

**Marlex® HXM TR-570 Polyethylene**

Version 3.3

Revision Date 2024-10-23

**SECTION 1: Identification of the substance/mixture and of the company/undertaking****Product information**

Product Name : Marlex® HXM TR-570 Polyethylene  
Material : 1019269, 1019820, 1019271, 1019267, 1019268, 1019822,  
1019270, 1019272, 1019823, 1019824, 1019821, 1019819,  
1018720, 1018716, 1017285

**Company** : Chevron Phillips Chemical Company LP  
10001 Six Pines Drive  
The Woodlands, TX 77380

**Emergency telephone:****Health:**

866.442.9628 (North America)

1.832.813.4984 (International)

**Transport:**

CHEMTREC 800.424.9300 or 703.527.3887(int'l)

Asia: CHEMWATCH (+612 9186 1132) China: 0532 8388 9090

Mexico CHEMTREC 01-800-681-9531 (24 hours)

South America SOS-Cotec Inside Brazil: 0800.111.767 Outside Brazil: +55.19.3467.1600

Argentina: +(54)-1159839431

EUROPE: BIG +32.14.584545 (phone) or +32.14583516 (telefax)

Austria: VIZ +43 1 406 43 43 (24 hours/day, 7 days/week)

Belgium: 070 245 245 (24 hours/day, 7 days/week)

Bulgaria: +359 2 9154 233

Croatia: +3851 2348 342 (24 hours/day, 7 days/week)

Cyprus: 1401

Czech Republic: Toxicological Information Center +420 224 919 293, +420 224 915 402

Denmark: Danish Poison Center (Giftlinjen): +45 8212 1212

Estonia: BIG +32.14.584545 (phone) or +32.14583516 (telefax)

Finland: 0800 147 111 09 471 977 (24 hours/day)

France: ORFILA number (INRS): + 33 (0) 1 45 42 59 59 (24 hours/day, 7 days/week)

Germany: BIG +32.14.584545 (phone) or +32.14583516 (telefax)

Greece: (0030) 2107793777 (24 hours/day, 7 days/week)

Hungary: +36-80-201-199 (24 hours/day, 7 days/week)

Iceland: 543 2222 (24 hours/day, 7 days/week)

Ireland: BIG +32.14.584545 (phone) or +32.14583516 (telefax)

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Italy: POISON CENTER MILAN – Azienda Ospedaliera Niguarda Ca` Grande Tel. +39 02 66101029; POISON CENTER ROME – Policlinico “Agostino Gemelli”, Servizio di tossicologia clinica Tel. +39 06 3054343; POISON CENTER ROME – Ospedale Pediatrico Bambino Gesù Tel. +39 06 68593726; POISON CENTER ROME – Policlinico “Umberto I” Tel. +39 06 4997 8000; POISON CENTER FOGGIA – Azienda Ospedaliera Universitaria Riuniti Tel. +39 0881 732326; POISON CENTER NAPLES – Azienda Ospedaliera “Antonio Cardarelli” Tel. +39 081 7472870; POISON CENTER FLORENCE – Azienda Ospedaliera universitaria Careggi Tel. +39 055 7947819; POISON CENTER PAVIA – IRCCS Fondazione Salvatore Maugeri Tel. +39 0382 24444; POISON CENTER BERGAMO – Azienda Ospedaliera “Papa Giovanni XXIII” Tel. 800 883 300; POISON CENTER VERONA – Azienda Ospedaliera Universitaria integrata Tel. 800 011 858;

Latvia: State Fire and Rescue Service, phone number: 112; Toxicology and Sepsis Clinic Poisoning and Drug Information Center, Hipokrāta 2, Riga, Latvia, LV-1038, phone number +371 67042473. (24 hours.)

Liechtenstein: BIG +32.14.584545 (phone) or +32.14583516 (telefax)

Lithuania: +370 (85) 2362052

Luxembourg: (+352) 8002 5500 (24 hours/day, 7 days/week)

Malta: +356 2395 2000

The Netherlands: NVIC: +31 (0)88 755 8000

Norway: 22 59 13 00 (24 hours/day, 7 days/week)

Poland: BIG +32.14.584545 (phone) or +32.14583516 (telefax)

Portugal: CIAV phone number: +351 800 250 250

Romania: +40213183606

Slovakia: +421 2 5477 4166

Slovenia: Phone number: 112

Spain: National Emergency Telephone Number of Spanish Poison Centre: +34 91 562 04 20 (24 hours/day, 7 days/week)

Sweden: 112 – ask for Poisons Information

Responsible Department : Product Safety and Toxicology Group  
E-mail address : SDS@CPChem.com  
Website : www.CPChem.com

**MEDICAL APPLICATION CAUTION:** Do not use this material in medical applications involving permanent implantation in the human body or permanent contact with internal body fluids or tissues fluids or tissues.

Do not use this material in medical applications involving brief or temporary implantation in the human body or contact with internal body fluids or tissues unless the material has been provided directly from Chevron Phillips Chemical Company LP or its legal affiliates under an agreement which expressly acknowledges the contemplated use.

Chevron Phillips Chemical Company LP and its legal affiliates makes no representation, promise, express warranty or implied warranty concerning the suitability of this material for use in implantation in the human body or in contact with internal body fluids or tissues.

**SECTION 2: Hazards identification****Classification of the substance or mixture**

This product has been classified in accordance with the hazard communication standard 29 CFR 1910.1200; the SDS and labels contain all the information as required by the standard.

**Classification**

: Combustible dust

**Labeling**

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|                                 |                                                                                                                                                                                                                                                                                                                                  |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Signal Word                     | : Warning                                                                                                                                                                                                                                                                                                                        |
| Hazard Statements               | : May form combustible dust concentrations in air.<br>While this product may not be a combustible dust as sold, further processing or handling may form combustible dust concentration in air.                                                                                                                                   |
| <b>Potential Health Effects</b> |                                                                                                                                                                                                                                                                                                                                  |
| Physical Hazards                | : Pellets may cause a slip hazard on hard surfaces.<br>Mechanical processing may form combustible dust concentrations in air and thermal processing at elevated temperatures may generate formaldehyde.                                                                                                                          |
| Inhalation                      | : Repeated exposure to dust from this material may cause respiratory irritation.<br>Fumes generated during thermal processing may cause irritation of the upper respiratory tract.                                                                                                                                               |
| Skin                            | : Contact with the skin is not expected to cause prolonged or significant irritation.<br>Contact with the skin is not expected to cause an allergic response.<br>If this material is heated, thermal burns may result from contact. Thermal burns may include pain or feeling of heat, discolorations, swelling, and blistering. |
| Eyes                            | : Contact with the eyes may cause irritation due to the abrasive action.<br>Not expected to cause prolonged or significant eye irritation. Thermal burns may result if heated material contacts eye.                                                                                                                             |
| Ingestion                       | : Ingestion of this product is not a likely route of exposure.                                                                                                                                                                                                                                                                   |
| <b>Carcinogenicity:</b>         |                                                                                                                                                                                                                                                                                                                                  |
| IARC                            | No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.                                                                                                                                                                         |
| NTP                             | No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.                                                                                                                                                                                         |

SECTION 3: Composition/information on ingredients

| Component                     | CAS-No.    | Weight % |
|-------------------------------|------------|----------|
| Polyethylene Hexene Copolymer | 25213-02-9 | 99 - 100 |

SECTION 4: First aid measures

|                         |                                                                                                                                              |
|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| If inhaled              | : Move to fresh air in case of accidental inhalation of dust or fumes from overheating or combustion. If symptoms persist, call a physician. |
| In case of skin contact | : If the molten material gets on skin, quickly cool in water. Seek immediate medical attention. Do not try to peel the solidified            |

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- material from the skin or use solvents or thinners to dissolve it.
- In case of eye contact : In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
- If swallowed : Do not induce vomiting without medical advice.

**SECTION 5: Firefighting measures**

- Flash point : No data available
- Autoignition temperature : No data available
- Suitable extinguishing media : Water. Water mist. Dry chemical. Carbon dioxide (CO<sub>2</sub>). Foam. If possible, water should be applied as a spray from a fogging nozzle since this is a surface burning material. The application of high velocity water will spread the burning surface layer. Avoid the use of straight streams that may create a dust cloud and the risk of a dust explosion. Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
- Specific hazards during fire fighting : Risks of ignition followed by flame propagation or secondary explosions can be caused by the accumulation of dust, e.g. on floors and ledges.
- Special protective equipment for fire-fighters : Use personal protective equipment. Wear self-contained breathing apparatus for firefighting if necessary.
- Further information : This material will burn although it is not easily ignited.
- Fire and explosion protection : Treat as a solid that can burn. Avoid generating dust; fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard.
- Hazardous decomposition products : Normal combustion forms carbon dioxide, water vapor and may produce carbon monoxide, other hydrocarbons and hydrocarbon oxidation products (ketones, aldehydes, organic acids) depending on temperature and air availability. Incomplete combustion can also produce formaldehyde.

**SECTION 6: Accidental release measures**

- Personal precautions : Sweep up to prevent slipping hazard. Avoid breathing dust. Avoid dust formation.
- Environmental precautions : Do not contaminate surface water. Prevent product from entering drains.
- Methods for cleaning up : Clean up promptly by sweeping or vacuum.
- Additional advice : Dust deposits should not be allowed to accumulate on surfaces, as these may form an explosive mixture if they are released into the atmosphere in sufficient concentration. Avoid

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dispersal of dust in the air (i.e., clearing dust surfaces with compressed air).

SECTION 7: Handling and storage

Handling

Advice on safe handling : Use good housekeeping for safe handling of the product. Keep out of water sources and sewers. Spilled pellets may create a slipping hazard.  
Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary, but may not by themselves be sufficient. At elevated temperatures (>350°F, >177°C), polyethylene can release vapors and gases, which are irritating to the mucous membranes of the eyes, mouth, throat, and lungs. These substances may include acetaldehyde, acetone, acetic acid, formic acid, formaldehyde and acrolein. Based on animal data and limited epidemiological evidence, formaldehyde has been listed as a carcinogen. Following all recommendations within this SDS should minimize exposure to thermal processing emissions.

Advice on protection against fire and explosion : Treat as a solid that can burn. Avoid generating dust; fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard.

Storage

Requirements for storage areas and containers : Keep in a dry place. Keep in a well-ventilated place.  
Advice on common storage : Do not store together with oxidizing and self-igniting products.

SECTION 8: Exposure controls/personal protection

Ingredients with workplace control parameters

US

| Components    | Basis    | Value | Control parameters | Note              |
|---------------|----------|-------|--------------------|-------------------|
| Nuisance Dust | OSHA Z-3 | TWA   | 15 mg/m3           | Total dust        |
|               | OSHA Z-3 | TWA   | 5 mg/m3            | (respirable dust) |

Control as Particulate Not Otherwise Classified (PNOC). The ACGIH Guideline\* for respirable dust is 3.0 mg/m3 and 10.0 mg/m3 for total dust. The OSHA PEL for respirable dust is 5.0 mg/m3 and 15.0 mg/m3 for total dust.  
\* This value is for inhalable (total) particulate matter containing no asbestos and < 1.0% crystalline silica.

Engineering measures

Consider the potential hazards of this material (see Section 2), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

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**Personal protective equipment**

- Respiratory protection : No respiratory protection is normally required. If heated material generates vapor or fumes that are not adequately controlled by ventilation, wear an appropriate respirator. Use the following elements for air-purifying respirators: Organic Vapor and Formaldehyde. A positive pressure, air-supplying respirator may be appropriate if there is potential for uncontrolled release, aerosolization, exposure levels are not known, or other circumstances where air-purifying respirators may not provide adequate protection.  
Dust safety masks are recommended when the dust concentration is excessive.
- Eye protection : Use of safety glasses with side shields for solid handling is good industrial practice. If this material is heated, wear chemical goggles or safety glasses with side shields or a face shield. If there is potential for dust, use chemical goggles.
- Skin and body protection : At ambient temperatures use of clean and protective clothing is good industrial practice. If the material is heated or molten, wear thermally insulated, heat-resistant gloves that are able to withstand the temperature of the molten product. If this material is heated, wear insulated clothing to prevent skin contact if engineering controls or work practices are not adequate.

**SECTION 9: Physical and chemical properties****Information on basic physical and chemical properties****Appearance**

- Form : Pellets  
Physical state : solid  
Color : Opaque  
Odor : Mild to no odor  
Odor Threshold : No data available

**Safety data**

- Flash point : No data available
- Lower explosion limit : Not applicable
- Upper explosion limit : Not applicable
- Autoignition temperature : No data available
- Thermal decomposition : Low molecular weight hydrocarbons, alcohols, aldehydes, acids and ketones can be formed during thermal processing.
- pH : Not applicable
- Melting point/ range : 90-140°C (194-284°F)

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|                                         |                                                                                                                                                                                                       |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Melting point/freezing point            | Not applicable                                                                                                                                                                                        |
| Initial boiling point and boiling range | : Not applicable                                                                                                                                                                                      |
| Vapor pressure                          | : Not applicable                                                                                                                                                                                      |
| Relative density                        | : Not applicable                                                                                                                                                                                      |
| Density                                 | : 0.91 - 0.97 g/cm3<br>Please refer to the Technical Data Sheet (TDS) for more detailed information relating to the nominal physical properties, including density, of this polyethylene resin grade. |
| Water solubility                        | : negligible                                                                                                                                                                                          |
| Partition coefficient: n-octanol/water  | : No data available                                                                                                                                                                                   |
| Solubility in other solvents            | : No data available                                                                                                                                                                                   |
| Viscosity, dynamic                      | : Not applicable                                                                                                                                                                                      |
| Viscosity, kinematic                    | : Not applicable                                                                                                                                                                                      |
| Relative vapor density                  | : Not applicable                                                                                                                                                                                      |
| Evaporation rate                        | : Not applicable                                                                                                                                                                                      |

**SECTION 10: Stability and reactivity**

|                                           |                                                                                                                                                                                                                                                                                      |
|-------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Reactivity</b>                         | : This material is considered non-reactive under normal ambient and anticipated storage and handling conditions of temperature and pressure.                                                                                                                                         |
| <b>Chemical stability</b>                 | : This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.                                                                                                                                               |
| <b>Possibility of hazardous reactions</b> |                                                                                                                                                                                                                                                                                      |
| <b>Conditions to avoid</b>                | : Avoid prolonged storage at elevated temperature.                                                                                                                                                                                                                                   |
| <b>Materials to avoid</b>                 | : Avoid contact with strong oxidizing agents.                                                                                                                                                                                                                                        |
| <b>Thermal decomposition</b>              | : Low molecular weight hydrocarbons, alcohols, aldehydes, acids and ketones can be formed during thermal processing.                                                                                                                                                                 |
| <b>Hazardous decomposition products</b>   | : Normal combustion forms carbon dioxide, water vapor and may produce carbon monoxide, other hydrocarbons and hydrocarbon oxidation products (ketones, aldehydes, organic acids) depending on temperature and air availability. Incomplete combustion can also produce formaldehyde. |

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Other data : No decomposition if stored and applied as directed.

SECTION 11: Toxicological information

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Acute oral toxicity : Presumed Not Toxic

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Acute inhalation toxicity : Presumed Not Toxic

Marlex® HXM TR-570 Polyethylene  
Acute dermal toxicity : Presumed Not Toxic

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Skin irritation : No skin irritation

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Eye irritation : No eye irritation

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Sensitization : Did not cause sensitization on laboratory animals.

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Further information : This product contains POLYMERIZED OLEFINS. During thermal processing (>350°F, >177°C) polyolefins can release vapors and gases (aldehydes, ketones and organic acids) which are irritating to the mucous membranes of the eyes, mouth, throat, and lungs. Generally these irritant effects are all transitory. However, prolonged exposure to irritating off-gases can lead to pulmonary edema. Formaldehyde (an aldehyde) has been classified as a carcinogen based on animal data and limited epidemiological evidence.

SECTION 12: Ecological information

Ecotoxicity effects

Biodegradability : This material is not expected to be readily biodegradable.

Elimination information (persistence and degradability)

Bioaccumulation : Does not bioaccumulate.

Mobility : The product is insoluble and floats on water.

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Additional ecological information : This material is not expected to be harmful to aquatic organisms., Fish or birds may eat pellets which may obstruct their digestive tracts.

Ecotoxicology Assessment

Short-term (acute) aquatic hazard : This product has no known ecotoxicological effects.

Long-term (chronic) aquatic hazard : This product has no known ecotoxicological effects.

SECTION 13: Disposal considerations

The information in this SDS pertains only to the product as shipped.

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by US EPA under RCRA (40 CFR 261) or other State and local regulations. Measurement of certain physical properties and analysis for regulated components may be necessary to make a correct determination. If this material is classified as a hazardous waste, federal law requires disposal at a licensed hazardous waste disposal facility.

SECTION 14: Transport information

**The shipping descriptions shown here are for bulk shipments only, and may not apply to shipments in non-bulk packages (see regulatory definition).**

Consult the appropriate domestic or international mode-specific and quantity-specific Dangerous Goods Regulations for additional shipping description requirements (e.g., technical name or names, etc.) Therefore, the information shown here, may not always agree with the bill of lading shipping description for the material. Flashpoints for the material may vary slightly between the SDS and the bill of lading.

**US DOT (UNITED STATES DEPARTMENT OF TRANSPORTATION)**  
NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

**IMO / IMDG (INTERNATIONAL MARITIME DANGEROUS GOODS)**  
NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

**IATA (INTERNATIONAL AIR TRANSPORT ASSOCIATION)**  
NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

**ADR (AGREEMENT ON DANGEROUS GOODS BY ROAD (EUROPE))**  
NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

**RID (REGULATIONS CONCERNING THE INTERNATIONAL TRANSPORT OF DANGEROUS GOODS (EUROPE))**  
NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

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ADN (EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY INLAND WATERWAYS)  
NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

Maritime transport in bulk according to IMO instruments

SECTION 15: Regulatory information

National legislation

SARA 311/312 Hazards : Combustible dust

EPCRA - EMERGENCY PLANNING COMMUNITY RIGHT - TO – KNOW

CERCLA Reportable Quantity : This material does not contain any components with a CERCLA RQ.

SARA 302 Reportable Quantity : This material does not contain any components with a SARA 302 RQ.

SARA 302 Threshold Planning Quantity : No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.  
SARA 304 Reportable Quantity : This material does not contain any components with a section 304 EHS RQ.

SARA 313 Components : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Clean Air Act

Ozone-Depletion Potential : This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).

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This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 111 SOCM Intermediate or Final VOC's (40 CFR 60.489).

US State Regulations

Pennsylvania Right To Know : No components are subject to the Pennsylvania Right to Know Act.

California Prop. 65 Components : This product, as shipped, does not contain any carcinogens or reproductive toxins presently known by the State of California to cause cancer or reproductive toxicity at a level of exposure subject to the requirements of California Proposition 65.

Notification status

- Europe REACH : On the inventory, or in compliance with the inventory
- Switzerland CH INV : On the inventory, or in compliance with the inventory
- United States of America (USA) TSCA : On or in compliance with the active portion of the TSCA inventory
- Canada DSL : All components of this product are on the Canadian DSL
- Australia AIIC : On the inventory, or in compliance with the inventory
- New Zealand NZIoC : On the inventory, or in compliance with the inventory
- Japan ENCS : On the inventory, or in compliance with the inventory
- Philippines PICCS : On the inventory, or in compliance with the inventory
- Korea KECI : A substance(s) in this product was not registered, notified to be registered, or exempted from registration by CPChem according to K-REACH regulations. Importation or manufacture of this product is still permitted provided the Korean Importer of Record has themselves notified the substance or the exported amount does not exceed the minimum threshold quantity of the non-registered substance(s).
- Taiwan TCSI : On the inventory, or in compliance with the inventory
- China IECSC : On the inventory, or in compliance with the inventory

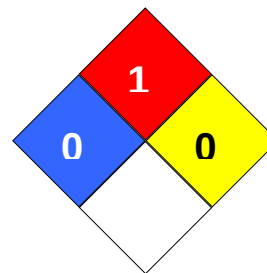
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**SECTION 16: Other information**

**NFPA Classification** : Health Hazard: 0  
Fire Hazard: 1  
Reactivity Hazard: 0

**Further information**

Significant changes since the last version are highlighted in the margin. This version replaces all previous versions.

The information in this SDS pertains only to the product as shipped.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

**Key or legend to abbreviations and acronyms used in the safety data sheet**

|        |                                                          |       |                                                                 |
|--------|----------------------------------------------------------|-------|-----------------------------------------------------------------|
| ACGIH  | American Conference of Government Industrial Hygienists  | LD50  | Lethal Dose 50%                                                 |
| AiIC   | Australian Inventory of Industrial Chemicals             | LOAEL | Lowest Observed Adverse Effect Level                            |
| DSL    | Canada, Domestic Substances List                         | NFPA  | National Fire Protection Agency                                 |
| NDSL   | Canada, Non-Domestic Substances List                     | NIOSH | National Institute for Occupational Safety & Health             |
| CNS    | Central Nervous System                                   | NTP   | National Toxicology Program                                     |
| CAS    | Chemical Abstract Service                                | NZIoC | New Zealand Inventory of Chemicals                              |
| EC50   | Effective Concentration                                  | NOAEL | No Observable Adverse Effect Level                              |
| EC50   | Effective Concentration 50%                              | NOEC  | No Observed Effect Concentration                                |
| EGEST  | EOSCA Generic Exposure Scenario Tool                     | OSHA  | Occupational Safety & Health Administration                     |
| EOSCA  | European Oilfield Specialty Chemicals Association        | PEL   | Permissible Exposure Limit                                      |
| EINECS | European Inventory of Existing Chemical Substances       | PICCS | Philippines Inventory of Commercial Chemical Substances         |
| MAK    | Germany Maximum Concentration Values                     | PRNT  | Presumed Not Toxic                                              |
| GHS    | Globally Harmonized System                               | RCRA  | Resource Conservation Recovery Act                              |
| >=     | Greater Than or Equal To                                 | STEL  | Short-term Exposure Limit                                       |
| IC50   | Inhibition Concentration 50%                             | SARA  | Superfund Amendments and Reauthorization Act.                   |
| IARC   | International Agency for Research on Cancer              | TLV   | Threshold Limit Value                                           |
| IECSC  | Inventory of Existing Chemical Substances in China       | TWA   | Time Weighted Average                                           |
| ENCS   | Japan, Inventory of Existing and New Chemical Substances | TSCA  | Toxic Substance Control Act                                     |
| KECI   | Korea, Existing Chemical Inventory                       | UVCB  | Unknown or Variable Composition, Complex Reaction Products, and |

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|      |                          |       |                                                  |
|------|--------------------------|-------|--------------------------------------------------|
|      |                          |       | Biological Materials                             |
| <=   | Less Than or Equal To    | WHMIS | Workplace Hazardous Materials Information System |
| LC50 | Lethal Concentration 50% | ATE   | Acute toxicity estimate                          |