LX MMA	Safety Data Sheet	Crea. Date	2016.05.12
		( )th	2nd
	Product Name : I-BMA CAS No : 97-86-9	Rev. date	2022.03.08

According to OSHA Hazcom Standard 29 CFR 1910.1200

1. IDENTIFICATION

A. Product name : I-BMA (Isobutyl methacrylate)

B. Recommended use and restriction on use

◯ General use : Paint, adhesive, etc.

◯ Restriction on use : Not available

C. Manufacturer/Supplier/Distributor information

◯ Company name : LX MMA Corporation

◯ Address : 495, Sandanjungang-ro, Yeosu-si, Jeollanam-do, Korea

◯ Emergency telephone number : +82-2-6930-3870

◯ Dept : Production 2 team

2. HAZARD IDENTIFICATION

A. GHS Classification :

Flammable liquids : Category 3

Skin corrosion/irritation : Category 2

Serious eye damage/irritation : Category 2A

Skin sensitization : Category 1

Specific target organ toxicity(Single exposure) : Category 3(Respiratory tract irritation)

Acute aquatic toxicity : Category 3

B. GHS label elements

◯ Hazard symbols	◯ Signal words	◯ Hazard statements
	Warning	H226 Flammable liquid and vapour H315 Causes skin irritation H317 May cause an allergic skin reaction H319 Cause serious eye irritation H335 May cause respiratory irritation H402 Harmful to aquatic life.

◯ Precautionary statements :

Prevention
P210Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233 Keep container tightly closed.
P240 Ground and bond container and receiving equipment.
P241 Use explosion-proof electrical/ventilating/lighting/equipment.
P242 Use non-sparking tools.
P243 Take action to prevent static discharges.
P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
P264 Wash hands thoroughly after handling.
P271 Use only outdoors or in a well-ventilated area.
P272 Contaminated work clothing should not be allowed out of the workplace.
P273 Avoid release to the environment.

P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection.
Response
P302+P352 IF ON SKIN: Wash with plenty of soap and water. P303+P361+P353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing. P305+P351+P338 IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P312 Call a POISON CENTER or doctor/physician if you feel unwell. P321 Specific treatment P332+P313 If skin irritation occurs: Get medical advice/attention. P333+P313 If skin irritation or rash occurs: Get medical advice/attention. P337+P317 IF eye irritation persists : Get medical help. P362 Take off contaminated clothing. P370+P378 In case of fire: Use Suitable extinguishing media for extinction (Refer Section MSDS 5).
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 regulation

C. Other hazards which do not result in classification : (NFPA Classification)

○ NFPA : Health: 2, Flammability: 2, Reacitivity: 0

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	Trade names and Synonyms	CAS No	Contents(%)
2-Methyl-2-propenoic acid 2-methylpropyl ester	ISOBUTYL-ALPHA-METHACRYLATE	97-86-9	100

4. FIRST AID MEASURES

A. Eye contact :

- Get medical attention immediately.
- Immediately flush eyes with plenty of water for at least 20 minutes and call a doctor/physician.

B. Skin contact :

- Get medical attention immediately.
- Wash skin with soap and water
- Remove contaminated clothing, shoes and isolate.
- IF ON SKIN (or hair): Remove / Take off immediately all contaminated clothing. Rinse skin with water / shower.
- Go to the hospital immediately if symptoms(flare, irritate) occur.
- In case of burns, cool the affected area immediately with cold water and do not remove clothing that adheres to the skin.

C. Inhalation contact :

- Get medical attention immediately.
- Move to fresh air.

- If breathing is stopped or irregular, give artificial respiration and supply oxygen.

D. Ingestion contact :

- Get medical attention immediately.

E. Delayed and immediate effects and also chronic effects from short and long term exposure :

- Not available

F. Notes to physician :

- Notify medical personnel of contaminated situations and have them take appropriate protective measures.

- Symptoms caused by contact and inhalation may be delayed.

5. FIREFIGHTING MEASURES

A. Suitable(Unsuitable) extinguishing media :

- Use alcohol foam, carbon dioxide or water spray when extinguishing this substance
- Dry sand or earth for extinguishing

B. Specific hazards arising from the chemical

- Containers may explode when heated.
- Flammable liquid and vapor : Easily ignited by the heat, sparks, flame.
- Leakage may cause fire / explosion / danger
- Steam explosion hazard - Indoor, outdoor and sewer
- Can form an explosive mixture at or above the flash point.
- Vapors may form explosive mixtures with air.
- Vapors may be ignited transferred to an ignition source.
- May emit irritating and very toxic gas during burning or thermal decomposition.

C. Special protective actions for firefighters :

- Wear appropriate protective equipment.
- Note that most are lighter than water.
- Most vapors are heavier than air and can spread along the ground and accumulate in low-lying ground or confined spaces.
- Keep safe distance away from the area and extinguishing.
- In case of conflagration, use automatic fire sprinkler. Major fire may require withdrawal, allowing the object itself to burn.
- Cool the container with plenty of water even after extinguishing and evolving in case of tank fire.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- In case of tank fire extinguish at maximum distance or use unmanned fire extinguishing equipment.
- In case of a fire in the tank, step back from the tank.

6. ACCIDENTAL RELEASE MEASURES

A. Personal precautions, protective equipment and emergency procedures :

- Avoid inhalation of (dust, fume, gas, mist, vapor, spray).
- Do not touch or walk around the spilled material.
- Very fine particles may cause fire or explosion.
- Remove all ignition sources.
- Ground all equipment when handling materials.
- Wipe up spills immediately and follow the protective precautions.
- Steam suppression foam can be used to reduce steam generation.
- Please pay attention to incompatibilities materials and conditions to avoid.

B. Environmental precautions :

- Leakage may cause contamination.
- Prevent runoff and contact with waterways, drains or sewers.

- Do not release into the environment

C. Methods and materials for containment and cleaning up :

- Collect spilled materials.
- In case of large leakage, make a dike.
- Absorb spills with inert material (eg dry sand or soil) and place in chemical waste containers.
- Build a dike and collect the material for extinguishing.
- Absorb liquids and wash contaminated area with detergent and water.
- Collect absorbed material using clean explosion proof tool.

7. HANDLING AND STORAGE

A. Precautions for safe handling :

- Avoid inhalation of (dust, fume, gas, mist, vapor, spray).
- Work with reference to engineering controls and personal protective equipment.
- Ground all equipment when handling materials.
- Use only non-sparking tools
- Do not apply pressure, cut, weld, solder, bond, drill, grind or expose to heat, open flames, static electricity or other sources of ignition.
- Follow all MSDS / label precautions as product residue may remain after the container is emptied.
- Do not take contaminated clothing out of the workplace.
- Avoid prolonged or prolonged skin contact.
- When working in low altitude sealed spaces, there is a risk of oxygen deficiency..
- Take antistatic measures
- Wash thoroughly after handling.
- Use explosion proof equipment such as electricity, ventilation and lighting.

B. Conditions for safe storage, including any incompatibilities :

- Empty drums should be completely drained and properly closed and returned immediately to the drum regulator or placed appropriately.
- Keep away from heat / sparks / open flames / hot surfaces.-No smoking.
- Keep container tightly closed.
- Please pay attention to incompatibilities materials and conditions to avoid.
- Store in a well-ventilated place and keep at low temperature

8. EXPOSURE CONTROL/PERSONAL PROTECTION

A. Exposure limits

○ ACGIH TLV : Not available

○ OSHA PEL : Not available

B. Engineering controls

- Business owner is recommended to maintain below recommended exposure limits for the working place with general exhaust of gas/vapour/mist/fume.
- Ventilate air pollution to keep it below the exposure level if dust or mist occurs during operation.
- Install eye wash and safety showers for facilities that store or use this substance.

C. Personal protective equipment

○ Respiratory protection

- Wear appropriate respiratory protection.

○ Eye protection

- Wear appropriate eye protection.

○ Hand protection

- Wear appropriate glove.

○ Skin protection

- Wear appropriate clothing.

9. PHYSICAL AND CHEMICAL PROPERTIES

A. Appearance : Colorless liquid	B. Odor : Characteristic odor
C. Odor threshold : Not available	D. pH : Not available
E. Melting point/Freezing point : -48 °C	F. Initial Boiling Point/Boiling Ranges : 155°C
G. Flash point : 49°C (c.c)	H. Evaporation rate : Not available
I. Flammability(solid, gas) : Not applicable	J. Upper/Lower Flammability or explosive limits : 8% / 1%
K. Vapour pressure : 2.11 hPa (20 °C) (ECHA)	L. Solubility : 400 mg/L
M. Vapour density : 4.9	N. Specific gravity :0.88 g/cm^3 (25 °C) (ECHA)
O. Partition coefficient of n-octanol/water : 2.95	P. Autoignition temperature : 390°C
Q. Decomposition temperature : Not available	R. Viscosity : 0.78 mm^2/s (ECHA)

10. STABILITY AND REACTIVITY

A. Chemical stability

- This material is stable under recommended storage and handling conditions.

B. Possibility of hazardous reactions

- Hazardous Polymerization will not occur.

C. Conditions to avoid

- Keep away from heat / sparks / open flames / hot surfaces.-No smoking.

D. Incompatible materials

- Not available

E. Hazardous decomposition products

- May emit irritating and very toxic gas if involved in fire.

11. TOXICOLOGICAL INFORMATION

A. Information on the likely routes of exposure :

○ (Respiratory tracts) : Irritating	○ (Oral) : Not classified
○ (Skin) : Irritating	○ (Eye) : Irritating

B. Delayed and immediate effects and also chronic effects from short and long term exposure :

○ Acute toxicity :

- Oral - LD50 > 2,000 mg/kg Rat (SIDS)
- Dermal - LD50 > 17,760 mg/kg Guinea pig (IUCLID)
- Inhalation - LC50 32.6 mg/L 4hr (SIDS)

○ Skin corrosion/irritation : Irritating to the skin. (SIDS)

○ Serious eye damage/irritation : Irritating (SIDS)

○ Respiratory sensitization : Not available

○ Skin sensitization : Sensitizing (EU CLP)

○ Carcinogenicity : Not available

○ Germ cell mutagenicity : The methacrylate esters have been tested in vitro and in vivo for gene mutations, chromosome mutations and aneugenic effects over relevant dose ranges. There is no indication that the methacrylate esters in the category cause gene mutations. (SIDS)

○ Reproductive toxicity : n-butanol did produce increased rudimentary cervical ribs at 8000 ppm (about 50x the TWA), it occurred only in the presence of maternal toxicity (SIDS)

○ STOT-single exposure : Respiratory irritation is reported in test animals. (NITE)

○ STOT-repeated exposure : The NOEL in females was 300 mg/kg bw/day based upon changes in the blood and urine parameters indicative of effects on the kidneys, however, these were not confirmed histopathologically. In a similar repeated oral exposure study (OECD 422) with EHMA, the NOAEL was 100 mg/kg bw/day in male rats and 30 mg/kg bw/day in females, based on organ weight changes in kidney (absolute and relative), without confirmatory histopathology, pituitary gland (relative), and liver (relative) in males and on organ weight changes in both liver (absolute and relative) and kidney(relative only) in females. (SIDS)

○ Aspiration hazard : Not available

12. ECOLOGICAL INFORMATION

A. Ecotoxicity :

- Fish : LC50 20 mg/l 96 hr (Oncorhynchus mykiss) (IUCLID)
- Crustceans : EC50 23mg/l 48hr (Daphnia magna) (IUCLID)
- Algae : EC50 44 mg/l 96hr, NOECr = 9.5 mg/L (Smyth and Long, 1999)
  ECr50-72h = 16 mg/L, NOECr = 5.8 mg/L (Hoberg, 2002)

B. Persistence and degradability : Not available

- Persistence : Log Kow 2.95 (SIDS)
- Degradability : Not available

C. Bioaccumulative potential :

- Bioaccumulative potential : BCF = 39.2 (IUCLID)
- Biodegration : 74.3 % 28 day (IUCLID)

D. Mobility in soil : Not available

E. Other adverse effects : Not available

13. DISPOSAL CONSIDERATIONS

A. Disposal methods :

- Since more than two kinds of designaed waste is mixed, it is difficult to treat seperatly, then can be reduction or stabilization by incineration or similar process.
- If water separation is possible, pre-process with Water separation process.
- Dispose by incineration.

B. Special precautions for disposal :

- The user of this product must disposal by oneself or entrust to waste disposer or person who other's waste recycle and dispose, person who establish and operate waste disposal facilities.
- Dispose of waste in accordance with all applicable laws and regulations.

14. TRANSPORT INFORMATION

A. UN No. (IMDG) : 2283

B. Proper shipping name : ISOBUTYL METHACRYLATE, STABILIZED

C. Hazard Class : 3 D. IMDG Packing group : III

E. Marine pollutant □ applicable ■ Not applicable

F. Special precautions for user related to transport or transportation measures

- Self-accelerating polymerization temperature(SAPT) : >60℃
- Risk of self-accelerated polymerization above 60℃
- But, this product contains polymerization inhibitor and there is no risk of polymerization
- Local transport follows in accordance with Dangerous goods Safety Management Law.
- Package and transport follow in accordance with Department of Transportation (DOT) and other regulatory agency requirements.
- EmS FIRE SCHEDULE : F-E (Non-water-reactive flammable liquids)
- EmS SPILLAGE SCHEDULE : S-D (Flammable liquids)

15. REGULATORY INFORMATION

A. National and/or international regulatory information :

○ POPs Management Law : Not applicable

○ Information of EU Classification :

* Classification : H226, H335, H315, H317

○ U.S. Federal regulations :

* OSHA PROCESS SAFETY (29CFR1910.119) : Not applicable

* CERCLA Section 103 (40CFR302.4) : Not applicable

* SARA 302 (EPCRA Section 302 (40CFR355.30)) : Not applicable

* SARA 304 (EPCRA Section 304 (40CFR355.40)) : Not applicable

* SARA 313 (EPCRA Section 313 (40CFR372.65)) : Not applicable

○ U.S. State Regulations :

* U.S. State Right-to-Know Regulations

Chemical Name	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island	California Proposition 65
2-Methyl-2-propenoic acid 2-methylpropyl ester (97-86-9)	Not Listed	Listed	Not Listed	Not Listed	Not Listed	Not Listed

○ Rotterdam Convention listed ingredients : Not applicable

○ Stockholm Convention listed ingredients : Not applicable

○ Montreal Protocol listed ingredients : Not applicable

16. OTHER INFORMATION

A. Reference :

- The information contained herein is believed to be accurate. It is provided independently of any sale of the product for purpose of hazard communication. It is not intended to constitute performance information concerning the product. No express warranty, or implied warranty of merchantability or fitness for a particular purpose is made with respect to the product or the information contained herein.
- This Safety Data Sheet was compiled with data and information from the following sources: KOSHA, NITE, ESIS, NLM, SIDS, IPCS

B. Issue date

- 2021.07.01

C. Revision number and Last date revised

- 2nd. 2022.03.08

D. Other

- This MSDS is prepared according to the Globally Harmonized System (GHS).