

Material Safety Data Sheet

Printing Date 04/10/2016

Version 0

Reviewed on 04/09/2016

*

1 Identification of substance

· **Product details**

· **Trade name:** Acetylene

· **Article number:** 4101-6214101-04-2016

· **Creation date:** 08/04/2016

· **Manufacturer/Supplier:**

Pakistan Oxygen Limited (Previously Linde Pakistan Limited)
 PO Box # 4845, Dockyard Road, West Wharf Karachi-74000, Pakistan.
 www.pakooxygen.com

Please ensure that this MSDS is received by the appropriate person.

2 Composition/Data on components

· **Chemical characterization:**

· **CAS No. Description**

74-86-2 Acetylene

· **Identification number(s)**

· **EINECS Number:** 200-816-9

· **Index number:** 601-015-00-0

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3 Hazards identification

· **Hazard description:**



Highly flammable

· **WHMIS-symbols:**

A - Compressed gas

B1 - Flammable gas

F - Dangerously reactive material



· **HMIS-ratings (scale 0 - 4)**

HEALTH	2
FIRE	4
REACTIVITY	2

Health = 2

Fire = 4

Reactivity = 2

(Contd. on page 2)

CDN

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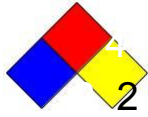
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· NFPA ratings (scale 0 - 4)

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Health = 2

Fire = 4

Reactivity = 2

· Information pertaining to particular dangers for man and environment: Heating may cause an explosion.

Highly flammable.

· Classification system:

The classification is in line with internationally approved calculation standards. It is expanded, however, by information from technical literature and by information furnished by supplier companies.

· GHS label elements
**Danger**

2.2/1 - Extremely flammable gas.

**Warning**

2.5/D - Contains gas under pressure; may explode if heated.

· Prevention:

Keep away from heat/sparks/open flames/hot surfaces. - No smoking.

· Response:

Leaking gas fire: Do not extinguish, unless leak can be stopped safely.

Eliminate all ignition sources if safe to do so.

· Storage:

Protect from sunlight. Store in a well-ventilated place.

Store in a well-ventilated place.

4 First aid measures

· After inhalation:

Supply fresh air. If required, provide artificial respiration and consult doctor. Keep patient warm.

· After skin contact: Generally the product does not irritate the skin.

· After eye contact: Rinse opened eye for at least 15 minutes under running water. Then consult a doctor.

· After swallowing: Not applicable

5 Fire fighting measures

· Suitable extinguishing agents:

Use fire fighting measures that suit the environment.

In the case of fires caused by ignited acetylene leaks:

- DO NOT extinguish unless it is possible (without risk) to shut-off gas flow; explosive vapours could form and re-ignition may occur.

Evacuate area as soon as possible.

· Protective equipment: Wear self-contained respiratory protective device.

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6 Accidental release measures

- **Person-related safety precautions:**

Wear protective equipment. Keep unprotected persons away. Ensure adequate ventilation.
Stop leak - ONLY if possible to do so without risk.

- **Measures for environmental protection:** Prevent seepage into sewage system, workpits and/or cellars.

- **Measures for cleaning/collecting:** Ensure adequate ventilation.

7 Handling and storage

- **Handling:**

An acetylene cylinder valve should not be opened more than approximately 1&1/2 turns. DO NOT use acetylene at pressures above 15 psig.

DO NOT withdraw/flow at a rate exceeding 1/10 (one tenth) of the cylinder capacity per hour during intermittent use and 1/15 (one-fifteenth) per hour during continuous use.

- **Information for safe handling:**

Keep away from heat and direct sunlight.
Handle with care. Avoid jolting, friction, and impact.
Use only in well ventilated areas.

Do not mix with air or oxygen above atmospheric pressure.

Store container in a secured area. Limit access to authorized personnel only. Report any incidents involving thefts, misuse, or inventory shortages to law enforcement and the supplier. Security shall be provided in accordance with all local, state (provincial) and federal regulations.

- **Information about protection against explosions**

and fires: Keep ignition sources away - Do not smoke.

Protect from heat.

Protect against electrostatic charges.

Pressurized container: protect from sunlight and do not expose to temperatures exceeding 50°C. Do not pierce or burn, even after use.

Prevent impact and friction.

- **Storage:**

- **Requirements to be met by storerooms and receptacles:**

Store in a cool location.

Do not expose cylinder to temperatures higher than 50°C (122 °F)

Protect cylinders from physical damage. Store in cool, dry, well-ventilated area away from heavily trafficked areas and emergency exits. Do not allow the temperature where cylinders are stored to exceed 125°F (52°C). Cylinders should be stored upright and firmly secured to prevent falling or being knocked over. Full and empty cylinders should be segregated. Use a "first in-first out" inventory system to prevent full cylinders being stored for excessive periods of time.

- **Information about storage in one common storage facility:**

Store separately from cylinders containing oxygen or oxidants by a minimum distance of 20' or by a barrier of non-combustible material at least 5' high having a fire resistant rating of at least 30minutes.

Sources of ignition should be removed from storage area.

- **Further information about storage conditions:**

Keep cylinder valve tightly closed.

Store in cool, dry conditions in well-sealed receptacles.

Store in accordance with local fire code and/or building code or any pertaining regulations.

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8 Exposure controls and personal protection

- **Additional information about design of technical systems:** Adequate local ventilation.

Safety showers and eyewash stations should be nearby.

- **Components with limit values that require monitoring at the workplace:**

74-86-2 Acetylene (23 -

100%) EL Simple asphyxiant

- **Additional information:** The lists that were valid during the creation were used as basis.

- **Personal protective equipment:**

- **General protective and hygienic measures:**

Wash hands before breaks and at the end of work.

Protective clothing and PPE should be kept free of oil and grease, generally in clean condition PPE should be inspected and maintained regularly to retain effectiveness.

- **Breathing equipment:**

Use atmosphere-supplying respirators (e.g. supplied-air: demand, pressure-demand, or continuous-flow or self-contained breathing apparatus: demand or pressure-demand or combination supplied-air with auxiliary self-contained air supply atmosphere-supplying respirator) in case of insufficient ventilation.

- **Protection of hands:**



Protective gloves.

- **Material of gloves**

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.

- **Eye protection:** Safety glasses

9 Physical and chemical properties

- **General Information**

Form:	Gaseous.
Color:	Colorless
Odor:	Ether-like

- **Change in condition**

Melting point/Melting range: -80.8°C

Boiling point/Boiling range: -83°C

- **Flash point:** < 0°C
Not applicable.

- **Flammability (solid, gaseous):** Highly flammable.

- **Ignition temperature:** 325°C

- **Danger of explosion:** In use, may form flammable/explosive vapour-air mixture.
Heating may cause an explosion.

- **Explosion limits:**

Lower:	2.5 Vol %
Upper:	78> Vol %

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Trade name: Acetylene

· **Solubility in / Miscibility with**
Water at 20°C: 1.185 g/l

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10 Stability and reactivity

- **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
- **Materials to be avoided:**
- **Dangerous reactions**
 May form explosive gas mixture with air. May react with oxidizing agents.
- **Dangerous products of decomposition:** No dangerous decomposition products known.

11 Toxicological information

- **Acute toxicity:**
- **LD/LC50 values that are relevant for classification:** LC50 - None available
- **Primary irritant effect:**
- **on the skin:** No irritating effect.
- **on the eye:** No irritating effect.
- **Sensitization:** No sensitizing effects known.

12 Ecological information

- **Additional ecological information:**
- **General notes:** Generally not hazardous for water

13 Disposal considerations

- **Product:**
- **Recommendation:** Unused product should be returned to vendor.
- **Uncleaned packagings:**
- **Recommendation:**
 Cylinder and unused product should be returned to vendor. Disposable Cylinder must be disposed of in accordance with local regulations.
- **Recommended cleansing agent:** Water, if necessary with cleansing agents.

14 Transport information

- **TDG and DOT regulations:**



- **Hazard class:** 2
- **Identification number:** UN1001
- **Packing group:** -

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Trade name: Acetylene

· **Proper shipping name (technical name):** ACETYLENE, DISSOLVED

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· **Label** 2.1· **Packaging group:** -· **Maritime transport IMDG:**· **IMDG Class:** 2.1· **UN Number:** 1001· **Label** 2.1· **Packaging group:** -· **EMS Number:** F-D,S-U· **Marine pollutant:** No· **Proper shipping name:** ACETYLENE, DISSOLVED· **Air transport ICAO-TI and IATA-DGR:**· **ICAO/IATA Class:** 2· **UN/ID Number:** 1001· **Label** 2.1· **Packaging group:** -· **Propper shipping name:** ACETYLENE, DISSOLVED· **UN "Model Regulation":** UN1001, ACETYLENE, DISSOLVED, 2.1

15 Regulations

· **Sara**· **Section 355 (extremely hazardous substances):** Substance is not listed.· **Section 313 (Specific toxic chemical listings):** Substance is not listed.· **TSCA (Toxic Substances Control Act):**
Substance is listed.· **Proposition 65**· **Chemicals known to cause cancer:** Substance is not listed.· **Chemicals known to cause reproductive toxicity for females:** Substance is not listed.· **Chemicals known to cause reproductive toxicity for males:** Substance is not listed.· **Chemicals known to cause developmental toxicity:** Substance is not listed.

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Trade name: Acetylene

- **Cancerogenity categories**

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- **EPA (Environmental Protection Agency)**

Substance is not listed.

- **NTP (National Toxicology Program)**

Substance is not listed.

- **TLV (Threshold Limit Value established by ACGIH)**

Substance is not listed.

- **NIOSH-Ca (National Institute for Occupational Safety and Health)**

Substance is not listed.

- **OSHA-Ca (Occupational Safety & Health Administration)**

Substance is not listed.

- **Canadian substance listings:**

- **Canadian Domestic Substances List (DSL)**

Substance is listed.

- **Canadian Ingredient Disclosure list (limit 0.1%)**

Substance is not listed.

- **Canadian Ingredient Disclosure list (limit 1%)**

Substance is not listed.

- **Product related hazard informations:**

The product was classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

- **Hazard symbols:**

Highly flammable

- **Risk phrases:**

Heating may cause an explosion.

Highly flammable.

- **Safety phrases:**

After contact with skin, was immediately with plenty of water Keep container in a well-ventilated place.

Keep away from sources of ignition - No smoking.

Take precautionary measures against static discharges.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

Please refer to the section 3 for NFPA and HMIS Hazard Codes.

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Although reasonable care has been taken in the preparation of this document, we extend no warranties and make no representations as to the accuracy or completeness of the information contained herein, and assume no responsibility regarding the suitability of this information for the user's intended purposes or for the consequences of its use. Each individual should make a determination as to the suitability of the information for their particular purpose(s).

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Trade name: Acetylene

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Between POL. (or any of its affiliates and subsidiaries) and the purchaser.

· **Department issuing MSDS:** Customer Service Centre: UAN: +92.21.111-262725

· **Abbreviations and Acronyms:**

ACGIH: American Conference of Governmental Industrial Hygienists

CAS: Chemical Abstract Service (Division of the American Chemical Society)

DOT: US Department of Transportation

EINECS: European Inventory of Existing Commercial Chemical Substances

GHS: Globally Harmonized System of Classification and Labelling of Chemicals

HMIS: Hazardous Material Identification System

IATA: International Air Transportation Association

IATA-DGR: Dangerous Goods Regulations by the "International Air Transportation Association"

ICAO: International Civil Aviation Association

ICAO-TI: Technical Instructions by the "International Civil Aviation Organization (ICAO)"

IMDG: International Marine Code for Dangerous Goods

WHIMS: Workplace Hazardous Material Information System

LC50: Lethal Concentration, 50 Percent

LD50: Lethal Dose, 50 Percent

N/A: Not Applicable

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Printing date 04/09/2016

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1 Identification of substance

- * **Product details**
- * **Trade name: Carbon Dioxide**
- * **Article number: 4101-7584101-1-04-2016**
- * **Creation date: 04/08/2016**
- * **Manufacturer/Supplier:**

Pakistan Oxygen Limited (Previously Linde Pakistan Limited)
PO Box # 4845, Dockyard Road, West Wharf Karachi-74000, Pakistan.
www.pakooxygen.com

- Please ensure that this MSDS is received by the appropriate person.

2 Composition/Data on components

- * **Chemical characterization:**
- * **CAS No. Description**
124-38-9 Carbon Dioxide
- * **Identification number(s)**
- * **EINECS Number: 204-696-9**

3 Hazards identification

- **Hazard description:**
- **WHMIS-symbols:**
A - Compressed gas



- **HMIS-ratings (scale 0 - 4)**

HEALTH	0	Health = 0
FIRE	0	Fire = 0
REACTIVITY	0	Reactivity = 0

- * **NFPA ratings (scale 0 - 4)**



- * **Information pertaining to particular dangers for man and environment: Not applicable.**

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Trade name: Carbon Dioxide

· **Classification system:**

(Contd. of page 1)

The classification is in line with internationally approved calculation standards. It is expanded, however, by information from technical literature and by information furnished by supplier companies.

* **GHS label elements** Void

4 First aid measures

- **After inhalation:** Supply fresh air; consult doctor in case of complaints.
- **After skin contact:** Generally the product does not irritate the skin.
- **After eye contact:** Rinse opened eye for at least 15 minutes under running water. Then consult a doctor.
- **After swallowing:** Not applicable

5 Fire fighting measures

- **Suitable extinguishing agents:**
CO₂, powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
- **Protective equipment:** Wear self-contained respiratory protective device.

6 Accidental release measures

- **Person-related safety precautions:**
Wear protective equipment. Keep unprotected persons away. Ensure adequate ventilation.
Stop leak - ONLY if possible to do so without risk.
- **Measures for environmental protection:** Prevent seepage into sewage system, workpits and/or cellars.
- **Measures for cleaning/collecting:** Ensure adequate ventilation.
- **Additional information:** No dangerous substances are released.

7 Handling and storage

* **Handling:**

* **Information for safe handling:**

Handle with care. Avoid jolting, friction, and impact. Use only in well ventilated areas.

Store container in a secured area. Limit access to authorized personnel only. Report any incidents involving thefts, misuse, or inventory shortages to law enforcement and the supplier. Security shall be provided in accordance with all local, state (provincial) and federal regulations.

* **Information about protection against explosions and**

fires: Keep ignition sources away - Do not smoke.

Pressurized container: protect from sunlight and do not expose to temperatures exceeding 50°C. Do not pierce or burn, even after use.

* **Storage:**

* **Requirements to be met by storerooms and receptacles:**

Do not expose cylinder to temperatures higher than 50°C (122 °F)

Protect cylinders from physical damage. Store in cool, dry, well-ventilated area away from heavily trafficked areas and emergency exits. Do not allow the temperature where cylinders are stored to exceed 125°F (52°C). Cylinders should be stored upright and firmly secured to prevent falling or being knocked over. Full and empty cylinders should be segregated. Use a "first in-first out" inventory system to prevent full cylinders being stored for excessive periods of time.

* **Information about storage in one common storage facility:**

Sources of ignition should be removed from storage area.

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Trade name: Carbon Dioxide

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Further information about storage
conditions: Keep cylinder valve tightly closed.

Store in accordance with local fire code and/or building code or any pertaining regulations.

8 Exposure controls and personal protection

Additional information about design of technical
systems: Adequate local ventilation.

Safety showers and eyewash stations should be nearby.

Components with limit values that require monitoring at the workplace:
124-38-9 Carbon Dioxide (23 - 100%)

EL Short-term value: 15000 ppm

Long-term value: 5000 ppm

EV Short-term value: 54.000 mg/m³, 30.000 ppmLong-term value: 9.000 mg/m³, 5.000 ppm
Additional information: The lists that were valid during the creation were used as basis.

Personal protective equipment:
General protective and hygienic measures:

Protective clothing and PPE should be kept free of oil and grease, generally in clean condition PPE should be inspected and maintained regularly to retain effectiveness.

Breathing equipment:

Use atmosphere-supplying respirators (e.g. supplied-air: demand, pressure-demand, or continuous-flow or self-contained breathing apparatus: demand or pressure-demand or combination supplied-air with auxiliary self-contained air supply atmosphere-supplying respirator) in case of insufficient ventilation.

Protection of hands:


Protective gloves.

Material of gloves

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.

Eye protection: Safety glasses

9 Physical and chemical properties

*** General Information**

Form: Gaseous.
Color: Colorless
Odor: Odorless

*** Change in condition**

Melting point/Melting range: -56.6°C
Boiling point/Boiling range: -78°C

· **Flash point:** Not applicable.

· **Danger of explosion:** Product does not present an explosion hazard.

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Trade name: Carbon Dioxide· **Solubility in / Miscibility with**

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Water at 20°C: 2000 g/l**10 Stability and reactivity**

- **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
- **Materials to be avoided:**
- **Dangerous reactions** No dangerous reactions known.
- **Dangerous products of decomposition:** No dangerous decomposition products known.

11 Toxicological information

- **Acute toxicity:**
- **LD/LC50 values that are relevant for classification:** LC50 - None available
- **Primary irritant effect:**
- **on the skin:** No irritating effect.
- **on the eye:** No irritating effect.
- **Sensitization:** No sensitizing effects known.
- **Additional toxicological information:**
When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us.
The substance is not subject to classification.

12 Ecological information

- **Additional ecological information:**
- **General notes:** Generally not hazardous for water

13 Disposal considerations

- **Product:**
- **Recommendation:** Unused product should be returned to vendor.
- **Uncleaned packagings:**
- **Recommendation:**
Cylinder and unused product should be returned to vendor. Disposable cylinder must be disposed of in accordance with local regulations.
- **Recommended cleansing agent:** None applicable.

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Trade name: Carbon Dioxide

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14 Transport information

· TDG and DOT regulations:



· Label 2.2

· Maritime transport IMDG:



· IMDG Class: 1
 · UN Number: 1013
 · Label 2.2
 · Marine pollutant: No
 · Proper shipping name: CARBON DIOXIDE

· Air transport ICAO-TI and IATA-DGR:



· ICAO/IATA Class: 1
 · UN/ID Number: 1013
 · Label 2.2
 · Proper shipping name: CARBON DIOXIDE

UN "Model Regulation": UN1013, CARBON DIOXIDE, 2A (2.2)

15 Regulations

· Sara

· Section 355 (extremely hazardous substances): Substance is not listed.

· Section 313 (Specific toxic chemical listings):

Substance is not listed.

· TSCA (Toxic Substances Control Act):

Substance is listed.

· Proposition 65

· Chemicals known to cause

cancer: Substance is not listed.

· Chemicals known to cause reproductive toxicity

for females: Substance is not listed.

· Chemicals known to cause reproductive toxicity

for males: Substance is not listed.

· Chemicals known to cause developmental

toxicity: Substance is not listed.

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Trade name: Carbon Dioxide

· **Carcinogenicity categories**

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· **EPA (Environmental Protection**

Agency) Substance is not listed.

· **NTP (National Toxicology**

Program) Substance is not listed.

· **TLV (Threshold Limit Value established by**

ACGIH) Substance is not listed.

· **NIOSH-Ca (National Institute for Occupational Safety**

and Health) Substance is not listed.

· **OSHA-Ca (Occupational Safety & Health**

Administration) Substance is not listed.

· **Canadian substance listings:**· **Canadian Domestic Substances**

List (DSL) Substance is listed.

· **Canadian Ingredient Disclosure list (limit**

0.1%) Substance is not listed.

· **Canadian Ingredient Disclosure list (limit**

1%) Substance is listed.

· **Product related hazard informations:**

Observe the general safety regulations when handling chemicals.

The substance is not subject to classification according to the sources of literature known to us.

The product was classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

· **Safety phrases:**

Keep container tightly closed in a cool place.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

Please refer to the section 3 for NFPA and HMIS Hazard Codes.

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· **Department issuing MSDS:** Customer Service Centre: UAN: +92.21.111-262725

· **Abbreviations and Acronyms:**

ACGIH: American Conference of Governmental Industrial Hygienists

CAS: Chemical Abstract Service (Division of the American Chemical Society)

DOT: US Department of Transportation

EINECS: European Inventory of Existing Commercial Chemical Substances

GHS: Globally Harmonized System of Classification and Labelling of Chemicals

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Trade name: Carbon Dioxide

HMIS: Hazardous Material Identification System

IATA: International Air Transportation Association

IATA-DGR: Dangerous Goods Regulations by the "International Air Transportation Association"

ICAO: International Civil Aviation Association

ICAO-TI: Technical Instructions by the "International Civil Aviation Organization (ICAO)"

IMDG: International Marine Code for Dangerous Goods

WHIMS: Workplace Hazardous Material Information System

LC50: Lethal Concentration, 50 Percent

LD50: Lethal Dose, 50 Percent

N/A: Not Applicable

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Material Safety Data Sheet

Printing date 07/28/2011

Version 5

Reviewed on 07/28/2011

1 Identification of substance

- **Product details**
- **Trade name: Helium (Compressed Gas)**
- **Article number:** 033-01-0001
- **Creation date:** 08/14/2006
- **Manufacturer/Supplier:**
Pakistan Oxygen Limited (Previously Linde Pakistan Limited)
PO Box # 4845, Dockyard Road, West Wharf
Karachi-74000, Pakistan.
www.pakooxygen.com
Please ensure that this MSDS is received by the appropriate person.
- **Information department:** Customer Service Centre: UAN: +92.21.111-262725

2 Composition/Data on components

- **Chemical characterization:**
- **CAS No. Description**
7440-59-7 Helium
- **Identification number(s)**
- **EINECS Number:** 231-168-5

Hazards identification

- **Hazard description:**
- **WHMIS-symbols:**
A - Compressed gas



- **HMS-ratings (scale 0 - 4)**

HEALTH	0	Health = 0
FIRE	0	Fire = 0
REACTIVITY	0	Reactivity = 0

- *** NFPA ratings (scale 0 - 4)**



- **Information pertaining to particular dangers for man and environment:** Not applicable.

(Contd. on page 2)

Material Safety Data Sheet

Printing date 07/28/2011

Version 5

Reviewed on 07/28/2011

Trade name: Helium (Compressed Gas)

(Contd. of page 1)

*** Classification system:**

The classification is in line with internationally approved calculation standards. It is expanded, however, by information from technical literature and by information furnished by supplier companies.

*** GHS label elements**

Warning

2.5/C - Contains gas under pressure; may explode if heated.

Storage:

Protect from sunlight. Store in a well-ventilated place.

*

First aid measures

- **After inhalation:** Supply fresh air; consult doctor in case of complaints.
- **After skin contact:** Generally the product does not irritate the skin.
- **After eye contact:** Rinse opened eye for at least 15 minutes under running water. Then consult a doctor.
- **After swallowing:** Not applicable

5 Fire fighting measures
Suitable extinguishing agents:

CO₂, powder or water spray. Fight larger fires with water spray or alcohol resistant foam.

Protective equipment: Wear self-contained respiratory protective device.

6 Accidental release measures
Person-related safety precautions:

Wear protective equipment. Keep unprotected persons away. Ensure adequate ventilation.

Stop leak - ONLY if possible to do so without risk.

Measures for environmental protection: Prevent seepage into sewage system, workpits and/or cellars.

Measures for cleaning/collecting: Ensure adequate ventilation.

Additional information: No dangerous substances are released.

7 Handling and storage
Handling:
Information for safe handling:

Handle with care. Avoid jolting, friction, and impact. Use only in well ventilated areas.

Store container in a secured area. Limit access to authorized personnel only. Report any incidents involving thefts, misuse, or inventory shortages to law enforcement and the supplier. Security shall be provided in accordance with all local, state (provincial) and federal regulations.

Information about protection against explosions and fires:

Keep ignition sources away - Do not smoke.

Pressurized container: protect from sunlight and do not expose to temperatures exceeding 50°C. Do not pierce or burn, even after use.

Storage:
Requirements to be met by storerooms and receptacles:

Do not expose cylinder to temperatures higher than 50°C (122 °F)

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Material Safety Data Sheet

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Reviewed on 07/28/2011

Trade name: Helium (Compressed Gas)

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- **Information about storage in one common storage facility:**

Sources of ignition should be removed from storage area.

- **Further information about storage conditions:**

Keep cylinder valve tightly closed.

Store cylinder in a well ventilated area.

Store in accordance with local fire code and/or building code or any pertaining regulations.

*

- **Additional information about design of technical systems:**

Adequate local ventilation.

Safety showers and eyewash stations should be nearby.

- **Components with limit values that require monitoring at the workplace:**

7440-59-7 Helium (23 - 100%)

EL Simple asphyxiant

- **Additional information:** The lists that were valid during the creation were used as basis.

- **Personal protective equipment:**

- **General protective and hygienic measures:**

Protective clothing and PPE should be kept free of oil and grease, generally in clean condition PPE should be inspected and maintained regularly to retain effectiveness.

- **Breathing equipment:**

Use atmosphere-supplying respirators (e.g. supplied-air: demand, pressure-demand, or continuous-flow or self-contained breathing apparatus: demand or pressure-demand or combination supplied-air with auxiliary self-contained air supply atmosphere-supplying respirator) in case of insufficient ventilation.

- **Protection of hands:**



Protective gloves.

Material of gloves

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.

Eye protection: Safety glasses

*

Physical and chemical properties
General Information

Form: Gaseous.

Color: Colorless

Odor: Odorless

- **Change in condition**

Melting point/Melting range: -272°C

Boiling point/Boiling range: -268°C

- **Flash point:** Not applicable.

- **Danger of explosion:** Product does not present an explosion hazard.

(Contd. on page 4)

CDN

Material Safety Data Sheet

Printing date 07/28/2011

Version 5

Reviewed on 07/28/2011

Trade name: Helium (Compressed Gas)

(Contd. of page 3)

- **Solubility in / Miscibility with Water at 20°C:** 8.6 g/l

10 Stability and reactivity

- * **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
- * **Materials to be avoided:**
- * **Dangerous reactions** No dangerous reactions known.
- * **Dangerous products of decomposition:** No dangerous decomposition products known.

11 Toxicological information

- **Acute toxicity:**
- **LD/LC50 values that are relevant for classification:** LC50 - None available
- **Primary irritant effect:**
- **on the skin:** No irritating effect.
- **on the eye:** No irritating effect.
- **Sensitization:** No sensitizing effects known.
- **Additional toxicological information:**

When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us.

The substance is not subject to classification.

12 Ecological information

- **Additional ecological information:**
- **General notes:** Generally not hazardous for water.

* Disposal considerations

- **Product:**
- **Recommendation:** Unused product should be returned to vendor.
- **Uncleaned packagings:**
- **Recommendation:**
Cylinder and unused product should be returned to vendor. Disposable cylinder must be disposed of in accordance with local regulations.
- **Recommended cleansing agent:** None applicable.

* 14 Transport information

- **TDG and DOT regulations:**



- **Hazard class:** 2
- **Identification number:** UN1046

(Contd. on page 5)

CDN

Material Safety Data Sheet

Printing date 07/28/2011

Version 5

Reviewed on 07/28/2011

Trade name: Helium (Compressed Gas)

(Contd. of page 4)

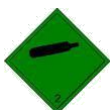
- **Proper shipping name (technical name):** HELIUM, COMPRESSED
- **Label** 2.2

- **Maritime transport IMDG:**



- **IMDG Class:** 2.2
- **UN Number:** 1046
- **Label** 2.2
- **Marine pollutant:** No
- **Proper shipping name:** HELIUM, COMPRESSED

- **Air transport ICAO-TI and IATA-DGR:**



- **ICAO/IATA Class:** 2
- **UN/ID Number:** 1046
- **Label** 2.2
- **Proper shipping name:** HELIUM, COMPRESSED

UN "Model Regulation": UN1046, HELIUM, COMPRESSED, 2.2

Regulations

Sara

Section 355 (extremely hazardous substances):

Substance is not listed.

Section 313 (Specific toxic chemical listings):

Substance is not listed.

TSCA (Toxic Substances Control Act):

Substance is listed.

Proposition 65

Chemicals known to cause cancer:

Substance is not listed.

Chemicals known to cause reproductive toxicity for females:

Substance is not listed.

Chemicals known to cause reproductive toxicity for males:

Substance is not listed.

Chemicals known to cause developmental toxicity:

Substance is not listed.

Carcinogenicity categories

EPA (Environmental Protection Agency)

Substance is not listed.

(Contd. on page 6)

CDN

Material Safety Data Sheet

Printing date 07/28/2011

Version 5

Reviewed on 07/28/2011

Trade name: Helium (Compressed Gas)

(Contd. of page 5)

NTP (National Toxicology Program)

Substance is not listed.

TLV (Threshold Limit Value established by ACGIH)

Substance is not listed.

NIOSH-Ca (National Institute for Occupational Safety and Health)

Substance is not listed.

OSHA-Ca (Occupational Safety & Health Administration)

Substance is not listed.

Canadian substance listings:
Canadian Domestic Substances List (DSL)

Substance is listed.

Canadian Ingredient Disclosure list (limit 0.1%)

Substance is not listed.

Canadian Ingredient Disclosure list (limit 1%)

Substance is not listed.

Product related hazard informations:

Observe the general safety regulations when handling chemicals.

The substance is not subject to classification according to the sources of literature known to us.

The product was classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

Safety phrases:

Keep container tightly closed in a cool place.

Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

Please refer to the section 3 for NFPA and HMIS Hazard Codes.

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Although reasonable care has been taken in the preparation of this document, we extend no warranties and make no representations as to the accuracy or completeness of the information contained herein, and assume no responsibility regarding the suitability of this information for the user's intended purposes or for the consequences of its use. Each individual should make a determination as to the suitability of the information for their particular purpose(s).

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* **Department issuing MSDS:** Customer Service Centre: UAN:

+92.21.111-262725

Abbreviations and Acronyms:

ACGIH: American Conference of Governmental Industrial Hygienists

CAS: Chemical Abstract Service (Division of the American Chemical Society)

DOT: US Department of Transportation

EINECS: European Inventory of Existing Commercial Chemical Substances

GHS: Globally Harmonized System of Classification and Labelling of Chemicals

HMIS: Hazardous Material Identification System

IATA: International Air Transportation Association

IATA-DGR: Dangerous Goods Regulations by the "International Air Transportation Association"

ICAO: International Civil Aviation Association

ICAO-TI: Technical Instructions by the "International Civil Aviation Organization (ICAO)"

(Contd. on page 7)

Material Safety Data Sheet

Printing date 07/28/2011

Version 5

Reviewed on 07/28/2011

Trade name: Helium (Compressed Gas)

(Contd. of page 6)

IMDG: International Marine Code for Dangerous Goods
WHIMS: Workplace Hazardous Material Information System
LC50: Lethal Concentration, 50 Percent
LD50: Lethal Dose, 50 Percent
N/A: Not Applicable

CDN

Material Safety Data Sheet

Printing date 06/06/2011

Version 4

Reviewed on 06/06/2011

Product details

- Trade name: Hydrogen
- Article number: 004-01-0003
- Creation date: 05/18/2006
- Manufacturer/Supplier:

Pakistan Oxygen Limited (Previously Linde Pakistan Limited)
 PO Box # 4845, Dockyard Road, West Wharf Karachi-74000, Pakistan.
www.pakooxygen.com

Please ensure that this MSDS is received by the appropriate person.

- Information department: Customer Service Centre: UAN: +92.21.111-262725

2 Composition/Data on components

- * Chemical characterization:
- * CAS No. Description
1333-74-0 Hydrogen
- * Identification number(s)
- * EINECS Number: 215-605-7
- * Index number: 001-001-00-9

3 Hazards identification

- * Hazard description:



Extremely flammable

- * WHMIS-symbols:

A - Compressed gas
 B1 - Flammable gas



- * HMIS-ratings (scale 0 - 4)

HEALTH	0	Health = 0
FIRE	4	Fire = 4
REACTIVITY	0	Reactivity = 0

(Contd. on page 2)

Material Safety Data Sheet

Printing date 06/06/2011

Version 4

Reviewed on 06/06/2011

Trade name: Hydrogen

(Contd. of page 1)

· NFPA ratings (scale 0 - 4)


Health = 0
Fire = 4
Reactivity = 0

*** Information pertaining to particular dangers for man and environment:**

Extremely flammable.

*** Classification system:**

The classification is in line with internationally approved calculation standards. It is expanded, however, by information from technical literature and by information furnished by supplier companies.

*** GHS label elements**

Danger

2.2/1 - Extremely flammable gas.


Warning

2.5/C - Contains gas under pressure; may explode if heated.

· Prevention:

Keep away from heat/sparks/open flames/hot surfaces. - No smoking.

· Response:

Leaking gas fire: Do not extinguish, unless leak can be stopped safely. Eliminate all ignition sources if safe to do so.

· Storage:

Protect from sunlight. Store in a well-ventilated place. Store in a well-ventilated place.

*

First aid measures

- **After inhalation:** Supply fresh air; consult doctor in case of complaints.
- **After skin contact:** Generally the product does not irritate the skin.
- **After eye contact:** Rinse opened eye for at least 15 minutes under running water. Then consult a doctor.
- **After swallowing:** Not applicable

5 Fire fighting measures
Suitable extinguishing agents:

CO₂, powder or water spray. Fight larger fires with water spray or alcohol resistant foam.

Protective equipment: Wear self-contained respiratory protective device.

6 Accidental release measures
Person-related safety precautions:

Wear protective equipment. Keep unprotected persons away. Ensure adequate ventilation.

Eliminate ignition sources

Stop leak - ONLY if possible to do so without risk.

Measures for environmental protection: Prevent seepage into sewage system, workpits and/or cellars.

(Contd. on page 3)

CDN

Material Safety Data Sheet

Printing date 06/06/2011

Version 4

Reviewed on 06/06/2011

Trade name: Hydrogen

(Contd. of page 2)

- **Measures for cleaning/collecting:** Ensure adequate ventilation.

Handling and storage

- **Handling:** Do not mix with air or oxygen above atmospheric pressure.
- **Information for safe handling:**
Open and handle cylinder with care.
Handle with care. Avoid jolting, friction, and impact. Use only in well ventilated areas.
Store container in a secured area. Limit access to authorized personnel only. Report any incidents involving thefts, misuse, or inventory shortages to law enforcement and the supplier. Security shall be provided in accordance with all local, state (provincial) and federal regulations.
- **Information about protection against explosions and fires:**
Keep ignition sources away - Do not smoke.
Protect against electrostatic charges.
Pressurized container: protect from sunlight and do not expose to temperatures exceeding 50°C. Do not pierce or burn, even after use.
- **Storage:**
- **Requirements to be met by storerooms and receptacles:**
Store in a cool location.
Do not expose cylinder to temperatures higher than 50°C (122 °F)
- **Information about storage in one common storage facility:**
Store away from oxidizing agents.
Store separately from cylinders containing oxygen or oxidants by a minimum distance of 20' or by a barrier of non-combustible material at least 5' high having a fire resistant rating of at least 30minutes.
Sources of ignition should be removed from storage area.
- **Further information about storage conditions:**
Keep cylinder valve tightly closed.
Store in cool, dry conditions in well sealed receptacles. Protect from heat and direct sunlight. Store cylinder in a well ventilated area.
Store in accordance with local fire code and/or building code or any pertaining regulations.

8 Exposure controls and personal protection

Additional information about design of technical systems:

Adequate local ventilation.

Safety showers and eyewash stations should be nearby.

Components with limit values that require monitoring at the workplace:

1333-74-0 Hydrogen (23 - 100%)

EL Simple asphyxiant

Additional information: The lists that were valid during the creation were used as basis.

Personal protective equipment:

General protective and hygienic measures:

Wash hands before breaks and at the end of work.

Protective clothing and PPE should be kept free of oil and grease, generally in clean condition PPE should be inspected and maintained regularly to retain effectiveness.

Breathing equipment:

Use atmosphere-supplying respirators (e.g. supplied-air: demand, pressure-demand, or continuous-flow or self-contained breathing apparatus: demand or pressure-demand or combination supplied-air with auxiliary self-contained air supply atmosphere-supplying respirator) in case of insufficient ventilation.

(Contd. on page 4)

CDN

Material Safety Data Sheet

Printing date 06/06/2011

Version 4

Reviewed on 06/06/2011

Trade name: Hydrogen

(Contd. of page 3)

Protection of hands:


Protective gloves.

Material of gloves

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.

Eye protection: Safety glasses

Physical and chemical properties

General Information

Form: Gaseous.
Color: Colorless
Odor: Odorless

Change in condition

Melting point/Melting range: -259°C
Boiling point/Boiling range: -253°C

Flash point: < 0°C
 Not applicable.

Ignition temperature: 560°C

* **Danger of explosion:** In use, may form flammable/explosive vapour-air mixture.

Explosion limits:

Lower: 4 Vol %
Upper: 75.6 Vol %

Solubility in / Miscibility with

Water at 20°C: 1.6 g/l

10 Stability and reactivity

Thermal decomposition / conditions to be avoided: No decomposition if used according to specifications.

Materials to be avoided:

Dangerous reactions

May form explosive gas mixture with air. May react with oxidizing agents.

Dangerous products of decomposition: No dangerous decomposition products known.

11 Toxicological information

*** Acute toxicity:**

* **LD/LC50 values that are relevant for classification:** LC50 - None available

* **Primary irritant effect:**

* **on the skin:** No irritating effect.

* **on the eye:** No irritating effect.

(Contd. on page 5)

CDN

Material Safety Data Sheet

Printing date 06/06/2011

Version 4

Reviewed on 06/06/2011

Trade name: Hydrogen

(Contd. of page 4)

- **Sensitization:** No sensitizing effects known.

12 Ecological information

- **Additional ecological information:**
- **General notes:** Generally not hazardous for water.

Disposal considerations

- **Recommendation:** Unused product should be returned to vendor.
- **Uncleaned packagings:**
- **Recommendation:**
Cylinder and unused product should be returned to vendor. Disposable cylinder must be disposed of in accordance with local regulations.
- **Recommended cleansing agent:** None applicable.

14 Transport information

- **TDG and DOT regulations:**



- **Hazard class:** 2
- **Identification number:** UN1049
- **Packing group:** -
- **Proper shipping name (technical name):** HYDROGEN, COMPRESSED
- **Label:** 2.1
- **Packaging group:** -

- **Maritime transport IMDG:**



- **IMDG Class:** 2.1
- **UN Number:** 1049
- **Label:** 2.1
- **Packaging group:** -
- **EMS Number:** F-D,S-U
- **Marine pollutant:** No
- **Proper shipping name:** HYDROGEN, COMPRESSED

- **Air transport ICAO-TI and IATA-DGR:**



- **ICAO/IATA Class:** 2

(Contd. on page 6)

Material Safety Data Sheet

Printing date 06/06/2011

Version 4

Reviewed on 06/06/2011

Trade name: Hydrogen

(Contd. of page 5)

- **UN/ID Number:** 1049
- **Label** 2.1
- **Packaging group:** -
- **Proper shipping name:** HYDROGEN, COMPRESSED
- **UN "Model Regulation":** UN1049, HYDROGEN, COMPRESSED, 2.1

15 Regulations

- **Sara**

- **Section 355 (extremely hazardous substances):**

Substance is not listed.

- **Section 313 (Specific toxic chemical listings):**

Substance is not listed.

- **TSCA (Toxic Substances Control Act):**

Substance is listed.

- **Proposition 65**

- **Chemicals known to cause cancer:**

Substance is not listed.

- **Chemicals known to cause reproductive toxicity for females:**

Substance is not listed.

- **Chemicals known to cause reproductive toxicity for males:**

Substance is not listed.

- **Chemicals known to cause developmental toxicity:**

Substance is not listed.

- **Carcinogeny categories**

- **EPA (Environmental Protection Agency)**

Substance is not listed.

- **NTP (National Toxicology Program)**

Substance is not listed.

- **TLV (Threshold Limit Value established by ACGIH)**

Substance is not listed.

- **NIOSH-Ca (National Institute for Occupational Safety and Health)**

Substance is not listed.

- **OSHA-Ca (Occupational Safety & Health Administration)**

Substance is not listed.

- **Canadian substance listings:**

- **Canadian Domestic Substances List (DSL)**

Substance is listed.

- **Canadian Ingredient Disclosure list (limit 0.1%)**

Substance is not listed.

- **Canadian Ingredient Disclosure list (limit 1%)**

Substance is not listed.

(Contd. on page 7)

CDN

Material Safety Data Sheet

Printing date 06/06/2011

Version 4

Reviewed on 06/06/2011

Trade name: Hydrogen

(Contd. of page 6)

Product related hazard informations:

The product was classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

Hazard symbols:

Extremely flammable

Risk phrases:

Extremely flammable.

Safety phrases:

Keep container in a well-ventilated place.

Keep away from sources of ignition - No smoking. Take precautionary measures against static discharges.

Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

Please refer to the section 3 for NFPA and HMIS Hazard Codes.

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· **Department issuing MSDS:** Customer Service Centre: UAN: +92.21.111-262725

Abbreviations and Acronyms:

ACGIH: American Conference of Governmental Industrial Hygienists
 CAS: Chemical Abstract Service (Division of the American Chemical Society)
 DOT: US Department of Transportation
 EINECS: European Inventory of Existing Commercial Chemical Substances
 GHS: Globally Harmonized System of Classification and Labelling of Chemicals
 HMIS: Hazardous Material Identification System
 IATA: International Air Transportation Association
 IATA-DGR: Dangerous Goods Regulations by the "International Air Transportation Association"
 ICAO: International Civil Aviation Association
 ICAO-TI: Technical Instructions by the "International Civil Aviation Organization (ICAO)"
 IMDG: International Marine Code for Dangerous Goods
 WHIMS: Workplace Hazardous Material Information System
 LC50: Lethal Concentration, 50 Percent
 LD50: Lethal Dose, 50 Percent
 N/A: Not Applicable

Material Safety Data Sheet

Printing date 04/10/2016

Reviewed on 04/09/2016

Version 0

1 Identification of substance

- Product details
- Trade name: Nitrogen (Refrigerated Liquid)
Short Name: LIN
- Article number: 4101-9104101-1-04-2016
- Creation date: 04/08/2016

Pakistan Oxygen Limited (Previously Linde Pakistan Limited)
PO Box # 4845, Dockyard Road, West Wharf Karachi-74000, Pakistan.
www.pakoxygen.com

Please ensure that this MSDS is received by the appropriate person.

2 Composition/Data on components

- *Chemical characterization:
- *CAS No. Description
7727-37-9 Nitrogen Gaseous

3 Hazards identification

Hazard description: Refrigerated liquefied gas.

WHMIS-symbols: A - Compressed gas

HMIS-ratings (scale 0 - 4)

HEALTH 0	Health = 0
FIRE 0	Fire = 0
REACTIVITY 0	Reactivity = 0

- * NFPA ratings (scale 0 - 4)

	Health = 0
	Fire = 0
	Reactivity = 0

- * Information pertaining to particular dangers for man and environment:

Danger of suffocation at accumulation in lower-lying or closed rooms.

Cold burns and frostbite.

- * Classification system:

The classification is in line with internationally approved calculation standards. It is expanded, however, by information from technical literature and by information furnished by supplier companies.

(Contd. on page 2)

CDN

Material Safety Data Sheet

Printing date 04/10/2016

Version 0

Reviewed on 04/09/2016

Trade name: Nitrogen (Refrigerated Liquid)

GHS label elements Void

(Contd. of page 1)

4 First aid measures

After inhalation: Supply fresh air; consult doctor in case of complaints.

After skin contact: In cases of frost bites, rinse with plenty of water. Do not remove clothing.

After eye contact: Rinse opened eye for at least 15 minutes under running water. Then consult a doctor.

After swallowing: Not applicable

5 Fire fighting measures

Suitable extinguishing agents: Use fire fighting measures that suit the environment.

Protective equipment: Wear self-contained respiratory protective device.

6 Accidental release measures

Person-related safety precautions:

Wear protective equipment. Keep unprotected persons away. Ensure adequate ventilation.

Stop leak - ONLY if possible to do so without risk.

Measures for environmental protection: Prevent seepage into sewage system, workpits and/or cellars.

Measures for cleaning/collecting: Ensure adequate ventilation.

Additional information: No dangerous substances are released.

7 Handling and storage

Handling:

Information for safe handling:

Ensure good ventilation/exhaustion at the workplace. Prevent formation of aerosols.

Handle with care. Avoid jolting, friction, and impact. Use only in well ventilated areas.

Store container in a secured area. Limit access to authorized personnel only. Report any incidents involving thefts, misuse, or inventory shortages to law enforcement and the supplier.

Security shall be provided in accordance with all local, state (provincial) and federal regulations.

Information about protection against explosions and

fires: Keep ignition sources away - Do not smoke.

Pressurized container: protect from sunlight and do not expose to temperatures exceeding 50°C. Do not pierce or burn, even after use.

Storage:

Requirements to be met by storerooms and receptacles:

Do not expose cylinder to temperatures higher than 50°C (122 °F)

Information about storage in one common storage facility:

Sources of ignition should be removed from storage area.

Further information about storage conditions: None.

8 Exposure controls and personal protection

Additional information about design of technical systems: Adequate local ventilation.

(Contd. on page 3)

CDN

Material Safety Data Sheet

Printing date 04/10/2016

Version 0

Reviewed on 04/09/2016

Trade name: Nitrogen (Refrigerated Liquid)

Safety showers and eyewash stations should be nearby.

(Contd. of page 2)

· Components with limit values that require monitoring at the workplace:

7727-37-9 Nitrogen Gaseous (23 -
100%) EL Simple asphyxiant

· Additional information: The lists that were valid during the creation were used as basis.

· Personal protective equipment:

· General protective and hygienic measures:

Protective clothing and PPE should be kept free of oil and grease, generally in clean condition PPE should be inspected and maintained regularly to retain effectiveness.

· Breathing equipment:

Self-Contained Breathing Apparatus (SCBA), or

Air Line respirator with 15 minute escape pack, SCBA as back-up

· Protection of hands: Cryogenic leather gauntlets/gloves

· Material of gloves

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.

· Eye protection: Safety goggles with face shield

· Body protection: Leather safety shoes/boots

· Skin Protection: Long sleeve shirt and long trousers/overalls (should not be tucked in)

Physical and chemical properties

· General Information

Form: Refrigerated liquefied gas
Color: Colorless
Odor: Odorless

· Change in condition

Melting point/Melting range: -210°C
Boiling point/Boiling range: -195°C

· Flash point: Not applicable.

· Danger of explosion: Product does not present an explosion hazard.

· Solubility in / Miscibility with

Water: Not miscible or difficult to mix.

10 Stability and reactivity

Thermal decomposition / conditions to be avoided: No decomposition if used according to specifications.

Dangerous reactions No dangerous reactions known.

Dangerous products of decomposition: No dangerous decomposition products known.

11 Toxicological information

* Acute toxicity:

* LD/LC50 values that are relevant for classification: LC50 - None available

* Primary irritant effect:

* on the skin: No irritating effect.

* on the eye: No irritating effect.

(Contd. on page 4)

CDN

Material Safety Data Sheet

Printing date 04/10/2016

Version 0

Reviewed on 04/09/2016

Trade name: Nitrogen (Refrigerated Liquid)

(Contd. of page 3)

Sensitization: No sensitizing effects known.

Additional toxicological information:

When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us.
The substance is not subject to classification.

12 Ecological information

- General notes: Generally not hazardous for water.

13 Disposal considerations

- Product:

- Recommendation: Unused product should be returned to vendor.

- Uncleaned packagings:

- Recommendation:

Cylinder and unused product should be returned to vendor. Disposable cylinder must be disposed of in accordance with local regulations.

- Recommended cleansing agent: None applicable.

14 Transport information

TDG and DOT regulations:



- Hazard class: 2.2

- Packing group: -

- Label: 2.2

- Packaging group: -

Maritime transport IMDG:



- IMDG Class: 2.2

- UN Number:

- Label: 2.2

- Packaging group: -

- Marine pollutant: No

Air transport ICAO-TI and IATA-DGR:



- ICAO/IATA Class: 2.2

(Contd. on page 5)

CDN

Material Safety Data Sheet

Printing date 04/10/2016

Version 0

Reviewed on 04/09/2016

Trade name: Nitrogen (Refrigerated Liquid)

• UN/ID Number: (Contd. of page 4)
 • Label 2.2
 Packaging group: -
 UN "Model Regulation": 2.2

15 Regulations

- Section 355 (extremely hazardous substances): Substance is not listed.
- * Section 313 (Specific toxic chemical listings): Substance is not listed.
- TSCA (Toxic Substances Control Act): Substance is listed.
- Proposition 65
- Chemicals known to cause cancer: Substance is not listed.
- Chemicals known to cause reproductive toxicity for females: Substance is not listed.
- * Chemicals known to cause reproductive toxicity for males: Substance is not listed.
- Chemicals known to cause developmental toxicity: Substance is not listed.
- Cancerogenity categories
- EPA (Environmental Protection Agency) Substance is not listed.
- NTP (National Toxicology Program) Substance is not listed.
- TLV (Threshold Limit Value established by ACGIH) Substance is not listed.
- NIOSH-Ca (National Institute for Occupational Safety and Health) Substance is not listed.
- OSHA-Ca (Occupational Safety & Health Administration) Substance is not listed.
- Canadian substance listings:
- Canadian Domestic Substances List (DSL) Substance is not listed.
- Canadian Ingredient Disclosure list (limit 0.1%) Substance is not listed.
- Canadian Ingredient Disclosure list (limit 1%) Substance is not listed.
- Product related hazard informations:
Observe the general safety regulations when handling chemicals.

(Contd. on page 6)
CDN

Material Safety Data Sheet

Printing date 04/10/2016

Version 0

Reviewed on 04/09/2016

Trade name: Nitrogen (Refrigerated Liquid)

(Contd. of page 5)

The substance is not subject to classification according to the sources of literature known to us. The product was classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

· Safety phrases:

Keep container in a well-ventilated place.

Do not breathe gas/fumes/vapour/spray (appropriate wording to be specified by the manufacturer).

*

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

Please refer to the section 3 for NFPA and HMIS Hazard

Codes. DISCLAIMER OF EXPRESSED AND IMPLIED

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· Department issuing MSDS: Customer Service Centre: UAN: +92.21.111-262725

· Abbreviations and Acronyms:

ACGIH: American Conference of Governmental Industrial Hygienists

CAS: Chemical Abstract Service (Division of the American Chemical Society)

DOT: US Department of Transportation

EINECS: European Inventory of Existing Commercial Chemical Substances

GHS: Globally Harmonized System of Classification and Labelling of Chemicals

HMIS: Hazardous Material Identification System

IATA: International Air Transportation Association

IATA-DGR: Dangerous Goods Regulations by the "International Air Transportation Association"

ICAO: International Civil Aviation Association

ICAO-TI: Technical Instructions by the "International Civil Aviation Organization (ICAO)"

IMDG: International Marine Code for Dangerous Goods

WHIMS: Workplace Hazardous Material Information System

LC50: Lethal Concentration, 50 Percent

LD50: Lethal Dose, 50 Percent

N/A: Not Applicable

CDN

Material Safety Data Sheet

Printing Date 04/10/2016

Version 0

Reviewed on 04/09/2016

1 Identification of substance

· **Product details**

· **Trade name: Nitrogen**

Article number: 4101-6214101-04-2016

* **Creation date:** 04/08/2016

* **Manufacturer/Supplier:**

Pakistan Oxygen Limited (Previously Linde Pakistan Limited)
 PO Box # 4845, Dockyard Road, West Wharf
 Karachi-74000, Pakistan.
 www.pakooxygen.com

Please ensure that this MSDS is received by the appropriate person.

2 Composition/Data on components

Chemical characterization:

CAS No. Description

7727-37-9 Nitrogen Gaseous

Identification number(s)

EINECS Number: 231-783-9

Chemical characterization

Dangerous components:

Chemical components

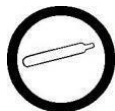
7727-37-9	Nitrogen Gaseous	23-100%
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3 Hazards identification

* **Hazard description:**

* **WHMIS-symbols:**

A - Compressed gas



* **HMIS- ratings (scale 0 - 4)**

HEALTH	0	Health = 0
FIRE	0	Fire = 0
REACTIVITY	0	Reactivity = 0

(Contd. on page 2)

Material Safety Data Sheet

Printing date 04/10/2016

Version 0

Reviewed on 04/09/2016

Trade name: Nitrogen

(Contd. of page 1)

* **NFPA ratings (scale 0 - 4)**



Health = 0

Fire = 0

Reactivity = 0

· **Information pertaining to particular dangers for man and environment:** Not applicable.

· **Classification system:**

The classification is in line with internationally approved calculation standards. It is expanded, however, by information from technical literature and by information furnished by supplier companies.

· **GHS label elements**



Warning

2.5/C - Contains gas under pressure; may explode if heated.

· **Storage:**

Protect from sunlight. Store in a well-ventilated place.

4 First aid measures

- * **After inhalation:** Supply fresh air; consult doctor in case of complaints.
- * **After skin contact:** Generally the product does not irritate the skin.
- * **After eye contact:** Rinse opened eye for at least 15 minutes under running water. Then consult a doctor.
- * **After swallowing:** Not applicable

5 Fire fighting measures

- **Suitable extinguishing agents:**
CO2, powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
- **Protective equipment:** Wear self-contained respiratory protective device.

6 Accidental release measures

Person-related safety precautions:

Wear protective equipment. Keep unprotected persons away. Ensure adequate ventilation.

Stop leak - ONLY if possible to do so without risk.

Measures for environmental protection: Prevent seepage into sewage system, workpits and/or cellars.

Measures for cleaning/collecting: Ensure adequate ventilation.

Additional information: No dangerous substances are released.

7 Handling and storage

Handling:

Information for safe handling:

Ensure good ventilation/exhaustion at the workplace. Handle with care. Avoid jolting, friction, and impact. Use only in well ventilated areas.

Store container in a secured area. Limit access to authorized personnel only. Report any incidents involving thefts, misuse, or inventory shortages to law enforcement and the supplier. Security shall be provided in accordance with all local, state (provincial) and federal regulations.

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CDN

Material Safety Data Sheet

Printing date 04/10/2016

Version 0

Reviewed on 04/09/2016

Trade name: Nitrogen

(Contd. of page 2)

Information about protection against explosions and
fires: Keep ignition sources away - Do not smoke.

Pressurized container: protect from sunlight and do not expose to temperatures exceeding 50°C. Do not pierce or burn, even after use.

Storage:
Requirements to be met by storerooms and receptacles:

Do not expose cylinder to temperatures higher than 50°C (122 °F)

Protect cylinders from physical damage. Store in cool, dry, well-ventilated area away from heavily trafficked areas and emergency exits. Do not allow the temperature where cylinders are stored to exceed 125°F (52°C). Cylinders should be stored upright and firmly secured to prevent falling or being knocked over. Full and empty cylinders should be segregated. Use a "first in-first out" inventory system to prevent full cylinders being stored for excessive periods of time.

Information about storage in one common storage facility:

Sources of ignition should be removed from storage area.

Further information about storage conditions:

Store in accordance with local fire code and/or building code or any pertaining regulations.

8 Exposure controls and personal protection

Additional information about design of technical
systems: Adequate local ventilation.

Safety showers and eyewash stations should be nearby.

Components with limit values that require monitoring at the workplace:
7727-37-9 Nitrogen Gaseous (23 - 100%)

EL Simple asphyxiant

Additional information: The lists that were valid during the creation were used as basis.

Personal protective equipment:
General protective and hygienic measures:

Protective clothing and PPE should be kept free of oil and grease, generally in clean condition PPE should be inspected and maintained regularly to retain effectiveness.

Breathing equipment:

Use atmosphere-supplying respirators (e.g. supplied-air: demand, pressure-demand, or continuous-flow or self-contained breathing apparatus: demand or pressure-demand or combination supplied-air with auxiliary self-contained air supply atmosphere-supplying respirator) in case of insufficient ventilation.

Protection of hands:


Protective gloves.

Material of gloves

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.

Eye protection: Safety glasses.

9 Physical and chemical properties

General Information
Form: Gaseous.

Color: Colorless

(Contd. on page 4)

CDN

Material Safety Data Sheet

Printing date 04/10/2016

Version 0

Reviewed on 04/09/2016

Trade name: Nitrogen

(Contd. of page 3)

Odor: Odorless* **Change in condition****Melting point/Melting range:** -210°C**Boiling point/Boiling range:** -268°C· **Flash point:** Not applicable.· **Danger of explosion:** Product does not present an explosion hazard.**10 Stability and reactivity****Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.**Materials to be avoided:****Dangerous reactions:** No dangerous reactions known.**Dangerous products of decomposition:** No dangerous decomposition products known.**11 Toxicological information****Acute toxicity:****LD/LC50 values that are relevant for classification:** LC50 - None available**Primary irritant effect:****on the skin:** No irritating effect.**on the eye:** No irritating effect.**Sensitization:** No sensitizing effects known.**Additional toxicological information:**

When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us.

The substance is not subject to classification.

12 Ecological information* **Additional ecological information:*** **General notes:** Generally not hazardous for water.**13 Disposal considerations*** **Product:*** **Recommendation:** Unused product should be returned to vendor.* **Uncleaned packagings:*** **Recommendation:**

Cylinder and unused product should be returned to vendor. Disposable cylinder must be disposed of in accordance with local regulations.

* **Recommended cleansing agent:** None applicable.

CDN

(Contd. on page 5)

Material Safety Data Sheet

Printing date 04/10/2016

Version 0

Reviewed on 04/09/2016

Trade name: Nitrogen

(Contd. of page 4)

* 14 Transport information

· TDG and DOT regulations:



- Hazard class: 2
- Identification number: UN1066
- Proper shipping name (technical name): AZOTE COMPRIMÉ
- Label: 2.2
- Packaging group: -

· Maritime transport IMDG:



- IMDG Class: 2
- UN Number: 1066
- Label: 2.2
- Marine pollutant: No
- Proper shipping name: NITROGEN, COMPRESSED



- ICAO/IATA Class: 2
- UN/ID Number: 1066
- Label: 2.2
- Proper shipping name: NITROGEN, COMPRESSED
- UN "Model Regulation": UN1066, NITROGEN, COMPRESSED, 2.2

15 Regulations

Sara

Section 355 (extremely hazardous

substances): Substance is not listed.

Section 313 (Specific toxic chemical listings):

Substance is not listed.

TSCA (Toxic Substances Control Act):

Substance is listed.

Proposition 65

Chemicals known to cause

cancer: Substance is not listed.

Chemicals known to cause reproductive toxicity for

females: Substance is not listed.

(Contd. on page 6)

CDN

Material Safety Data Sheet

Printing date 04/10/2016

Version 0

Reviewed on 04/09/2016

Trade name: Nitrogen

(Contd. of page 5)

- **Chemicals known to cause reproductive toxicity**

for males: Substance is not listed.

- **Chemicals known to cause developmental**

toxicity: Substance is not listed.

- **Carcinogenicity categories**

- **EPA (Environmental Protection**

Agency) Substance is not listed.

- **NTP (National Toxicology**

Program) Substance is not listed.

- **TLV (Threshold Limit Value established by**

ACGIH) Substance is not listed.

- **NIOSH-Ca (National Institute for Occupational Safety**

and Health) Substance is not listed.

- **OSHA-Ca (Occupational Safety & Health**

Administration) Substance is not listed.

- **Canadian substance listings:**

- **Canadian Domestic Substances**

List (DSL) Substance is not listed.

- **Canadian Ingredient Disclosure list (limit**

0.1%) Substance is not listed.

- **Canadian Ingredient Disclosure list (limit**

1%) Substance is not listed.

- **Product related hazard informations:**

Observe the general safety regulations when handling chemicals.

The substance is not subject to classification according to the sources of literature known to us.

The product was classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

- **Safety phrases:**

Keep container in a well-ventilated place.

Do not breathe gas/fumes/vapour/spray (appropriate wording to be specified by the manufacturer).

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

Please refer to the section 3 for NFPA and HMIS Hazard Codes.

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CDN

Material Safety Data Sheet

Printing date 04/10/2016

Version 0

Reviewed on 04/09/2016

Trade name: Nitrogen

· **Department issuing MSDS:** Customer Service Centre: UAN: +92.21.111-262725

· **Abbreviations and Acronyms:**

- ACGIH: American Conference of Governmental Industrial Hygienists
- CAS: Chemical Abstract Service (Division of the American Chemical Society)
- DOT: US Department of Transportation
- EINECS: European Inventory of Existing Commercial Chemical Substances
- GHS: Globally Harmonized System of Classification and Labelling of Chemicals
- HMIS: Hazardous Material Identification System
- IATA: International Air Transportation Association
- IATA-DGR: Dangerous Goods Regulations by the "International Air Transportation Association"
- ICAO: International Civil Aviation Association
- ICAO-TI: Technical Instructions by the "International Civil Aviation Organization (ICAO)"
- IMDG: International Marine Code for Dangerous Goods
- WHIMS: Workplace Hazardous Material Information System
- LC50: Lethal Concentration, 50 Percent
- LD50: Lethal Dose, 50 Percent
- N/A: Not Applicable

CDN



Material Safety Data Sheet

Printing date 04/10/2016

Version 0

Reviewed on 04/09/2016

1 Identification of substance

- **Product details**
- **Trade name: Nitrogen (Refrigerated Liquid)**
Short Name: LIN
- **Article number:** 4101-9104101-1-04-2016
- **Creation date:** 04/08/2016
Pakistan Oxygen Limited (Previously Linde Pakistan Limited)
PO Box # 4845, Dockyard Road, West Wharf
Karachi-74000, Pakistan.
www.pakxygen.com
- Please ensure that this MSDS is received by the appropriate person.

2 Composition/Data on components

- **Chemical characterization:**
- **CAS No. Description**
7727-37-9 Nitrogen Gaseous
- **Identification number(s)**
- **EINECS Number:** 231-783-9

3 Hazards identification

- **Hazard description:** Refrigerated liquefied gas.
- **WHMIS-symbols:** A - Compressed gas
- **HMIS-ratings (scale 0 - 4)**

HEALTH	0	Health = 0
FIRE	0	Fire = 0
REACTIVITY	0	Reactivity = 0

- **NFPA ratings (scale 0 - 4)**

	Health = 0
	Fire = 0
	Reactivity = 0

- **Information pertaining to particular dangers for man and environment:**

Danger of suffocation at accumulation in lower-lying or closed rooms.
Cold burns and frostbite.

- **Classification system:**

The classification is in line with internationally approved calculation standards. It is expanded, however, by information from technical literature and by information furnished by supplier companies.

(Contd. on page 2)
CDN

Material Safety Data Sheet

Printing date 04/10/2016

Version 0

Reviewed on 04/09/2016

Trade name: Nitrogen (Refrigerated Liquid)

GHS label elements Void

(Contd. of page 1)

4 First aid measures

- **After inhalation:** Supply fresh air; consult doctor in case of complaints.
- **After skin contact:** In cases of frost bites, rinse with plenty of water. Do not remove clothing.
- **After eye contact:** Rinse opened eye for at least 15 minutes under running water. Then consult a doctor.
- **After swallowing:** Not applicable

5 Fire fighting measures

- **Suitable extinguishing agents:** Use fire fighting measures that suit the environment.
- **Protective equipment:** Wear self-contained respiratory protective device.

6 Accidental release measures

- **Person-related safety precautions:**
Wear protective equipment. Keep unprotected persons away. Ensure adequate ventilation.
Stop leak - ONLY if possible to do so without risk.
- **Measures for environmental protection:** Prevent seepage into sewage system, workpits and/or cellars.
- **Measures for cleaning/collecting:** Ensure adequate ventilation.
- **Additional information:** No dangerous substances are released.

7 Handling and storage

- **Handling:**
- **Information for safe handling:**
Ensure good ventilation/exhaustion at the workplace.
Prevent formation of aerosols.
Handle with care. Avoid jolting, friction, and impact.
Use only in well ventilated areas.
Store container in a secured area. Limit access to authorized personnel only. Report any incidents involving thefts, misuse, or inventory shortages to law enforcement and the supplier. Security shall be provided in accordance with all local, state (provincial) and federal regulations.
- **Information about protection against explosions and fires:**
Keep ignition sources away - Do not smoke.
Pressurized container: protect from sunlight and do not expose to temperatures exceeding 50°C. Do not pierce or burn, even after use.
- **Storage:**
- **Requirements to be met by storerooms and receptacles:**
- **Information about storage in one common storage facility:**
Sources of ignition should be removed from storage area.
- **Further information about storage conditions:** None.

8 Exposure controls and personal protection

- **Additional information about design of technical systems:**
Adequate local ventilation.

(Contd. on page 3)

CDN

Material Safety Data Sheet

Printing date 04/10/2016

Version 0

Reviewed on 04/09/2016

Trade name: Nitrogen (Refrigerated Liquid)

Safety showers and eyewash stations should be nearby.

(Contd. of page 2)

Components with limit values that require monitoring at the workplace:

7727-37-9 Nitrogen Gaseous (23 - 100%)

EL Simple asphyxiant

Additional information: The lists that were valid during the creation were used as basis.**Personal protective equipment:****General protective and hygienic measures:**

Protective clothing and PPE should be kept free of oil and grease, generally in clean condition

PPE should be inspected and maintained regularly to retain effectiveness.

Breathing equipment:

Self-Contained Breathing Apparatus (SCBA), or

Air Line respirator with 15 minute escape pack, SCBA as back-up

Protection of hands: Cryogenic leather gauntlets/gloves**Material of gloves**

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.

Eye protection: Safety goggles with face shield**Body protection:** Leather safety shoes/boots**Skin Protection:** Long sleeve shirt and long trousers/overalls (should not be tucked in)**9 Physical and chemical properties****General Information****Form:** Refrigerated liquefied gas**Color:** Colorless**Odor:** Odorless* **Change in condition****Melting point/Melting range:** -210°C**Boiling point/Boiling range:** -195°C· **Flash point:** Not applicable.* **Danger of explosion:** Product does not present an explosion hazard.* **Solubility in / Miscibility with****Water:** Not miscible or difficult to mix.**10 Stability and reactivity****Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.**Dangerous reactions** No dangerous reactions known.**Dangerous products of decomposition:** No dangerous decomposition products known.**11 Toxicological information*** **Acute toxicity:*** **LD/LC50 values that are relevant for classification:** LC50 - None available* **Primary irritant effect:*** **on the skin:** No irritating effect.* **on the eye:** No irritating effect.

(Contd. on page 4)

CDN

Material Safety Data Sheet

Printing date 04/10/2016

Version 0

Reviewed on 04/09/2016

Trade name: Nitrogen (Refrigerated Liquid)

(Contd. of page 3)

Sensitization: No sensitizing effects known.

Additional toxicological information:

When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us.
The substance is not subject to classification.

12 Ecological information

General notes: Generally not hazardous for water.

13 Disposal considerations

Product:

Recommendation: Unused product should be returned to vendor.

Uncleaned packagings:

Recommendation:

Cylinder and unused product should be returned to vendor. Disposable cylinder must be disposed of in accordance with local regulations.

Recommended cleansing agent: None applicable.

14 Transport information

TDG and DOT regulations:



- **Hazard class:** 2.2
- **Packing group:-**
- **Label** 2.2
- **Packaging group:** -

Maritime transport IMDG:



- **IMDG Class:** 2.2
- **UN Number:**
- **Label** 2.2
- * **Packaging group:** -
- **EMS Number:** F-C,S-V
- **Marine pollutant:** No

Air transport ICAO-TI and IATA-DGR:



- **ICAO/IATA Class:** 2.2

(Contd. on page 5)

CDN

Material Safety Data Sheet

Printing date 04/10/2016

Version 0

Reviewed on 04/09/2016

Trade name: Nitrogen (Refrigerated Liquid)

· UN/ID Number:	(Contd. of page 4)
· Label	2.2
· Packaging group:	-
· UN "Model Regulation":	2.2

15 Regulations

* **Section 355 (extremely hazardous**

substances): Substance is not listed.

* **Section 313 (Specific toxic**

chemical listings): Substance is not listed.

* **TSCA (Toxic Substances**

Control Act): Substance is listed.

* **Proposition 65**

* **Chemicals known to**

cause cancer: Substance is not listed.

* **Chemicals known to cause reproductive toxicity for**

females: Substance is not listed.

* **Chemicals known to cause reproductive toxicity**

for males: Substance is not listed.

* **Chemicals known to cause developmental**

toxicity: Substance is not listed.

* **Carcinogen categories**

* **EPA (Environmental Protection**

Agency) Substance is not listed.

* **NTP (National Toxicology**

Program) Substance is not listed.

* **TLV (Threshold Limit Value established**

by ACGIH) Substance is not listed.

* **NIOSH-Ca (National Institute for Occupational**

Safety and Health) Substance is not listed.

* **OSHA-Ca (Occupational Safety & Health**

Administration) Substance is not listed.

* **Canadian substance listings:**

* **Canadian Domestic Substances**

List (DSL) Substance is not listed.

* **Canadian Ingredient Disclosure list**

(limit 0.1%) Substance is not listed.

* **Canadian Ingredient Disclosure list**

(limit 1%) Substance is not listed.

* **Product related hazard informations:**

Observe the general safety regulations when handling chemicals.

(Contd. on page 6)

CDN

Material Safety Data Sheet

Printing date 04/10/2016

Version 0

Reviewed on 04/09/2016

Trade name: Nitrogen (Refrigerated Liquid)

The substance is not subject to classification according to the sources of literature known to us.
The product was classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

Safety phrases:

Keep container in a well-ventilated place.

Do not breathe gas/fumes/vapour/spray (appropriate wording to be specified by the manufacturer).

(Contd. of page 5)

The product was classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

Safety phrases:

Keep container in a well-ventilated place.

Do not breathe gas/fumes/vapour/spray (appropriate wording to be specified by the manufacturer).

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

Please refer to the section 3 for NFPA and HMIS Hazard Codes.

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CAS: Chemical Abstract Service (Division of the American Chemical Society)

DOT: US Department of Transportation

EINECS: European Inventory of Existing Commercial Chemical Substances

GHS: Globally Harmonized System of Classification and Labelling of Chemicals

HMIS: Hazardous Material Identification System

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ICAO: International Civil Aviation Association

ICAO-TI: Technical Instructions by the "International Civil Aviation Organization (ICAO)

IMDG: International Marine Code for Dangerous Goods

WHIMS: Workplace Hazardous Material Information System

LC50: Lethal Concentration, 50 Percent

LD50: Lethal Dose, 50 Percent

N/A: Not Applicable

Material Safety Data Sheet

Printing date 04/10/2016

Version 0

Reviewed on 04/09/2016

1 Identification of substance

- * **Product details**
 - * **Trade name: Oxygen**
 - * **Article number: 4101-9004101-1-04-2016**
 - * **Creation Date: 04/08/2016**
- Pakistan Oxygen Limited (Previously Linde Pakistan Limited)
 PO Box # 4845, Dockyard Road, West Wharf
 Karachi-74000, Pakistan.
 www.pakooxygen.com

· Please ensure that this MSDS is received by the appropriate person.

2 Composition/Data on components

- **Chemical characterization:**
- **CAS No. Description**
7782-44-7 Oxygen
- **Identification number(s)**
- **EINECS Number: 231-956-9**
- **Index number: 008-001-00-8**

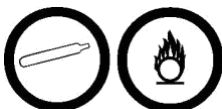
3 Hazards identification

- **Hazard description:**



Oxidizing

- **WHMIS-symbols: A**
- Compressed gas C -
- Oxidizing materials



- **HMIS-ratings (scale 0 - 4)**

HEALTH	0	Health = 0
FIRE	0	Fire = 0
REACTIVITY	3	Reactivity = 3

Material Safety Data Sheet

Printing Date 04/10/2016

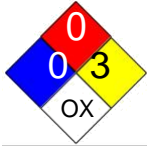
Version 0

Reviewed on 04/09/2016

Trade name: Oxygen

· NFPA ratings (scale 0 - 4)

(Contd. of page 1)



Health = 0

Fire = 0

Reactivity = 3

* **Information pertaining to particular dangers for man and environment:** Contact with combustible material may cause fire.

* **Classification system:**

The classification is in line with internationally approved calculation standards. It is expanded, however, by information from technical literature and by information furnished by supplier companies.

* **GHS label elements****Danger**

2.4/1 - May cause or intensify fire; oxidizer.

**Warning**

2.5/C - Contains gas under pressure; may explode if heated.

* **Prevention:**

Keep/Store away from clothing/combustible materials.
Keep reduction valves free from grease and oil.

* **Response:**

In case of fire: Stop leak if safe to do so.

* **Storage:**

Protect from sunlight. Store in a well-ventilated place. Store in a well-ventilated place.

4 First aid measures

- * **After inhalation:** Supply fresh air; consult doctor in case of complaints.
- * **After skin contact:** Generally the product does not irritate the skin.
- * **After eye contact:** Rinse opened eye for at least 15 minutes under running water. Then consult a doctor.
- * **After swallowing:** Not applicable

5 Fire fighting measures

- **Suitable extinguishing agents:**
CO₂, powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
- **Protective equipment:** Wear self-contained respiratory protective device.

6 Accidental release measures

- * **Person-related safety precautions:**
Wear protective equipment. Keep unprotected persons away. Ensure adequate ventilation.
Eliminate ignition sources
Stop leak - ONLY if possible to do so without risk.
- * **Measures for environmental protection:** Prevent seepage into sewage system, workpits and/or cellars.

(Contd. on page 3)

CDN

Material Safety Data Sheet

Printing Date 04/10/2016

Version 0

Reviewed on 04/09/2016

Trade name: Oxygen· **Measures for cleaning/collecting:** Ensure adequate ventilation

(Contd. of page 2)

7 Handling and storage**Handling:****Information for safe handling:**

Handle with care. Avoid jolting, friction, and impact. Use only in well ventilated areas.

Store container in a secured area. Limit access to authorized personnel only. Report any incidents involving thefts, misuse, or inventory shortages to law enforcement and the supplier. Security shall be provided in accordance with all local, state (provincial) and federal regulations.

Information about protection against explosions and fires:

Keep ignition sources away - Do not smoke.

Pressurized container: protect from sunlight and do not expose to temperatures exceeding 50°C. Do not pierce or burn, even after use.

Storage:**Requirements to be met by storerooms and receptacles:**

Do not expose cylinder to temperatures higher than 50°C (122 °F)

Protect cylinders from physical damage. Store in cool, dry, well-ventilated area away from heavily trafficked areas and emergency exits. Do not allow the temperature where cylinders are stored to exceed 125°F (52°C). Cylinders should be stored upright and firmly secured to prevent falling or being knocked over. Full and empty cylinders should be segregated. Use a "first in-first out" inventory system to prevent full cylinders being stored for excessive periods of time.

Information about storage in one common storage facility:

Store separately from cylinders containing flammables by a minimum distance of 20' or by a barrier of non-combustible material at least 5' high having a fire resistant rating of at least 30minutes.

Sources of ignition should be removed from storage area.

Further information about storage conditions:

Store cylinder in a well-ventilated area.

Store in accordance with local fire code and/or building code or any pertaining regulations.

8 Exposure controls and personal protection· **Additional information about design of**

technical systems: Adequate local ventilation.

Safety showers and eyewash stations should be nearby.

· **Components with limit values that require monitoring at the workplace:** Not required.· **Additional information:** The lists that were valid during the creation were used as basis.· **Personal protective equipment:**· **General protective and hygienic measures:** Wash hands before breaks and at the end of work.

Protective clothing and PPE should be kept free of oil and grease, generally in clean condition PPE should be inspected and maintained regularly to retain effectiveness.

· **Breathing equipment:**

Use atmosphere-supplying respirators (e.g. supplied-air: demand, pressure-demand, or continuous-flow or self-contained breathing apparatus: demand or pressure-demand or combination supplied-air with auxiliary self-contained air supply atmosphere-supplying respirator) in case of insufficient ventilation.

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· Protection of hands:

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Protective gloves.

· Material of gloves

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.

- * **Eye protection:** Safety glasses.

9 Physical and chemical properties

· General Information

Form:	Gaseous.
Color:	Colorless
Odor:	Odorless

* Change in condition

Melting point/Melting range: -219°C
Boiling point/Boiling range: -182°C

· **Flash point:** Not applicable.

* **Flammability (solid, gaseous):** Contact with combustible material may cause fire.

* **Danger of explosion:** Explosive when mixed with combustible material.

* Solubility in / Miscibility with

Water at 20°C: 39 g/l

10 Stability and reactivity

· **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.

· **Materials to be avoided:**

· **Dangerous reactions**

May react violently with reducing agents.

Violently oxidises organic substances.

May react violently with combustible substances.

· **Dangerous products of decomposition:** No dangerous decomposition products known.

11 Toxicological information

· **Acute toxicity:**

· **LD/LC50 values that are relevant for classification:** LC50 - None available

· **Primary irritant effect:**

· **on the skin:** No irritating effect.

· **on the eye:** No irritating effect.

· **Sensitization:** No sensitizing effects known.

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12 Ecological information

- **Additional ecological information:**
- **General notes:** Generally not hazardous for water

13 Disposal considerations

- Product:**
- Recommendation:** Unused product should be returned to vendor.
- Uncleaned packagings:**
- Recommendation:**
Cylinder and unused product should be returned to vendor. Disposable cylinder must be disposed of in accordance with local regulations.
- Recommended cleansing agent:** None applicable.

14 Transport information

- **TDG and DOT regulations:**



- **Hazard class:** 2.2
- **Identification number:** UN1072
- **Packing group:** -
- **Proper shipping name (technical name):** OXYGEN, COMPRESSED
- **Label:** 2.2+5.1
- **Packaging group:** -

- **Maritime transport IMDG:**



- **IMDG Class:** 2.2
- **UN Number:** 1072
- **Label:** 2.2+5.1
- **Packaging group:** -
- **EMS Number:** F-C,S-W
- **Marine pollutant:** No
- **Proper shipping name:** OXYGEN, COMPRESSED

- **Air transport ICAO-TI and IATA-DGR:**



- **ICAO/IATA Class:** 2.2
- **UN/ID Number:** 1072
- **Label:** 2.2+5.1
- **Packaging group:** -

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Propper shipping name: OXYGEN, COMPRESSED

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UN "Model Regulation": UN1072, OXYGEN, COMPRESSED, 2.2 (5.1)

15 Regulations**Sara****Section 355 (extremely hazardous**

substances): Substance is not listed.

Section 313 (Specific toxic chemical listings):

Substance is not listed.

TSCA (Toxic Substances Control Act):

Substance is listed.

Proposition 65**Chemicals known to cause****cancer:** Substance is not listed.**Chemicals known to cause reproductive toxicity for****females:** Substance is not listed.**Chemicals known to cause reproductive toxicity for****males:** Substance is not listed.**Chemicals known to cause developmental****toxicity:** Substance is not listed.**Carcinogeny categories****EPA (Environmental Protection****Agency) Substance is not listed.****NTP (National Toxicology****Program) Substance is not listed.****TLV (Threshold Limit Value established by****ACGIH) Substance is not listed.****NIOSH-Ca (National Institute for Occupational Safety and****Health) Substance is not listed.****OSHA-Ca (Occupational Safety & Health****Administration) Substance is not listed.****Canadian substance listings:****Canadian Domestic Substances List****(DSL) Substance is listed.****Canadian Ingredient Disclosure list (limit****0.1%) Substance is not listed.****Canadian Ingredient Disclosure list (limit****1%) Substance is not listed.****Product related hazard informations:**

The product was classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

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Trade name: Oxygen· **Hazard symbols:**

Oxidizing

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· **Risk phrases:**

Contact with combustible material may cause fire.

· **Safety phrases:**

After contact with skin, was immediately with plenty of water Keep out of the reach of children.
Keep away from combustible material.

* **16 Other information**

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

Please refer to the section 3 for NFPA and HMIS Hazard Codes.

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Although reasonable care has been taken in the preparation of this document, we extend no warranties and make no representations as to the accuracy or completeness of the information contained herein, and assume no responsibility regarding the suitability of this information for the user's intended purposes or for the consequences of its use. Each individual should make a determination as to the suitability of the information for their particular purpose(s).

GENERAL DISCLAIMER

For terms and conditions, including limitation of liability, please refer to the purchase agreement in effect between POL. (or any of its affiliates and subsidiaries) and the purchaser.

· **Department issuing MSDS:**

Customer Service Centre: UAN: +92.21.111-262725

· **Abbreviations and Acronyms:**

ACGIH: American Conference of Governmental Industrial Hygienists
 CAS: Chemical Abstract Service (Division of the American Chemical Society)
 DOT: US Department of Transportation
 EINECS: European Inventory of Existing Commercial Chemical Substances
 GHS: Globally Harmonized System of Classification and Labelling of Chemicals
 HMIS: Hazardous Material Identification System
 IATA: International Air Transportation Association
 IATA-DGR: Dangerous Goods Regulations by the "International Air Transportation Association"
 ICAO: International Civil Aviation Association
 ICAO-TI: Technical Instructions by the "International Civil Aviation Organization (ICAO)"
 IMDG: International Marine Code for Dangerous Goods
 WHIMS: Workplace Hazardous Material Information System
 LC50: Lethal Concentration, 50 Percent
 LD50: Lethal Dose, 50 Percent
 N/A: Not Applicable

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