



Safety Data Sheet

Crea. date 2007.10.27

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Product Name : MMA
CAS No : 80-62-6

Rev. date 2021.07.01

According to OSHA Hazcom Standard 29 CFR 1910.1200

1. IDENTIFICATION

A. Product name : MMA

B. Recommended use and restriction on use

General use : Artificial Marbles, Transparent ABS, MBS, Adhesives, SB-Latex, PMMA, Paint, Casting Sheet, Fiber Materials, Cement Fluidization Material.

Restriction on use : Not available

C. Manufacturer/Supplier/Distributor information

Company name : LX MMA Corporation

Address : YeosuSandan 4-ro, Yeosu-si, Jeollanam-do, Korea

Emergency telephone number : +81-2-6930-3870

Dept : MMA Production team

2. HAZARD IDENTIFICATION

A. GHS Classification :

Flammable liquids : Category2

Skin corrosion/irritation : Category2

Skin sensitization : Category1

Serious eye damage/eye irritation : Category 2A

Respiratory sensitization : Category 1

Specific target organ toxicity(Single exposure) : Category3(Respiratory tract irritation)

B. GHS label elements :

<input type="radio"/> Hazard symbols	<input type="radio"/> Signal words	<input type="radio"/> Hazard statements
	Danger	H225 Highly flammable liquid and vapour H315 Causes skin irritation H317 May cause an allergic skin reaction H319 Causes serious eye irritation H334 May cause allergic or asthmatic symptoms or breathing difficulties if inhaled H335 May cause respiratory irritation.

Precautionary statements :

Prevention

P210 Keep 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.
 P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection.
 P284 [In case of inadequate ventilation] wear respiratory 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 IF IN EYES: Rinse cautiously with water for several minutes.
 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+P313 If eye irritation persists: Get medical advice/attention.
 P342+P311 If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician.
 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 :

- Not available

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	Trade names and Synonyms	CAS No	Contents(%)
2-Methyl-2-propenoic acid methyl ester	Methyl methylacrylate	80-62-6	100

4. FIRST AID MEASURES

A. Eye contact :

- Do not rub your eyes.
- Immediately flush eyes with plenty of water for at least 20 minutes and call a doctor/physician.
- Get medical attention immediately.
- Remove contact lenses if worn.

B. Skin contact :

- Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.
- Wash contaminated clothing thoroughly before re-using.
- Get medical attention immediately.
- Take the doctor's examination.
- Wash thoroughly after handling.

C. Inhalation contact :

- When exposed to large amounts of steam and mist, move to fresh air.
- Take specific treatment if needed.
- Get medical attention immediately.
- If breathing is stopped or irregular, give artificial respiration and supply oxygen.

D. Ingestion contact :

- Please be advised by doctor whether induction of vomit is demanded or not.
- Rinse your mouth with water immediately.
- 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.

5. FIREFIGHTING MEASURES

A. Suitable(Unsuitable) extinguishing media :

- Dry chemical, carbon dioxide, regular foam extinguishing agent, spray
- Avoid use of water jet for extinguishing

B. Specific hazards arising from the chemical :

- Above flash point, vapor-air mixtures are explosive within flammable limits noted Section 9 (Physical and chemical properties).
- Polymerization may be caused by elevated temperature, oxidizers, peroxides, or sunlight.
- Vapors can flow along surfaces to distant ignition source and flash back.
- Sealed containers may rupture when heated.
- During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

C. Special protective actions for firefighters :

- In case of conflagration, use automatic fire sprinkler. Major fire may require withdrawal, allowing the object itself to burn.
- Avoid inhalation of materials or combustion by-products.
- Do not approach the tank surrounded by fire until it is extinguished.
- Use appropriate extinguishing measure suitable for surrounding fire.
- Wear appropriate protective equipment.
- Keep containers cool with water spray.

- Vapor or gas is burned at distant ignition sources can be spread quickly.
- In case of fire, wear a full face positive-pressure self contained breathing apparatus and protective suit.

6. ACCIDENTAL RELEASE MEASURES

A. Personal precautions, protective equipment and emergency procedures :

- Wear proper personal protective apparatus as indicated in Section 8 and avoid skin contact and inhalation.
- Do not touch spilled material. Stop leak if you can do it without risk.
- Remove all sources of ignition.
- Handling the damaged containers or spilled material after wearing protective equipment.
- Do not direct water at spill or source of leak.
- Avoid skin contact and inhalation.

B. Environmental precautions :

- Prevent runoff and contact with waterways, drains or sewers.
- If large amounts have been spilled, inform the relevant authorities.

C. Methods and materials for containment and cleaning up :

- Large spill : Stay upwind and keep out of low areas. Dike for later disposal.
- Notification to central government, local government. When emissions at least of the standard amount.
- Dispose of waste in accordance with local regulation.
- Appropriate container for disposal of spilled material collected.
- Small leak: sand or other non-combustible material, please let use absorption.
- Wipe off the solvent.
- Dike for later disposal.

7. HANDLING AND STORAGE

A. Precautions for safe handling :

- Do not get in eyes, on skin, on clothing. Do not take internally.
- Use with adequate ventilation.
- Do not breathe vapors/gases/dust.
- In case of inadequate ventilation wear respiratory protection.
- Keep the containers closed when not in use.
- Use non-sparking type tools and equipment, including explosion proof equipment.
- Use connections properly earthed to prevent generation of electrostatic charges.
- Vapours are heavier than air and may travel considerable distances to a source of ignition and flash back.
- Have emergency equipment (for fires, spills, leaks, etc.) readily available.
- Ensure all containers are labelled.
- Do not use, store, spill or pour near heat, sparks or open flame.
- Uncontrolled exothermic polymerization in closed systems might lead to explosion caused by increasing pressure

B. Conditions for safe storage, including any incompatibilities :

- Store in suitable labelled containers.
- Store the containers tightly closed.
- Store away from heat and sources of ignition.

- Protect from direct sunlight.
- Keep containers placed in cool, well-ventilated areas.
- Have appropriate fire extinguishers available in and near the storage area.
- Store separately from incompatibles.

8. EXPOSURE CONTROL/PERSONAL PROTECTION

A. Exposure limits :

- ACGIH TLV : TWA, 50 ppm (205 mg/m³) STEL 100 ppm (410 mg/m³)
- OSHA PEL : 100 ppm 410 mg/m³

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.

C. Personal protective equipment :

- Respiratory protection
 - Respiratory protection is ranked in order from minimum to maximum.
 - Consider warning properties before use.
 - Any chemical cartridge respirator with organic vapor cartridge(s).
 - Any chemical cartridge respirator with a full facepiece and organic vapor cartridge(s).
 - Any air-purifying respirator with a full facepiece and an organic vapor canister.
 - For Unknown Concentration or Immediately Dangerous to Life or Health : Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply. Any self-contained breathing apparatus with a full facepiece.
 - Under conditions of frequent use or heavy exposure, Respiratory protection may be needed.
- Eye protection
 - Wear primary eye protection such as splash resistant safety goggles with a secondary protection face shield.
 - Provide an emergency eye wash station and quick drench shower in the immediate work area.
- Hand protection
 - Wear appropriate chemical resistant protective clothing.
- Skin protection
 - Not available

9. PHYSICAL AND CHEMICAL PROPERTIES

- | | |
|---|--|
| A. Appearance : Clear, colorless liquid | B. Odor : Characteristic odor |
| C. Odor threshold : Not available | D. pH : Not available |
| E. Melting point/Freezing point : -48.2°C | F. Initial Boiling Point/Boiling Ranges : 100.3 °C |
| G. Flash point : 10 °C (open cup) | H. Evaporation rate : 3.1 (EA=1) |
| I. Flammability(solid, gas) : Not applicable | J. Upper/Lower Flammability or explosive limits : 12.5 / 1.7 % |
| K. Vapour pressure : 38.5 mmHg (25°C) [IPCS] | L. Solubility : 15.6 g/L (water, 20°C) |
| M. Vapour density : 3.5 (air=1) | N. Specific gravity(Relative density) : 0.94 (water=1) |
| O. Partition coefficient of n-octanol/water :
1.38 | P. Autoignition temperature : 421°C (1,013 hPa) |
| Q. Decomposition temperature : Not available | R. Viscosity : 0.60 mPa s (20°C) |

S. Molecular weight : 100.13

10. STABILITY AND REACTIVITY

A. Chemical stability

- Inhibited MMA is stable at room temperature for a limited storage period. Vapors are uninhibited and may form polymers in vents, causing stoppage. Polymerization may be caused by elevated temperature, oxidizers, peroxides, or sunlight.

B. Possibility of hazardous reactions

- Polymerizes easily, especially on heating or in presence of traces of hydrochloric acid.
- The product is readily polymerized by light, heat, or oxidants without inhibitor.
- If the polymerization takes place inside some containers, it is subject to violent rupture.

C. Conditions to avoid

- Insufficient inhibitor, incompatibles, heat, flame and ignition sources.

D. Incompatible materials

- Contact with polymerization catalysts (e.g. peroxides, persulfates), nitric acid, strong oxidizers and other bases (e.g. ammonia, amines), halogens and halogen compounds.

E. Hazardous decomposition products

- Oxides of carbon (COx)

11. TOXICOLOGICAL INFORMATION

A. Information on the likely routes of exposure :

- (Respiratory tracts) : May cause respiratory irritation.
- (Oral) : Not classified
- (Eye-Skin) : Causes skin irritation. May cause an allergic skin reaction

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

Acute toxicity :

- Oral - LD50 7872 mg/kg Rat (RTECS)
- Dermal - LD50 >5000 mg/kg Rabbit (RTECS)
- Inhalation - LC50 78,000 mg/m³ 4 hr Rat (RTECS)

Skin corrosion/irritation : Although at 2 and 5 g/kg bw (after 24 h of exposure), reversal of tissue damage was not demonstrated by day 14 , the fact that is used a 24 hr contact period, and that reversibility was observed at 0.2 g/kg bw, correspond more closely to the applied dose used under a guideline skin irritation study (0.5 ml / 4 h) the overall conclusion from these dermal irritation and toxicity studies is that MMA is irritant to the skin of rabbits.

Serious eye damage/irritation : Irritating, and may injure eye tissue if not removed promptly.

Respiratory sensitization : Respiratory irritation data

Skin sensitization : Skin sensitizing.

Carcinogenicity :

- * IARC : Group 3
- * OSHA : Not available
- * ACGIH : A4
- * NTP : Not available
- * EU CLP : Not available

Germ cell mutagenicity : Not expected to cause mutagenicity based on some mutagenicity assay.

- Reproductive toxicity : Exposure by inhalation to methyl methacrylate concentrations up to 8.44 mg/L (2028 ppm) resulted in no embryo or fetal toxicity or malformations even at exposure levels that resulted in maternal toxicity. (ECHA)
- STOT-single exposure : May cause respiratory irritation. (EU CoRAP, 2018)
- STOT-repeated exposure : No relevant effects were observed up to the highest dose tested (2000 ppm, limited by palatability) in a 2 years study in rats by oral administration in drinking water. (ECHA)
- Aspiration hazard : No data available

12. ECOLOGICAL INFORMATION

A. Ecotoxicity :

- Fish : LC50 191 mg/l 96 hr *Lepomis macrochirus* (EPA 1975)
LC50 >79 mg/L 96 hr *Oncorhynchus mykiss* (EPA, 40 CFR Part 797 Guideline 797.1400)
- Crustaceans : EC50 69 mg/l 48 hr *Daphnia magna* (EPA 1975)
EC50 720 mg/L 24 hr *Daphnia magna*
- Algae : EC50 37 mg/l 7 days *Scenedesmus quadricauda*
EC50 170 mg/l 4 days *Scenedesmus quadricauda* (OECD 201, 1990)

B. Persistence and degradability :

- Persistence : 1.38 log Kow
- Degradability : Not available

C. Bioaccumulative potential :

- Bioaccumulative potential : BCF 2 - 6.59 (calculated), 2.350 (calculated) MMA is not expected to significantly bioaccumulate due to low bioaccumulation factor (BCF).
- Biodegradation : 88 % 28 day (aerobic)

D. Mobility in soil : If MMA released into the soil, MMA is expected to quickly evaporate.

- On the basis of its vapor pressure and its low absorption to soil (K= 21.3 – 34), MMA is expected to volatilize relatively rapidly from soil [Online literature search, Environfate data base, 1991 SRC, 1988].

E. Other adverse effects : No data available

13. DISPOSAL CONSIDERATIONS

A. Disposal methods :

- Must be disposed of as a special waste in accordance with regulations for special waste.
- Small quantities may be incinerated under controlled conditions in incinerators suitable for methacrylates.
- Hazardous wastes must be transported by a licensed hazardous waste transporter and disposed of or treated in a properly licensed hazardous waste treatment, storage, disposal or recycling facility.

B. Special precautions for disposal :

- Consult local, state, and federal regulations for specific requirements.

14. TRANSPORT INFORMATION

A. UN No. (IMDG) : 1247

B. Proper shipping name : METHYL METHACRYLATE MONOMER, STABILIZED

C. Hazard Class : 3

D. IMDG Packing group : II

E. Marine pollutant applicable Not applicable

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

- Self-accelerating polymerization temperature(SAPT) : >60°C
- Risk of self-accelerated polymerization above 60°C
- 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 : H225, H335, H315, H317
- U.S. Federal regulations :
 - * OSHA PROCESS SAFETY (29CFR1910.119) : Not applicable
 - * CERCLA Section 103 (40CFR302.4) : 453.599 kg 1000 lb
 - * 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)) : Applicable
- 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

- 1st. 2021.07.01

D. Other

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