

**AIR LIQUIDE****MATERIAL SAFETY DATA SHEET**

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Revised edition no : 4

Date : 14 / 11 / 2012

Supersedes : 24 / 10 / 2012

Oxygen**AL605****Danger****SECTION 1. Identification of the substance/mixture and of the company/undertaking****1.1. Product identifier**

Trade name : Oxygen
 SDS Nr : AL605
 Chemical formula : O₂

1.2. Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses : Industrial and professional. Perform risk assessment prior to use.
 Test gas / Calibration gas. Laboratory use Contact supplier for more uses information
 Use : Welding and cutting of metals. Medical applications. Industrial applications. Combustion aid.

1.3. Details of the supplier of the safety data sheet

Company identification : Air Liquide Australia Limited
 Level 9 / 380 St. Kilda Road
 Melbourne VIC 3004 Australia
 Tel: + 61 3 9697 9888
 Fax: + 61 3 9690 7107
 ALAEnquiries@AirLiquide.com

1.4. Emergency telephone number

Emergency telephone number : 1800 812 588

SECTION 2. Hazards identification**2.1. Classification of the substance or mixture****Hazard Class and Category Code Regulation EC 1272/2008 (CLP)**

R Phrase(s) : R8 : Contact with combustible material may cause fire.
 • Physical hazards : Oxidizing gases - Category 1 - Danger - (CLP : Ox. Gas 1) - H270
 Gases under pressure - Compressed gas - Warning - (CLP : Press. Gas) - H280

Classification EC 67/548 or EC 1999/45

: O; R8

2.2. Label elements**Labelling Regulation EC 1272/2008 (CLP)**

• Hazard pictograms



• Hazard pictograms code : GHS03 - GHS04
 • Signal word : Danger
 • Hazard statements : H270 - May cause or intensify fire; oxidizer.
 H280 - Contains gas under pressure; may explode if heated.
 • Precautionary statements
 - Prevention : P244 - Keep valves and fittings free from oil and grease
 P220 - Keep away from combustible materials.
 - Response : P370+P376 - In case of fire : Stop leak if safe to do so.

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SECTION 2. Hazards identification (continued)

- Storage : P403 - Store in a well-ventilated place.

2.3. Other hazards

: None.

SECTION 3. Composition/information on ingredients

3.1. Substance / 3.2. Mixture

Substance.

Substance name	Contents	CAS No	EC No	Annex No		Classification
Oxygen	: 100 %	7782-44-7	231-956-9	008-001-00-8	* 1	O; R8 Ox. Gas 1 (H270) Press. Gas (H280)

Contains no other components or impurities which will influence the classification of the product.

* 1: Listed in Annex IV / V REACH, exempted from registration.

* 2: Registration deadline not expired.

* 3: Registration not required: Substance manufactured or imported < 1t/y

Full text of R-phrases see chapter 16. Full text of H-statements see chapter 16

SECTION 4. First aid measures

4.1. Description of first aid measures

First aid measures

- Inhalation : Continuous inhalation of concentrations higher than 75% may cause nausea, dizziness, respiratory difficulty and convulsion.
Remove victim to uncontaminated area.
- Skin contact : Adverse effects not expected from this product.
- Eye contact : Adverse effects not expected from this product.
- Ingestion : Ingestion is not considered a potential route of exposure.

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

: Refer to section 11.

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

: None.

SECTION 5. Fire-fighting measures

5.1. Extinguishing media

Extinguishing media

- Suitable extinguishing media : All known extinguishants can be used.

5.2. Special hazards arising from the substance or mixture

- Specific hazards : Oxygen will accelerate burning of combustible materials.
Oxidant. Strongly supports combustion. May react violently with combustible materials.
Exposure to fire may cause containers to rupture/explode.
Supports combustion.

- Hazardous combustion products : None.

5.3. Advice for fire-fighters

- Specific methods : Coordinate fire measure to the surrounding fire. Cool endangered containers with water spray jet from a protected position. Do not empty contaminated fire water into drains.
If possible, stop flow of product.
Move away from the container and cool with water from a protected position.

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SECTION 5. Fire-fighting measures (continued)

Special protective equipment for fire fighters : None.

SECTION 6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions : Try to stop release.
: Evacuate area.
Ensure adequate air ventilation.
Eliminate ignition sources.

6.2. Environmental precautions

: None.
: Try to stop release.
Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.

6.3. Methods and material for containment and cleaning up

Clean up methods : None.
: Ventilate area.

6.4. Reference to other sections

: See also sections 8 and 13.

SECTION 7. Handling and storage

7.1. Precautions for safe handling

Safe use of the product : Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt.
Only experienced and properly instructed persons should handle gases under pressure.
The product must be handled in accordance with good industrial hygiene and safety procedures.
Do not smoke while handling product.
Ensure the complete gas system was (or is regularly) checked for leaks before use.

Safe handling of the gas receptacle : Refer to supplier's container handling instructions.
Do not allow backfeed into the container.
Protect cylinders from physical damage; do not drag, roll, slide or drop.
When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders.
Leave valve protection caps in place until the container has been secured against either a wall or bench or placed in a container stand and is ready for use.
If user experiences any difficulty operating cylinder valve discontinue use and contact supplier.
Never attempt to repair or modify container valves or safety relief devices.
Damaged valves should be reported immediately to the supplier.
Keep container valve outlets clean and free from contaminants particularly oil and water.
Replace valve outlet caps or plugs and container caps where supplied as soon as container is disconnected from equipment.
Close container valve after each use and when empty, even if still connected to equipment.
Never attempt to transfer gases from one cylinder/container to another.
Never use direct flame or electrical heating devices to raise the pressure of a container.
Do not remove or deface labels provided by the supplier for the identification of the cylinder contents.

Handling : Use no oil or grease.
Open valve slowly to avoid pressure shock.
Suck back of water into the container must be prevented.
Do not allow backfeed into the container.
Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt.
Keep away from ignition sources (including static discharges).
Refer to supplier's container handling instructions.

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SECTION 7. Handling and storage (continued)

7.2. Conditions for safe storage, including any incompatibilities

- Storage** :
- Keep container below 50°C in a well ventilated place.
 - Observe all regulations and local requirements regarding storage of containers.
 - Containers should not be stored in conditions likely to encourage corrosion.
 - Containers should be stored in the vertical position and properly secured to prevent toppling.
 - Stored containers should be periodically checked for general condition and leakage.
 - Container valve guards or caps should be in place.
 - Store containers in location free from fire risk and away from sources of heat and ignition.
 - Keep away from combustible materials.
 - Segregate from flammable gases and other flammable materials in store.
 - Keep container below 50°C in a well ventilated place.

7.3. Specific end use(s)

: None.

SECTION 8. Exposure controls/personal protection

8.1. Control parameters

- DNEL: Derived no effect level** : None available.
- PNEC: Predicted no effect concentration** : None available.

8.2. Exposure controls

- 8.2.1. Appropriate engineering controls** :
- Systems under pressure should be regularly checked for leakages.
 - Provide adequate general and local exhaust ventilation.
 - Consider work permit system e.g. for maintenance activities.
- 8.2.2. Individual protection measures, e.g. personal protective equipment** :
- A risk assessment should be conducted and documented in each work area to assess the risks related to the use of the product and to select the PPE that matches the relevant risk.
 - The following recommendations should be considered.
 - Wear safety glasses with side shields
 - Wear leather safety gloves and safety shoes when handling cylinders.
- Personal protection** :
- Do not smoke while handling product.
 - Wear suitable hand, body and head protection. Wear goggles with suitable filter lenses when use is cutting/welding.
 - Avoid oxygen rich (>21%) atmospheres.
 - Ensure adequate ventilation.
- 8.2.3. Environmental exposure controls** :
- Refer to local regulations for restriction of emissions to the atmosphere. See section 13 for specific methods for waste gas treatment.

SECTION 9. Physical and chemical properties

9.1. Information on basic physical and chemical properties

- Appearance**
- Physical state at 20°C / 101.3kPa : Gas.
 - Colour : Colourless gas.
 - Odour** : No odour warning properties.
 - Odour threshold** : Odour threshold is subjective and inadequate to warn for overexposure.
 - pH value** : Not applicable for gas-mixtures.
 - Molar mass [g/mol]** : 32
 - Melting point [°C]** : -219
 - Boiling point [°C]** : -183
 - Critical temperature [°C]** : -118
 - Flash point [°C]** : Not applicable.
 - Evaporation rate (ether=1)** : Not applicable.

Oxygen**AL605****SECTION 9. Physical and chemical properties (continued)**

Flammability range [vol% in air]	: Oxidiser.
Vapour pressure [20°C]	: Not applicable. Not applicable. Not applicable.
Relative density, gas (air=1)	: 1.1
Relative density, liquid (water=1)	: 1.1
Solubility in water [mg/l]	: 39
Partition coefficient n-octanol/water	: Not known.
Auto-ignition temperature [°C]	: Not applicable.
Viscosity at 20°C [mPa.s]	: Not applicable.
Explosive Properties	: Not applicable.

9.2. Other information

Other data	: Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level.
Molecular weight	: 32

SECTION 10. Stability and reactivity**10.1. Reactivity**

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

10.2. Chemical stability

: Stable under normal conditions.

10.3. Possibility of hazardous reactions

: Do not use oxygen as a substitute for air, nitrogen or any other gas.
Use only with equipment cleaned for oxygen service and rated for cylinder pressure.
Use only oxygen approved lubricants and oxygen approved sealings.
Oxygen will accelerate burning of combustible materials.

10.4. Conditions to avoid

: Avoid sparks, flames and other sources of ignition.
Violently oxidises organic material.

10.5. Incompatible materials

: May react violently with combustible materials.
May react violently with reducing agents.
Violently oxidises organic material.
Keep equipment free from oil and grease.

10.6. Hazardous decomposition products

: Under normal conditions of storage and use, hazardous decomposition products should not be produced.
: None.

SECTION 11. Toxicological information**11.1. Information on toxicological effects**

Toxicity information	: No known toxicological effects from this product.
Acute toxicity	: No known toxicological effects from this product.
Rat inhalation LC50 [ppm/4h]	: No data available.
Skin corrosion/irritation	: No known effects from this product.
Serious eye damage/irritation	: No known effects from this product.
Respiratory or skin sensitisation	: No known effects from this product.

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SECTION 11. Toxicological information (continued)

Carcinogenicity	: No known effects from this product.
Germ cell mutagenicity	: No known effects from this product.
Toxic for reproduction : Fertility	: No known effects from this product.
Toxic for reproduction : unborn child	: No known effects from this product.
STOT-single exposure	: No known effects from this product.
STOT-repeated exposure	: No known effects from this product.
Aspiration hazard	: Not applicable for gases and gas-mixtures.

SECTION 12. Ecological information

12.1. Toxicity

: No data available.

12.2. Persistence - degradability

: No data available.

12.3. Bioaccumulative potential

: No data available.

12.4. Mobility in soil

: No data available.

12.5. Results of PBT and vPvB assessment

: No data available.

12.6. Other adverse effects

Ecological effects information : No ecological damage caused by this product.

SECTION 13. Disposal considerations

13.1. Waste treatment methods

May be vented to atmosphere in a well ventilated place.
Do not discharge into any place where its accumulation could be dangerous.
Refer to the code of practice of EIGA (Doc. 30/10 "Disposal of Gases, downloadable at <http://www.eiga.org>) for more guidance on suitable disposal methods
Contact supplier if guidance is required.

General : May be vented to atmosphere in a well ventilated place.
Do not discharge into any place where its accumulation could be dangerous.
Contact supplier if guidance is required.

13.2. Additional information

: None.

SECTION 14. Transport information

UN number : 1072
Labelling ADR, IMDG, IATA

: 2.2 : Non flammable, non toxic gas.
5.1 : Oxidizing substances.

Land transport (ADR/RID)

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SECTION 14. Transport information (continued)

H.I. nr : 25
UN proper shipping name : OXYGEN, COMPRESSED
Transport hazard class(es) : 2
Classification code : 1 O
Packing Instruction(s) : P200
Tunnel Restriction : E : Passage forbidden through tunnels of category E.
HAZCHEM - Emergency Action Code : 2S
2 = Fine water spray.
S = Risk of violent reaction or explosion. Recommended personal protective equipment : Full fire kit and breathing apparatus. Appropriate measures : dilute.

Sea transport (IMDG)

Proper shipping name : OXYGEN, COMPRESSED
OXYGEN, COMPRESSED
Class : 2.2
Emergency Schedule (EmS) - Fire : F-C
Emergency Schedule (EmS) - Spillage : S-W
Packing instruction : P200

Air transport (ICAO-TI / IATA-DGR)

Proper shipping name (IATA) : OXYGEN, COMPRESSED
Class : 2.2
Passenger and Cargo Aircraft : Allowed.
Packing instruction - Passenger and Cargo Aircraft : 200
Cargo Aircraft only : Allowed.
Packing instruction - Cargo Aircraft only : 200

Special precautions for user

: Avoid transport on vehicles where the load space is not separated from the driver's compartment.
Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency.
Before transporting product containers :
- Ensure there is adequate ventilation.
- Ensure that containers are firmly secured.
- Ensure cylinder valve is closed and not leaking.
- Ensure valve outlet cap nut or plug (where provided) is correctly fitted.
- Ensure valve protection device (where provided) is correctly fitted.

- IMO-IMDG code
- ICAO/IATA

Other transport information : Avoid transport on vehicles where the load space is not separated from the driver's compartment.
Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency.
Before transporting product containers :
- Ensure that containers are firmly secured.
- Ensure cylinder valve is closed and not leaking.
- Ensure valve outlet cap nut or plug (where provided) is correctly fitted.
- Ensure valve protection device (where provided) is correctly fitted.
- Ensure there is adequate ventilation.
- Compliance with applicable regulations.



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SECTION 15. Regulatory information

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

EU legislation

Seveso directive 96/82/EC : Not covered.

National legislation

: Ensure all national/local regulations are observed.

15.2. Chemical Safety Assessment

: A CSA does not need to be carried out for this product.

SECTION 16. Other information

- Indication of changes** : Revised safety data sheet in accordance with commission regulation (EU) No 453/2010
- Training advice** : Ensure all national/local regulations are observed.
Receptacle under pressure.
Ensure operators understand the hazard of oxygen enrichment.
- List of full text of R-phrases in section 3.** : R8 : Contact with combustible material may cause fire.
- List of full text of H-statements in section 3.** : H270 - May cause or intensify fire; oxidizer.
H280 - Contains gas under pressure; may explode if heated.
- Further information** : Classification in accordance with calculation methods of regulation (EC) 1272/2008 CLP / (EC) 1999/45 DPD.
This Safety Data Sheet has been established in accordance with the applicable European Union legislation.
- Note** : This Safety Data Sheet has been established in accordance with the applicable European Union legislation.
- DISCLAIMER OF LIABILITY** : Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out.
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