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## **SECTION 1: Product and Company Identification**

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### 1.1 Product identifier

Product name : Nitrogen, compressed liquid  
 Trade name : No information.

### 1.2 Other means of identification

Chemical Name : Nitrogen  
 Chemical Formula : N<sub>2</sub>

### 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**

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### 2.1 Classification of the substance or mixture

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

### 2.2 GHS label elements, including precautionary statements

Pictogram(s) : 

Signal word(s) : Warning  
 Hazard statement(s) : H280 – Contains gas under pressure; may explode if heated  
 Precautionary statements  
 Prevention : None.  
 Response : None.  
 Storage : P403+P410 - Store in a well-ventilated place. Protect from sunlight.

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Disposal : None.

#### 2.3 Other hazards which do not result in classification

Inhalation hazard : Difficult breathing, nausea, vomiting, tingling sensation, suffocation, convulsions, coma, headache, drowsiness, dizziness, loss of coordination, unconsciousness, fatigue, impairment of judgement, irregular heartbeat.

### **SECTION 3. Composition/Information on ingredients**

#### 3.1 Substances / 3.2. Mixture

<b>Substance name</b>	<b>Contents</b>	<b>CAS No.</b>
Nitrogen	100 %	7727-37-9

### **SECTION 4. First-aid measures**

#### 4.1 Description of first aid measures

Inhalation : Immediately remove victim to fresh air. If breathing stopped, give artificial respiration. Get immediate medical attention.

Skin contact : Wash exposed skin with soap and water.

Eye contact : Flush eyes with plenty of water for at least 15 minutes. Seek immediate medical attention.

Ingestion : If a large amount is swallowed, seek immediate medical attention.

#### 4.2 Most important symptoms/effect, acute and delayed

Contact with evaporating liquid may cause cold burns/frostbite.

#### 4.3 Indication of immediate medical attention and special treatment needed, if necessary

Note to physicians : Thaw frosted parts with lukewarm water. Do not rub affected area. Get immediate medical advice/attention.

### **SECTION 5. Fire-fighting measures**

#### 5.1 Extinguishing media

Suitable extinguishing media : Carbon Dioxide, regular dry chemical.

Unsuitable extinguishing media : None.

#### 5.2 Special hazards arising from the substance or mixture

Specific hazards : Negligible fire hazard.  
Container may rupture or explode if exposed to sufficient heat.

Hazardous combustion products : None.

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#### 5.3 Advice for fire-fighters

Special fire fighting procedures : Move container away or cool with water from a protected position. If possible, stop flow of product.

Special protective equipment for fire-fighters : Wear self-contained breathing apparatus for firefighting if necessary. Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, SCBA. Guideline:  
EN 469 - Protective clothing for firefighters. Performance requirements for protective clothing for firefighting.  
EN 15090 - Footwear for firefighters.  
EN 659 - Protective gloves for firefighters.  
EN 443 - Helmets for fire fighting in buildings and other structures.  
EN 137 - Respiratory protective devices - Self-contained open circuit compressed air breathing apparatus with full face mask - Requirements, testing, marking.

### **SECTION 6. Accidental release measures**

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#### 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**

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#### 7.1 Precautions for safe handling

Operators should wear protective clothing while handling this gas. If ventilation controls are not adequate to provide sufficient oxygen content, proper respiratory protection equipment should be provided.

#### 7.2 Conditions for safe storage, including any incompatibilities

Storage Conditions : Store and handle in accordance with all current regulations and standards. Cylinders should be stored upright and be secured firmly to prevent falling. Protect cylinders against extreme weather and from dampness from ground to prevent resting. Store cylinders in well-ventilated area, away from direct heat and ignition source. Do not allow area where cylinders are stored to exceed 52°C.

Incompatible materials : None known.

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## **SECTION 8. Exposure controls/personal protection**

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### 8.1 Control parameters/Occupational exposure limits

None of the components have assigned exposure limits.

### 8.2 Appropriate engineering control measures

Ventilation systems. Local exhaust ventilation to prevent accumulation of high concentrations and maintain air-oxygen levels at or above 19.5%.

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 : Sturdy work gloves are recommended for handling cylinders. Loose fitting thermal insulated or leather gloves.  
Standard EN 388 – Protective gloves against mechanical risk.  
Wear cold insulating gloves when transfilling or breaking transfer connections.  
Standard EN 511 – Cold insulating gloves.

Eye/face protection : Provide emergency eye wash fountain and quick drench shower in immediate work area.  
Safety eyewear, goggles or face-shield to EN166 should be used to avoid exposure to liquid splashes. Wear eye protection to EN 166 when using gases. Where there is reasonable probability of liquid contact, wear chemical safety goggles.  
EN 166 - Personal Eye Protection.

Skin or Body protection : Work gloves and safety shoes are recommended when handling cylinders.  
Wear cold insulating gloves when handling liquid.  
Wear safety shoes while handling containers.

Respiratory protection : ISO 20345 - Personal protective equipment - Safety footwear.  
Under conditions of frequent use or exposure, respiratory protection may be needed.  
Provide local exhaust ventilation system. Ensure compliance with applicable exposure limit.

Hygiene measures : Ensure adequate ventilation.  
Handle in accordance with good industrial hygiene and safety practice.

## **SECTION 9: Physical and chemical properties**

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### 9.1 Information on basic physical and chemical properties

#### **Appearance**

Physical state : Gas  
Colour : Colourless.

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Odour	:	Odourless.
Odour threshold	:	Not established.
pH	:	Not applicable.
Melting point	:	-210 °C (-346 °F)
Boiling point	:	-196 °C (-320.8 °F)
Flash point	:	Not applicable.
Critical Temperature	:	-147 °C (-232.6 °F)
Flammability (solid, gas)	:	This product is not flammable.
Lower explosive limit	:	Not applicable.
Upper explosive limit	:	Not applicable.
Vapour pressure	:	760 mmHg @ -196 °C
Vapour density (air=1)	:	0.967
Density	:	1.2506 g/L
Molecular mass	:	28.01 g/mol
Solubility	:	Water 20 mg/l
Viscosity	:	No data available.
Partition coefficient: n-octanol/water	:	No data available.
Evaporation rate	:	Not applicable.
Decomposition temperature	:	Not applicable.
Autoignition temperature	:	Non-flammable.

## Section 10. Stability and reactivity

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### 10.1 Reactivity

No reactivity hazard other than the effects described in sub-section below.

### 10.2 Chemical stability

Stable under normal conditions.

### 10.3 Possibility of hazardous reactions

Considered as non-reactive.

### 10.4 Conditions to avoid

Cylinders exposed to high temperatures or direct flame can rupture or burst.

### 10.5 Incompatible materials

None known.

### 10.6 Hazardous decomposition products

None known.

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## **SECTION 11. Toxicology information**

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### 11.1 Information on toxicological effects

Acute toxicity (Oral)	:	Not classified.
Acute toxicity (Inhalation)	:	Product is a simple asphyxiant.
Skin corrosion or irritation	:	Not classified.
Serious eye damage or irritation	:	Not classified.
Respiratory or skin sensitization	:	Not classified.
Germ cell mutagenicity	:	Not classified.
Carcinogenicity	:	None of this product's components are listed by WSHA, ACGIH or OSHA
Reproductive toxicity	:	Not classified.
Specific Target Organ Toxicity (STOT)-single exposure	:	Simple asphyxiant.
STOT-repeated exposure	:	Not classified.
Aspiration hazard	:	Not applicable

## **SECTION 12. Ecological information**

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### 12.1 Ecotoxicity

No adverse ecological effects expected.

### 12.1 Persistence and degradability

Not applicable.

### 12.2 Other adverse effects

Can cause frost damage to vegetation.

## **SECTION 13. Disposal information**

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### 13.1 Disposal methods

Disposal methods	:	Discharge, treatment, or disposal may be subject to national, state, or local laws. Never attempt to dispose off residual locally, return cylinders with residual to gas suppliers.
Contaminated packaging	:	Return in the shipping container PROPERLY LABELED WITH ANY VALVE OUTLET PLUGS OR CAPS SECURED AND VALVE PROTECTION CAP IN PLACE to Iwatani for proper disposal.

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## **SECTION 14. Transport information**

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### 14.1 UN number

: UN1066

### 14.2 UN proper shipping name

: NITROGEN, COMPRESSED

### 14.3 Transport Hazard Class(es)

#### UNRTDG (United Nations Recommendations Transport Dangerous Goods)

Class : 2.2  
 Subsidiary risk : Not classified.

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

Class : 2.2  
 Subsidiary risk : Not classified.

#### IMDG (International Maritime Dangerous Goods) – Code

Class : 2.2  
 Subsidiary risk : Not classified.

### 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**

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### 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.

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Applicable national regulations : Safety, health and environmental regulations/legislation specific for the substance or mixture are observed.

## **SECTION 16. Other information**

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### **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 compatibility and safety study should be carried out. Details given in this document are believed to be correct at 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 can be accepted.

**End of Safety Data Sheet**