HUNTSMAN

14. REGULATORY INFORMATION

Federal Regulations:

SARA Title III:

Section 302/304 Extremely Hazardous Substances

| Chemical Name | CAS Number | Range in % | TPQ | RQ |
|---------------|------------|------------|-----|----|
| None. | | | | |

Section 311 Hazardous Categorization:

Acute **Chronic** **Fire** **Pressure** **Reactive** **N/A** **X**

Section 313 Toxic Chemical

| Chemical Name | CAS Number | Concentration |
|---------------|------------|---------------|
| None. | | |

CERCLA 102(a)/DOT Hazardous Substances:

| Chemical Name | CAS Number | Range in % | RQ |
|---------------|------------|------------|----|
| None. | | | |

States Right-to-Know Regulations:

| Chemical Name | State Right-to-know |
|---------------|---------------------|
| None. | |

State list: CT (Connecticut), FL (Florida), IL (Illinois), MI (Michigan), LA (Louisiana), MA (Massachusetts), NJ (New Jersey), PA (Pennsylvania), RI (Rhode Island)

California Prop. 65:

The following detectable components of this product are substances, or belong to classes of substances, known to the State of California to cause cancer and/or reproductive toxicity.

| Chemical Name | CAS Number |
|------------------------------------|------------|
| Residual propylene oxide (typical) | 75-56-9 |

INTERNATIONAL REGULATIONS:

TSCA Inventory Status:

This product, or its components, are listed on, or are exempt from the Toxic Substance Control Act (TSCA) Chemical Substance Inventory.

WHMIS Classification:

Not regulated.

Canadian Inventory Status:

This product, or its components, are listed on or are exempt from the Canadian Domestic Substance List (DSL).

EINECS Inventory Status:

This product, or its components, are listed on or are exempt from the European Inventory of Existing Chemical Substances (EINECS) or the European List of Notified Chemical Substances (ELINCS).

Australian Inventory Status:

This product, or its components, are listed on or are exempt from the Australian Inventory of Chemical Substances (AICS).

Japan Inventory Status:

This product, or its components, are listed on or are exempt from the Japanese Ministry of International Trade and Industry (MITI) inventory.

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15. ENVIRONMENTAL INFORMATION

Aquatic Toxicity:

LC50-96hr Aquatic toxicity rating is believed to be > 100.00 mg/liter practically nontoxic

Mobility:

Not determined.

Persistence and Biodegradability:

This product is reported to have a moderate ($\geq 30\%$) rate of biodegradation in a test for ready biodegradation.

Potential to Bioaccumulate:

This product is reported to have a low potential to bioconcentrate.

Remarks:

None

16. OTHER INFORMATION 7/30/2002

This product is not to be used to produce fogs or mists in theatrical, musical or other entertainment performances.

THE INFORMATION CONTAINED HEREIN IS BELIEVED TO BE ACCURATE. IT IS PROVIDED INDEPENDENTLY OF ANY SALE OF THE PRODUCT FOR PURPOSE OF HAZARD COMMUNICATION AS PART OF HUNTSMAN'S PRODUCT SAFETY PROGRAM. IT IS NOT INTENDED TO CONSTITUTE PERFORMANCE INFORMATION CONCERNING THE PRODUCT. NO EXPRESS WARRANTY, OR IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE IS MADE WITH RESPECT TO THE PRODUCT OR THE INFORMATION CONTAINED HEREIN. DATA SHEETS ARE AVAILABLE FOR ALL HUNTSMAN PRODUCTS. YOU ARE URGED TO OBTAIN DATA SHEETS FOR ALL HUNTSMAN PRODUCTS YOU BUY, PROCESS, USE OR DISTRIBUTE AND YOU ARE ENCOURAGED AND REQUESTED TO ADVISE THOSE WHO MAY COME IN CONTACT WITH SUCH PRODUCTS OF THE INFORMATION CONTAINED HEREIN.

TO DETERMINE APPLICABILITY OR EFFECTS OF ANY LAW OR REGULATION WITH RESPECT TO THE PRODUCT, USER SHOULD CONSULT HIS LEGAL ADVISOR OR THE APPROPRIATE GOVERNMENT AGENCY. HUNTSMAN DOES NOT UNDERTAKE TO FURNISH ADVICE ON SUCH MATTERS.

Supersedes: 7/8/2002

The following sections have been revised: 11, 14

Date Issued: 7/30/2002.

Inquiries regarding MSDS should be directed to:

HUNTSMAN
Coordinator, Product Safety
P.O. Box 27707
Houston, TX 77227-7707

Technical Bulletin

HUNTSMAN

PROPYLENE GLYCOL – ANTIFREEZE GRADE (PG-AFG)

| | |
|----------------------|--|
| GENERIC NAMES | 1,2 propanediol |
| DESCRIPTION | A relatively nontoxic liquid that is practically colorless, odorless, and tasteless. |
| APPLICATIONS | For use in blending of antifreeze coolants and heat transfer fluids. |

SALES SPECIFICATIONS

| <u>Property</u> | <u>Specifications</u> | <u>Test Method *</u> |
|----------------------------------|--|----------------------|
| Acidity (as acetic acid), wt. % | 0.005 max. | ST-31.46, B |
| Appearance | Substantially free of suspended matter | ST-30.1 |
| Ash, wt. % | 0.005 max. | ST-31.12 |
| Assay as PG, wt. % | 99.0 min. | ST-35.102 |
| Chlorides (Inorganic) as Cl, ppm | 1.0 max. | ST-4.7 |
| Color, Pt-Co | 10 max. | ST-30.12 |
| Iron as FE, ppm | 1.0 max. | ST-4.9 |
| Water, wt. % | 0.2 max. | ST-31.53 |

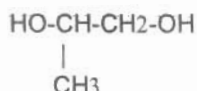
* Test methods are available upon request.

PROPYLENE GLYCOL – ANTIFREEZE GRADE

TYPICAL PROPERTIES

Chemical Properties

Structure



Molecular Weight

76

Physical Properties

Boiling range,

ASTM, °C, IBP

185 min.

ASTM, °C, DP

189 min.

Flash point, PMCC, °F

212

Freezing point, °C

<-76

Refractive index, 25°C

1.4300 min.

1.4324 max.

Specific gravity, 25/25°C

1.0350 min.

1.0370 max.

Specific heat, 0°C, cal/gm/°C

Vapor pressure, 20°C, mm

<1

Hg

Viscosity, 20°C, cp

60

Water solubility, %

>10

Weight, 20°C, lb/gal

8.64

Regulatory Information

DOT Classification

not regulated

Freight Classification

propylene glycol

OSHA Classification

Not Hazardous

HMIS Code

0-1-0

CAS Number

57-55-6

TSCA Inventory

Listed

WHMIS Classification

not regulated

Canadian DSL

Listed

European EINECS

Listed

Australian AICS

Listed

Japanese MITI

Listed

PRODUCT SAFETY POLICY

It is the product safety policy of Huntsman ICI Chemicals, LLC to provide our customers with information on the safe handling and use of our products. The Material Safety Data Sheet (MSDS) should always be read and understood thoroughly before handling the product, and adequate safety procedures should be followed. Information on the toxicity, environmental, and industrial hygiene aspects of our products may be found in the MSDS. Precautionary measures include: use only with adequate ventilation; avoid breathing vapor, mist or gas; avoid contact with eyes, skin and clothing; keep container closed; wash thoroughly after handling.

HANDLING AND STORAGE

Precautionary measures include: use only with adequate ventilation; avoid breathing vapor, mist or gas; avoid contact with eyes, skin and clothing; keep container closed; and wash thoroughly after handling.

SHIPPING

Product is available in barges, tank cars and tank trucks, and 55-gallon non-returnable drums, 480 pounds net weight. DOT label required: None. Freight classification: Propylene glycol. Certain government regulations may apply at the time of shipment.

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Huntsman ICI Chemicals, LLC

2021-7/99

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