

SAFETY DATA SHEET

BE-6™ Bactericide

Revision Date: 08-Nov-2022

Revision Number: 11

1. Identification of the hazardous chemical and of the supplier

Product identifier

Product Name BE-6™ Bactericide

Other means of identification

Hazardous Material Number: HB000124

Recommended use of the chemical and restrictions on use

Recommended Use Microbiocide

Supplier details

Halliburton Energy Service (M) Sdn Bhd
10th Floor, G Tower,
199 Jalan Tun Razak,
50400, Kuala Lumpur, Malaysia
Phone Number: +603-9206 6888

Halliburton Energy Service (M) Sdn Bhd
Labuan Base,
Ranca-Ranca Industrial Estate
Labuan FT, LAB 82223 Malaysia
Phone Number: +60 87-596 200 ext Gate B-886086263

Halliburton Energy Service (M) Sdn Bhd
Warehouse 38, Phase 2, Kemaman Supply Base (KSB)
24007, Kemaman
Terengganu, Malaysia
Phone Number : +609-862 8000

For further information, please contact:

E-mail Address fdunexchem@halliburton.com

Emergency Phone number

+60 015 4 877 0772
Global Incident Response Access Code: 334305
Contract Number: 14012

2. Hazard Identification

Classification of the hazardous chemical

Acute Oral Toxicity	Category 4 - H302
Acute toxicity - Dermal	Category 4 - H312
Skin Corrosion / Irritation	Category 1 - H314
Serious Eye Damage/Irritation	Category 1 - H318
Specific Target Organ Toxicity - (Single Exposure)	Category 3 - H335
Acute Aquatic Toxicity	Category 1 - H400
Chronic Aquatic Toxicity	Category 2 - H411

Flammable solids

Category 2 - H228

Label Elements**Hazard Pictograms****Signal Word:****Danger****Hazard Statements**

H228 - Flammable solid
 H302 - Harmful if swallowed
 H312 - Harmful in contact with skin
 H314 - Causes severe skin burns and eye damage
 H318 - Causes serious eye damage
 H335 - May cause respiratory irritation
 H400 - Very toxic to aquatic life
 H411 - Toxic to aquatic life with long lasting effects

Precautionary Statements**Prevention**

P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P240 - Ground and bond container and receiving equipment.

P241 - Use explosion-proof electrical/ventilating/lighting/equipment

P260 - Do not breathe 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

P273 - Avoid release to the environment

Response

P280 - Wear protective gloves/eye protection/face protection

P301 + P330 + P331 - IF SWALLOWED: rinse mouth. Do NOT induce vomiting

P303 + P361 + P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].

P363 - Wash contaminated clothing before reuse

P304 + P340 - IF INHALED: Remove person to fresh air and keep 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

P370 + P378 - In case of fire: Use water spray for extinction

Storage

P403 + P233 - Store in a well-ventilated place. Keep container tightly closed

P405 - Store locked up

Disposal

P501 - Dispose of contents/container to an approved incineration plant

Contains**Substances**

2-Bromo-2-nitro-1,3-propanediol

CAS Number

52-51-7

Other hazards which do not result in classification

None known

3. Composition and information on ingredients of the hazardous chemical

Substances	CAS Number	PERCENT (w/w)	GHS Classification - Malaysia
2-Bromo-2-nitro-1,3-propanediol	52-51-7	> 60%	Acute Tox. 4 (H302) Acute Tox. 4 (H312) Skin Corr. 1 (H314) Eye Dam. 1 (H318) STOT SE 3 (H335) Aquatic Acute 1 (H400) Aquatic Chronic (H411) Flam. Sol. 2 (H228)

4. First aid measures**Description of first aid measures****Inhalation**

If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.

Eyes

Immediately flush eyes with large amounts of water for at least 30 minutes. Seek prompt medical attention.

Skin

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

Do NOT induce vomiting. Give nothing by mouth. Obtain immediate medical attention.

Most important symptoms and effects, both acute and delayed

Causes severe eye irritation which may damage tissue. Causes severe skin irritation with tissue destruction. May cause respiratory irritation. Harmful if swallowed. Harmful in contact with skin.

Indication of any immediate medical attention and special treatment needed**Notes to Physician**

Treat symptomatically

5. Fire-fighting measures**Suitable extinguishing media****Suitable Extinguishing Media**

Water fog, carbon dioxide, foam, dry chemical.

Extinguishing media which must not be used for safety reasons

None known.

Physicochemical hazards arising from the chemical**Special exposure hazards in a fire**

Decomposition in fire may produce harmful gases.

Special protective equipment and precautions for fire fighters**Special protective equipment for firefighters**

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

6. Accidental release measures**Personal precautions, protective equipment and emergency procedures**

Use appropriate protective equipment.

See Section 8 for additional information.

Environmental precautions

Prevent from entering sewers, waterways, or low areas.

Methods and material for containment and cleaning up

Scoop up and remove. Flush area with water.

7. Handling and storage

Precautions for safe handling

Avoid contact with eyes, skin, or clothing. Avoid creating or inhaling dust. Wash hands after use. Launder contaminated clothing before reuse.

Hygiene Measures

Handle in accordance with good industrial hygiene and safety practice.

Conditions for safe storage, including any incompatibilities

Store away from oxidizers. Store in a cool, dry location. Store in a well ventilated area. Store locked up. Use good housekeeping in storage and work areas to prevent accumulation of dust. Close container when not in use. Store at temperatures below 104 F (40 C) and 140 F (60 C) for short periods. Product has a shelf life of 48 months.

8. Exposure controls and personal protection

Control parameters

Exposure Limits

Substances	CAS Number	Malaysia OEL	ACGIH TLV-TWA
2-Bromo-2-nitro-1,3-propanediol	52-51-7	Not applicable	Not applicable

Appropriate engineering controls

Engineering Controls Use in a well ventilated area.

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 with a dust/mist filter. (A2P2/P3)
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. (>= 8 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. Rubber boots.
Eye Protection	Dust proof goggles.
Other Precautions	Eyewash fountains and safety showers must be easily accessible.
Environmental Exposure Controls	No information available

9. Physical and chemical properties

Information on basic physical and chemical properties

Physical State:	Solid Powder	Color:	White
Odor:	Characteristic	Odor Threshold:	No information available

<u>Property</u> <u>Remarks/ - Method</u>	<u>Values</u>
pH:	5 - 7
Freezing Point / Range	130 °C
Melting Point / Range	No data available
Pour Point / Range	No data available
Boiling Point / Range	> 130 °C / > 266 °F
Flash Point	> 93 °C / 199 °F (PMCC)
Evaporation rate	No data available
Vapor Pressure	0.0005 @ 20 C (mmHg)
Vapor Density	> 1 (air = 1)
Specific Gravity	1.1
Water Solubility	Soluble in water
Solubility in other solvents	No data available
Partition coefficient: n-octanol/water	0.18
Autoignition Temperature	No data available
Decomposition Temperature	No data available
Viscosity	No data available
Explosive Properties	No information available
Oxidizing Properties	No information available
<u>Other information</u>	
VOC Content (%)	No data available

10. Stability and reactivity

Reactivity

Not expected to be reactive.

Chemical stability

Stable

Possibility of hazardous reactions

Will Not Occur

Conditions to avoid

Keep away from heat, sparks and flame.

Incompatible materials

Strong oxidizers. Contact with alkalis. Contact with metals. Amines.

Hazardous decomposition products

Oxides of nitrogen. Bromine. Hydrogen bromide. Carbon monoxide and carbon dioxide. Formaldehyde.

11. Toxicological information

Information on possible routes of exposure

Principle Route of Exposure Eye or skin contact, inhalation.

Symptoms related to exposure

Most Important Symptoms/Effects

Causes severe eye irritation which may damage tissue. Causes severe skin irritation with tissue destruction. May cause respiratory irritation. Harmful if swallowed. Harmful in contact with skin.

Numerical measures of toxicity

Toxicology data for the components

Substances	CAS Number	LD50 Oral	LD50 Dermal	LC50 Inhalation
2-Bromo-2-nitro-1,3-prop	52-51-7	305 mg/kg (Rat) 307 mg/kg (Rat)	1600 mg/kg (Rat)	> 0.588 mg/L (Rat) 4h > 5 mg/L (Rat) 4h

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Immediate, delayed and chronic health effects from exposure

Inhalation	Causes severe respiratory irritation.
Eye Contact	Causes severe eye irritation which may damage tissue.
Skin Contact	Harmful in contact with skin. Causes severe burns.
Ingestion	Harmful if swallowed. Irritation of the mouth, throat, and stomach. May cause abdominal pain, vomiting, nausea, and diarrhea.

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

Exposure Levels

No data available

Interactive effects

Skin disorders. Eye ailments. Gastrointestinal disorders.

Data limitations

No data available

Substances	CAS Number	Skin corrosion/irritation
2-Bromo-2-nitro-1,3-propane diol	52-51-7	Causes severe skin irritation with tissue destruction. (Rabbit)
Substances	CAS Number	Serious eye damage/irritation
2-Bromo-2-nitro-1,3-propane diol	52-51-7	Causes severe eye irritation which may damage tissue. (Rabbit)
Substances	CAS Number	Skin Sensitization
2-Bromo-2-nitro-1,3-propane diol	52-51-7	Patch test on human volunteers did not demonstrate sensitization properties Did not cause sensitization on laboratory animals (guinea pig)
Substances	CAS Number	Respiratory Sensitization
2-Bromo-2-nitro-1,3-propane diol	52-51-7	No information available
Substances	CAS Number	Mutagenic Effects
2-Bromo-2-nitro-1,3-propane diol	52-51-7	Some in vitro tests have shown mutagenic effects. In vivo tests did not show mutagenic effects.
Substances	CAS Number	Carcinogenic Effects
2-Bromo-2-nitro-1,3-propane diol	52-51-7	Did not show carcinogenic effects in animal experiments
Substances	CAS Number	Reproductive toxicity
2-Bromo-2-nitro-1,3-propane diol	52-51-7	Animal testing did not show any effects on fertility. Did not show teratogenic effects in animal experiments.
Substances	CAS Number	STOT - single exposure
2-Bromo-2-nitro-1,3-propane diol	52-51-7	May cause respiratory irritation.
Substances	CAS Number	STOT - repeated exposure
2-Bromo-2-nitro-1,3-propane diol	52-51-7	No significant toxicity observed in animal studies at concentration requiring classification.
Substances	CAS Number	Aspiration hazard
2-Bromo-2-nitro-1,3-propane diol	52-51-7	Not applicable

12. Ecological information

Ecotoxicity

12.1. Toxicity

Ecotoxicity effects

Very toxic to aquatic life. Toxic to aquatic life with long lasting effects.

Substances	CAS Number	Toxicity to Algae	Toxicity to Fish	Toxicity to Microorganisms	Toxicity to Invertebrates
2-Bromo-2-nitro-1,3-propanediol	52-51-7	EC50 (72h) 0.25 mg/L (Skeletonema costatum) EC50 (72h) 0.37 mg/L (Pseudokirchnerella subcapitata) EC50 (72h) 0.89 mg/L (Chlorella vulgaris)	LC50 (96h) 58 mg/l (Pimephales promelas) LC50 (96h) 35.7 mg/L (Lepomis macrochirus) LC50 (96h) 41.2 mg/L (Oncorhynchus mykiss) LC50 (96h) 57.6 mg/L (Cyprinodon variegatus) NOEC (49d) 21.5 mg/L (Oncorhynchus mykiss) LC50 (49d) 39.1 mg/L (Oncorhynchus mykiss)	EC20 (150m) 2 mg/L (Activated Sludge, Respiration Inhibition) EC50 (150m) 43 mg/L (Activated sludge)	EC50 (48h) 1.4 mg/L (Daphnia magna) EC50 (48h) 3.5 mg/L (Acartia tonsa) NOEC (21d) 0.27 mg/L (Daphnia magna) EC50 (21d) 0.27-0.88 mg/L (Daphnia magna)

Persistence and degradability

Substances	CAS Number	Persistence and Degradability
2-Bromo-2-nitro-1,3-propanediol	52-51-7	Readily biodegradable (70% @ 28d)

Bioaccumulative potential

Substances	CAS Number	Bioaccumulation
2-Bromo-2-nitro-1,3-propanediol	52-51-7	0.22

Mobility in soil

Substances	CAS Number	Mobility
2-Bromo-2-nitro-1,3-propanediol	52-51-7	KOC = > 4

Other adverse effects

Endocrine Disruptor Information

This product does not contain any known or suspected endocrine disruptors

13. Disposal considerations

Disposal methods

Disposal methods

Disposal should be made in accordance with federal, state, and local regulations. Incineration recommended in approved incinerator according to federal, state, and local regulations. Substance should NOT be deposited into a sewage facility.

Contaminated Packaging

Follow all applicable national or local regulations.

14. Transportation information

Transportation Information

UN Number	UN3241
UN proper shipping name:	2-Bromo-2-Nitropropane-1,3-Diol
Transport Hazard Class(es):	4.1
Packing Group:	III
Environmental Hazards:	Marine Pollutant

IMDG/IMO

UN Number	UN3241
UN proper shipping name:	2-Bromo-2-Nitropropane-1,3-Diol
Transport Hazard Class(es):	4.1
Packing Group:	III

Environmental Hazards: Marine Pollutant
EMS: EmS F-J, S-G

IATA/CAO

UN Number UN3241
UN proper shipping name: 2-Bromo-2-Nitropropane-1,3-Diol
Transport Hazard Class(es): 4.1
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

HazChem Code

1Y

15. Regulatory information**International Agreements**

Montreal Protocol - Ozone Depleting Substances:	Does not apply.
Stockholm Convention - Persistent Organic Pollutants:	Does not apply
Rotterdam Convention - Prior Informed Consent:	Does not apply.
Basel Convention - Hazardous Waste:	Does not apply.

Safety, health, and environmental regulations specific for the hazardous chemical

Malaysia Occupation Safety and Health - Prohibition of Use Substances:	Does not apply
Malaysia Substances Requiring Medical Surveillance:	Does not apply
Malaysia Environmentally Hazardous Substances (EHS):	One or more components listed.

16. Other information**Revision Date:** 08-Nov-2022**Revision Note**
Update to Format**Key literature references and sources for data**

www.ChemADVISOR.com/
 NZ CCID
 OSHA

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

bw – body weight
 CAS – Chemical Abstracts Service
 EC – European Commission
 EC10 – Effective Concentration 10%
 EC50 – Effective Concentration 50%
 EEC – European Economic Community
 ErC50 – Effective Concentration growth rate 50%
 IBC Code – International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk
 LC50 – Lethal Concentration 50%
 LD50 – Lethal Dose 50%
 LL0 – Lethal Loading 0%
 LL50 – Lethal Loading 50%
 MARPOL – International Convention for the Prevention of Pollution from Ships
 mg/kg – milligram/kilogram
 mg/L – milligram/liter
 NIOSH – National Institute for Occupational Safety and Health
 NOEC – No Observed Effect Concentration

NTP – National Toxicology Program
OEL – Occupational Exposure Limit
PBT – Persistent Bioaccumulative and Toxic
PC – Chemical Product category
PEL – Permissible Exposure Limit
ppm – parts per million
PROC – Process category
STEL – Short Term Exposure Limit
h - hour
d - day

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End of Safety Data Sheet