

Section 1. Product and Company Identification

Product Name Glycidyl Methacrylate
CAS Number 106-91-2

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EMERGENCY RESPONSE NUMBER
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Section 2. Hazards Identification

Classification of the substance or mixture

Physical Hazards: Flammable liquids - Category 4

Health Hazards: Acute toxicity (oral) - Category 4

Acute toxicity (dermal) - Category 3

Acute toxicity (inhalation) - Category 3

Skin irritation - Category 2

Skin sensitization - Category 1

Eye irritation - Category 2A

Environmental Hazards: None

GHS Label Elements

Pictograms:



Signal word: Danger

Hazard and precautionary statements

Hazard Statements

Combustible liquid. [H227]

Harmful if swallowed. [H302]

Toxic in contact with skin. [H311]

Toxic if inhaled. [H331]

Causes skin irritation. [H315]

May cause an allergic skin reaction. [H317]

Causes serious eye irritation. [H319]



Precautionary Statements

Prevention

Keep away from flames and hot surfaces. No smoking. [P210]
Wear protective gloves, protective clothing, eye protection, and face protection. [P280]
Wash hands thoroughly after handling. [P264]
Do not eat, drink, or smoke when using this product. [P270]
Avoid breathing dust, fumes, gas, mist, vapors, and/or spray. [P261]
Contaminated work clothing must not be allowed out of the workplace. [P272]
Use only outdoors or in a well-ventilated area. [P271]

RESPONSE

In case of fire: Use dry chemical, foam, carbon dioxide, water spray/fog to extinguish. [P370+P378]
If SWALLOWED: Call a POISON CENTER or doctor if you feel unwell. [P301+P312]
Rinse mouth. [P330]
If on SKIN: Wash with plenty of water. [P302+P352]
Call a POISON CENTER or doctor if you feel unwell. [P312]
For specific treatment, see First Aid section on this label. [P321]
Take off immediately all contaminated clothing and wash it before reuse. [P361+P364]
IF INHALED: Remove person to fresh air and keep comfortable for breathing. [P304+P340]
If skin irritation or rash occurs: Get medical advice or attention. [P333+P313]
If in EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do so. Continue rinsing. [P305+P351+P338]
If eye irritation persists: Get medical advice or attention. [P337+P313]
STORAGE: Store in a well-ventilated place. Keep cool. [P403+P235]
DISPOSAL: Dispose of contents/container in accordance with local/regional/national regulations. [P501]

Other Classification and Labeling Information

Hazards Not Otherwise Classified: Hazardous polymerization can occur at elevated temperatures and/or the loss of inhibitor.
Unknown Acute Toxicity: None.

Section 3. Composition / Information on Ingredients

Common Name	Glycidyl Methacrylate
Synonym(s)	GMA; 2-Propenoic acid, 2-methyl-, oxiranylmethyl ester; Methacrylic acid, 2,3-epoxypropyl ester; 2,3-Epoxypropyl methacrylate ; Methacrylic acid, glycidyl ester
Formula	C ₇ H ₁₀ O ₃

PRODUCT	CAS NUMBER	% BY WEIGHT
Glycidyl Methacrylate	106-91-2	≥ 99.5% 99.8% (Typical)
Diglycidyl Ether	2238-07-5	< 0.1%
Epichlorohydrin	106-89-5	≤ 100 ppm 30 ppm (Typical)



Hydroquinone Methyl Ether	150-76-5	80 - 120 ppm
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Section 4. First Aid Measures

First Aid Measures

Skin: Wash with plenty of water, then with soap and water for 15 minutes. Discard contaminated clothing and shoes. Call physician immediately if exposed to large quantities, if contact is prolonged, or if exposure causes more than minor discomfort.

Eyes: Immediately flush with a continuous water stream for at least 20 minutes. Washing immediately after exposure is expected to be effective in preventing damage to the eyes. Get immediate medical attention.

Inhalation: Remove to fresh air. If not breathing give artificial respiration. If there is breathing difficulty, give oxygen. Get immediate medical attention.

Ingestion/Swallowed: Do not induce vomiting. Dilute by giving 1 or 2 glasses of milk or water. Nothing by mouth if unconscious. Get immediate medical attention

Section 5. Firefighting Measures

Flash Point: 178°F / 81°C [closed cup] 187°F / 86°C [open cup]

Explosion/Flammable Limits: Not known.

Auto Ignition Temperature: Not known.

Extinguishing Media: Use dry chemical, foam, carbon dioxide, and water spray/fog as needed. For large fires alcohol resistant foams are preferred. Synthetic or protein foams can be used, but may not be as effective. Water may not be effective for large fires.

Special Fire Fighting Procedures: As in any fire, wear a self-contained breathing apparatus pressure demand (MSHA/NIOSH approved or equivalent) and full protective gear. Toxic vapors may evolve. Fight fires from a safe distance or protected areas. Fire hoses with fog nozzles may be used for controlling fires but care must be exercised not to spread flaming. Use of large volumes of water may produce run-off that could be harmful to wildlife and/or pose a hazardous waste disposal problem. Water may not be effective for large fires.

Unusual Fire and Explosion Hazards: Heat can cause hazardous exothermic polymerization. Sealed containers can explode in the heat of fire. Vapors may travel to ignition source because they are heavier than air. Run off may create an explosion, fire, and environmental hazard.

Section 6. Accidental Release Measures

Spill/Release and Cleanup Procedures: In case of spill, evacuate the area and remove all ignition sources. Dike and contain spill with vermiculite or other absorbent materials such as polyethylene fiber or polypropylene fiber products and sand. Do not use sawdust and clay-based absorbents (e.g., Absorb-n-Dri, Drierite, Millsorb) since they do not sufficiently stabilize the material for safe transport. Do not discharge the washings and other effluents into ponds, streams, or lakes as the material is expected to be harmful to aquatic organisms. Wear appropriate respiratory and protective clothing as described in Section 8. In the event of an uncontrolled release of this material, the user should determine if the release is reportable under applicable laws and regulations.



Section 7. Handling and Storage

Precautions To Be Taken In Handling And Storage: Caution - hazardous polymerization may cause drum to rupture. Evacuate immediate area. Material undergoing hazardous polymerization is generally evidenced by a warm drum, high drum pressure, and/or bulging drum. If hazardous polymerization is evident, control or slow polymerization by spraying drum with cold water. When polymerization has ended (cold drum), carefully remove drum cap or bung (use blanket to cover cap or bung to prevent splashing) to release excess pressure. Workers conducting such operations should wear personal equipment including eye, face, and hand protection. If the material has not fully polymerized (i.e., not 100% solid), add 1% w/w of phenothiazine (PTZ) to stabilize material for transport and disposal. Properly dispose of both the drum and its contents. This substance contains the inhibitor methyl ether of hydroquinone (MEHQ), at a level of 80 - 120 ppm, which requires oxygen in air in order to be effective. Inhibitor level must be checked monthly in material stored for more than 3 months. Inhibitor must be maintained at original level to prevent unintended polymerization. Permit air space to exist inside storage containers, however, never use pure nitrogen or oxygen blanketing.

Other Precautions: Do not drop. Keep away from fire, heat, open flames, lights, and other ignition sources. Wear goggles and gloves when handling. Harmful by dermal, inhalation, and oral exposure. Do not breathe vapors. Eye-wash stations and emergency showers need to exist in areas where this product is handled, especially areas where loading and unloading operations occur. Wash hands thoroughly after handling and before eating, drinking, or smoking. Ground all containers when transferring the material. Do not contaminate water, food, or feed by storage or disposal. Keep the product in original containers. Store in cool, dry, well ventilated, low fire risk area away from sunlight. Keep containers closed. Store only in approved containers, under approved conditions. Avoid pressure build-up in containers. An automatic water spray device should be immediately available. A spill control and containment plan should be provided. Storage area should not be subject to rapid temperature changes as such changes may cause increased internal pressure. Isolate from toxic materials or substances that may release corrosive, toxic, or flammable fumes on reaction.

Section 8. Exposure Controls / Personal Protection

Respiratory Protection: Airborne concentrations of this material should be kept below the recommended exposure level of 1 ppm (TWA). Use MSHA/NIOSH-approved respiratory equipment. Respirators should be selected based on the form and concentration of the contaminant in the air and in accordance with OSHA (29 CFR 1910.134). Self-contained breathing apparatus is recommended any time exposure is above low levels. Handle only in the presence of adequate ventilation. In respirator breakthrough testing, two respirator cartridges have been shown to be effective in removing GMA from breathing air: 3M 6001 and American Optical R51A.

Protective Gloves: Wear chemical resistant gloves appropriate to the conditions to prevent skin/dermal exposure. Generally, gloves made of butyl rubber have been shown to provide adequate hand protection against dermal exposure to this material. (Gloves made of nitrile and neoprene were not found to provide adequate protection in glove testing. PVC gloves are also not



recommended.) Rinse and remove gloves immediately after use, and wash hands thoroughly with soap and water. Gloves should be removed and replaced immediately if there are any signs of degradation or breakthrough.

Note: In glove permeation testing, Best Butyl 874 gloves showed no breakthrough when tested over 8 hours under ASTM standard F 739-99a: Standard Test Method for Resistance of Protective Clothing Materials to Permeation by Liquids or Gases under Conditions of Continuous Contact.

Protective Clothing: Wear protective clothing and boots impervious to the product for the duration of the anticipated exposure if there is a potential for skin contact. An emergency shower should be readily accessible. Discard any contaminated clothing.

Eye Protection: Chemical safety goggles meeting the specifications of ANSI Standard Z87.1 should be worn whenever there is the possibility of contact with the eyes. Spectacle type safety glasses do not provide satisfactory protection. An eyewash fountain should be readily accessible. Wear plastic face shield in addition to safety goggles where there is a danger of splashing.

Section 9. Physical and Chemical Properties

Appearance: Colorless

Odor: Strong ester odor

Boiling Point: 189°C (760 mmHg) 75°C (10 mmHg)

Specific Gravity: 1.074 (20°C/4°C)

Vapor Pressure: 0.36 mm Hg (20°C)

Vapor Density: Heavier than air

Refractive Index: 1.4495 (20°C)

Viscosity: 2.53 cps (20°C)

Freezing Point: < -60°C

Solubility (20°C):

Water in GMA = 2.04%

GMA in water = 2.50%

Percent Volatile: 100%

Color (APHA): 20 (max.)

Weight per gallon: 8.9 lbs

T_g of Homopolymer: 46°C

Note: This material has a very low vapor pressure and evaporates very slowly. Depending on the actual volatile test used (especially with respect to time and temperature), results may vary between 0% and 100% volatiles.

Section 10. Stability and Reactivity

Stability: Stable under normal conditions when properly inhibited.

Conditions to Avoid: Avoid heat, fire, open flames, direct light, ignition sources, and UV radiation.

Incompatibility/Materials to Avoid: Incompatible with free radical initiators, oxidizing and reducing agents, and free iron or rust.



Hazardous Decomposition or Byproducts: Not expected under normal conditions.

Hazardous Polymerization: Hazardous polymerization can occur upon depletion or absence of inhibitor or upon exposure to elevated temperatures. Hazardous polymerization may result in the release of hazardous decomposition products and vapors.

Conditions to Avoid Polymerization: Avoid free radical initiators, and oxidizing and reducing agents. Also avoid excessive heat, open flames, UV radiation, and ignition sources. Store product with inhibitor.

Section 11. Toxicological Information

Acute Toxicological Data

Oral Rat LD₅₀: 600 - 700 mg/kg

Oral Mouse LD₅₀: 390 mg/kg

Oral Guinea Pig LD₅₀: 697 mg/kg

Dermal Rabbit LD₅₀: 480 mg/kg

Inhalation Rabbit LC₁₀: 241 ppm [6-hour]

i.p. Mouse LD₅₀: 1,122 mg/kg

Other Acute Data: In acute inhalation studies, this material has generally caused labored breathing, as well as respiratory tract and eye irritation. In one rat acute inhalation study, exposure to saturated vapor (474 ppm) resulted in a maximum survival time of 2 hours.

Eye Irritation Data: This material when tested in albino rabbits caused moderate to severe eye irritation and corneal damage. Untreated, the corneal damage did not heal within 7 days after exposure; this ocular damage, however, was prevented by washing with water within 30 seconds after exposure. Separately, exposure to vapors during an acute inhalation study in rats caused eye irritation and corneal clouding.

Skin Irritation Data: This material was found to induce moderate to severe skin irritation including slight necrosis and slight to moderate edema during a single covered topical application to the skin of albino rabbits for 4 hours. Separately, a 10% aqueous solution produced slight redness and edema after one application over 4 hours and a moderate burn after 2 applications. In the U.S. Dept. of Transportation test, this material was found to cause corrosion to the skin within 4 hours.

Skin Sensitization Data: This material has been found to cause skin sensitization in humans and laboratory test animals. Studies on guinea pigs have shown delayed and rapid allergenic response in test animals indicating that the compound causes strong sensitization.

Subchronic Data: In repeated dose inhalation studies, this material caused respiratory difficulties along with hyperplasia, necrosis, and inflammation of the nasal tissues. Testing has also shown that, up to certain exposure levels, these effects were found to be reversible or partially reversible.

Reproductive Toxicity: Mice injected i.p. over 5 consecutive days at doses of 0, 25, 50, or 100 mg/kg/day showed an increase in the number of abnormal sperm and decrease in the number of sperm. This study was repeated with similar results. An oral toxicity study in rats also showed limited reproductive effects. The NOAEL for reproductive performance of the parents was found to be 30 mg/kg/day.



Teratogenicity (Birth Defects): In one teratology study, rabbits were exposed to concentrations of 2.9 (0.5 ppm), 11.6 (2 ppm), or 58.2 mg/m³ (10 ppm) for 7 hours/day daily during gestation days 7 to 19. The principal indication of maternal toxicity was inflammation of the nasal olfactory and respiratory epithelium at the 11.6 and 58.2 mg/m³ dose levels. There were no adverse effects on any reproductive or embryo/fetal parameters at any dose. The NOAEL for maternal toxicity was 2.9 mg/m³ and the NOAEL for teratogenicity was 58.2 mg/m³.

Mutagenicity (In Vitro): This material has been shown to be mutagenic in in vitro tests including in *S. typhimurium* and *E. coli* both with and without metabolic activation. In the in vitro chromosomal aberration test using CHL/IU cells, both structural abnormalities and polyploidy were induced both with and without activation. In the CHO/HGPRT forward gene mutation assay, this material produced a weakly positive response.

Mutagenicity (In Vivo): This material has generally produced negative results when tested in vivo. In three mouse bone marrow micronucleus tests, the substance generally produced negative results. A very slight increase in unscheduled DNA synthesis in the germ cells of male mice has been reported, though the results were not dose-related. Separately, a study was conducted to assess the potential mutagenicity of this substance in the olfactory and respiratory mucosa of transgenic Big Blue® Fischer 344 rats with the *lacI* gene. The compound was found to be ineffective in inducing gene mutations in the olfactory and respiratory mucosa of transgenic rats via inhalation up to a concentration that resulted in clear signs of target organ toxicity.

Chronic Effects/Carcinogenicity: There are no chronic effects or carcinogenicity data on this material. Chronic exposure to this substance may produce adverse effects.

Section 12. Ecological Information

Summary of Ecological Data: This material is expected to be harmful in the aquatic environment. Substance is readily biodegradable and expected to biodegrade in a wastewater treatment facility. Not expected to bioaccumulate.

ECOTOXICOLOGICAL DATA

Fish - *Oryzias latipes* LC₅₀

24-hr: 12.9 mg/l

48-hr: 5.66 mg/l

72-hr: 3.66 mg/l

96-hr: 2.83 mg/l

Daphnia magna EC₅₀

24-hr: 42.3 mg/l

48-hr: 24.9 mg/l

Algae IC₅₀

72-hr: 14.6 mg/l

NOEC: 3.2 mg/l



Other Ecotoxicological Data: A 21-day reproductive rate study was conducted using *Daphnia magna*. *Daphnia* were exposed to concentrations from 0.5 to 25 mg/l. The 21-day reproduction rate EC50 was determined to be 3.18 mg/l. The NOEC and LOEC were found to be 1.02 and 3.18, mg/l, respectively. In addition, in a 14-day study in fish (*Oryzias latipes*) at concentrations of 0.5 to 3.0 mg/l, the LC₅₀ was determined to be 1.9 mg/l.

Environmental Fate Data: This material underwent 100% degradation after 28 days and was therefore considered to be readily biodegradable. The biochemical oxygen demand (BOD) was found to be 94% after 28 days. The total organic carbon (TOC) was found to be 96% after 28 days. Modeling data indicate that this material is not expected to bioaccumulate.

Physical/Chemical Properties: The hydrolysis of the substance, as a function of pH, was tested; at pH levels of 4, 7, and 9, the half-life of the substance was found to be 2.83, 3.66, and 2.22 days, respectively. The Log Kow was determined to be 0.96.

Section 13. Disposal Considerations

Waste Treatment Methods: Dispose of product and contaminated packaging in accordance with all local, state, and federal environmental control regulations.

Section 14. Transport Information

U.S./International Shipping Information Under DOI/IMO/IATA Regulations

Label/Placard: Corrosive liquid, Toxic (subsidiary risk)

Proper Shipping Name: Corrosive liquids, toxic, n.o.s. (Glycidyl methacrylate, Stabilized)

Hazard Class: Class 8, Packaging Group III Subsidiary risk: 6.1

UN or ID No.: UN 2922

Section 15. Regulatory Information

Regulatory Status: All chemical substances contained within this product either are listed on the Toxic Substances Control Act (TSCA) Chemical Substance Inventory or exempt under TSCA. The chemical substances contained within this product, including its impurities, may be subject to specific reporting/notification, recordkeeping, and/or testing requirements under: TSCA, EPCRA/SARA III, RCRA, CERCLA, CAA, SDWA, and CWA.

EPCRA Section 313 Supplier Notification: This product contains no chemicals at or above de-minimus levels subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-to-Know Act.

California Proposition 65: This product contains epichlorohydrin [CAS RN 106-89-8], a substance known to the State of California to cause cancer and male reproductive toxicity. The maximum level of epichlorohydrin in this product is 100 ppm, with a typical level of 30 ppm. This information is provided to assist users of this product that conduct business in California in discharging any warning obligations that that person may have under California Proposition 65.

Other State Chemical Lists: This product may contain certain chemicals that are identified on state chemical lists.



Section 16. Other Information

Disclaimer: The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product.

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