



AGE ENTERPRISE CO. LTD

SAFETY DATA SHEET

Original MSDS Preparation Date 22/11/2009

Latest Revision Date 07/01/2022

SECTION 1 : IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF THE COMPANY / UNDERTAKING

1.1. Product Identifier

Product Name GEM-MASTER 1.81 REFRACTIVE INDEX LIQUID

1.2. Relevant Identified Uses of the Substance or Mixture and uses advised against

Recommended Use : Produced solely for use in gemological refractometry, as an optical contact liquid. For use strictly by qualified gemologists, jewelry professionals or students under supervision, in a suitably appointed laboratory, workplace or classroom. Specially packaged, in a limited quantity of 3.2 ml and used in a single droplet of 1 to 2 mm in diameter per application.

Uses Advised Against : Not applicable

1.3. Details of the supplier of the safety data sheet

Company : AGE Enterprise Co. Ltd.,

Address : 999/826 Soi Mooban Setthakit 31,
Bangkhae Neua, Bangkhae,
Bangkok 10160, Thailand.

Telephone (Bss. Hrs.) +66 2808 0481

E-mail address : info@gem-master.com

1.4. Emergency Telephone Number

(24 Hours / 7 Days) : +66 868 447 440

SECTION 2 : HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

Hazard Class / Category : Acute Toxicity / GHS Category 4

Hazard Statements : H302 - Harmful if swallowed
H332 - Harmful if inhaled

H313 - May be harmful in contact with skin

H315 - Causes skin irritation
H319 - Causes serious eye irritation
H335 - May cause respiratory irritation

Precautionary Statements : P261 - Avoid breathing vapour
P262 - Do not get in eyes, on skin or on clothing
P270 - Do not eat, drink or smoke when using this product
P271 - Use only in a well ventilated area

2.2. Label Elements

Symbols / Pictograms :



Signal Word : WARNING

Supplemental Information : THIS PRODUCT CONTAINS METHYLENE IODIDE AND TETRAIODOETHYLENE. HARMFUL LIQUID AND VAPOUR. HARMFUL IF SWALLOWED OR INHALED. AVOID CONTACT WITH SKIN AND EYES. USE ONLY AS RECOMMENDED IN A WELL VENTILATED AREA. TIGHTEN CAP SECURELY AFTER USE AND STORE SAFELY. REFER TO THE DETAILED INFORMATION SHEET INSIDE THE BOX.

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SECTION 3 : COMPOSITION / INFORMATION ON INGREDIENTS

3.1. Components of the Mixture

Component	Other Names	Cas No.	EC No.	GHS Hazard Category	Weight %
(1) Methylene Iodide	Diiodomethane	75-11-6	200-841-5	⚠ Acute Tox. 4 (H302/H332/H313) ⚠ Skin Irritant 2 (H315) ⚠ Eye Irritant 2A (H319)	> 60 %
(2) Tetraiodoethylene	Periodoethylene	513-92-8	208-176-2	⚠ Skin Irritant 2 (H315)	(CBI)
(3) Sulfur	Brimstone	7704-34-9	231-722-6	⚠ Skin Irritant 2 (H315)	(CBI)

3.2. Additional Information

- a) The percentages for components (2) and (3), due to this being confidential business information (CBI) / a trade secret.
- b) Both components (2) and (3) are less hazardous than component (1). Neither of them increase the hazardous properties of the mixture.
- c) The mixture is supplied in a limited quantity of 3.2 ml. The bottle is fitted with a special, 'restrictor' neck-insert, which prevents accidental ingestion, minimises spillage and reduces the emission of vapour.

SECTION 4 : FIRST AID MEASURES

4.1. Description of first aid measures

- In case of Ingestion :** Immediately wash out mouth. Give several glasses of water to drink. Do not induce vomiting. Seek immediate medical attention.
- In case of Inhalation :** Move to fresh air. If necessary, seek medical attention.
- In case of Skin Contact :** Immediately remove any contaminated clothing, then wash the affected area with soap and water and rinse thoroughly. Check for any residual odour and, if necessary, wash again. If irritation develops or persists, seek medical attention.
- In case of Eye Contact :** Immediately flush eye(s) with running water, holding eyelid(s) open. Continue at intervals for 15 minutes. If irritation develops or persists, seek medical attention.

4.2. Most important symptoms and effects, both acute and delayed

None, either reported or reasonably expected.

4.2. Indication of any immediate medical attention and special treatment needed

None, either reported or reasonably expected.

SECTION 5 : FIREFIGHTING MEASURES

5.1. Extinguishing Media

Suitable Extinguishing Media : Water Spray / Carbon Dioxide (CO₂) Foam.

5.2. Special hazards arising from the substance or mixture

Thermal decomposition may result in release of irritating gases and vapours, including : Carbon Monoxide (CO) / Carbon Dioxide (CO₂) / Hydrogen Iodide (HI).

5.3. Advice for firefighters

Treat the same as any other fire involving chemicals and wear approved, self-contained, breathing apparatus.

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SECTION 6 : ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

In the event of breakage or an accident resulting in spillage :

- a. Wear suitable protective gloves and immediately clean up with absorbent paper tissue.
- b. In case of skin contact, remove any contaminated clothing and wash affected area with soap and water. Check for any residual odour and, if necessary, wash again.
- c. Thoroughly clean all contaminated surfaces using an industrial grade detergent.
- d. Increase ventilation to the area to disperse any residual odours.
- e. Place contaminated clothing and waste materials in sealable bags or containers and remove from the work area. Dispose of waste material according to statutory regulations.

6.2. Environmental Precautions

No Issues expected / None required.

SECTION 7 : HANDLING AND STORAGE

7.1. Specific end use :

This product is supplied exclusively for use in Gemological Refractometry (Gem Testing), either by qualified professionals and semi-professionals or students under supervision. All persons using this product are advised to fully familiarize themselves with the following recommended handling and safety procedures :

7.2. Precautions for safe handling

- 7.2.1 (In Use)** :
- : Always use in a properly ventilated area and wear suitable protective clothing.
 - : Do not eat, drink or smoke while using this liquid.
 - : Use only the smallest amount (typically 1 droplet), sufficient to create optical contact, between the surface of the gemstone under test and the refractometer prism / hemicylinder.
 - : Replace the cap on the bottle immediately after each application.
 - : When working, keep the bottle at arms length, away from hot lamps and warm surfaces or equipment.
 - : When positioning a gemstone on the refractometer prism, do not use fingers. Rather, use a non-scratching tool, such as plastic or plastic-tipped tweezers, a wooden or plastic rod, a rubber-ended pencil, etc.
 - : When finished testing, remove all traces of the liquid from the refractometer prism and prism-plate, using a soft, absorbent tissue (Alcohol or Acetone may be used to remove any dried residue). Dispose of the waste tissue into a sealable plastic bag or container.
- 7.2.2 (Spillage)** :
- : Refer to Section 6. Accidental Release Measures.
- 7.2.3 (After Use)** :
- : Securely tighten the cap on the bottle and then store safely. In order to maintain an optimum seal, periodically clean the inside of the cap and bottle threads with Acetone to remove any built up deposits of crystals (make sure that no Acetone enters the bottle !).
 - : Wash hands thoroughly using a laboratory grade hand cleaning soap. Check hands for any residual odour and if necessary wash again.
- 7.2.4 (Disposal)** :
- : Dispose of all contaminated waste materials in accordance with local regulations.

7.3 Conditions for safe storage, including any incompatibilities

- : Store in a warm, dry area @ 20 to 30°C (68 to 88°F).
- : Store away from direct light.
- : **Do Not** refrigerate.

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SECTION 8 : EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1. Control parameters

- Exposure limits** : Exposure limits have not been established for this product.
Biological limit values : Biological limit values have not been established for this product.
Monitoring methods : Monitoring methods have not been established for this product.

8.2. Exposure controls

- Engineering Methods** : Not Applicable
Personal protection Equipment : Skin & Body : Laboratory Coat or similar (Recommended)
: Nose & Mouth : Face-Mask (Recommended)
: Eyes : Safety glasses (Recommended)
: Hands : Disposable latex gloves (Optional)

SECTION 9 : PHYSICAL AND CHEMICAL PROPERTIES

8.2. Information on basic physical and chemical properties

- Appearance (Form & Colour)** : Clear, amber colored liquid
Odor : Characteristic (Similar to Chloroform)
pH : Not determined
Freezing / Melting Point : 5 to 6 °C (41-43 °F)
Boiling Point : 181 °C (358 °F)
Flash Point : >110 °C (>230 °F)
Auto Ignition Temperature : Not Determined
Decomposition Temperature : Not Determined
Evaporation Rate : 1.0 approx. (Water = 1)
Vapor Pressure : 1.5 - 2.00 mm Hg
Vapor Density : >9 (Air = 1)
Relative Density : 3.15 approx.
Viscosity : 6.5 cP approx.
Solubility : Very slightly soluble in Water / Slightly soluble in Alcohol, Ethanol / Soluble in Acetone, Methylene Chloride, Methylene Iodide, Toluene.

SECTION 10 : STABILITY & REACTIVITY

- 10.1 Reactivity** : None, based on available information.
10.2 Chemical Stability : Stable under recommended storage conditions.
10.3 Light Stability : Darkens readily on exposure to light.
10.3 Possibility of hazardous reactions : Hazardous Polymerization - Will not occur.
: Hazardous Reactions - None under conditions of intended use.
10.4 Conditions to avoid : Prolonged or excessive Heat.
10.5 Incompatible Materials : None under conditions of intended use.
10.6 Hazardous decomposition products : Carbon Monoxide, Carbon Dioxide, Iodine Oxides, Hydrogen Iodide

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SECTION 11 : TOXICOLOGICAL INFORMATION

11.1 Information on Toxicological Effects

a) Acute Toxicity :

ATEMIX LD50 (Rat), Oral : 400 mg/kg (GHS Acute Toxicity, Hazard Category 4)

b) Skin Corrosion / Irritation : Causes Skin Irritation (GHS Skin Irritation Category 2)

c) Eye Damage/Irritation : Causes serious Eye Irritation (GHS Eye Irritation Category 2A)

d) Respiratory/Skin sensitization :

Respiratory : No information available

Skin : No information available

e) Germ Cell Mutagenicity : No information available

f) Carcinogenicity : According to IARC Monographs, ACGIH, NIOSH, NTP and OSHA, none of the ingredients of this product are listed as either known or suspected carcinogens.

g) Reproductive Toxicity : No information available

h) STOT (Single Exposure) : May cause respiratory irritation (GHS STOT Category 3)

i) STOT (Repeated Exposure) : No information available

j) Aspiration Hazard : No information available.

SECTION 12 : ECOLOGICAL INFORMATION

Toxicity :

Aquatic Toxicity : May be harmful to aquatic life

Persistence & Degradability : No relevant information

Bioaccumulative potential : No relevant information

Mobility in soil : No relevant information

Additional Ecological Information : None

General notes : Due to the small volume of the product (3.2 ml) and its' long shelf-life, there is virtually no need to discard unused material. When an 'empty' bottle is finally discarded any remaining liquid has already been safely removed. Environmental contamination is therefore not an issue.

SECTION 13 : DISPOSAL CONSIDERATIONS

13.1 Waste Treatment Methods

Recommendation : When a bottle is finished and no more liquid can be withdrawn by the applicator rod, there will be a minute quantity of liquid remaining. This can be safely removed, with the 'neck-insert' in place, as follows :

1) Choose a safe area, preferably outside, then simply remove the cap and let the bottle stand for a few days to allow the small quantity of liquid residue to evaporate.

2) Up-end the bottle over a paper towel and shake until there is no remaining liquid,

After replacing the cap, dispose of the bottle and any waste material responsibly.

: All waste containers which have contained hazardous chemicals and contaminated absorbent materials are classed as hazardous waste and should be disposed of in accordance with local regulations.

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SECTION 14 : TRANSPORT INFORMATION

DOT / ADR / IMDG / IMO / IATA

- 14.1 UN-Number : Not Regulated
- 14.2 UN proper shipping name : Not Required
- 14.3 Transport Hazard Class(es) : Not Required
- 14.4 Packing Group : Not Required
- 14.5 Environmental Hazards
- Marine Pollutant : No
- 14.6 Special precautions for user : None
- 14.7 Transport in bulk : Not applicable

SECTION 15 : REGULATORY INFORMATION

15.1 Safety, health and environmental regulations / legislation specific for the substance or mixture

International Inventories : Details / mention of the hazardous components in the product are included in the following inventory lists.

Europe / Asia / Australasia

Chemical Name	EINECS	ENCS	IECSC	PICCS	KECL	AICS	NZIoC
Diiodomethane	Yes	Yes	Yes	Yes	No	Yes	Yes
Tetraiodoethylene	Yes	No	No	Yes	No	No	Yes

United States / Canada

Chemical Name	TSCA	DSL	NDSL
Diiodomethane	Yes	Yes	Yes
Tetraiodoethylene	Yes	Yes	Yes

EPA / SARA : Extremely Hazardous substances / Specific Toxic Chemical listings

Chemical Name	All Lists
Diiodomethane	No
Tetraiodoethylene	No

15.2 Chemical safety assessment : A chemical safety assessment (CSA) has not been conducted.

SECTION 16 : OTHER INFORMATION

This Safety Data Sheet has been prepared in compliance with current competent authority guidelines and summarises to the best of our knowledge, the health, safety and hazard information of the product. Each person using the product should read this, together with the general information sheet provided with each bottle and consider the information in the context of how the product will be used in their own workplace.

Disclaimer :

The information contained herein is based on information available at the time of preparation and is believed to be correct. No warranty or guarantee of any kind, either expressed or implied, is made with respect to the information presented. It is the users' sole responsibility to determine the suitability, for his or her own use, of the product as described.

Date of preparation (Latest Revision) : 07/01/2022

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Meanings of Terms & Abbreviations used in this Safety Data Sheet

Acute Toxicity	- The harmful effect of a single or short term exposure to a toxic substance.
ADR	- European Agreement on the International Carriage of Dangerous Goods by Road.
AICS	- Australian Inventory of Chemical Substances (Australia)
ATE_{Mix}	- Acute Toxicity Estimate of a mixture.
CAS	- Chemical Abstract Service (USA)
CBI	- Confidential Business Information / Trade Secret
Chronic Toxicity	- The harmful effect of long term exposure to a toxic substance.
CIECS	- China Inventory of Existing Chemical Substances (China)
C.I.U.	- Conditions of Intended Use
CLP	- Classification, Labelling & Packaging (EU)
Competent Authority	- Any National / International body or Authority involved with regulatory Initiatives
DSL	- Domestic Substances List (Canada)
EC / EU	- European Community / European Union
EC Number	- A reference number used to identify hazardous substances, registered with EINECS (EU).
ECHA	- European Chemicals Agency (EU)
EINECS	- European Inventory of Existing Commercial Chemical Substances (EU)
ENCS	- Existing and New Chemical Substances (Japan)
EPA	- Environmental Pollution Authority (USA / International)
GHS	- The Globally Harmonised System of Classification and Labelling of Chemicals (UN)
Hazard Category	- The degree or ranking (from 1 to 5) of the severity of hazard, within a particular Hazard Class, according to the GHS
Hazard Class	- Classification of the nature of the physical, health or environmental Hazard of a hazardous substance
Hazard Statement	- A statement and corresponding number, assigned to a Hazard Class or Hazard Category, that describes the nature of the hazard of a hazardous substance.
HMIS	- Hazardous Materials Identification System (US)
HSE	- UK Health & Safety Executive (UK)
IARC	- International Agency for Research on Cancer (UN)
IATA	- International Air Transport Authority
IMDG / IMO	- International Maritime Dangerous Goods Code / International Maritime Organisation
KECL	- Korean Existing and Evaluated Chemical Substances (Korea)
Label Element	- A pictogram or piece of information that has been harmonized for use in a label
MSDS	- Material Safety Data Sheet
NDSL	- Non-Domestic Substances List (Canada)
NZIoC	- New Zealand Inventory of Chemicals (New Zealand)
NIEHS	- National Institute of Environmental Health Sciences (USA)
NIOSH	- National Institute for Occupational Safety & Health (USA)
NOHSC	- National Occupational Health & Safety Commission (Australia)
NTP	- National Toxicity Program (US)
OSHA	- Occupational Safety & Health Administration (USA)
PICCS	- Phillipines Inventory of Chemicals & Chemical Substances (Phillipines)
Pictogram	- An internationally recognised graphic sign displaying a symbol, designed to represent the adverse nature or effect of a hazardous substance
Precautionary Statement	- A phrase and corresponding number that describes recommended measures that should be taken to limit or prevent adverse effects resulting from exposure to a hazardous substance.
REACH	- Registration, Evaluation & Authorisation of Chemical Substances (UN)
RTECS	- Registry of Toxic Effects of Chemical Substances (USA)
SDS	- Safety Data Sheet - replaces MSDS
Signal Word	- A word, included on a label, used to indicate the relative level of severity of hazard and alert the reader to a potential hazard (Eg. WARNING)
Supplemental Label Element	- Any non-harmonized information added to the label of a hazardous substance that is not required or specified under the GHS. In some cases this information may be required by other competent authorities or it may be added at the discretion of the manufacturer / distributor.
TRI	- Toxics Release Inventory (USA)
TSCA	- Toxic Substances Control Act (USA)
UN	- United Nations
WHMIS	- Workplace Hazardous Materials Information System (Canada)
WHO	- World Health Organisation (UN)

Key Sources of Information

Regulatory Agencies	- REACH / ECHA / GHS / CLP
Toxicological Data	- RTECS / PubChem / AltTox.org (various)
Textbooks, Manuals etc.	- Patty's Industrial Hygiene, CRC Manual of Pesticides (G.W. Milne), Gemmology (P. Reid)
Periodicals, Journals etc.	- Annals of Emergency Medicine, Nature, Minsocam, Australian Gemmologist.
Other References	- Suppliers Safety Data Sheets, direct discussions with selected individual manufacturers.