

## SAFETY DATA SHEET

Original MSDS Preparation Date 22/11/2009

Latest Revision Date 01/12/2019

### 1. PRODUCT / SUPPLIER IDENTIFICATION

**Product Name** : GEM-MASTER 1.81 REFRACTIVE INDEX LIQUID

**Conditions of Intended Use** : (C.I.U.) Produced solely for use in gemological refractometry, as an optical contact liquid. For use only by qualified gemologists, or students under supervision, in a suitably appointed laboratory or workplace. Supplied in a limited quantity pack ( 10gm / 3.2ml ). Used in a single droplet per application.

**Manufacturer / Supplier** : AGE Enterprise Co. Ltd.

**Address** : 999/826 Soi Mooban Setthakit 31,  
Bang Khae Neua, Bang Khae,  
Bangkok 10160, Thailand.

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### 2 HAZARDS IDENTIFICATION

#### 2.1 Classification of the Substance or Mixture

**Hazard Class / Category** : Acute Toxicity ( Oral/Dermal/Inhalation ) - GHS Category 4

**Hazard Statements** : H302 - Harmful if Swallowed  
H332 - Harmful if inhaled

: H313 - May be harmful in contact with skin  
H335 - May cause respiratory irritation.

: H316 - Causes mild skin irritation.  
H320 - Causes eye 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 / INHALED OR IN CONTACT WITH SKIN / EYES. USE ONLY AS RECOMMENDED IN A WELL VENTILATED AREA. TIGHTEN CAP SECURELY AFTER USE. STORE SAFELY. REFER TO DETAILED INFORMATION SHEET INSIDE THE BOX .

### 3. COMPOSITION / INFORMATION ON HAZARDOUS INGREDIENTS

<u>Chemical Name</u>	<u>Common Name</u>	<u>CAS No.</u>	<u>Formula</u>	<u>%</u>
Diiodomethane	Methylene Iodide	75-11-6	CH <sub>2</sub> I <sub>2</sub>	>60%
Tetraiodoethylene	Tetraiodoethylene	513-92-8	C <sub>2</sub> I <sub>4</sub>	CBI

#### **4. FIRST AID MEASURES**

- In case of Ingestion : Wash out mouth. Give several glasses of water. Do not induce vomiting. Seek immediate Medical attention.
- In case of Eye Contact : Immediately flush eyes with running water, holding eyelids open. Continue at intervals for 15 minutes. If irritation develops or persists, seek medical attention.
- In case of Inhalation : Move to fresh air. If necessary, seek medical attention.
- In case of Skin Contact : Wash immediately with soap and water. Rinse thoroughly. Check for any residual odour and if necessary, wash again.

#### **5. FIRE-FIGHTING MEASURES**

- Suitable Extinguishing Media : CO<sub>2</sub> Foams / Water Spray.
- Special Fire Fighting Equipment : Self Contained Breathing Apparatus ( if required ).
- Unusual Fire Hazards : Iodide fumes possible.

#### **6. ACCIDENTAL RELEASE MEASURES**

In the event of breakages and resulting product spillage, wear suitable protective gloves and immediately clean up using absorbent paper tissue. Remove any contaminated clothing. Clean contaminated surfaces thoroughly using an industrial grade detergent and increase ventilation to remove any strong odour. Place contaminated clothing and waste materials in separate, sealable plastic bags or containers and remove from the work area.

#### **7. HANDLING & STORAGE**

This product is supplied specifically for use in Gemmological 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 :

- Handling** - 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.
  - : 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 or repositioning 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 ). Immediately dispose of the waste tissue into a sealable plastic bag or container.
- Spillage : Refer to Section 6. Accidental Release Measures.
- After Use :
- : Securely tighten the cap on the bottle and then store safely.
  - : Wash hands thoroughly using a laboratory grade hand cleaning soap. Check hands for any residual odour and if necessary wash again.
- Disposal : Dispose of all contaminated waste materials in accordance with local regulations.

## 7. HANDLING & STORAGE ( Continued )

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

## 8. EXPOSURE CONTROLS

**Occupational Exposure Limits** : No data available.

**Personal Protective Equipment** :

- Skin and Body** : Laboratory Coat or similar ( Recommended )
- Hands** : Disposable latex gloves ( Optional )
- Eyes** : Safety glasses ( Optional )
- Nose & Mouth** : Face-Mask ( Optional )

## 9. PHYSICAL & CHEMICAL PROPERTIES

- Form & Appearance** : Clear, Amber Coloured Liquid.
- Odour** : Characteristic ( Similar to Chloroform )
- Refractive Index (  $n_D$  )** : 1.81 +/- 0.002 @ 25°C
- Specific Gravity** : 3.15 approx. @ 25°C
- Boiling Point** : 180°C approx.
- Freezing/Melting Point** : 5 to 6°C.
- Vapour Pressure** : 1.5 mm Hg, approx @ 25°C
- Relative Vapour Density** : >9 ( Air = 1 )
- Flash Point** : >110°C
- Percent Volatile by Volume** : >70%
- Solubility** : Insoluble in Water.  
Slightly Soluble in Ethanol, Turpentine.  
Soluble in Acetone, Methylene Chloride, Toluene.

## 10. STABILITY & REACTIVITY

- Reactivity** : Not Applicable
- Chemical Stability** : Stable under recommended storage conditions.
- Possibility of Hazardous Reactions** :
  - Hazardous Polymerisation** : Will not occur.
  - Hazardous Reactions** : None under Conditions of Intended Use.
- Conditions to Avoid** : Prolonged contact with aluminium and other metals.
- Incompatible Materials** : None under Conditions of Intended Use.
- Hazardous Decomposition Products** : Iodine Oxides, Hydrogen Iodide.

### 11. TOXICOLOGICAL INFORMATION

Acute Toxicity Estimate ( LD <sub>50</sub> - Oral )	: 500 mg/kg	( See Addendum )
“ “ “ ( LD <sub>50</sub> - Dermal )	: 1100 mg/kg	
“ “ “ ( LC <sub>50</sub> - Inhalation )	: 11.0 mg/L	
Irritation / Skin Corrosion	: No information available	
Sensitisation	: No information available	
Chronic Toxicity	: No information available	
Carcinogenicity / Mutagenicity	: IARC Monographs - Not Reported / Not listed ACGIH, NIOSH - Not Reported / Not listed NTP, OSHA - Not Reported / Not Listed	
Footnote	: This product does not present a toxicity hazard, in C.I.U., based on any generally known or supplied information.	

### 12. ECOLOGICAL INFORMATION

General Environment	: No issues expected.
Ecotoxicological	: No issues expected.

### 13. DISPOSAL CONSIDERATIONS

Containers ( Bottles )	: Fully drain, wash and rinse thoroughly prior to disposal.
Waste Material	: Dispose in accordance with applicable Local, State, National or International waste regulation authority recommendations.

### 14. TRANSPORT INFORMATION

Shipping Name	: Not Regulated.
UN No.	: Not Applicable
Class	: Not Applicable
Packing Group	: Not Applicable
Air Transport	: Not Dangerous Goods
Additional Information	: Gem-Master 1.81 Refractive Index Liquid is packed in individual, 'spill-proof', amber glass bottles, each containing a limited quantity of 10gm ( approx. 3.2ml ).

### 15. REGULATORY INFORMATION

Details / mention of the hazardous components in the product may be found on the following International Competent Authority inventory lists :

Chemical Name	AICS	DSL	EINECS	ENCS	IECSC	NDSL	PICCS	TSCA
Diiodomethane	Yes	Yes	Yes	Yes	Yes	-	Yes	Yes
Tetraiodoethylene	-	-	Yes	-	-	Yes	Yes	Yes

## 16. OTHER INFORMATION

The information supplied herewith, on the component ingredients of **Gem-Master 1.81 Refractive Index Liquid**, is based on available data relating to the individual hazardous ingredient substances as they are normally supplied, in standard commercial quantities, typically for industrial or laboratory use.

In view of the exclusive purpose of this product, the limited volume per individual container, the unique design of the closure and the minute quantity used in an application, it is considered that this material is not hazardous, provided that it is used and handled as recommended.

### Summary :

This Safety Data Sheet, which has been prepared in line with current competent authority guidelines, summarises to the best of the author's knowledge, the health and safety / hazard information of the product. Each person using the product should read this SDS, 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 data available at the time of preparation and is believed to be correct. No warranty or guarantee of any kind, either expressed or implied, can be 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 described herein.

## ADDENDUM

Refer Section 2. ( Hazards Identification ) & Section 11. ( Toxicological Information )

Hazard Class / Category : Acute Toxicity ( Oral/Dermal/Inhalation ) / Category 4 \*

Acute Toxicity Estimate ( LD<sub>50</sub> - Oral ) : 500 mg/kg  
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## GHS HAZARD CATEGORIES

Category	Oral ( LD <sub>50</sub> )	Dermal ( LD <sub>50</sub> )	Inhalation ( LC <sub>50</sub> )	Hazard Statement
1	≤ 5 mg/kg	≤ 50 mg/kg	≤ 0.5 mg/L	Fatal
2	> 50 mg/kg ≤ 50 mg/kg	> 50 mg/kg ≤ 200 mg/kg	> 0.5 mg/L ≤ 2.0 mg/L	Fatal
3	> 50 mg/kg ≤ 300 mg/kg	> 200 mg/kg ≤ 1000 mg/kg	> 2.0 mg/L ≤ 10.0 mg/L	Toxic
4 *	> 300 mg/kg ≤ 2000 mg/kg	> 1000 mg/kg ≤ 2000 mg/kg	> 10.0 mg/L ≤ 20.0 mg/L	Harmful
5	> 2000 mg/kg ≤ 5000 mg/kg	> 2000 mg/kg ≤ 5000 mg/kg	> 20.0 mg/L ≤ 50.0 mg/L	Maybe Harmful

## MEANINGS OF TERMS AND ABBREVIATIONS

### EITHER USED OR REFERRED TO

### IN THIS SAFETY DATA SHEET

<u>TERM / ABBREVIATION</u>	<u>MEANING</u>
<b>Acute Toxicity</b>	The harmful effect of a single or short term exposure to a toxic substance.
<b>AICS</b>	<i>Australian Inventory of Chemical Substances - Australia</i>
<b>ATE</b>	<i>Acute Toxicity Estimate ( GHS Guide to Hazards - Section 3.1.2 )</i>
<b>ADR</b>	<i>European Agreement on the International Carriage of Dangerous Goods by Road</i>
<b>CAS</b>	<i>Chemical Abstract Service - US</i>
<b>CBI</b>	<i>Confidential Business Information ( Trade Secret )</i>
<b>Chronic Toxicity</b>	The harmful effect of long term exposure to a toxic substance.
<b>CIECS</b>	<i>China Inventory of Existing Chemical Substances - China</i>
<b>CIU</b>	<i>Conditions of Intended Use</i>
<b>CLP</b>	<i>Classification, Labelling &amp; Packaging - EU</i>
<b>Competent Authority</b>	Any National / International body / Authority involved with GHS Initiatives
<b>DSL</b>	<i>Domestic Substances List - Canada</i>
<b>EC Number</b>	A reference number used by the <i>European Communities</i> to identify dangerous substances, in particular those registered with EINECS.
<b>ECHA</b>	<i>European Chemicals Agency - EU</i>
<b>EINECS</b>	<i>European Inventory of Existing Commercial Chemical Substances - EU</i>
<b>ENCs</b>	<i>Existing and New Chemical Substances - Japan</i>
<b>EPA</b>	<i>Environmental Pollution Authority - US / International</i>
<b>EU / EC</b>	<i>European Union / European Community</i>
<b>GHS</b>	<i>The Globally Harmonised System of Classification and Labelling of Chemicals - UN</i>
<b>Hazard Category</b>	The degree or ranking ( from 1 to 5 ) of the severity of hazard, within a particular <i>Hazard Class</i> , according to the <i>GHS</i>
<b>Hazard Class</b>	Classification of the nature of the physical, health or environmental Hazard of a hazardous substance
<b>Hazard Statement</b>	A statement and corresponding number, assigned to a <i>Hazard Class</i> or <i>Hazard Category</i> , that describes the nature of the hazard of a hazardous substance.
<b>HMIS</b>	<i>Hazardous Materials Identification System - US</i>
<b>HSE</b>	<i>UK Health &amp; Safety Executive - UK</i>
<b>IARC</b>	<i>International Agency for Research on Cancer - UN</i>
<b>Label Element</b>	A pictogram or piece of information that has been harmonized for use in a label
<b>MSDS</b>	<i>Material Safety Data Sheet</i>
<b>NDSL</b>	<i>Non-Domestic Substances List - Canada</i>
<b>NIEHS</b>	<i>National Institute of Environmental Health Sciences - US</i>
<b>NIOSH</b>	<i>National Institute for Occupational Safety &amp; Health - US</i>
<b>NOHSC</b>	<i>National Occupational Health &amp; Safety Commission - Australia</i>
<b>NTP</b>	<i>National Toxicity Program - US</i>
<b>OSHA</b>	<i>Occupational Safety &amp; Health Administration</i>
<b>PICCS</b>	<i>Phillipines Inventory of Chemicals &amp; Chemical Substances - Phillipines</i>
<b>Pictogram</b>	An internationally recognised graphic sign displaying a symbol, designed to represent the adverse nature or effect of a hazardous substance
<b>Precautionary Statement</b>	A phrase and corresponding number that describes recommended measures that should be taken to minimize or prevent adverse effects resulting from exposure to a hazardous substance.
<b>REACH</b>	<i>Registration, Evaluation &amp; Authorisation of Chemical Substances - UN</i>
<b>RTECS</b>	<i>Registry of Toxic Effects of Chemical Substances - US</i>
<b>SDS</b>	<i>Safety Data Sheet - replaces MSDS ( Material Safety Data Sheet )</i>
<b>Signal Word</b>	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 )
<b>Supplemental Label Element</b>	Any non-harmonized information added to the label of a hazardous substance that is not required or specified under the <i>GHS</i> . In some cases this information may be required by other competent authorities or it may be added at the discretion of the manufacturer / distributor.
<b>TRI</b>	<i>Toxics Release Inventory - US</i>
<b>TSCA</b>	<i>Toxic Substances Control Act - US</i>
<b>UN</b>	<i>United Nations</i>
<b>WHMIS</b>	<i>Workplace Hazardous Materials Information System - Canada</i>
<b>WHO</b>	<i>World Health Organisation - UN</i>