Section1- Product and Company Identification

Product Name:	Glycidyl methacrylate, **GMA**
Company Name:	Weicheng Advanced Material (Shandong) Co.,Ltd.
Address:	Fuqian Road, Zouwu Chemical Industry Park, Xuecheng District, Zaozhuang City, Shandong Province
Zip Code:	277000
Tel:	+86-21-5187 0801
Fax:	+86-21-5156 7101
State Emergency Tel:	86-0532-83889090

Section 2 - Hazards Identification

GHS- classification and hazard statement

Acute toxicity - oral	Category 4	H302	Harmful if swallowed
Acute toxicity - dermal	Category 3	H311	Toxic in contact with skin.
Skin corrosion	Category 1C	H314	Causes severe skin burns and eye damage.
Serious eye damage	Category 1	H318	Causes serious eye damage.
Skin sensitisation	Category 1A	H317	May cause an allergic skin reaction.
Reproductive toxicity	Category 1B	H360	May damage fertility or the unborn child
Germ cell mutagenicity	Category 2	H341	Suspected of causing genetic defects
Carcinogenicity	Category 1B	H350	May cause cancer
Specific target organ toxicity - single	Category 3	H335	May cause respiratory irritation.
Specific target organ toxicity - repeated	Category 1	H372	Causes damage to organs

Label elements

Labelling according Regulation (EC) No 1272/2008

Pictogram

Signal word Danger

Hazard statement

H302	Harmful if swallowed
H311	Toxic in contact with skin.
H314	Causes severe skin burns and eye damage.
H317	May cause an allergic skin reaction.
H341	Suspected of causing genetic defects.
H350	May cause cancer.
H360	May damage fertility or the unborn child
H335	May cause respiratory irritation.
H372	Causes damage to organs

Precaution Statement

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P260	Do not breathe dust/fume/gas/mist/vapours/spray.
P264	Wash ... thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P271	Use only outdoors or in a well-ventilated area.
P272	Contaminated work clothing should not be allowed out of the workplace

P363	Wash contaminated clothing before reuse.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P301+P312	IF SWALLOWED: Call a POISON CENTER/doctor/... if you feel unwell.
P301+P330+P331	IF SWALLOWED: rinse mouth. Do NOT induce vomiting.
P303+P361+P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P310	Immediately call a POISON CENTER/doctor/…
P312	Call a POISON CENTER/doctor/.../if you feel unwell.
P314	Get medical advice/attention if you feel unwell.
P333+P313	If skin irritation or rash occurs: Get medical advice/attention.
P322	Specific measures (see ... on this label).
P308+P313	IF exposed or concerned: Get medical advice/attention.
Storage(s)	
P403+P233	Store in a well-ventilated place.Keep the container closed.
P405	Storage must be locked.
Abandon(s)	
P501	Dispose of contents/containers to approved waste treatment plants.
Other hazards	None

Section 3 - Composition/Information on Ingredients

Chemical Name	Cas No.	Chemical Formula	Content
Glycidyl Methacrylate	106-91-2	$C_7H_{10}O_3$	100%

Section 4 - First aid measures

INHALATION
Move any exposed person to fresh air at once. Keep warm and at rest. If there is respiratory distress give oxygen. If respiration stops or shows signs of failing, apply artificial respiration (if by mouth to mouth: use rescuer protection such as pocket mask, etc). Get medical attention immediately.

INGESTION
Wash out mouth with water and give plenty of water to drink, provided person is conscious. Do not induce vomiting. Get medical attention immediately.

SKIN CONTACT
Immediately wash skin with plenty of running water and non-abrasive soap, under a shower if affected area is large enough to warrant this, while removing contaminated clothing and shoes. Get medical attention immediately
Destroy contaminated leather items such as shoes, belts, and watchbands. First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection).

EYE CONTACT
Rinse immediately eye with plenty of low pressure water for at least 30 minutes. Remove any contact lenses. Get medical attention immediately preferably from an ophthalmologist.

NOTES TO PHYSICIAN
Due to irritant properties, swallowing may result in burns/ulceration of mouth, stomach and lower gastrointestinal tract with subsequent stricture. Aspiration of vomitus may cause lung injury. Suggest endotracheal / oesophageal control if lavage is done. Respiratory symptoms, including pulmonary oedema, may be delayed. Persons receiving significant exposure should be observed 24-48 hours for signs of respiratory distress. Maintain adequate ventilation and oxygenation of the patient. Chemical eye burns may require extended irrigation. Obtain prompt consultation, preferably from an ophthalmologist. If burn is present, treat as any thermal burn, after decontamination. No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

Medical Conditions Aggravated by Exposure:
Excessive exposure may aggravate pre-existing asthma and other respiratory disorders (e.g. emphysema, bronchitis, reactive airways dysfunction syndrome).

Section 5 - Fire Fighting Measures

EXTINGUISHING MEDIA
Glycidyl methacrylate is a combustible liquid (class IIIA).
For small fires, use dry chemical, carbon dioxide, water spray or foam. Alcohol resistant foams (ATC type) are preferred. General purpose synthetic foams (including AFFF) or protein foams may function, but will be less effective.
For large fires, use water spray, fog, or foam. Use water spray to cool fire-exposed containers. Do NOT use straight streams of water.

SPECIAL FIRE FIGHTING PROCEDURES
Keep people away. Isolate fire and deny unnecessary entry. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of re-ignition has passed. Fight fire from protected location or safe distance. Consider the use of unmanned hose holders or monitor nozzles. Immediately withdraw all personnel from the area in case of rising sound from venting safety device or discoloration of the container. Do not use direct water stream. May spread fire. Move container from fire area if this is possible without hazard. Burning liquids may be moved by flushing with water to protect personnel and minimize property damage. Water fog, applied gently may be used as a blanket for fire extinguishment.

UNUSUAL FIRE & EXPLOSION HAZARDS
Container may rupture from gas generation in a fire situation.
Violent steam generation or eruption may occur upon application of direct water stream to hot liquids.

SPECIFIC HAZARDS
During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Carbon monoxide and Carbon dioxide.

PROTECTIVE MEASURES IN FIRE
Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). Avoid contact with this material during fire fighting operations. If contact is likely, change to full chemical resistant fire fighting clothing with self-contained breathing apparatus. If this is not available, wear full chemical resistant clothing with self-contained breathing apparatus and fight fire from a remote location. For protective equipment in post-fire or non-fire clean-up situations, refer to the relevant sections of this SDS.

Section 6- Accidental Release Measures

PERSONAL PRECAUTIONS
See section 8.
Evacuate area. Only trained and properly protected personnel must be involved in clean-up operations. Keep upwind of spill. Ventilate area of leak or spill.

ENVIRONMENTAL PRECAUTIONS
Take precautionary measures against discharges into the environment.

SPILL CLEAN UP METHODS
Contain spilled material if possible and dike area to contain spill.
Absorb spill with inert material (e.g. polyethylene or polypropylene fiber products, sand or earth), then place in suitable container with shovel.
Do NOT use absorbent materials such as: cellulose, clay, sawdust, Milsorb®. Drierite, Absorn-n-dri.
Clean up spills immediately, observing precautions in the Protective Equipment section.

Section 7- Handling and Storage Measures

USAGE PRECAUTION
Only to be handled and used under very well controlled conditions in closed systems as industrial feedstock for further synthesis (mainly polymerisation)
Do not get on skin or clothing. Do not swallow. Avoid contact with eyes. Use only in a well-ventilated area and avoid inhalation.
Glycidyl methacrylate is stable under recommended storage conditions. Elevated temperatures can cause hazardous polymerisation. Polymerisation can be catalysed by the absence of air, the presence of free radical initiators and peroxides, acids, UV light, bases or high temperature. GMA usually contains an inhibitor (stabiliser) to minimise polymerisation (ca 100 ppm mequinol CAS #150-76-5, EC #205-769-8).

Wash thoroughly after handling. Empty containers retain product residue, (liquid and/or vapour), and can be dangerous. Keep container tightly closed. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.

STORAGE PRECAUTIONS
Keep away from heat, sparks, and flame. Keep away from sources of ignition. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Store away from direct sunlight or UV light. Use containers from non-UV transmitting material. Maintain inhibitor and dissolved oxygen level. Do not purge containers of this material with nitrogen. Uninhibited monomer vapours can polymerize and plug relief devices.
Shelf life: Use within 12 months
Storage temperature: < 25 °C

Section 8 - Exposure Controls, Personal Protection

EXPOSURE LIMITS
None listed.

USE LIMITS
Only to be handled and used under very well controlled conditions in closed systems as industrial feedstock for further synthesis.

PNECs (see also section 12)
PNEC Aqua freshwater 0.01 mg/L Sediment freshwater 0.09 mg/kg sediment dw
Marine water 0.001 mg/L Sediment marine water 0.009 mg/kg sediment dw
Sewage treatment plant 10 mg/L Agricultural soil 0.09 mg/kg soil dw

DNELs/DMELs
The main derived long-term DNELs/DMELs for long term systemic effects for glycidyl methacrylate are:
Workers General population Type
Oral not relevant 2.3 µg/kg bw/day DMEL
Dermal 12.76 µg/kg bw/day 2.3 µg/kg bw/day DMEL
Inhalation 45 µg/m3 4.0 µg/m3 DMEL

The CHESAR v2.3 tool and exposure model for this substance shows for indoor industrial activities taking more than 4 hours/day, with local exhaust ventilation (LEV) present (and running), provided workers wear masks with at least 95% respiratory protection and gloves with at least 95%/99% dermal protection, the following exposures:

Inhalation dermal RCR RCR RCR Dermal Max nr of
mg/m3 mg/kg/d inhalation dermal total protection working hours
PROC1 0.002 0.002 0.046 0.133 0.179 95% 8
Use in closed process, no likelihood of exposure
PROC2 0.021 0.007 0.461 0.537 0.998 95% 8
Use in closed, continuous process with occasional controlled exposure
PROC3 0.012 0.003 0.276 0.269 0.545 95% 1
Use in closed batch process (synthesis or formulation)
PROC8b 0.01 0.0068 0.230 0.538 0.768 99% 1
Transfer of chemicals from/to vessels/large containers at dedicated facilities
PROC9 0.021 0.0068 0.461 0.538 0.999 99% 1
Transfer of chemicals into small containers (dedicated filling line)
PROC15 0.021 0.002 0.461 0.133 0.594 95% 1
Use as laboratory reagent

The applied RMMs/OCs will also control the risks relating to skin & eye damage / corrosion (H314) and skin sensitisation (H317).
Notes:
• The outcome of ECETOC TRA v3 (10 April 2012) is identical to CHESAR v2.3
• Good general ventilation is assumed in all cases (3-5 air exchanges per hour)
• PROC4 (Use in batch and other process (synthesis) where opportunity for exposure arises) is not shown but gives the same results as PROC9
• PROC1, PROC2 and PROC15 require gloves with at least 95% dermal protection, and all other PROCs 99%
• LEV is considered for both inhalation and dermal exposures and its efficiencies are as follows:
o For PROC1 LEV is not an exposure modifier
o For PROC2, PROC3, PROC9 and PROC15 LEV reduces both inhalation and dermal exposure with 90%
o For PROC8b LEV reduces both inhalation and dermal exposure with 95%
• The number of working hours is determined by the inhalation exposure
o PROC 3, 8b, 9 and 15 are only allowed for less than 1 hour activity per day
• Professional and consumer use is strictly forbidden

Consumer exposure: Glycidyl methacrylate is produced, handled and used in a closed system under very well controlled conditions at industries as monomer for the synthesis of polymers and as an intermediate for further chemical synthesis. Therefore consumer exposure will be very limited.

GENERAL
At all times strict engineering controls should prevent direct exposure (even accidental) to GMA. However, as an extra measure in case these engineering controls would fail, respiratory and skin protection as mentioned below are required. Personal protective equipment can never be an alternative to engineering controls but is always additional. GMA is only approved and registered for a very limited number of industrial uses. Professional and consumer uses are forbidden.

MAXIMUM DURATION OF ACTIVITY
For PROC3, 8b, 9 and 15 max 1 hour per day.

PROTECTIVE EQUIPMENT
Protective gloves, boots, safety goggles, respiratory mask and protective clothing.

RESPIRATORY EQUIPMENT
Wear positive pressure self-contained breathing apparatus classified under EN 137:2006 and give operators specific training. Cartridges must be discarded after each working day.

HAND PROTECTION
Wear appropriate protective gloves to prevent skin exposure. Use chemically resistant gloves classified under EN 374, class 6 (breakthrough time > 480 minutes) and made of butyl rubber with a minimal thickness of 0.3 mm (preferably 0.7 mm). Give operators specific training. An advanced occupational health and safety management system must be in use. Discard gloves after one working day or when they have come into direct contact with the substance.

EYE PROTECTION
Wear approved safety goggles classified under EN 166:2001.

HYGIENE MEASURES
Wash at the end of each work shift and before eating, drinking, smoking or using the toilet.

SKIN PROTECTION
Wear protective clothing and boots.

Section 9 - Physical and Chemical Properties

a) Appearance:	clear, colorless liquid
b) Odor:	Fruity (ester-like)
c) Odour Threshold	No data available
d) PH:	No data available
e) Melting point/freezing point	Melting point/freezing point: -41.49 °C at ca.1,013 hPa
f) Initial boiling point and boiling range	189 °C - lit.
g) Flash point	76 °C - closed cup, 84 °C - open cup
h) Evaporation rate	No data available
i) Flammability (solid, gas)	No data available
j) Upper/lower flammability or explosive limits	No data available
k) Vapour pressure	ca.4.2*100 Pa at 25 °C
l) Vapour density	No data available
m) Relative density	1.071 g/mL at 25 °C - lit.
n) Water solubility	ca.50 g/l at 25 °C
o) Partition coefficient: noctanol/water	log P(octanol/water)=0.96 at 25 °C
p) Auto-ignition temperature	389 °C
q) Decomposition temperature	No data available
r) Viscosity	5.481 cP at 2 °C
s) Explosive properties	No data available
t) Oxidizing properties	No data available

Section 10 - Stability and Reactivity

STABILITY
Combustible liquid. Stable at room temperature. However, it may undergo explosive polymerization if uninhibited.

MATERIALS TO AVOID
Avoid unintended contact with activated carbon or silica gel, as this may cause polymerisation. Also avoid contact with cellulose or clay based absorbents, and with incompatible materials such as oxidising or reducing agents, strong acids and bases, metals (cast iron, mild steel, copper, brass) and metal oxides.

CONDITIONS TO AVOID
Incompatible materials, ignition sources.

HAZARDOUS DECOMPOSITION PRODUCTS
(CO)x, carbon monoxide, carbon dioxide.

Section 11 - Toxicological Information

ACUTE TOXICITY
Dermal, rabbit: LD50 = 480 mg/kg
Inhalation, rat: LC0 = 2394 mg/m3/4H
Oral, rat: LD50 = 597 mg/kg

CARCINOGENICITY
Glycidyl methacrylate is due to its metabolism to glycidol carcinogenic category 1B. The T25 is 57 mg/kg bw/d.

INHALATION
May cause respiratory tract irritation.

INGESTION
Harmful if swallowed. Swallowing may result in gastrointestinal irritation or ulceration. Swallowing may result in burns of the mouth and throat. Aspiration into the lungs may occur during ingestion or vomiting, causing tissue damage or lung injury.

SKIN CONTACT
Toxic in contact with skin. May be absorbed through the skin in toxic amounts.
Causes skin corrosion.
May cause skin sensitisation.

EYE CONTACT
Causes serious eye damage.
May cause severe corneal injury. Effects may be slow to heal. Vapour may cause corneal injury.

TOXICOKINETCS, METABOLISM, DISTRIBUTION
In rabbits, after an iv injection of 200 mg/kg, more than 95% of the substance disappeared from the blood within 10 minutes. It is quickly metabolised by the carboxyl esterase route to glycidol.

REPEATED DOSE TOXICITY
The major toxicity is tissue damages in the first exposure sites such as the fore stomach after oral administration and the respiratory tract after inhalation, due to irritation.

GENOTOXICITY
Most in vitro genotoxicity studies show positive results. In an in vivo micronucleus test, oral administration of glycidyl methacrylate increased the frequency of micronucleated polychromatic erythrocytes only at the highest dose (750 mg/kg in male and 1000 mg/kg in female mice), although mostly negative results were shown in

other in vivo genotoxicity studies including micronucleus tests by intraperitoneal administration. Glycidol, a metabolite of glycidyl methacrylate, is classified as a Category 2 germ cell mutagen under REACH and CLP. Based on the available studies for glycidyl methacrylate itself and data for glycidol , glycidyl methacrylate is considered to be a substance with genotoxic potential.

TOXICITY TO REPRODUCTION
In rat studies a decreased fertility index (number of delivered animals / number of mated animals) was seen at 100 mg/kg. This is supported by studies in mice showing an increase in the percentage of abnormal sperm and decrease in the number of sperm. GMA is classified as toxic to reproduction category 1B.

DEVELOPMENTAL TOXICITY
No teratogenic effects were seen, not even at dose levels which caused maternal toxicity.

Section 12 - Ecological Information

ECOTOXICITY
LC50 (freshwater fish, 96h): 2.8 mg/l
EC50 (Daphnia, 48h): 24.9 mg/l
EC50 (Algae, 72h): 14.6 mg/l

Acute and chronic toxicity data of glycidyl methacrylate to aquatic organisms are summarized as follows:
As the lowest acute and chronic toxicity data, 14 day LC50 of Oryzias latipes (1.9 mg/l) and 21 day NOEC (reproduction) of Daphnia magna were selected (1.02 mg/l), respectively.
An assessment factor of 100 was chosen and applied to the chronic toxicity data to determine PNEC, because chronic toxicity data for fish were not available. Thus, PNEC (aqua fresh-water) of gycidyl methacrylate is 0.01 mg/l.
The CHESAR v2.3 tool predicts the following for the relevant ERCs 1/2/6a/6c/6d (with fraction of tonnage to region = 1):
ERC1 ERC2 ERC6a/6c ERC6d
PEC RCR PEC RCR PEC RCR PEC RCR
PEC for local freshwater 0.01 0.968 0.01 0.968 0.01 0.968 6.7e-5 0.007mg/l
PEC for freshwater sediment 0.067 0.743 0.067 0.743 0.067 0.743 4.63e-4 0.005mg/kg dw
PEC for marine water (mg/l) 0.001 0.968 0.001 0.968 0.001 0.968 6.6e-6 0.007mg/l
PEC for marine water sediment 0.007 0.743 0.007 0.743 0.007 0.743 4.54e-5 0.005mg/kg dw
PEC for STP 0.097 0.01 0.097 0.01 0.097 0.01 6.04e-4 6.0e-5mg/l
PEC for agricultural soil 0.004 0.045 0.004 0.047 0.004 0.043 0.001 0.014mg/kg dw
Man via the environment n.a. 0.509 n.a. 0.665 n.a. 0.394 n.a. 0.964 total

Max tonnage to be used per day 1 3 7.5 7.5
Maximum tonnage to be used per year 350 1000 2500 1250

ERC1 = manufacture
ERC2 = formulation
ERC6a = Industrial use as intermediate for further processing (not under strictly controlled conditions)
ERC6c = Industrial use of monomers for manufacture of thermoplastics
ERC6d = Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers

Note: the RMMs / OCs are a sewage treatment plant with 67.77% efficiency. ERC1 and ERC2 require filtration/scrubbing with an effectiveness of 99% water / 90% air (ERC 6a/6c/6d require 99% water / 99% air).

Glycidyl methacrylate is not a Persitent/Bioaccumulative (PB) or a veryPersitent/veryBioaccumulative (vP/vB) substance, and readily biodegradable but not meeting the 10 day window. It is Toxic (T).

WATER HAZARD CLASSIFICATION
According to the German VwVwS: WGK: 1 (low danger for water pollution)

Section 13 - Disposal Considerations

GENERAL INFORMATION
Place into a suitable closed container for disposal.

DISPOSAL METHODS
Dispose of in accordance with local and national regulations. This product, when being disposed of in its unused and uncontaminated state should be treated as a hazardous waste. Do not dump into any sewers, on the ground, or into any body of water. DO NOT CUT, DRILL, GRIND, WELD OR PERFORM SIMILAR OPERATIONS ON OR NEAR CONTAINERS EVEN WHEN EMPTY.

Section 14 - Transport Information

UN number

ADR/RID: 2922	IMDG: 2922	IATA: 2922

UN proper shipping name

ADR/RID:	CORROSIVE LIQUID, TOXIC, N.O.S. (Glycidyl methacrylate)
IMDG:	CORROSIVE LIQUID, TOXIC, N.O.S. (Glycidyl methacrylate)
IATA:	Corrosive liquid, toxic, n.o.s. (Glycidyl methacrylate)

Transport hazard class(es)

ADR/RID: 8 (6.1)	IMDG: 8 (6.1)	IATA: 8 (6.1)

Packaging group

ADR/RID: III	IMDG: III	IATA: III

Environmental hazards

ADR/RID: no	IMDG Marine pollutant: no	IATA: no

Special precautions for user: No data available
Packages: Iron Drum
Precautions for transportation: check whether the packaging container is complete and sealed before transportation, and ensure that the container does not leak, collapse, fall or damage during transportation.It is strictly prohibited to mix with oxidant, acid, alkali, food chemicals, etc.Transport vehicles and vessels must be thoroughly cleaned and disinfected, or no other goods may be shipped.When shipping, the fitting position should be far away from bedroom, kitchen, and isolated from engine room, power supply, fire source and other parts.When carrying goods by road, we should follow the prescribed route.

Section 15 - Regulatory Information

Regulatory information: hazardous chemical materials safety management regulations (promulgated by the state council on March 15, 2002), the chemical dangerous goods safety management regulations, implementing rules (lowe hair [1992] no. 677), using chemicals workplace safety regulation (labor department is sent [1996] no. 423), such as laws and regulations, for the safe use of hazardous chemicals, production, storage, transportation, loading and unloading and so on all has made the corresponding provisions;Classification and labelling of commonly used hazardous chemicals (GB 13690-92).

Section 16 - Additional Information

References:
MSDS Creation Date: Oct. 20, 2012
Creation Department: Weicheng Advanced Material (Shandong) Co.,Ltd.
Data audit unit: Weicheng Advanced Material (Shandong) Co.,Ltd.
Revision date: 17th Jan. 2022