Safety Data Sheet
FROST FREE- 40

SDS Revision Date: **12/12/2022**

1. Identification

1.1. Product identifier

Product Identity	FROST FREE- 40
Alternate Names	35-836, Frost Free, Ethylene Glycol 40% Solution Ratio, Chiller, Anti-Freeze, Heat Transfer Fluid- 5 gallon

1.2. Relevant identified uses of the substance or mixture and uses advised against

Intended use	Designed to use in a multitude of systems; chillers, refrigeration systems, process cooling, food processing, thermal storage, computer cooling rooms, solar systems, heating and cooling loops, sprinkler and radiant heating systems.
Application Method	Read all precautions and instructions carefully before and after use.

1.3. Details of the supplier of the safety data sheet

Company Name	ComStar International Inc. 20-47 128th Street, College Point, NY 11356
Telephone No.	718-445-7900 800-328-0142 Fax: 718-353-5998

Emergency 24 HR response No: 1-800-424-9300 & 703-527-3887 CHEMTREC

Note: The CHEMTREC phone number is only for emergencies involving spills, leaks, fire, exposure or accident. Please direct all other inquiries to our customer service phone number.

2. Hazard(s) identification

2.1. Classification of the substance or mixture

Acute Oral Toxicity, Category 4, H302	Harmful if swallowed. Target organ toxicant (repeated exposure): Category 2(kidney)

2.2. Label elements

Using the Toxicity Data listed in section 11 and 12 the product is labeled as follows.

Warning

[Health Hazards]:

H302 Harmful if swallowed.

H373 May cause damage to organs through prolonged or repeated exposure if swallowed. Kidney

Environmental Hazards:

Not classified as an environmental hazard under GHS criteria.

[Prevention]:

P264 Wash hands thoroughly after handling.

P270 Do not eat, drink or smoke when using this product.

P260 Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.

[Response]:

P301+312: If swallowed Call a poison center or doctor / physician if you feel unwell.

P314 Get medical advice/ attention if you feel unwell.

P330 Rinse mouth

P340 Remove victim to fresh air and keep at rest in a position comfortable for breathing.

[Storage]:

No GHS storage statements

[Disposal]:

P501 Dispose of contents and container to appropriate waste site or reclaimer in accordance with local and national regulations.

Other hazards which do not result in classification

Inhalation of vapours or mists may cause irritation to the respiratory system. The classification of this material is based on OSHA HCS 2012 criteria.

3. Composition/information on ingredients

This product contains the following substances that present a hazard within the meaning of the relevant State and Federal Hazardous Substances regulations.

Ingredient/Chemical Designations	Weight %	GHS Classification	Notes
ETHYLENE GLYCOL CAS#: 107-21-1	40	Acute toxicity, Oral 4, H302	

In accordance with paragraph (i) of §1910.1200, the specific chemical identity and/or exact percentage (concentration) of composition has been withheld as a trade secret.
*The full texts of the phrases are shown in Section 16.

4. First aid measures

4.1. Description of first aid measures

General In all cases of doubt, or when symptoms persist, seek medical attention. Never give anything by mouth to an unconscious person.

Inhalation Remove to fresh air, keep patient warm and at rest. If breathing is irregular or stopped, give artificial respiration. If unconscious place in the recovery position and obtain immediate medical attention. Give nothing by mouth.

Eyes Irrigate copiously with clean water for at least 15 minutes, holding the eyelids apart and seek medical attention.

Skin	Remove contaminated clothing. Wash skin thoroughly with soap and water or use a recognized skin cleanser.
Ingestion	DO NOT DELAY: If swallowed, do not induce vomiting: transport to nearest medical facility for additional treatment. If vomiting occurs spontaneously, keep head below hips to prevent aspiration.

4.2. Most important symptoms and effects, both acute and delayed

Overview	No specific symptom data available. See section 2 for further details.
Inhalation	Harmful if inhaled.

Most important symptoms and effects, both acute and delayed:
Kidney toxicity may be recognized by blood in the urine or increased or decreased urine flow. Other signs and symptoms can include nausea, vomiting, abdominal cramps, diarrhea, lumbar pain shortly after ingestion, and possibly narcosis and death. Eye irritation signs and symptoms may include a burning sensation, redness, swelling, and/or blurred vision. Skin irritation signs and symptoms may include a burning sensation, redness, swelling, and/or blisters. Respiratory irritation signs and symptoms may include a temporary burning sensation of the nose and throat, coughing, and/or difficulty breathing.
Protection of first-aiders:
When administering first aid, ensure that you are wearing the appropriate personal protective equipment according to the incident, injury and surroundings.
Immediate medical attention, special treatment:
Immediate Treatment Is Extremely important! may cause significant renal, respiratory, and CNS toxicity. May cause significant acidosis. Call a doctor or poison control center for guidance.

5. Fire-fighting measures

5.1. Extinguishing media

Suitable extinguishing media:

Alcohol-resistant foam, water spray or fog. Dry chemical powder, carbon dioxide, sand or earth may be used for small fires only.

Unsuitable extinguishing media:

Do not use water in a jet.

5.2. Special hazards arising from the substance or mixture

Material will not burn unless preheated. Carbon monoxide may be evolved if incomplete combustion occurs. Containers exposed to intense heat from fires should be cooled with large quantities of water.

5.3. Specific extinguishing methods:

Standard procedure for chemical fires.

5.4. Further information

Clear fire area of all non-emergency personnel. Evacuate the area of all non-essential personnel. Keep adjacent containers cool by spraying with water.

5.5. Special protective equipment for firefighters

Proper protective equipment including chemical resistant gloves are to be worn; chemical resistant suit is indicated if large contact with spilled product is expected. Self-Contained Breathing Apparatus must be worn when approaching a fire in a confined space. Select fire fighter's clothing approved to relevant Standards (e.g. Europe: EN469).

5.6. Advice for fire-fighters

Wear self-contained breathing apparatus and protective clothing.

ERG Guide No. ---

6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Observe all relevant local and international regulations. Notify authorities if any exposure to the general public or the environment occurs or is likely to occur. Local authorities should be advised if significant spillages cannot be contained.
Avoid contact with skin, eyes and clothing.

6.2. Environmental precautions

Prevent from spreading or entering into drains, ditches or rivers by using sand, earth, or other appropriate barriers. Use appropriate containment to avoid environmental contamination. Ventilate contaminated area thoroughly.

6.3. Methods and material for containment and cleaning up

Contain run-off from residue flush and dispose of properly. Soak up residue with an absorbent such as clay, sand or other suitable material. For small liquid spills (< 1 drum), transfer by mechanical means to a labeled, sealable container for product recovery or safe disposal. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely Remove contaminated soil and dispose of safely. For large liquid spills (> 1 drum), transfer by mechanical means such as vacuum truck to a salvage tank for recovery or safe disposal. Do not flush away residues with water. Retain as contaminated waste. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely. Remove contaminated soil and dispose of safely.

6.4. Additional advice

For guidance on selection of personal protective equipment see Chapter 8 of this Safety Data Sheet. For guidance on disposal of spilled material see Chapter 13 of this Safety Data Sheet.

7. Handling and storage

7.1. Precautions for safe handling:

Use local exhaust extraction over processing area. Handle and open container with care in a well-ventilated area. Do not empty into drains. When handling product in drums, safety footwear should be worn and proper handling equipment should be used. Handling Temperature: Ambient

See section 2 for further details. - [Prevention]:

Technical measures:

Avoid breathing of or direct contact with material. Only use in well ventilated areas. Wash thoroughly after handling. For guidance on selection of personal protective equipment see Chapter 8 of this Safety Data Sheet. Use the information in this data sheet as input to a risk assessment of local circumstances to help determine appropriate controls for safe handling, storage and disposal of this material. Ensure that all local regulations regarding handling and storage facilities are followed.

Avoidance of contact:

Strong oxidizing agents.
Strong acids.
Strong bases.

Product Transfer:

Keep containers closed when not in use. Do not pressurize drum containers to empty.

7.2. Conditions for safe storage, including any incompatibilities:

Refer to section 15 for any additional specific legislation covering the packaging and storage of this product.

Tanks must be clean, dry and rust-free. Keep container tightly closed. Must be stored in a diked (bunded) well-ventilated area, away from sunlight, ignition sources and other sources of heat. Cleaning, inspection and maintenance of storage tanks is a specialist operation, which requires the implementation of strict procedures and precautions. Drums should be stacked to a maximum of 3 high.
Storage Temperature: Ambient.

See section 2 for further details. - [Storage]:

Packaging material

Suitable material: Stainless steel., Mild steel., Carbon steel Unsuitable material: Data not available

Container Advice

Containers, even those that have been emptied, can contain explosive vapours. Do not cut, drill, grind, weld or perform similar operations on or near containers.

7.3. Specific end use(s)

No data available.
Ensure that all local regulations regarding handling and storage facilities are followed.

8. Exposure controls and personal protection

8.1. Control parameters

Exposure

CAS No.	Ingredient	Source	Value
107-21-1	ETHYLENE GLYCOL	OSHA	25 ppm
		ACGIH	25 ppm
		NIOSH	Ceiling 50 ppm
		Supplier	No Established Limit

Carcinogen Data

CAS No.	Ingredient	Source	Value
107-21-1	ETHYLENE GLYCOL	OSHA	Select Carcinogen: No
		NTP	Known: No; Suspected: No
		IARC	Group 1: No; Group 2a: No; Group 2b: No; Group 3: No; Group 4: No;
		IARC	Group 1: No; Group 2a: No; Group 2b: No; Group 3: No; Group 4: No;

Biological occupational exposure limits

No biological limit allocated.

Monitoring Methods

Monitoring of the concentration of substances in the breathing zone of workers or in the general workplace may be required to confirm compliance with an OEL and adequacy of exposure controls. For some substances biological monitoring may also be appropriate. Validated exposure measurement methods should be applied by a competent person and samples analyzed by an accredited laboratory.

Examples of sources of recommended exposure measurement methods are given below or contact the supplier. Further national methods may be available.
National Institute of Occupational Safety and Health (NIOSH), USA: Manual of Analytical Methods
http://www.cdc.gov/niosh/
Occupational Safety and Health Administration (OSHA), USA: Sampling and Analytical Methods
http://www.osha.gov/
Health and Safety Executive (HSE), UK: Methods for the Determination of Hazardous Substances
http://www.hse.gov.uk/
Institut für Arbeitsschutz Deutschen Gesetzlichen Unfallversicherung (IFA), Germany
http://www.dguv.de/inhalt/index.jsp
L'Institut National de Recherche et de Securité, (INRS), France http://www.inrs.fr/accueil

8.2. Exposure controls

Respiratory	If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker health, select respiratory protection equipment suitable for the specific conditions of use and meeting relevant legislation. Check with respiratory protective equipment suppliers. Where air-filtering respirators are unsuitable (e.g., airborne concentrations are high, risk of oxygen deficiency, confined space) use appropriate positive pressure breathing apparatus. Where air-filtering respirators are suitable, select an appropriate combination of mask and filter. If air-filtering respirators are suitable for conditions of use: Select a filter suitable for the combination of organic gases and vapours [Type A/Type P boiling point >65°C (149°F)]. Respirator selection, use and maintenance should be in accordance with the requirements of the OSHA Respiratory Protection Standard, 29 CFR 1910.134.
Eyes	If material is handled such that it could be splashed into eyes, protective eyewear is recommended.
Skin	Skin protection is not ordinarily required beyond standard work clothes. It is good practice to wear chemical resistant gloves.
Protective measures	Personal protective equipment (PPE) should meet recommended national standards. Check with PPE suppliers.
Hygiene measures	Wash hands before eating, drinking, smoking and using the toilet. Launder contaminated clothing before re-use.
Engineering Controls	The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Select controls based on a risk assessment of local circumstances. Appropriate measures include: Adequate explosion-proof ventilation to control airborne concentrations. Where material is heated, sprayed or mist formed, there is greater potential for airborne concentrations to be generated. Eye washes and showers for emergency use.

General Information	Always observe good personal hygiene measures, such as washing hands after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practice good housekeeping. Define procedures for safe handling and maintenance of controls. Educate and train workers in the hazards and control measures relevant to normal activities associated with this product. Ensure appropriate selection, testing and maintenance of equipment used to control exposure, e.g., personal protective equipment, local exhaust ventilation. Drain down system prior to equipment break-in or maintenance. Retain drain downs in sealed storage pending disposal or subsequent recycle.
Hand Protection Remarks	Where hand contact with the product may occur the use of gloves approved to relevant standards (e.g., Europe: EN374, US: F739) made from the following materials may provide suitable chemical protection. When prolonged or frequent repeated contact occurs. Nitrile rubber gloves. Incidental contact/Splash protection: PVC or neoprene rubber gloves for continuous contact we recommend gloves with breakthrough time of more than 240 minutes with preference for > 480 minutes where suitable gloves can be identified. For short-term/splash protection we recommend the same, but recognize that suitable gloves offering this level of protection may not be available and in this case a lower breakthrough time maybe acceptable so long as appropriate maintenance and replacement regimes are followed. Glove thickness is not a good predictor of glove resistance to a chemical as it is dependent on the exact composition of the glove material. Glove thickness should be typically greater than 0.35 mm depending on the glove make and model. Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact, chemical resistance of glove material, dexterity. Always seek advice from glove suppliers. Contaminated gloves should be replaced. Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturizer is recommended.
Other Work Practices	Use good personal hygiene practices. Wash hands before eating, drinking, smoking or using toilet. Promptly remove soiled clothing and wash thoroughly before reuse.

See section 2 for further details. - [Prevention]:

9. Physical and chemical properties

Appearance	Slightly viscous liquid
Color	Colorless
Odor	mild
Odor threshold	25 ppm
pH	Data not available
Melting point / freezing point	-13 °C / 9 °F
Initial boiling point and boiling range	196 - 200 °C / 385 - 392 °F
Flash Point	116 °C / 241 °F
Evaporation rate (Ether = 1)	0.01 Method: ASTM D 3539, nBuAc=1
Flammability (solid, gas)	Not classified as a flammability hazard
Upper explosion limits	28 %(V)

Lower explosion limit	3.2 %(V)
Vapor pressure (Pa)	< 10 Pa (20 °C / 68 °F)
Relative vapor density	2.2
Relative density	1.1155 (20 °C / 68 °F)
Density	Typical 1,113 kg/m3 (20 °C / 68 °F) Method: ASTM D4052
Specific Gravity	> 2 (H20 = 1)
Solubility in Water	Completely soluble
Partition coefficient n-octanol/water (Log Kow)	log Pow: -1.93 (20 °C / 68 °F) Data not available
Auto-ignition temperature	398 °C / 748 °F
Decomposition temperature	Data not available
Viscosity, dynamic	16.1 mPa.s (25 °C / 77 °F)
Viscosity, kinematic	24.8 mm2/s (20 °C / 68 °F)
Explosive properties	Not applicable
Oxidizing properties	Not applicable
Surface tension	Data not available
Conductivity	Data not available
Molecular weight	62 g/mol
Volatiles (% by weight)	NA
Octanol/Water Partition Coefficient	NA

9.2. Other information

No other relevant information.

10. Stability and reactivity

10.1. Reactivity

The product does not pose any further reactivity hazards in addition to those listed in the following sub-paragraph.

10.2. Chemical stability

No hazardous reaction is expected when handled and stored according to provisions oxidizes on contact with air.

10.3. Possibility of hazardous reactions

No data available.

10.4. Conditions to avoid

Extremes of temperature and direct sunlight. Product cannot ignite due to static electricity.

10.5. Incompatible materials

Strong oxidizers
Strong acids.
Strong bases.

10.6. Hazardous decomposition products

Thermal decomposition is highly dependent on conditions. A complex mixture of airborne solids, liquids and gases including carbon monoxide, carbon dioxide, sulphur oxides and unidentified organic compounds will be evolved when this material undergoes combustion or thermal or oxidative degradation.

11. Toxicological information

Acute toxicity

Ingredient	Oral LD50, mg/kg	Skin LD50, mg/kg	Inhalation Vapor LC50, mg/L/4hr	Inhalation Dust/Mist LC50, mg/L/4hr	Inhalation Gas LC50, ppm
ETHYLENE GLYCOL (107-21-1)	4,700 mg/kg, Rat	10,626 mg/kg, Rabbit	No data available	No data available	No data available

Basis for assessment

Information given is based on product testing, and/or similar products, and/or components.

Information on likely routes of exposure

Skin and eye contact are the primary routes of exposure although exposure may occur through inhalation or following accidental ingestion.

Acute toxicity

Product:

Acute oral toxicity

LD 50 (Rat): >300 - <=2000 milligram per kilogram Remarks: Harmful if swallowed. There is a marked difference in acute oral toxicity between rodents and man, man being more susceptible than rodents. The estimated fatal dose for man is 100 milliliters (1/2 cup). This material has also been shown to be toxic and potentially lethal by ingestion to cats and dogs.

LD 50 (Rat): >300 - <=2000 milligram per kilogram Remarks: Harmful if swallowed. There is a marked difference in acute oral toxicity between rodents and man, man being more susceptible than rodents. The estimated fatal dose for man is 100 milliliters (1/2 cup). This material has also been shown to be toxic and potentially lethal by ingestion to cats and dogs.

Acute inhalation toxicity

Remarks: Low toxicity by inhalation.

Acute dermal toxicity

LD 50: > 5,000 mg/kg Remarks: Expected to be of low toxicity:

Skin corrosion/irritation

Product: Remarks: Slightly irritating to skin.

Serious eye damage/eye irritation

Product: Remarks: Slightly irritating to the eye.

Respiratory or skin sensitization

Product: Remarks: Not expected to be a sensitizer.

Germ cell mutagenicity

Product: Remarks: No evidence of mutagenic activity.

Carcinogenicity

Product: Remarks: Not carcinogenic in animal studies.

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

Reproductive toxicity

Product: Remarks: Does not impair fertility., Not a developmental toxicant., Causes foetotoxicity in animals; considered to be secondary to maternal toxicity.

STOT - single exposure

Product: Remarks: Inhalation of vapours or mists may cause irritation to the respiratory system., Ingestion may cause drowsiness and dizziness.

STOT - repeated exposure

Product: Target Organs: Kidney Remarks: May cause damage to organs or organ systems through prolonged or repeated exposure.

Aspiration toxicity

Product: Not considered an aspiration hazard.

Note: When no route specific LD50 data is available for an acute toxin, the converted acute toxicity point estimate was used in the calculation of the product's ATE (Acute Toxicity Estimate).

12. Ecological information

Basis for assessment: Information given is based on product testing.

Ecotoxicity

Product:
Toxicity to fish (Acute toxicity): LC50: > 100 mg/l
Remarks: Practically nontoxic:
Toxicity to daphnia and other aquatic invertebrates (Acute toxicity): EC50: > 100 mg/l
Remarks: Practically nontoxic: Toxicity to algae (Acute toxicity): ErC50: > 100 mg/l
Remarks: Practically nontoxic:
Toxicity to fish (Chronic toxicity): Remarks: NOEC/NOEL > 100 mg/l
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity):
Remarks: NOEC/NOEL > 100 mg/l
Toxicity to bacteria (Acute toxicity): IC50: > 100 mg/l
Remarks: Practically nontoxic:

12.1. Toxicity

No additional information provided for this product. See Section 3 for chemical specific data.

Aquatic Ecotoxicity

Ingredient	96 hr. LC50 fish, mg/l	48 hr. EC50 crustacea, mg/l	ErC50 algae, mg/l

ETHYLENE GLYCOL (107-21-1)	18,500 mg/L	41,000 mg/L	Not Available

12.2. Persistence and degradability

Readily biodegradable

12.3. Bioaccumulative potential

Does not have the potential to bioaccumulate significantly.

12.4. Mobility in soil

If the product enters soil, one or more constituents will or may be mobile and may contaminate groundwater. Dissolves in water.

12.5. Results of PBT and vPvB assessment

This product contains no PBT/vPvB chemicals.

12.6. Other adverse effects

No data available.

13. Disposal considerations

13.1. Waste treatment methods
Recover or recycle if possible. Waste arising from a spillage or tank cleaning should be disposed of in accordance with prevailing regulations, preferably to a recognized collector or contractor. The competence of the collector or contractor should be established beforehand. Remove all packaging for recovery or waste disposal. Do not dispose into the environment, in drains or in water courses Waste product should not be allowed to contaminate soil or water.
13.2. Contaminated packaging
Dispose in accordance with prevailing regulations, preferably to a recognized collector or contractor. The competence of the collector or contractor should be established beforehand.
13.3. Local legislation Remarks
Disposal should be in accordance with applicable regional, national, and local laws and regulations.

14. Transport information

National Regulations

US Department of Transportation Classification (49 CFR Parts 171-180)

UN/ID/NA number: UN 3082
Proper shipping name: Environmentally hazardous substances, liquid, n.o.s. (Ethylene glycol)
Class: 9
Packing group: III
Labels: 9
Reportable quantity Ethylene glycol (5,000 lb)
Marine pollutant: yes

International Regulation

IATA-DGR

Not regulated as a dangerous good

IMDG-Code

Not regulated as a dangerous good

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

Pollution category: Y
Ship type: 2
Product name: Ethylene glycol
Special precautions: Refer to Chapter 7, Handling & Storage, for special precautions which a user needs to be aware of or needs to comply with in connection with transport.

Special precautions for user
Not applicable

Additional Information:
This product may be transported under nitrogen blanketing. Nitrogen is an odorless and invisible gas. Exposure to nitrogen-enriched atmospheres displaces available oxygen which may cause asphyxiation or death. Personnel must observe strict safety precautions when involved with a confined space entry.

15. Regulatory information

OSHA Hazards: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

EPCRA - Emergency Planning and Community Right-to-Know Act
CERCLA Reportable Quantity

Components:	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
	107-21-1	5000	5000

SARA 304 Extremely Hazardous Substances Reportable Quantity
This material does not contain any components with a section 304 EHS RQ.
SARA 311/312 Hazards: Immediate (Acute) Health Hazard
SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.
SARA 313: The following components are subject to reporting levels established by SARA Title III, Section 313:
Ethylene Glycol 107-21-1 100 %

Clean Water Act
This product does not contain any Hazardous Chemicals listed under the U.S. Clean Water Act, Section 311, Table 117.3.
Pennsylvania Right to Know Ethylene Glycol 107-21-1
New Jersey Right to Know Ethylene Glycol 107-21-1
California Prop 65 This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.
The components of this product are reported in the following inventories:
AICS: Listed
DSL: Listed
IECSC: Listed
ENCS: Listed
KECI: Listed
NZIoC: Listed
PICCS: Listed
CH INV: Listed
TSCA: Listed

Other regulations: The regulatory information is not intended to be comprehensive. Other regulations may apply to this material.

16. Other information

Further information
NFPA Rating (Health, Fire, Reactivity) 1, 1, 0
A vertical bar (|) in the left margin indicates an amendment from the previous version. Due to the conversion of this product to GHS classification and labelling, there has been a significant change to the nature of the information presented in chapter 2. Abbreviations and Acronyms: The standard abbreviations and acronyms used in this document can be looked up in reference literature (e.g. scientific dictionaries) and/or websites.
ACGIH = American Conference of Governmental Industrial Hygienists
ADR = European Agreement concerning the International
Carriage of Dangerous Goods by Road
AICS = Australian Inventory of Chemical Substances
ASTM = American Society for Testing and Materials
BEL = Biological exposure limits
BTEX = Benzene, Toluene, Ethylbenzene, Xylenes
CAS = Chemical Abstracts Service
CEFIC = European Chemical Industry Council
CLP = Classification Packaging and Labelling
COC = Cleveland Open-Cup
DIN = Deutsches Institut fur Normung
DMEL = Derived Minimal Effect Level
DNEL = Derived No Effect Level
DSL = Canada Domestic Substance List
EC = European Commission
EC50 = Effective Concentration fifty
ECETOC = European Center on Ecotoxicology and Toxicology of Chemicals
ECHA = European Chemicals Agency
EINECS = The European Inventory of Existing Commercial Chemical Substances EL50 = Effective Loading fifty
ENCS = Japanese Existing and New Chemical Substances Inventory
EWC = European Waste Code
GHS = Globally Harmonised System of Classification and Labelling of Chemicals
IARC = International Agency for Research on Cancer
IATA = International Air Transport Association
IC50 = Inhibitory Concentration fifty
IL50 = Inhibitory Level fifty
IMDG = International Maritime Dangerous Goods
INV = Chinese Chemicals Inventory
IP346 = Institute of Petroleum test method N° 346 for the determination of polycyclic aromatics DMSO-extractables
KECI = Korea Existing Chemicals Inventory
LC50 = Lethal Concentration fifty
LD50 = Lethal Dose fifty per cent.
LL/EL/IL = Lethal Loading/Effective Loading/Inhibitory loading
LL50 = Lethal Loading fifty
MARPOL = International Convention for the Prevention of Pollution from Ships
NOEC/NOEL = No Observed Effect Concentration / No Observed Effect Level
OE_HPV = Occupational Exposure - High Production Volume

PBT = Persistent, Bioaccumulative and Toxic
PICCS = Philippine Inventory of Chemicals and Chemical Substances
PNEC = Predicted No Effect Concentration
REACH = Registration Evaluation and Authorisation of Chemicals
RID = Regulations Relating to International Carriage of Dangerous Goods by Rail
SKIN_DES = Skin Designation
STEL = Short term exposure limit
TRA = Targeted Risk Assessment
TSCA = US Toxic Substances Control Act
TWA = Time-Weighted Average
vPvB = very Persistent and very Bioaccumulative

Sources of key data used to compile the Safety Data Sheet

The quoted data are from, but not limited to, one or more sources of information (e.g., toxicological data from Shell Health Services, material suppliers' data, CONCAWE, EU IUCLID date base, EC 1272 regulation, etc.).

The information and recommendations contained herein are based upon data believed to be correct. However, no guarantee or warranty of any kind, expressed or implied, is made with respect to the information contained herein. We accept no responsibility and disclaim all liability for any harmful effects which may be caused by exposure to our products. Customers/users of this product must comply with all applicable health and safety laws, regulations, and orders.

The opinions expressed are those of qualified experts within ComStar International Inc. We believe that the information contained is current as of the date of the Material Safety Data Sheet. Since the use of this information and of these opinions and the conditions of the use of the product are not within the control of ComStar International Inc., it is the user's obligation to determine the conditions of safe use of the product.

End of Document