Material Safety Data Sheet

1. PRODUCT AND COMPANY IDENTIFICATION

MMA - 15 PPM MEHQ

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Supplier

THE DOW CHEMICAL COMPANY*
Agent for Rohm and Haas Chemicals LLC
100 INDEPENDENCE MALL WEST
PHILADELPHIA, PA 19106-2399 United States

For non-emergency information contact: 215-592-3000

For non-emergency information contact: 215-592-3000

Emergency telephone number

1 800 424 9300

Local Emergency telephone number

989-636-4400

2. COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS-No.	Concentration
Methyl methacrylate	80-62-6	>= 99.8%
Other ester adducts	Not Required	<= 0.2%
Methoxyphenol	150-76-5	<= 20.0PPM

3. HAZARDS IDENTIFICATION

Emergency Overview

Appearance

Form	liquid
Colour	clear
Odour	Fruity odor

Hazard Summary	**WARNING!** FLAMMABLE LIQUID AND VAPOR. IRRITATING TO EYES, RESPIRATORY SYSTEM AND SKIN. MAY CAUSE SENSITIZATION BY SKIN CONTACT. LIVER AND KIDNEY INJURIES MAY OCCUR. REACTIVE MONOMER

Potential Health Effects

Primary Routes of Entry: Inhalation
Eye contact
Skin contact

Eyes: Material can cause the following:
slight irritation

Skin: Material can cause the following:
Moderate irritation.
May cause sensitization by skin contact.

Ingestion: May be harmful if swallowed.

Inhalation: Inhalation of vapor or mist can cause the following:
irritation of nose, throat, and lungs
Inhalation of vapor or mist is
harmful; possibly fatal in high concentrations.

Chronic Exposure: Prolonged or repeated overexposure at near lethal concentrations can cause the following:
kidney damage
liver damage

Methyl methacrylate	ACGIH	Sensitiser.
Methyl methacrylate	ACGIH	Not classifiable as a human carcinogen.
Methyl methacrylate	IARC	Classification not possible from current data.
Methyl methacrylate	IRIS	Not a human carcinogen.

4. FIRST AID MEASURES

Inhalation: Move to fresh air. Oxygen or artificial respiration if needed. Call a physician immediately.

Skin contact: Wash off with soap and plenty of water. Wash contaminated clothing before re-use. If skin irritation persists, call a physician.

Eye contact: Rinse with plenty of water. If eye irritation persists, consult a specialist.

Ingestion: Drink 1 or 2 glasses of water. Never give anything by mouth to an unconscious person. Consult a physician. If vomiting occurs spontaneously, keep airway clear.

5. FIRE-FIGHTING MEASURES

Flash point	8 °C (46 °F) SETAFLASH CLOSED CUP
Ignition temperature	435.0 °C (815.00 °F)
Lower explosion limit	2.10 %(V)
Upper explosion limit	12.50 %(V)
Suitable extinguishing media:	water spray dry powder foam alcohol-resistant foam carbon dioxide (CO2)

Specific hazards during fire fighting: Vapors can travel to a source of ignition and flash back. Heat can cause polymerization. Heated containers can explode.

Special protective equipment for fire-fighters: Wear self-contained breathing apparatus and protective suit.

Further information: EXPLOSION HAZARD. Fight advanced fires from a protected location. Cool containers / tanks with spray water.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions
Use personal protective equipment.
If exposed to material during clean-up operations, see SECTION 4, First Aid Measures, for actions to follow.

Environmental precautions
CAUTION: Keep spills and cleaning runoff out of municipal sewers and open bodies of water.
Do not allow material to contaminate ground water system.

Methods for cleaning up
Remove all sources of ignition.
Contain spills immediately with inert materials (e.g., sand, earth).
Transfer liquids and solid diking material to separate suitable containers for recovery or disposal.
Contaminated monomer may be unstable. Add inhibitor to prevent polymerization.
Absorbent can act as a contaminant (removes inhibitor) in liquid monomer. Avoid freestanding monomer with absorbent or add inhibitor to stabilize. Dispose of promptly.

7. HANDLING AND STORAGE

Handling
May cause sensitization of susceptible persons by skin contact. For personal protection see section 8.
Ground all metal containers during storage and handling.

Storage
Storage conditions: Minor deviations (7C/13F) above the recommended temperature (see below) are acceptable for short periods of time (one week) for material in transit. Store in cool place. Keep away from direct sunlight. Material can burn; limit indoor storage to approved areas equipped with automatic sprinklers. Ground all metal containers during storage and handling. This product contains inhibitor to stabilize it during shipment and storage. The effectiveness of the inhibitor is dependent on the presence of dissolved oxygen. In order to maintain sufficient dissolved oxygen in the liquid to avoid

polymerization, the monomer must always be stored with a vapor space oxygen concentration of 5% to 21%(air). Store material in containers made of the following: stainless steel carbon steel glass aluminum Keep container tightly closed.
Storage temperature: <= 38 °C (<= 100 °F)
Storage period: 8 Months
Other data: Use monomer within the recommended storage period from date of manufacture to avoid loss of stability or risk of polymerization.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure limit(s)

Exposure limits are listed below, if they exist.

Component	Regulation	Type of listing	Value
Methyl methacrylate	ACGIH	TWA	50 ppm
	ACGIH	STEL	100 ppm
	OSHA_TRANS	PEL	410 mg/m3 100 ppm
	Z1A	TWA	410 mg/m3 100 ppm
	Rohm and Haas	TWA	50 ppm
	Rohm and Haas	STEL	75 ppm

Component	Regulation	Type of listing	Value
Methoxyphenol	Rohm and Haas	TWA	5 mg/m3
	ACGIH	TWA	5 mg/m3

Eye protection: Chemical resistant goggles must be worn. Eye protection worn must be compatible with respiratory protection system employed.

Hand protection: Chemical-resistant gloves should be worn whenever this material is handled. The glove(s) listed below may provide protection against permeation. (Gloves of other chemically resistant materials may not provide adequate protection): Butyl rubber Rinse and remove gloves immediately after use. Wash hands with soap and water. Gloves should be removed and replaced immediately if there is any indication of degradation or chemical breakthrough. NOTE: Material is a possible skin sensitizer. Reference: Methacrylate Producers Association, Inc., "Chemical- Protective Gloves for Methacrylic Acid and its Esters", September 1998.

Skin and body protection: Use chemically resistant apron or other impervious clothing to avoid prolonged or repeated skin contact.

Respiratory protection: A respiratory protection program meeting OSHA 1910.134 and ANSI Z88.2 requirements or equivalent must be followed whenever workplace conditions warrant a respirator's use. None required if airborne concentrations are maintained below the exposure limit listed in Exposure Limit Information. Up to 10 times the exposure limit: Wear a properly fitted NIOSH approved (or equivalent) half-mask, air-purifying respirator. Up to 50 times the exposure limit: Wear a properly fitted NIOSH approved (or equivalent) full-facepiece, air-purifying respirator, OR full-facepiece, airline respirator in the pressure demand mode. Above 50 times the exposure limit or Unknown: Wear a properly fitted NIOSH approved (or equivalent) self-contained breathing apparatus in the pressure demand mode, OR full-facepiece, airline respirator in the pressure demand mode with emergency escape provision. Air-purifying respirators should be equipped with NIOSH approved (or equivalent) organic vapor cartridges and N95 filters. If oil mist is present, use R95 or P95 filters. NOTE: Contact Rohm and Haas Company for air monitoring method.

Protective measures: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.

Engineering measures: Use explosion-proof local exhaust ventilation with a minimum capture velocity of 100 ft/min (0.5 m/sec) at the point of vapor evolution. Refer to the current edition of Industrial Ventilation: A Manual of Recommended Practice published by the American Conference of Governmental Industrial Hygienists for information on the design, installation, use, and maintenance of exhaust systems.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Form	liquid
Colour	clear
Odour	Fruity odor
Boiling point/range	101 °C (213.80 °F)
Melting point/range	-48.00 °C (-54.40 °F)
Flash point	8 °C (46 °F) SETAFLASH CLOSED CUP
Ignition temperature	435 °C (815.00 °F)
Lower explosion limit	2.10 %(V)
Upper explosion limit	12.50 %(V)
Vapour pressure	29.0 mmHg at 20 °C (68.00 °F)
Relative vapour density	3.5
Water solubility	15.00000 g/l at 0.00 °C (32.00 °F)
Relative density	0.94
Viscosity, dynamic	0.530 mPa.s
Evaporation rate	>1.00
Percent volatility	100 %

NOTE: The physical data presented above are typical values and should not be construed as a specification.

10. STABILITY AND REACTIVITY

Hazardous reactions	Inhibitor is added to this product to prevent polymerization. However, this material can undergo hazardous polymerization. See Hazardous Polymerization for conditions to avoid. This material is considered stable under specified conditions of storage, shipment and/or use. See SECTION 7, Handling And Storage, for specified conditions.
Materials to avoid	Avoid contact with the following: acids bases oxidizing agents reducing agents UV light free radical initiators organic peroxides
Hazardous decomposition products	There are no known hazardous decomposition products for this material.,

polymerization	Excessive aging, heat, contamination with polymerization catalysts, oxygen-free atmosphere, inhibitor depletion or ultraviolet light (sunlight) may cause polymerization. An uncontrolled polymerization may produce a rapid release of energy with the potential for an explosion of unvented closed containers.

11. TOXICOLOGICAL INFORMATION

Acute oral toxicity	LD50 rat > 5,000 mg/kg
Acute inhalation toxicity	LC50 rat 4 h 7094 ppm
Acute dermal toxicity	LD50 rabbit > 5,000 mg/kg
Skin irritation	rabbit Moderate irritation.
Eye irritation	rabbit slight irritation
Sensitization	May cause sensitization by skin contact.

Teratogenicity
MMA did not cause birth defects, malformations, or fetal toxicity in pregnant rats inhaling concentrations up to 2028 ppm.

Mutagenicity
Methyl methacrylate has produced mutations and chromosomal aberrations in certain in-vitro assays using cultured mammalian cells. However, there is no convincing evidence for in-vivo clastogenicity of methyl methyacryl ate. In several lifetime animal studies, methyl methacrylate has been shown to be non-carcinogenic.

In a retrospective study of the effects of exposure to ethyl acrylate and methyl methacrylate on workers hired in one plant between 1933 and 1945, a higher-than-expected incidence of colorectal cancer mortality was observed. However, there was no association of risk in similarly exposed populations from other locations or in subsequent evaluations of the same location.

12. ECOLOGICAL INFORMATION

Elimination information (persistence and degradability)

Biodegradability	Ultimately biodegradable (88% within 28 days) under aerobic conditions
Physico-chemical removability	28-Day Hydrolysis Study: Rapidly hydrolyzed under alkaline conditions.
Stability in soil	Adsorption/Desorption:Very highly mobile, not adsorbed to soilSoil metabolism: MMA is rapidly dissipated, t1/2<1 day
Ecotoxicity effects	
Toxicity to fish	LC50 Oncorhynchus mykiss (rainbow trout) 96 h > 79 mg/l
Toxicity to algae	EC50 Algae (Selenastrum capricornutum) 72 h 170 mg/l

Toxicity to aquatic invertebrates	EC50 Daphnia magna 48 h 69 mg/l

13. DISPOSAL CONSIDERATIONS

Environmental precautions: CAUTION: Keep spills and cleaning runoff out of municipal sewers and open bodies of water.
Do not allow material to contaminate ground water system.

Disposal

Waste Classification: 40 CFR 261.20 - .24 - Characteristic Waste D001
When a decision is made to discard this material as supplied, it is classified as a RCRA hazardous waste with the characteristic of ignitability.
After the addition of excess inhibitor, incinerate liquid and contaminated diking material in accordance with local, state, and federal regulations.

Contaminated packaging: Dispose of as unused product. CONTAINERS MAY BE HAZARDOUS WHEN EMPTY. Since emptied containers retain product residue follow all MSDS and label warnings even after container is emptied. Do not burn, or use a cutting torch on, the empty drum. Pursue safe, legal methods for recycle of empty containers. Improper disposal or re-use of this container may be dangerous and illegal. Refer to applicable local, state and federal regulations.

14. TRANSPORT INFORMATION

DOT

Proper shipping name	Methyl methacrylate monomer, stabilized
UN-No	UN 1247
Class	3
Packing group	II
Reportable Quantity	Methyl methacrylate

IMO/IMDG

Proper shipping name	METHYL METHACRYLATE MONOMER, STABILIZED
UN-No	UN 1247
Class	3
Packing group	II

Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations

15. REGULATORY INFORMATION

Workplace Classification
This product is considered hazardous under the OSHA Hazard Communication Standard (29 CFR 1910.1200).

This product is a 'controlled product' under the Canadian Workplace Hazardous Materials Information System (WHMIS).

SARA TITLE III: Section 311/312 Categorizations (40CFR370): Acute Health Hazard
Chronic Health Hazard
Fire Hazard
Reactivity Hazard

SARA TITLE III: Section 313 Information (40CFR372)
This product contains a chemical which is listedin Section 313 at or above de minimis concentrations. The following listed chemicals are present: (Quantity present is found elsewhere on this MSDS.)
SARA Title III Components: Methyl methacrylate 80-62-6

CERCLA Information (40CFR302.4)
This material is regulated under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)and the Superfund Amendments and Reauthorization Act (SARA) Title III Section 304. This material is or contains chemical(s) listed in 40 CFR Table 302.4 or nondesignated RCRA ICR substance(s). (Nondesignated ICR substances apply to materials that will not be reused.) The Reportable Quantity(s) (RQ) are listed below. Releases in excess of its reportable quantity must be reported to the National Response Center (1-800-424-8802) and to the appropriate state and local emergency response organizations.
CERCLA Components: Methyl methacrylate 80-62-6 1,000 lbs RQ

US. Toxic Substances Control Act (TSCA) All components of this product are in compliance with the inventory listing requirements of the U.S. Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

16. OTHER INFORMATION

Further information
MONOMER END USES

Acrylic and methacrylic monomers are industrial chemicals and intended for industrial use only. They are not intended for direct consumer, medical, cosmetic, or personal uses. Exposure to high levels of acrylic or methacrylic monomer vapors may cause respiratory tract irritation, skin sensitization, or other effects.

DO NOT USE IN APPLICATIONS INVOLVING IMPLANTATION IN THE HUMAN BODY OR PROLONGED CONTACT WITH INTERNAL BODY FLUIDS OR TISSUES. DO NOT USE FOR IN-SITU POLYMERIZATIONS ON, OR ADHESION TO, ANY HUMAN BODY PART.Rohm and Haas Company's acrylic and methacrylic monomers are not designed or manufactured for these uses.

Rohm and Haas Company does not recommend the use of acrylic or methacrylic monomers in medical applications or artificial fingernail extension or replacement applications. Rohm and Haas Company has neither sought, nor received, approval from the FDA or any other agency for these applications. Rohm and Haas Company has not performed technical or clinical testing on the suitability of acrylic or methacrylic monomers in uses involving prolonged contact with human tissues or in artificial fingernail extension or replacement applications. Use of unpolymerized, liquid acrylic or methacrylic monomers in artificial fingernail extension or replacement applications may result in loosening, shedding, fungal infection of nails.

ACRYLIC AND METHACRYLIC POLYMERS ARE USED SAFELY IN A WIDE VARIETY OF APPLICATIONS, INCLUDING PERSONAL CARE AND HYGIENE PRODUCTS.

If you have any questions concerning the safe use of acrylic and methacrylic monomers, please call the manufacturer.

Hazard Rating

	Health	Fire	Reactivity
HMIS	2*	3	2

Legend

ACGIH	American Conference of Governmental Industrial Hygienists
BAc	Butyl acetate
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
STEL	Short Term Exposure Limit (STEL):
TLV	Threshold Limit Value
TWA	Time Weighted Average (TWA):
|	Bar denotes a revision from prior MSDS.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

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