SECTION 1: Product and Company Identification

1.1 Product identifier

Product name	:	Helium, refrigerated liquid
Trade name	:	Liquid Helium

1.2 Other means of identification

Chemical Name	:	Helium
Chemical Formula	:	He

1.3 Recommended use and restrictions on use

Product use	:	Semiconductor Processes Industrial & Professional use Synthetic/Analytical chemistry Photovoltaic Processes

1.4 Details of supplier of the safety data sheet

Company identification	:	Iwatani Corporation (Singapore) Pte. Ltd.
Address	:	6 Shenton Way, OUE Downtown 2 #13-11, Singapore 068809
Phone	:	+65 6862 2111

1.5 Emergency contact

Emergency phone number	:	+65 6220 8347

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Physical hazards	:	Gases under pressure- refrigerated liquefied gas. (cryogenic gas)
Characteristic	:	Non-flammable.
Acute toxicity (inhalation)	:	Not applicable.
Skin corrosion/irritation	:	Not applicable.
Serious eye damage/eye irritation	:	Not applicable.
Acute aquatic toxicity	:	Not applicable.

2.2 GHS label elements, including precautionary statements

Pictogram(s) :

Signal word(s)	:	Warning
Hazard statement(s)	:	H281 – Contains refrigerated gas; may cause cryogenic burns or injury
Precautionary statements		
Prevention	:	P282 - Wear cold insulating gloves and either face shield or eye protection.

Response : P336+P315 - Thaw frosted parts with lukewarm water. Do not rub affected area. Get Immediate medical advice.

Storage : P403 – Store in well-ventilated place.

2.3 Other hazards which do not result in classification

Other hazards : Asphyxiant in high concentrations. Asphyxiant, effects are due to lack of oxygen. Moderate concentrations may cause headache, drowsiness, dizziness, excitation, excess salivation, nausea, vomiting, and unconsciousness. The vapor from a liquid release may also cause incoordination, abdominal pain. Effects may be delayed. Lack of oxygen can kill.

SECTION 3. Composition/Information on ingredients

3.1 Substances / 3.2. Mixture

Substance name	Contents	CAS No.
Helium	100 %	7440-59-7

SECTION 4. First-aid measures

4.1 Description of first aid measures

Inhalation : Immediately remove to fresh air.
If not breathing, give artificial respiration.
If breathing is difficult, qualified personnel may give oxygen.
Call a physician.

Skin contact : Wash with soap and water.
Seek medical attention if discomfort persist.

Eye contact : Flush eyes thoroughly with water.
Get medical attention if discomfort persist.

Ingestion : This product is a gas at normal temperature and pressure.

Notes to physician : This product is inert. Treatment of overexposure should be directed at the control of symptoms and the clinical of the patient.

SECTION 5. Fire-fighting measures

5.1 Extinguishing media

Suitable extinguishing media : Helium is incombustible. Use media appropriate for surrounding fire.

Unsuitable extinguishing media : None.

5.2 Special hazards arising from the substance or mixture

Specific hazards	:	Exposure to fire may cause containers to rupture/explode.
Hazardous combustion products	:	None.

5.3 Advice for fire-fighters

Specific methods	:	CAUTION! High pressure compressed gas. Using water spray from windward to keep fire-exposed cylinders cool.

SECTION 6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Evacuate area.
Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe.
Ventilate area or move cylinder to well-ventilated area.

6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so.

6.3 Methods and materials for containment and cleaning up

Provide adequate ventilation.

SECTION 7. Handling and storage

7.1 Precautions for safe handling

Segregate from flammable gases and other flammable materials.
Do not back feed into the container.
Use properly specified equipment which is suitable for this product, its supply pressure and temperature.

7.2 Conditions for safe storage, including any incompatibilities

Store and use adequate ventilation.
Firmly secure cylinders upright to keep them from falling or knocked over.
Store only where temperature will not exceed 52°C (125°F).

SECTION 8. Exposure controls/personal protection

8.1 Control parameters/Occupational exposure limits

None of the components have assigned exposure limits.

8.2 Appropriate engineering control measures

Provide adequate general and local exhaust ventilation.
System under pressure should be checked for leakages regularly.
Oxygen detectors should be used when asphyxiating gases may be released.

8.3 Personal protection

Individual protection measures, such as personal protective equipment (PPE)		A risk assessment should be conducted and documented in each work area to assess the risks related to the use of the product and to select the PPE that matches the relevant risk. The following recommendations should be considered: Protect eyes, face and skin from liquid splashes. PPE compliant to the recommended EN/ISO standards should be selected.
Hand protection	:	Wear working gloves when handling gas containers. Standard EN 388 – Protective gloves against mechanical risk.
Eye/face protection	:	Wear safety glasses with side shields. Standard EN 166 – Personal eye-protection – specifications. Provide readily accessible eye wash stations and safety showers.
Skin and Body protection	:	Wear safety shoes while handling containers. Standard EN ISO 20345 Personal protective equipment - Safety footwear
Respiratory protection	:	Wear NIOSH/MESA approved full or half face piece (with goggles) respiratory protective equipment.
Hygiene measures	:	Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance		
Physical state	:	Gas
Colour	:	Colourless.
Odour	:	Odourless.
Odour threshold	:	Not applicable.
pH	:	Not applicable.
Melting point	:	-272.2 °C (-458.0 °F)
Boiling point	:	-268.9 °C (-452.0 °F)
Flash point	:	Not applicable.
Critical Temperature	:	-268.0 °C (-450.4 °F)
Flammability (solid, gas)	:	This product is not flammable.
Lower explosive limit	:	Not applicable.
Upper explosive limit	:	Not applicable.
Vapour pressure	:	2275 kPa (critical point).
Gas Density	:	0.178 kg/m3(0 °C, 101.3kPa)
Liquid density	:	0.1250 kg/L (- 268.9°C, 101.3 kPa)
Molecular mass	:	4 g/mol
Solubility	:	Water 0.0086 L/L (20°C, 101.3 kPa)
Viscosity	:	Not applicable.
Partition coefficient: n-octanol/water	:	Not applicable.
Evaporation rate	:	Not applicable.
Decomposition temperature	:	No data available.

Autoignition temperature : Not applicable.

Section 10. Stability and reactivity

10.1 Reactivity
Not reactive under normal conditions.

10.2 Chemical stability
Stable under normal conditions.

10.3 Possibility of hazardous reactions
No data available.

10.4 Conditions to avoid
None known.

10.5 Incompatible materials
None known. Helium is chemically inert.

10.6 Hazardous decomposition products
Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11. Toxicology information

11.1 Information on toxicological effects
No known toxicological effects from this product.

SECTION 12. Ecological information

12.1 Persistence and degradability
No known ecological damage caused by this product.

12.3 Other adverse effects
Can cause frost damage to vegetation.

SECTION 13. Disposal information

13.1 Disposal methods
General : Do not discharge into any place where its accumulation could be dangerous.
To atmosphere in a well ventilate place.
Contact supplier if guidance is required.

Refer to the EIGA code of practice (Doc.30 "Disposal of Gases", downloadable at http://www.eiga.org) for more guidance on suitable disposal methods.

SECTION 14. Transport information

14.1 UN number

: UN1963

14.2 UN proper shipping name

: HELIUM, REFRIGERATED LIQUID

14.3 Transport Hazard Class(es)

UNRTDG (United Nations Recommendations Transport Dangerous Goods)

Class : 2.2
Subsidiary risk : Not applicable.

IATA-DGR (International Air Transport Association – Dangerous Goods)

Class : 2.2
Subsidiary risk : Not applicable.

IMDG (International Maritime Dangerous Goods) – Code

Class : 2.2
Subsidiary risk : Not applicable.

14.4 Packing group

Not assigned by regulation.

14.5 Environmental hazards

None.

14.6 Special precaution for user

Avoid transport on vehicles where the load space is not separated from the driver's compartment.
Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency.
Before transporting product containers:

- Ensure there is adequate ventilation.
- Ensure that containers are firmly secured.
- Ensure valve is closed and not leaking.
- Ensure valve outlet cap nut or plug (where provided) is correctly fitted.
- Ensure valve protection device (where provided) is correctly fitted.

SECTION 15. Regulatory information

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

Restrictions on use	:	None.
Other information, restriction and prohibition regulations	:	Ensure all national/local regulations are observed.
Applicable national regulations	:	Safety, health and environmental regulations/legislation specific for the substance or mixture are observed.

SECTION 16. Other information

16.1 Other information

Indication of changes	:	Ensure all national/local regulations are observed.
Disclaimer of liability	:	Before using this product in any new process or experiment, a thorough material combability and safety study should be carried out. Details given in this document are believed to be correct a the time of going to press. Whilst proper care has been taken in the preparation of this document, no liability for injury or damage resulting from its use ca be accepted.

End of Safety Data Sheet