SAFETY DATA SHEET **LITHIUM BROMIDE SOLUTION, INHIBITED**

1. Identification of the Substance/Mixture and of the Company/Undertaking:

1.1 **Product Identifier:** Lithium Bromide Solution, Inhibited
1.1.1 **Substances** Not applicable
1.1.2 **Mixture name:** Lithium Bromide Solution, Inhibited
1.2 **Relevant Identified Uses of the Substance or Mixture and Uses Advised Against:**
Industrial Manufacturing
Only to be supplied for industrial uses
Do not use for private purposes (household).
1.3 **Details of the Supplier of the Safety Data Sheet**

North America
FMC Corporation
2801 Yorkmont Road, Suite 300
Charlotte, NC 28208
Phone: +1.704.426.5300
Fax: +1.704.426.5370
1.888.lithium

Europe
FMC Chemicals
Commercial Road
Bromborough, Merseyside
CH62 3NL, England
Phone: +44.151. 334.8085
Fax: +44.151.482.7361

Asia Pacific
FMC Asia Innovation Center
No 3 Building No. 4560
Jinke Road
Shanghai, China 201203
T: +86.21.2067.5888

Email: lithium.info@fmc.com
Web: www.fmclithium.com

1.4 **Emergency Telephone Number:**

North America
CHEMTREC: +1.800.424.9300
+1.703.527.3887
Plant: +1.704.629.5361
Medical: +1.303.595.9048

Europe
24 hr Specialist advice number:
CHEMTREC: +44 870 8200418

Asia Pacific
Phone: +86.21.2067.5888

2. Hazards Identification

2.1 **Classification of the Substance or mixture:**
2.1.1 GHS Classification [EC Regulation No 1272/2008 and US OSHA regulations]
Acute Toxicity, Category 4
Eye Irritant, Category 2
Skin irritant, Category 2
Skin sensitization, Category 1
2.2.2 EC: Classification according to 67/548/EEC or 1999/45/EC [DSD/DPD]
Xn, R22; Xi, R36/38, R43
2.2 **Label Elements:**
2.2.3 Hazard Pictograms(s):

2.2.4 Signal Word: Warning

Hazard Statement(s):	Harmful if swallowed	H302
	Causes serious eye irritation	H319
	Causes skin irritation	H315
	May cause an allergic skin reaction	H317

Precautionary Statement(s):

Wear protective gloves/protective clothing/eye protection/face protection.	P280
IF IN EYES: Rinse cautiously w/ water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.	P305 + P351 + P338
If eye irritation persists: Get medical advice/attention.	P337 + P313
IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.	P301 + P312
IF ON SKIN: Wash with plenty of soap and water.	P302 + P352

If skin irritation occurs: Get medical advice/attention.	P332 + P313

Additional Precautionary Statements(s):

Contaminated work clothing should not be allowed out of the workplace.	P272
Wash contaminated clothing before reuse.	P363
Avoid breathing dust/fume/gas/mist/vapours/spray.	P261
Wash hands thoroughly after handling.	P264
Do not eat, drink or smoke when using this product.	P270
Take off contaminated clothing and wash before reuse	P362
Dispose of contents/ container to an approved waste disposal plant.	P501

2.3 Other Hazards

None.

3. Composition / Information on Ingredients

3.1 Substances Not applicable.

3.2 Mixtures

3.2.1 GHS Classification [EC: Regulation No 1272/2008; US: OSHA regulations]

Chemical Name	CAS #	EC No	EC Index No	REACH Reg No	Wt.%	Classification, Hazard Statement Codes	
Lithium bromide	7550-35-8	231-439-8	None	01-2119970708-24-0000	52-56	Acute tox 4 Skin Irrit 2 Eye Irrit 2 Skin Sens 1	H 302 H315 H319 H317
Water	7732-18-5	None	None	None	44-48	None	

3.2.2 EC: Classification according to 67/548/EEC or 1999/45/EC [DSD/DPD]

Chemical Name	CAS #	EC No	EC Index No	REACH Reg No	Wt.%	Classification, Hazard Phrases	
Lithium bromide	7550-35-8	231-439-8	None	01-2119970708-24-0000	52-56	R 22 R 36/38 R43	
Water	7732-18-5	None	None	None	44-48	None	

(see Section 16 for abbreviations and R-phrase text)

4. First Aid Measures

4.1 Description of First Aid Measures

EYES: Immediately flush with water for at least 15 minutes, lifting the upper and lower eyelids intermittently. See a medical doctor or ophthalmologist immediately.

SKIN: Immediately flush with plenty of water while removing contaminated clothing and/or shoes, and thoroughly wash with soap and water. Obtain medical attention if signs of irritation or ill-health.

INGESTION: Quickly wipe material from the mouth and rinse mouth with water. Do not induce vomiting unless under medical supervision. Obtain medical attention if signs of irritation or ill-health.

INHALATION: Remove to fresh air. If breathing discomfort occurs and persists, see a medical doctor.

4.2 Most Important Symptoms and effects, both acute and delayed

Symptoms of over-exposure will typically be a result of the irritant nature of the substance with discomfort to skin and if swallowed, local effects with discomfort to the mouth and GI tract.

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

Notes to medical doctor:

Product is irritant to the eyes, skin and mucous membranes. Treatment is controlled removal

of exposure followed by symptomatic and supportive care.

5. Fire-Fighting Measures

5.1 **Extinguishing media** Dry chemical, CO2, water spray or regular foam.

5.2 **Special hazards arising from the substance or mixture**

Hazardous combustion products	None. Not combustible.
General Hazard	No known physical hazard, non-combustible.
Properties contributing to Flammability	Not flammable
Flashpoint	Not applicable
Flammable limits in air	Not applicable
Auto ignition temperature	Not applicable. .
Sensitivity to static discharge	Not applicable
Sensitivity to static impact	Not applicable

5.3 **Advice for fire-fighters**

Wear full protective clothing and self-contained breathing apparatus (SCBA) approved for fire fighting. This is necessary to protect against the hazards of heat, products of combustion and oxygen deficiency. Do not breathe smoke, gases or vapors generated.

6. Accidental Release Measures

6.1 **Personal precautions, protective equipment and emergency procedures**

Before cleanup measures begin, review the entire SDS with particular attention to Section 2, Hazards Identification; and Section 8, Exposure Controls/Personal Protection

6.2 **Environmental precautions**

Contain spill. Do not wash into drains. Dispose of at qualified waste disposal facility.

6.3 **Methods and material for containment and cleaning up**

Contain spill with absorbant. Sweep up and place in approved transport container. Dispose of waste according to local and Federal laws and regulations.

6.4 **Reference to other sections**

Before cleanup measures begin, review the entire SDS with particular attention to Section 2, Hazards Identification; and Section 8, Exposure Controls/Personal Protection.

6.5 **Additional information**

Not specified.

7. Handling and Storage

7.1 **Precautions for safe handling**

Avoid contact with eyes, skin or clothing. Avoid breathing mist. Use with adequate ventilation. Wear safety glasses or goggles and rubber gloves. Wash thoroughly after handling.

7.2 **Conditions for safe storage, including any incompatibilities**

Keep away from strong acids. Keep container closed. This product does not contain a corrosion inhibitor and therefore may corrode steel and stainless steel containers and equipment

7.3 **Specific end use(s)**

Defined in Exposure scenarios. Industrial and professional use only

8. Exposure Controls / Personal Protection

8.1 **Control parameters**

Lithium bromide

DNEL

Long-term exposure, systemic, inhalation	3.8 mg/m^3
Long-term exposure, systemic, dermal	10.9 mg/kg/day

PNEC

PNEC aqua (freshwater)	21.3 mg/l
PNEC STP	287 mg/l

EXPOSURE LIMITS

Chemical Name	EU		EH40 (UK WEL)		USA (ACGIH)		USA (OSHA)	
	TWA	STEL	TWA	STEL	TWA	STEL/Ceiling	PEL	STEL/Ceiling
Lithium bromide	none		none		None		None	

8.2 Exposure controls

Engineering controls:

Use local exhaust ventilation to keep airborne concentrations below exposure limits.

Personal protective equipment

Eyes and Face: Safety glasses or goggles.

Respiratory: When engineering controls are not adequate, wear a respirator approved for protection against inorganic dusts.
US: NIOSH or MSHA approved
Europe: CEN Class P type

Protective Clothing: **Gloves:** Nitrile/Neoprene/PVC/Natural Rubber (permeation breakthrough not detected during 6 hr test)
These glove recommendations should not be used as the absolute basis for glove selection. Actual in-use conditions may vary glove performance from the controlled conditions of laboratory tests. Factors such as concentration and temperature, glove thickness and glove reuse, may affect performance. Other glove requirements, such as length, dexterity, cut, abrasion, puncture and snag resistance, or glove grip need to be considered in making your final selection.

Other: Not specified.

Work Hygienic Practices: Quick-drench eyewash and safety shower.

9. Physical and Chemical Properties

9.1 Information on basic physical and chemical properties

Appearance:	Clear, colorless liquid
Odor:	Odorless
Odor threshold:	Not applicable
pH:	(1% solution) @ 25ºC: 9
Melting point:	Not applicable
Boiling point:	140°C (284°F)
Flash point:	Not applicable
Evaporation rate(butyl acetate = 1):	Not applicable
Flammability:	Not flammable
Flammable limits:	Not applicable
Vapor pressure:	Not applicable
Vapor density (air = 1):	Not applicable
Specific gravity:	3.5 g/cc
Solubility in water:	Miscible in any proportion
Partition coefficient n-octanol/ water:	Not applicable. No components considered to be soluble in octanol
Autoignition temperature:	Not applicable
Decomposition temperature:	Not available
Viscosity:	Not available
Explosive properties:	Not explosive
Oxidizing properties:	Not an oxidizer

9.2 Other information

Self-reactive properties	Does not meet classification criteria.
Pyrophoric properties	Does not meet classification criteria
Self-heating properties	Does not meet classification criteria.
Water reactive properties	Does not meet classification criteria.
Corrosive to metals	Does not meet classification criteria.
Molecular weight:	86.84 (LiBr)

10. Stability and Reactivity

10.1	**Reactivity**	Reacts with acids to form hydrogen bromide. Not reactive with water or air
10.2	**Chemical stability**	Stable.
10.3	**Possibility of hazardous reaction**	Hazardous polymerization will not occur.
10.4	**Conditions to avoid**	Contact with acids
10.5	**Incompatible materials**	Acids
10.6	**Hazardous decomposition products**	None

11. Toxicological Information

11.1 **Information on toxicological effects**

The mixture has not been tested, but properties can be predicted based on the properties of the two components

(a) acute toxicity	Lithium bromide discriminating acute oral dose > 500 mg/kg Lithium bromide solution (ca 50%) acute inhalation toxicity > 15.57 mg/l Lithium bromide discriminating acute dermal > 2000 mg/kg
(b) skin corrosion/irritation	Classified as irritant to skin on the basis of lithium bromide
(c) serious eye damage/irritation	Classified as irritant to eyes on the basis of lithium bromide
(d) respiratory/skin sensitisation	Classed as sensitizer to skin on the basis of lithium bromide
(e) germ cell mutagenicity	None of the components considered to be mutagenic.
(f) carcinogenicity	None on the components considered to be carcinogenic
(g) reproductive toxicity	None on the components suspected of damaging fertility or the unborn child.
(h) STOT-single exposure	None on the components considered to cause organ damage
(i) STOT-repeated exposure	None on the components considered to cause organ damage
(j) aspiration hazard	Lithium bromide in aqueous solution, does not present an aspiration hazard.

Lithium bromide has been extensively tested for REACH registration

Acute Effects From Overexposure:
No data available for the formulation.
No envisaged effects other than acute effects from local irritation

Chronic Effects From Overexposure:
No data available for product.

Carcinogenicity Listings

EH40: Not listed.
IARC: Not listed.
NTP: Not listed.
OSHA: Not considered a carcinogen under OSHA.
ACGIH: Not listed.

12. Ecological Information

12.1 **Toxicity:**

The mixture has not been tested, but properties can be predicted based on the properties of lithium bromide

Fish 96h LC_{50} estimated > 800 mg/L (trout)
Aquatic invertebrate 48h EC_{50} estimated > 500 mg/L (daphnia)
Plant 96h LC_{50} estimated > 500 mg/l (algae)
Sludge inhibition, 3h EC_{50} > 200 mg/l

12.2 **Persistence and degradability**
Inorganic salt.

12.3 **Bioaccumulative potential**

Inorganic. Lithium salts are not bioaccumulative

12.4 **Mobility in soil**
Not expected to be mobile.

12.5 Results of PBT and vPvB assessment
Inorganic

12.6 Other adverse effects
Due to the nature of the material and the specialist applications, this product is not considered to be a risk to the environment.

13. Disposal Considerations

13.1 Waste treatment methods
Disposal method:
Do not discharge to waste water systems.
Dispose of waste according to local and national laws and regulations.

14. Transport Information

14.1	**UN Number**	Not classified
14.2	**UN proper shipping name (IMDG, ICAO, ADR, DOT)**	None
14.3	**Transport hazard class(es) (IMDG, ICAO, ADR, DOT)**	None
14.4	**Packing group (IMDG, ICAO, ADR, DOT)**	None
14.5	**Environmental hazards**	None
14.6	**Special precautions for user**	None
14.7	**Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	None

15. Regulatory Information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

EUROPEAN UNION:

German Wassergefährdungsklasse (water hazard class)

Lithium bromide	1

UNITED STATES:

Section 311 Hazard Category (40 CFR 370):	Immediate (acute) health hazard,
Section 313 Reportable Ingredients (40 CFR 372):	This product does not contain a toxic chemical subject to the reporting requirements of Section 313 of Emergency Planning and Community Right-To-Know Act of 1986.
Section 302 Extremely Hazardous Substances (40 CFR 355):	Not listed
CERCLA Hazardous Substance (40 CFR 302.4):	Not listed
TSCA Sec 12b Export Notification:	This product is not subject to TSCA 12 (b) Export Notification Requirements.
NFPA Rating:	**Health:** 1 **Flammability:** 0 **Reactivity:** 0 **Special:** None

INTERNATIONAL INVENTORY STATUS:

Inventory/Country	**Product Status**
EINECS (EU)	Listed
TSCA (US)	Listed
ECL (Korea)	Listed
DSL (Canada)	Listed

15.2 Chemical Safety Assessment
A Chemical Safety Assessment has been carried out for lithium bromide

16. Other Information

European Union:

R Phrases:

R22 Harmful if swallowed.
R36/38 Irritating to eyes and skin.
R43 May cause sensitisation by skin contact

List of Abbreviations used in this SDS:

PBT	Persistent, Bioaccumulative and Toxic
vPvB	very Persistent, very Bioaccumulative
PEC	Predicted environmental concentration
PNEC	Predicted no effect concentration
DNEL	Derived no effect level

Specific uses identified for Exposure Scenarios

ES1	Manufacture of fine chemicals and pharmaceutical synthesis
ES2	Industrial use of substances in closed systems- Absorption Chillers
ES3	Professional use of substances in closed systems- Absorption Chillers

REVISION SUMMARY: Revision # 0. New SDS.

This SDS has been prepared to meet U. S. OSHA Hazard Communication Standard requirements.
type 1a