

SAFETY DATA SHEET

Product Trade Name: BARAFILM™

Revision Date: 02-Jun-2015

Revision Number: 19

1. Identification

1.1. Product Identifier

Product Trade Name: BARAFILM™
Synonyms: None
Chemical Family: Amine salt of modified fatty acid
Internal ID Code HM003506

1.2 Recommended use and restrictions on use

Application: Corrosion Inhibitor
Uses Advised Against No information available

1.3 Manufacturer's Name and Contact Details

Manufacturer/Supplier Baroid Fluid Services
 Product Service Line of Halliburton
 P.O. Box 1675
 Houston, TX 77251
 Telephone: (281) 871-4000
 Emergency Telephone: (281) 575-5000

Prepared By Chemical Stewardship
 Telephone: 1-580-251-4335
 e-mail: fdunexchem@halliburton.com

1.4. Emergency telephone number

Emergency Telephone Number (281) 575-5000

2. Hazard(s) Identification

2.1 Classification in accordance with paragraph (d) of §1910.1200

Aspiration Category	Category 1 - H304
Skin Corrosion / Irritation	Category 1 - H314
Serious Eye Damage / Eye Irritation	Category 1 - H318
Specific Target Organ Toxicity - (Single Exposure)	Category 2 Category 3 - H336
Acute Aquatic Toxicity	Category 1 - H400
Chronic Aquatic Toxicity	Category 2 - H411
Flammable liquids.	Category 4 - H227

2.2. Label Elements

Hazard Pictograms



Signal Word	Danger
Hazard Statements	H227 - Combustible liquid H304 - May be fatal if swallowed and enters airways H314 - Causes severe skin burns and eye damage H318 - Causes serious eye damage H336 - May cause drowsiness or dizziness H371 - May cause damage to organs H400 - Very toxic to aquatic life H411 - Toxic to aquatic life with long lasting effects
Precautionary Statements	
Prevention	P210 - Keep away from heat/sparks/open flames/hot surfaces. - No smoking P260 - Do not breathe dust/fume/gas/mist/vapors/spray P261 - Avoid breathing dust/fume/gas/mist/vapors/spray P264 - Wash face, hands and any exposed skin thoroughly after handling P270 - Do not eat, drink or smoke when using this product P271 - Use only outdoors or in a well-ventilated area P273 - Avoid release to the environment P280 - Wear protective gloves/eye protection/face protection
Response	P301 + P310 - IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician P331 - Do NOT induce vomiting P303 + P361 + P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower P363 - Wash contaminated clothing before reuse P304 + P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing P310 - Immediately call a POISON CENTER or doctor/physician P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing P308 + P313 - IF exposed or concerned: Get medical advice/attention P370 + P378 - In case of fire: Use water spray for extinction P391 - Collect spillage
Storage	P403 + P233 - Store in a well-ventilated place. Keep container tightly closed P403 + P235 - Store in a well-ventilated place. Keep cool P405 - Store locked up
Disposal	P501 - Dispose of contents/container in accordance with local/regional/national/international regulations
Contains Substances	CAS Number
Heavy aromatic petroleum naphtha	64742-94-5
1H-Imidazole-1-ethanamine, 4,5-dihydro-, 2-(C7-17 and C7-17-unsaturated alkyl) derivatives	90411-92-0
N-Tallow alkyltrimethyldiamines, ethoxylated	61790-85-0

2.3 Hazards not otherwise classified

None known

3. Composition/information on Ingredients

Substances	CAS Number	PERCENT (w/w)	GHS Classification - US
Heavy aromatic petroleum naphtha	64742-94-5	60 - 100%	STOT SE 3 (H336) Asp. Tox. 1 (H304) Aquatic Acute 2 (H401) Aquatic Chronic 2 (H411)
1H-Imidazole-1-ethanamine, 4,5-dihydro-, 2-(C7-17 and C7-17-unsaturated alkyl) derivatives	90411-92-0	10 - 30%	Skin Corr. 1B (H314) Eye Corr. 1 (H318) STOT SE 2 (H371) Aquatic Acute 1 (H400) Aquatic Chronic 1 (H410)
N-Tallow alkyltrimethyldiamines, ethoxylated	61790-85-0	1 - 5%	Acute Tox. 4 (H302) Skin Corr. 1 (H314) Eye Corr. 1 (H318)

The exact percentage (concentration) of the composition has been withheld as proprietary.

4. First-Aid Measures

4.1. Description of first aid measures

Inhalation	If inhaled, move victim to fresh air and seek medical attention.
Eyes	Immediately flush eyes with large amounts of water for at least 30 minutes. Seek prompt medical attention.
Skin	Remove contaminated clothing and launder before reuse. Wash with soap and water. Get medical attention if irritation persists. In case of contact, immediately flush skin with plenty of soap and water for at least 30 minutes and remove contaminated clothing, shoes and leather goods immediately. Get medical attention immediately.
Ingestion	Get medical attention! If vomiting occurs, keep head lower than hips to prevent aspiration. Rinse mouth. Never give anything by mouth to an unconscious person.

4.2 Most important symptoms/effects, acute and delayed

Causes severe eye irritation which may damage tissue. Causes severe skin irritation with tissue destruction. May cause headache, dizziness, and other central nervous system effects. Aspiration into the lungs may cause chemical pneumonitis including coughing, difficulty breathing, wheezing, coughing up blood and pneumonia, which can be fatal. May cause damage to internal organs.

4.3. Indication of any immediate medical attention and special treatment needed

Notes to Physician Treat symptomatically.

5. Fire-fighting measures

5.1. Extinguishing media

Suitable Extinguishing Media

Carbon dioxide, dry chemical, foam.

Extinguishing media which must not be used for safety reasons

None known.

5.2 Specific hazards arising from the substance or mixture

Special Exposure Hazards

Use water spray to cool fire exposed surfaces. Decomposition in fire may produce harmful gases.

5.3 Special protective equipment and precautions for fire-fighters

Special Protective Equipment for Fire-Fighters

Full protective clothing and approved self-contained breathing apparatus required for fire fighting personnel.

6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Use appropriate protective equipment. Wear self-contained breathing apparatus in enclosed areas.
See Section 8 for additional information

6.2. Environmental precautions

Prevent from entering sewers, waterways, or low areas.

6.3. Methods and material for containment and cleaning up

Isolate spill and stop leak where safe. Contain spill with sand or other inert materials. Scoop up and remove.

7. Handling and storage**7.1. Precautions for Safe Handling****Handling Precautions**

Avoid contact with eyes, skin, or clothing. Avoid breathing vapors. Wash hands after use. Launder contaminated clothing before reuse.

Hygiene Measures

Handle in accordance with good industrial hygiene and safety practice.

7.2. Conditions for safe storage, including any incompatibilities**Storage Information**

Store away from oxidizers. Store in a cool well ventilated area. Keep from heat, sparks, and open flames. Keep container closed when not in use. Product has a shelf life of 24 months.

8. Exposure Controls/Personal Protection**8.1 Occupational Exposure Limits**

Substances	CAS Number	OSHA PEL-TWA	ACGIH TLV-TWA
Heavy aromatic petroleum naphtha	64742-94-5	Not applicable	Not applicable
1H-Imidazole-1-ethanamine, 4,5-dihydro-, 2-(C7-17 and C7-17-unsaturated alkyl) derivatives	90411-92-0	Not applicable	Not applicable
N-Tallow alkyltrimethyldiamines, ethoxylated	61790-85-0	Not applicable	Not applicable

8.2 Appropriate engineering controls**Engineering Controls**

Use in a well ventilated area. Local exhaust ventilation should be used in areas without good cross ventilation.

8.3 Individual protection measures, such as personal protective equipment**Personal Protective Equipment**

If engineering controls and work practices cannot prevent excessive exposures, the selection and proper use of personal protective equipment should be determined by an industrial hygienist or other qualified professional based on the specific application of this product.

Respiratory Protection

If engineering controls and work practices cannot keep exposure below occupational exposure limits or if exposure is unknown, wear a NIOSH certified, European Standard EN 149, AS/NZS 1715:2009, or equivalent respirator when using this product. Selection of and instruction on using all personal protective equipment, including respirators, should be performed by an Industrial Hygienist or other qualified professional.
Organic vapor respirator.

Hand Protection

Chemical-resistant protective gloves (EN 374) Suitable materials for longer, direct contact (recommended: protection index 6, corresponding to > 480 minutes)

	permeation time as per EN 374): Nitrile gloves. (≥ 0.35 mm thickness)
	This information is based on literature references and on information provided by glove manufacturers, or is derived by analogy with similar substances. Please note that in practice the working life of chemical-resistant protective gloves may be considerably shorter than the permeation time determined in accordance with EN 374 as a result of the many influencing factors (e.g. temperature). If signs of wear and tear are noticed then the gloves should be replaced. Manufacturer's directions for use should be observed because of great diversity of types.
Skin Protection	Rubber apron.
Eye Protection	Chemical goggles; also wear a face shield if splashing hazard exists.
Other Precautions	Eyewash fountains and safety showers must be easily accessible.

9. Physical and Chemical Properties

9.1. Information on basic physical and chemical properties

Physical State:	Liquid	Color:	Dark brown
Odor:	Aromatic hydrocarbon	Odor	No information available
		Threshold:	

<u>Property</u>	<u>Values</u>
<u>Remarks/ - Method</u>	
pH:	6-8
Freezing Point/Range	-20 °C / -4 °F
Melting Point/Range	No data available
Boiling Point/Range	150 °C / 302 °F
Flash Point	> 65 °C / > 149 °F PMCC
Flammability (solid, gas)	No data available
upper flammability limit	No data available
lower flammability limit	No data available
Evaporation rate	No data available
Vapor Pressure	No data available
Vapor Density	No data available
Specific Gravity	0.915
Water Solubility	Insoluble in water
Solubility in other solvents	No data available
Partition coefficient: n-octanol/water	No data available
Autoignition Temperature	No data available
Decomposition Temperature	No data available
Viscosity	No data available
Explosive Properties	No information available
Oxidizing Properties	No information available

9.2. Other information

VOC Content (%)	No data available
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10. Stability and Reactivity

10.1. Reactivity

Not expected to be reactive.

10.2. Chemical Stability

Stable

10.3. Possibility of Hazardous Reactions

Will Not Occur

10.4. Conditions to Avoid

None anticipated

10.5. Incompatible Materials

Strong oxidizers.

10.6. Hazardous Decomposition Products

Carbon monoxide and carbon dioxide.

11. Toxicological Information

11.1 Information on likely routes of exposure

Principle Route of Exposure Eye or skin contact, inhalation.

11.2 Symptoms related to the physical, chemical and toxicological characteristics

Acute Toxicity

Inhalation

May cause respiratory irritation. May cause central nervous system depression including headache, dizziness, drowsiness, incoordination, slowed reaction time, slurred speech, giddiness and unconsciousness.

Eye Contact

Causes severe eye irritation which may damage tissue.

Skin Contact

Causes severe skin irritation with tissue destruction. May cause skin defatting with prolonged exposure.

Ingestion

May cause abdominal pain, vomiting, nausea, and diarrhea. Aspiration into the lungs may cause chemical pneumonitis including coughing, difficulty breathing, wheezing, coughing up blood and pneumonia, which can be fatal.

Chronic Effects/Carcinogenicity No data available to indicate product or components present at greater than 0.1% are chronic health hazards.

11.3 Toxicity data

Toxicology data for the components

Substances	CAS Number	LD50 Oral	LD50 Dermal	LC50 Inhalation
Heavy aromatic petroleum naphtha	64742-94-5	> 5000 mg/kg (Rat)	> 2000 mg/kg (Rabbit)	> 4.778 mg/L (Rat) 4h
1H-Imidazole-1-ethanamine, 4,5-dihydro-, 2-(C7-17 and C7-17-unsaturated alkyl) derivatives	90411-92-0	> 2500 mg/kg (Rat) (Similar substance)	> 2000 mg/kg (Rabbit) (Similar substance)	No data available
N-Tallow alkyltrimethyldiamines, ethoxylated	61790-85-0	689 mg/kg (Rat) (similar substance)	> 1260 mg/kg (Rabbit) (similar substance)	No data available

Substances	CAS Number	Skin corrosion/irritation
Heavy aromatic petroleum naphtha	64742-94-5	Non-irritating to the skin (Rabbit)
1H-Imidazole-1-ethanamine, 4,5-dihydro-, 2-(C7-17 and C7-17-unsaturated alkyl) derivatives	90411-92-0	Skin, rabbit: Causes severe skin irritation with tissue destruction. (similar substances)
N-Tallow alkyltrimethyldiamines, ethoxylated	61790-85-0	Skin, rabbit: Causes severe skin irritation with tissue destruction.

Substances	CAS Number	Eye damage/irritation
Heavy aromatic petroleum naphtha	64742-94-5	Non-irritating to the eye (Rabbit)
1H-Imidazole-1-ethanamine, 4,5-dihydro-, 2-(C7-17 and	90411-92-0	Causes severe eye irritation which may damage tissue. (Rabbit) (similar substances)

C7-17-unsaturated alkyl) derivatives		
N-Tallow alkyltrimethyldiamines, ethoxylated	61790-85-0	Eye, rabbit: Causes severe eye irritation.

Substances	CAS Number	Skin Sensitization
Heavy aromatic petroleum naphtha	64742-94-5	Patch test on human volunteers did not demonstrate sensitization properties
1H-Imidazole-1-ethanamine, 4,5-dihydro-, 2-(C7-17 and C7-17-unsaturated alkyl) derivatives	90411-92-0	Did not cause sensitization on laboratory animals (guinea pig) (similar substances)
N-Tallow alkyltrimethyldiamines, ethoxylated	61790-85-0	No data of sufficient quality are available.

Substances	CAS Number	Respiratory Sensitization
Heavy aromatic petroleum naphtha	64742-94-5	No information available
1H-Imidazole-1-ethanamine, 4,5-dihydro-, 2-(C7-17 and C7-17-unsaturated alkyl) derivatives	90411-92-0	No information available
N-Tallow alkyltrimethyldiamines, ethoxylated	61790-85-0	No information available

Substances	CAS Number	Mutagenic Effects
Heavy aromatic petroleum naphtha	64742-94-5	In vitro tests did not show mutagenic effects In vivo tests did not show mutagenic effects.
1H-Imidazole-1-ethanamine, 4,5-dihydro-, 2-(C7-17 and C7-17-unsaturated alkyl) derivatives	90411-92-0	In vitro tests did not show mutagenic effects (similar substances)
N-Tallow alkyltrimethyldiamines, ethoxylated	61790-85-0	In vitro tests did not show mutagenic effects In vivo tests did not show mutagenic effects. (similar substances)

Substances	CAS Number	Carcinogenic Effects
Heavy aromatic petroleum naphtha	64742-94-5	Did not show carcinogenic effects in animal experiments
1H-Imidazole-1-ethanamine, 4,5-dihydro-, 2-(C7-17 and C7-17-unsaturated alkyl) derivatives	90411-92-0	No information available.
N-Tallow alkyltrimethyldiamines, ethoxylated	61790-85-0	No information available.

Substances	CAS Number	Reproductive toxicity
Heavy aromatic petroleum naphtha	64742-94-5	Animal testing did not show any effects on fertility. Did not show teratogenic effects in animal experiments.
1H-Imidazole-1-ethanamine, 4,5-dihydro-, 2-(C7-17 and C7-17-unsaturated alkyl) derivatives	90411-92-0	Animal testing did not show any effects on fertility. Did not show teratogenic effects in animal experiments. (similar substances)
N-Tallow alkyltrimethyldiamines, ethoxylated	61790-85-0	Not a confirmed teratogen or embryotoxin. (similar substances)

Substances	CAS Number	STOT - single exposure
Heavy aromatic petroleum naphtha	64742-94-5	May cause disorder and damage to the Central Nervous System (CNS)
1H-Imidazole-1-ethanamine, 4,5-dihydro-, 2-(C7-17 and C7-17-unsaturated alkyl) derivatives	90411-92-0	No information available

N-Tallow alkyltrimethyldiamines, ethoxylated	61790-85-0	No information available
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Substances	CAS Number	STOT - repeated exposure
Heavy aromatic petroleum naphtha	64742-94-5	No significant toxicity observed in animal studies at concentration requiring classification.
1H-Imidazole-1-ethanamine, 4,5-dihydro-, 2-(C7-17 and C7-17-unsaturated alkyl) derivatives	90411-92-0	No significant toxicity observed in animal studies at concentration requiring classification. (similar substances)
N-Tallow alkyltrimethyldiamines, ethoxylated	61790-85-0	No information available

Substances	CAS Number	Aspiration hazard
Heavy aromatic petroleum naphtha	64742-94-5	Aspiration into the lungs may cause chemical pneumonitis including coughing, difficulty breathing, wheezing, coughing up blood and pneumonia, which can be fatal.
1H-Imidazole-1-ethanamine, 4,5-dihydro-, 2-(C7-17 and C7-17-unsaturated alkyl) derivatives	90411-92-0	Not applicable
N-Tallow alkyltrimethyldiamines, ethoxylated	61790-85-0	No information available

12. Ecological Information

12.1. Toxicity Ecotoxicity Effects

Product Ecotoxicity Data

No data available

Substance Ecotoxicity Data

Substances	CAS Number	Toxicity to Algae	Toxicity to Fish	Toxicity to Microorganisms	Toxicity to Invertebrates
Heavy aromatic petroleum naphtha	64742-94-5	EC50 (72h) 7.8 mg/L (Pseudokirchneriella subcapitata)	LL50 (96h) 3.6 mg/L (Oncorhynchus mykiss) LC50 (96h) 357.7 mg/L (Scophthalmus maximus)	No information available	EL50 (48h) 1.1 mg/L (Daphnia magna) (similar substance)
1H-Imidazole-1-ethanamine, 4,5-dihydro-, 2-(C7-17 and C7-17-unsaturated alkyl) derivatives	90411-92-0	EC50(72h): 0.084 mg/L (growth rate) (Pseudokirchnerella subcapitata) (similar substance)	LC50(96h): 0.4 mg/L (Oncorhynchus mykiss) (similar substance)	EC50(3h): 97 mg/L (Activated sludge of a predominantly domestic sewage) (similar substance)	EC50(48h): 0.098 mg/L (Daphnia magna) (similar substance)
N-Tallow alkyltrimethyldiamines, ethoxylated	61790-85-0	No information available	No information available	No information available	No information available

12.2. Persistence and degradability

Substances	CAS Number	Persistence and Degradability
Heavy aromatic petroleum naphtha	64742-94-5	Readily biodegradable (58% @ 28d)
1H-Imidazole-1-ethanamine, 4,5-dihydro-, 2-(C7-17 and C7-17-unsaturated alkyl) derivatives	90411-92-0	(28% @ 28d) (similar substances)
N-Tallow alkyltrimethyldiamines, ethoxylated	61790-85-0	(14% @ 28d)

12.3. Bioaccumulative potential

Substances	CAS Number	Log Pow
Heavy aromatic petroleum naphtha	64742-94-5	2.9 - 6.1

1H-Imidazole-1-ethanamine, 4,5-dihydro-, 2-(C7-17 and C7-17-unsaturated alkyl) derivatives	90411-92-0	No information available
N-Tallow alkyltrimethyldiamines, ethoxylated	61790-85-0	No information available

12.4. Mobility in soil

Substances	CAS Number	Mobility
Heavy aromatic petroleum naphtha	64742-94-5	No information available
1H-Imidazole-1-ethanamine, 4,5-dihydro-, 2-(C7-17 and C7-17-unsaturated alkyl) derivatives	90411-92-0	No information available
N-Tallow alkyltrimethyldiamines, ethoxylated	61790-85-0	No information available

12.5 Other adverse effects

No information available

13. Disposal Considerations**13.1. Waste treatment methods**

Disposal Method	Disposal should be made in accordance with federal, state, and local regulations. Incineration recommended in approved incinerator according to federal, state, and local regulations.
Contaminated Packaging	Follow all applicable national or local regulations.

14. Transport Information**US DOT**

UN Number:	UN3267
UN Proper Shipping Name:	Corrosive Liquid, Basic, Organic, N.O.S. (Contains 1H-Imidazole-1-ethanamine, 4,5-dihydro-, 2-(C7-17 and C7-17-unsaturated alkyl) derivatives)
Transport Hazard Class(es):	8
Packing Group:	III
Environmental Hazards:	Marine Pollutant
NAERG:	NAERG 153

US DOT Bulk

DOT (Bulk)	Not applicable
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Canadian TDG

UN Number:	UN3267
UN Proper Shipping Name:	Corrosive Liquid, Basic, Organic, N.O.S. (Contains 1H-Imidazole-1-ethanamine, 4,5-dihydro-, 2-(C7-17 and C7-17-unsaturated alkyl) derivatives)
Transport Hazard Class(es):	8
Packing Group:	III
Environmental Hazards:	Marine Pollutant

IMDG/IMO

UN Number:	UN3267
UN Proper Shipping Name:	Corrosive Liquid, Basic, Organic, N.O.S. (Contains 1H-Imidazole-1-ethanamine, 4,5-dihydro-, 2-(C7-17 and C7-17-unsaturated alkyl) derivatives)
Transport Hazard Class(es):	8
Packing Group:	III
Environmental Hazards:	Marine Pollutant
EMS:	EmS F-A, S-B

IATA/ICAO

UN Number:	UN3267
UN Proper Shipping Name:	Corrosive Liquid, Basic, Organic, N.O.S. (Contains 1H-Imidazole-1-ethanamine, 4,5-dihydro-, 2-(C7-17 and C7-17-unsaturated alkyl) derivatives)

4,5-dihydro-, 2-(C7-17 and C7-17-unsaturated alkyl) derivatives)
Transport Hazard Class(es): 8
Packing Group: III
Environmental Hazards: Marine Pollutant

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: Not applicable

Special Precautions for User: None

15. Regulatory Information

US Regulations

US TSCA Inventory Product contains one or more components not listed on the inventory.

EPA SARA Title III Extremely Hazardous Substances

Substances	CAS Number	EPA SARA Title III Extremely Hazardous Substances
Heavy aromatic petroleum naphtha	64742-94-5	Not applicable
1H-Imidazole-1-ethanamine, 4,5-dihydro-, 2-(C7-17 and C7-17-unsaturated alkyl) derivatives	90411-92-0	Not applicable
N-Tallow alkyltrimethyldiamines, ethoxylated	61790-85-0	Not applicable

EPA SARA (311,312) Hazard Class

Acute Health Hazard

Fire Hazard

EPA SARA (313) Chemicals

Substances	CAS Number	Toxic Release Inventory (TRI) - Group I	Toxic Release Inventory (TRI) - Group II
Heavy aromatic petroleum naphtha	64742-94-5	Not applicable	Not applicable
1H-Imidazole-1-ethanamine, 4,5-dihydro-, 2-(C7-17 and C7-17-unsaturated alkyl) derivatives	90411-92-0	Not applicable	Not applicable
N-Tallow alkyltrimethyldiamines, ethoxylated	61790-85-0	Not applicable	Not applicable

EPA CERCLA/Superfund Reportable Spill Quantity

Substances	CAS Number	CERCLA RQ
Heavy aromatic petroleum naphtha	64742-94-5	Not applicable
1H-Imidazole-1-ethanamine, 4,5-dihydro-, 2-(C7-17 and C7-17-unsaturated alkyl) derivatives	90411-92-0	Not applicable
N-Tallow alkyltrimethyldiamines, ethoxylated	61790-85-0	Not applicable

EPA RCRA Hazardous Waste Classification

If product becomes a waste, it does NOT meet the criteria of a hazardous waste as defined by the US EPA.

California Proposition 65 All components listed do not apply to the California Proposition 65 Regulation.

MA Right-to-Know Law Does not apply.

NJ Right-to-Know Law Does not apply.

PA Right-to-Know Law Does not apply.

Canadian Regulations

Canadian DSL Inventory Product contains one or more components not listed on the inventory.

16. Other information

Preparation Information

Prepared By

Chemical Stewardship
Telephone: 1-580-251-4335
e-mail: fdunexchem@halliburton.com

Revision Date:

02-Jun-2015

Reason for Revision

SDS sections updated:
2

Additional information

For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Safety Data Sheet for this or other Halliburton products, contact Chemical Stewardship at 1-580-251-4335.

Key or legend to abbreviations and acronyms

bw – body weight
CAS – Chemical Abstracts Service
EC50 – Effective Concentration 50%
ErC50 – Effective Concentration growth rate 50%
LC50 – Lethal Concentration 50%
LD50 – Lethal Dose 50%
LL50 – Lethal Loading 50%
mg/kg – milligram/kilogram
mg/L – milligram/liter
NIOSH – National Institute for Occupational Safety and Health
NTP – National Toxicology Program
OEL – Occupational Exposure Limit
PEL – Permissible Exposure Limit
ppm – parts per million
STEL – Short Term Exposure Limit
TWA – Time-Weighted Average
UN – United Nations
h - hour
mg/m³ - milligram/cubic meter
mm - millimeter
mmHg - millimeter mercury
w/w - weight/weight
d - day

Key literature references and sources for data

www.ChemADVISOR.com/

Disclaimer Statement

This information is furnished without warranty, expressed or implied, as to accuracy or completeness. The information is obtained from various sources including the manufacturer and other third party sources. The information may not be valid under all conditions nor if this material is used in combination with other materials or in any process. Final determination of suitability of any material is the sole responsibility of the user.

End of Safety Data Sheet