

**Liquid HE® 150 Polymer**

Version 2.14

Revision Date 2017-05-18

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

Product Name : Liquid HE® 150 Polymer  
Material : 1112193, 1107988, 1103427, 1105173

Use : Oilfield Fluids Additive

**Company** : Chevron Phillips Chemical Company LP  
Drilling Specialties Company LLC  
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)

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

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

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

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

**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**

: Flammable liquids, Category 4

**Labeling**

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Signal Word : Warning

Hazard Statements : H227: Combustible liquid.

Precautionary Statements : **Prevention:**  
P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.  
P280 Wear protective gloves/ eye protection/ face protection.  
**Response:**  
P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.  
**Storage:**  
P403 + P235 Store in a well-ventilated place. Keep cool.  
**Disposal:**  
P501 Dispose of contents/ container to an approved waste disposal plant.

**Carcinogenicity:****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**

Synonyms : Liquid Acid Gelling Agent

Molecular formula : Mixture

| Component                                   | CAS-No.    | Weight % |
|---------------------------------------------|------------|----------|
| C12-C14 Isoalkanes                          | 68551-19-9 | 0 - 60   |
| Distillates (petroleum), hydrotreated light | 64742-47-8 | 0 - 60   |
| Polymerization bottoms                      | 64741-71-5 | 0 - 60   |

**SECTION 4: First aid measures**

General advice : No hazards which require special first aid measures.

If inhaled : Move to fresh air. If unconscious, place in recovery position and seek medical advice. If symptoms persist, call a physician.

In case of skin contact : If on skin, rinse well with water. If on clothes, remove clothes.

In case of eye contact : Flush eyes with water as a precaution. Remove contact lenses. Protect unharmed eye. Keep eye wide open while rinsing. If eye irritation persists, consult a specialist.

If swallowed : Keep respiratory tract clear. Never give anything by mouth to an unconscious person. Take victim immediately to hospital.

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**SECTION 5: Firefighting measures**

|                                                |                                                                                                                                                                                                                                                                                  |
|------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Flash point                                    | : 87 °C (188 °F)<br>Method: Tag closed cup                                                                                                                                                                                                                                       |
| Autoignition temperature                       | : 232 °C (450 °F)                                                                                                                                                                                                                                                                |
| Suitable extinguishing media                   | : Carbon dioxide (CO2).                                                                                                                                                                                                                                                          |
| Unsuitable extinguishing media                 | : High volume water jet.                                                                                                                                                                                                                                                         |
| Special protective equipment for fire-fighters | : Wear self-contained breathing apparatus for firefighting if necessary.<br>Wear self-contained breathing apparatus for firefighting if necessary.                                                                                                                               |
| Further information                            | : For safety reasons in case of fire, cans should be stored separately in closed containments. Use a water spray to cool fully closed containers.                                                                                                                                |
| Fire and explosion protection                  | : Do not spray on an open flame or any other incandescent material. Keep away from open flames, hot surfaces and sources of ignition.<br><br>Do not spray on an open flame or any other incandescent material. Keep away from open flames, hot surfaces and sources of ignition. |
| Hazardous decomposition products               | : Carbon oxides.                                                                                                                                                                                                                                                                 |

**SECTION 6: Accidental release measures**

|                           |                                                                                                                                                                                                                                                                                     |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Environmental precautions | : Prevent further leakage or spillage if safe to do so. If the product contaminates rivers and lakes or drains inform respective authorities.                                                                                                                                       |
| Methods for cleaning up   | : Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13). Keep in suitable, closed containers for disposal. |

**SECTION 7: Handling and storage****Handling**

|                         |                                                                                                                                                                                                                                                                                         |
|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Advice on safe handling | : Avoid formation of aerosol. For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area. Provide sufficient air exchange and/or exhaust in work rooms. Dispose of rinse water in accordance with local and national regulations. |
|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

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Advice on protection against fire and explosion : Do not spray on an open flame or any other incandescent material. Keep away from open flames, hot surfaces and sources of ignition.  
Do not spray on an open flame or any other incandescent material. Keep away from open flames, hot surfaces and sources of ignition.

**Storage**

Requirements for storage areas and containers : No smoking. Keep container tightly closed in a dry and well-ventilated place. Observe label precautions. Electrical installations / working materials must comply with the technological safety standards.  
No smoking. Keep in a well-ventilated place. Observe label precautions. Electrical installations / working materials must comply with the technological safety standards.

**SECTION 8: Exposure controls/personal protection****Ingredients with workplace control parameters****Chevron Phillips Chemical Company LP**

| Ingredients        | Basis        | Value | Control parameters | Note |
|--------------------|--------------|-------|--------------------|------|
| C12-C14 Isoalkanes | Manufacturer | TWA   | 1,200 mg/m3        | RCP, |

RCP Reciprocal Calculation Procedure

**US**

| Ingredients | Basis | Value | Control parameters | Note |
|-------------|-------|-------|--------------------|------|
|-------------|-------|-------|--------------------|------|

**Engineering measures**

Adequate ventilation to control airborne concentrations below the exposure guidelines/limits. 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.

**Personal protective equipment**

Respiratory protection : Wear a supplied-air NIOSH approved respirator unless ventilation or other engineering controls are adequate to maintain minimal oxygen content of 19.5% by volume under normal atmospheric pressure. Wear a NIOSH approved respirator that provides protection when working with this material if exposure to harmful levels of airborne material may occur, such as: Air-Purifying Respirator for Organic Vapors. Use a positive pressure, air-supplying respirator if there is potential for uncontrolled release, exposure levels are not known, or other circumstances where air-purifying respirators may not provide adequate protection.

Hand protection : The suitability for a specific workplace should be discussed with the producers of the protective gloves. Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the

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|                          |                                                                                                                                                                                                                                   |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                          | contact time. Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.                                                                                                         |
| Eye protection           | : Eye wash bottle with pure water. Tightly fitting safety goggles.                                                                                                                                                                |
| Skin and body protection | : Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place. Wear as appropriate:. Flame-resistant clothing. Footwear protecting against chemicals. |
| Hygiene measures         | : Wash hands before breaks and at the end of workday.                                                                                                                                                                             |

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

|                |                      |
|----------------|----------------------|
| Physical state | : Liquid             |
| Color          | : White              |
| Odor           | : Slight hydrocarbon |

**Safety data**

|                                        |                                            |
|----------------------------------------|--------------------------------------------|
| Flash point                            | : 87 °C (188 °F)<br>Method: Tag closed cup |
| Lower explosion limit                  | : No data available                        |
| Upper explosion limit                  | : No data available                        |
| Oxidizing properties                   | : No                                       |
| Autoignition temperature               | : 232 °C (450 °F)                          |
| Molecular formula                      | : Mixture                                  |
| Molecular weight                       | : Not applicable                           |
| pH                                     | : 7                                        |
| Freezing point                         | : No data available                        |
| Boiling point/boiling range            | : 223 - 244 °C (433 - 471 °F)              |
| Vapor pressure                         | : 0.01 PSI<br>at 25 °C (77 °F)             |
| Relative density                       | : 0.96<br>at 15.6 °C (60.1 °F)             |
| Density                                | : 958.6 g/l                                |
| Water solubility                       | : dispersible                              |
| Partition coefficient: n-octanol/water | : No data available                        |
| Viscosity, kinematic                   | : 79007 cSt                                |

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Relative vapor density : 3  
(Air = 1.0)

Evaporation rate : < 1

**SECTION 10: Stability and reactivity**

Chemical stability : This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

**Possibility of hazardous reactions**

Conditions to avoid : Avoid contact with strong oxidizers. Avoid contact with heat, light, catalysts, halogens or any other chemicals. Avoid high temperatures  
Heat, flames and sparks.

Materials to avoid : May react with oxygen and strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.

Hazardous decomposition products : Carbon oxides

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

**SECTION 11: Toxicological information****Acute oral toxicity**

C12-C14 Isoalkanes : LD50: > 5000 milligram per kilogram  
Species: Rat  
Method: OECD Test Guideline 401  
Information given is based on data obtained from similar substances.

Distillates (petroleum), hydrotreated light : No data available

Polymerization bottoms : LD50: > 5,000 mg/kg  
Species: Rat

**Acute inhalation toxicity**

C12-C14 Isoalkanes : LC50: > 5.0 milligram per liter Exposure time: 4 h  
Species: Rat  
Test atmosphere: vapor  
Method: OECD Test Guideline 403  
An LC50/inhalation/4h/rat could not be determined because no mortality of rats was observed at the maximum achievable concentration.  
Information given is based on data obtained from similar substances.

Distillates (petroleum), : No data available

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hydrotreated light

**Acute dermal toxicity**

Distillates (petroleum),  
hydrotreated light : No data available

Polymerization bottoms LD50: > 2,000 mg/kg  
Species: Rat

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Skin irritation**

: No skin irritation

**Liquid HE® 150 Polymer  
Eye irritation**

: No eye irritation

**Liquid HE® 150 Polymer  
Sensitization**

: Not a skin sensitizer.

**Repeated dose toxicity**

C12-C14 Isoalkanes : Species: Monkey  
Application Route: Inhalation  
Dose: 0, 654 ppm  
Exposure time: 4 wk  
Number of exposures: 6 h/d, 3 d/wk  
NOEL: > 654 ppm  
Method: OECD Test Guideline 412

Species: Rat, male and female  
Sex: male and female  
Application Route: oral gavage  
Dose: 0, 25, 150, 1000 mg/kg/d  
Exposure time: 4 wk  
Number of exposures: daily  
NOEL: >= 1000 mg/kg/d  
Method: OECD Guideline 422  
Information given is based on data obtained from similar substances.

Polymerization bottoms No adverse effects expected

**Reproductive toxicity**

C12-C14 Isoalkanes : Species: Rat  
Sex: male  
Application Route: oral gavage  
Dose: 0, 750, 1500, 3000 mg/kg/bw/d  
Number of exposures: daily  
Test period: 90 d  
Method: OECD Test Guideline 415  
NOAEL Parent: >= 3000 mg/kg/bw/d  
Information given is based on data obtained from similar substances.

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Species: Rat  
Sex: female  
Application Route: oral gavage  
Dose: 0, 750, 1500 mg/kg/bw/d  
Number of exposures: daily  
Test period: 90 d  
Method: OECD Test Guideline 415  
NOAEL Parent:  $\geq 1500$  mg/kg/bw/d  
NOAEL F1: 750 mg/kg/bw/d  
Information given is based on data obtained from similar substances.

Species: Rat  
Sex: male and female  
Application Route: inhalation (vapor)  
Dose: 100, 300 ppm  
Number of exposures: 6 h/d/5d/wk  
Test period: 8 wk  
Method: OECD Guideline 421  
NOAEL Parent:  $\geq 300$  ppm  
NOAEL F1:  $\geq 300$  ppm  
Information given is based on data obtained from similar substances.

Polymerization bottoms

No adverse effects expected

**Developmental Toxicity**

C12-C14 Isoalkanes

: Species: Rat  
Application Route: Inhalation  
Dose: 100, 300 ppm  
Exposure time: GD 6-15  
Number of exposures: 6 h/d  
NOAEL Teratogenicity:  $\geq 300$  ppm  
Information given is based on data obtained from similar substances.



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Species: Rat  
 Application Route: Inhalation  
 Dose: 300, 900 ppm  
 Exposure time: GD 6-15  
 Number of exposures: 6 h/d  
 Method: OECD Guideline 414  
 NOAEL Teratogenicity:  $\geq$  900 ppm  
 NOAEL Maternal:  $\geq$  900 ppm  
 Information given is based on data obtained from similar substances.

Species: Rat  
 Application Route: oral gavage  
 Dose: 0, 500, 1000, 1500 mg/kg/d  
 Exposure time: GD 6-15  
 Number of exposures: Daily  
 Method: OECD Guideline 414  
 NOAEL Teratogenicity: 1,000 mg/kg  
 NOAEL Maternal: 500 mg/kg  
 Information given is based on data obtained from similar substances.

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**Aspiration toxicity**

: No aspiration toxicity classification.

**CMR effects**

## C12-C14 Isoalkanes

: Carcinogenicity: Limited evidence of carcinogenicity in animal studies  
 Mutagenicity: Tests on bacterial or mammalian cell cultures did not show mutagenic effects., In vivo tests did not show mutagenic effects  
 Teratogenicity: Animal testing did not show any effects on fetal development.  
 Reproductive toxicity: No adverse effects expected

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**Further information**

: High concentration of vapors may cause irritation to eyes and respiratory system and produce narcotic effects. Solvents may degrease the skin.

**SECTION 12: Ecological information****Toxicity to fish**

## C12-C14 Isoalkanes

: LL50: > 1,000 mg/l  
 Exposure time: 96 h  
 Species: Oncorhynchus mykiss (rainbow trout)  
 semi-static test Method: OECD Test Guideline 203  
 Information given is based on data obtained from similar substances.

## Polymerization bottoms

LL50: > 1,000 mg/l  
 Exposure time: 96 h  
 Species: Oncorhynchus mykiss (rainbow trout)

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**Toxicity to daphnia and other aquatic invertebrates**

C12-C14 Isoalkanes : EL50: > 1,000 mg/l  
 Exposure time: 48 h  
 Species: Daphnia magna (Water flea)  
 static test Method: OECD Test Guideline 202  
 Information given is based on data obtained from similar substances.

Distillates (petroleum), hydrotreated light EL50: > 100 mg/l  
 Exposure time: 48 h  
 Species: Daphnia magna (Water flea)  
 static test Method: OECD Test Guideline 202  
 Aquatic toxicity is unlikely due to low solubility.

Polymerization bottoms EL50: > 100 mg/l  
 Exposure time: 48 h  
 Species: Daphnia magna (Water flea)  
 static test Method: OECD Test Guideline 202

**Toxicity to algae**

C12-C14 Isoalkanes : EL50: > 1,000 mg/l  
 Exposure time: 72 h  
 Species: Pseudokirchneriella subcapitata (green algae)  
 Growth inhibition Method: OECD Test Guideline 201  
 Information given is based on data obtained from similar substances.

Polymerization bottoms EL50: > 1,000 mg/l  
 Exposure time: 96 h  
 Species: Selenastrum capricornutum (green algae)

**Toxicity to fish (Chronic toxicity)**

C12-C14 Isoalkanes : NOELR: 0.316 mg/l  
 Exposure time: 28 d  
 Species: Oncorhynchus mykiss (rainbow trout)  
 Method: QSAR modeled data

**Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)**

Polymerization bottoms : NOEC: 5 mg/l  
 Exposure time: 21 d  
 Species: Daphnia magna (Water flea)  
 static renewal  
 Method: OECD Test Guideline 211

Elimination information (persistence and degradability)

Biodegradability : Taking into consideration the properties of several ingredients, the product is estimated not to be readily biodegradable according to OECD classification.

**Ecotoxicology Assessment**

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|                                   |                                                                     |
|-----------------------------------|---------------------------------------------------------------------|
| Results of PBT assessment         |                                                                     |
| C12-C14 Isoalkanes                | : Non-classified PBT substance, Non-classified vPvB substance       |
| Polymerization bottoms            | : Non-classified PBT substance, Non-classified vPvB substance       |
| Additional ecological information | : This material is not expected to be harmful to aquatic organisms. |

**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.

|                        |                                                                                                                                                                                                                                                                                                                                        |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Product                | : Do not dispose of waste into sewer. Do not contaminate ponds, waterways or ditches with chemical or used container. Send to a licensed waste management company.<br>Do not dispose of waste into sewer. Do not contaminate ponds, waterways or ditches with chemical or used container. Send to a licensed waste management company. |
| Contaminated packaging | : Empty remaining contents. Dispose of as unused product. Do not re-use empty containers. Do not burn, or use a cutting torch on, the empty drum.<br>Empty remaining contents. Dispose of as unused product. Do not re-use empty containers. Do not burn, or use a cutting torch on, the empty drum.                                   |

**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.

Testing (ASTM D4206) has shown product does not sustain combustion.

**IMO / IMDG (INTERNATIONAL MARITIME DANGEROUS GOODS)**

NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

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**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.

**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.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

**SECTION 15: Regulatory information****National legislation**

**SARA 311/312 Hazards** : Fire Hazard

**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 Ingredients** : 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.

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**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).

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 I Intermediate or Final VOC's (40 CFR 60.489).

**US State Regulations**

Pennsylvania Right To Know

: Distillates (petroleum), hydrotreated light - 64742-47-8

California Prop. 65  
Ingredients

: This product does not contain any chemicals known to the State of California to cause cancer, birth, or any other reproductive defects.

**Notification status**

Europe REACH

: A substance or substances in this product is not registered or notified to be registered. Importation or manufacture of this product is still permitted provided that it does not exceed the REACH minimum threshold quantity of the non-regulated substances.

United States of America (USA)  
TSCA

: On TSCA Inventory

Switzerland CH INV  
Canada DSL

: Not in compliance with the inventory

: All components of this product are on the Canadian DSL

Australia AICS  
New Zealand NZIoC  
Japan ENCS  
Korea KECI  
Philippines PICCS  
China IECSC

: On the inventory, or in compliance with the inventory

: Not in compliance with the inventory

: Not in compliance with the inventory

: Not in compliance with the inventory

: Not in compliance with the inventory

: On the inventory, or in compliance with the inventory

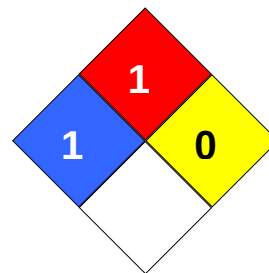
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**SECTION 16: Other information**

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

**Further information**

Legacy SDS Number : CPC00496

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%                                         |
| AICS   | Australia, Inventory of Chemical Substances             | 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                        | TSCA  | Toxic Substance Control Act                             |

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|      |                                    |       |                                                                                      |
|------|------------------------------------|-------|--------------------------------------------------------------------------------------|
|      | New Chemical Substances            |       |                                                                                      |
| KECI | Korea, Existing Chemical Inventory | UVCB  | Unknown or Variable Composition, Complex Reaction Products, and Biological Materials |
| <=   | Less Than or Equal To              | WHMIS | Workplace Hazardous Materials Information System                                     |
| LC50 | Lethal Concentration 50%           |       |                                                                                      |