

**Danger**



### SECTION 1: Identification of the substance/mixture and of the company/undertaking

#### 1.1. Product identifier

Trade name : LASAL™ 201  
SDS no : 2009060

#### 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.  
Contact supplier for more information on uses.

Uses advised against : Consumer use.

#### 1.3. Details of the supplier of the safety data sheet

Company identification : AIR LIQUIDE SINGAPORE PTE LTD  
HEAD OFFICE : 438B ALEXANDRA ROAD, BLOCK B, ALEXANDRA TECHNOPARK #07-01  
SINGAPORE 119968 SPECIALGASES OFFICE, NO 24 JALAN BUROH SINGAPORE 619480  
+65 6 265 3788  
<https://industry.airliquide.sg/resources/safety-data-sheets-sds>  
Sg-info@airliquide.com

#### 1.4. Emergency telephone number

Emergency telephone number : +65 6265 3788, +65 9619 9229 (After Office Hour)

### SECTION 2: Hazards identification

#### 2.1. Classification of the substance or mixture

##### Classification according to Regulation (EC) No. 1272/2008 [CLP]

Physical hazards	Gases under pressure : Compressed gas	H280
Health hazards	Reproductive toxicity, Category 1A	H360
	Specific target organ toxicity — Repeated exposure, Category 2	H373

#### 2.2. Label elements

##### Labelling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms (CLP) :



GHS04

GHS08

Signal word (CLP) : Danger

Hazard statements (CLP) : H280 - Contains gas under pressure; may explode if heated.  
H360 - May damage fertility or the unborn child.  
H373 - May cause damage to organs through prolonged or repeated exposure.

Precautionary statements (CLP)

- Prevention : P201 - Obtain special instructions before use.  
P202 - Do not handle until all safety precautions have been read and understood.  
P260 - Do not breathe dust/fume/gas/mist/vapours/spray.  
P280 - Wear protective gloves, protective clothing, eye protection, face protection.
- Response : P314 - Get medical advice/attention if you feel unwell.
- Storage : P405 - Store locked up.

Supplemental information

: Restricted to professional users.

**2.3. Other hazards**

: None.

**SECTION 3: Composition/information on ingredients**

**3.1. Substances** : Not applicable

**3.2. Mixtures**

Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
Helium	(CAS-No.) 7440-59-7 (EC-No.) 231-168-5 (EC Index-No.) (REACH-no) *1	65	Press. Gas (Comp.), H280
Nitrogen	(CAS-No.) 7727-37-9 (EC-No.) 231-783-9 (EC Index-No.) (REACH-no) *1	19	Press. Gas (Comp.), H280
Carbon monoxide	(CAS-No.) 630-08-0 (EC-No.) 211-128-3 (EC Index-No.) 006-001-00-2 (REACH-no) 01-2119480165-39	6	Flam. Gas 1, H220 Press. Gas (Comp.), H280 Acute Tox. 3 (Inhalation:gas), H331 Repr. 1A, H360D STOT RE 1, H372
Carbon dioxide	(CAS-No.) 124-38-9 (EC-No.) 204-696-9 (EC Index-No.) (REACH-no) *1	4	Press. Gas (Liq.), H280
Xenon	(CAS-No.) 7440-63-3 (EC-No.) 231-172-7 (EC Index-No.) (REACH-no) *1	3	Press. Gas (Liq.), H280

Oxygen	(CAS-No.) 7782-44-7 (EC-No.) 231-956-9 (EC Index-No.) 008-001-00-8 (REACH-no) *1	3	Ox. Gas 1, H270 Press. Gas (Comp.), H280
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Full text of H-statements: see section 16

*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.

## SECTION 4: First aid measures

### 4.1. Description of first aid measures

- Inhalation : Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Perform cardiopulmonary resuscitation if breathing stopped.
- 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

- : In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation.
- Prolonged exposure to small concentrations may result in pulmonary oedema.
- Low concentrations of CO2 cause increased respiration and headache.
- Refer to section 11.

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

- : None.

## SECTION 5: Firefighting measures

### 5.1. Extinguishing media

- Suitable extinguishing media : Water spray or fog.
- Unsuitable extinguishing media : Do not use water jet to extinguish.

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

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

### 5.3. Advice for firefighters

- Specific methods : Use fire control measures appropriate for the surrounding fire. Exposure to fire and heat radiation may cause gas receptacles to rupture. Cool endangered receptacles with water spray jet from a protected position. Prevent water used in emergency cases from entering sewers and drainage systems.
- If possible, stop flow of product.
- Use water spray or fog to knock down fire fumes if possible.
- Move containers away from the fire area if this can be done without risk.

Special protective equipment for fire fighters : Wear gas tight chemically protective clothing in combination with self contained breathing apparatus.  
Standard EN 943-2: Protective clothing against liquid and gaseous chemicals, aerosols and solid particles. Gas-tight chemical protective suits for emergency teams.  
Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask.

## SECTION 6: Accidental release measures

### 6.1. Personal precautions, protective equipment and emergency procedures

: Try to stop release.  
Evacuate area.  
Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe.  
Ensure adequate air ventilation.  
Act in accordance with local emergency plan.  
Stay upwind.

### 6.2. Environmental precautions

: Try to stop release.

### 6.3. Methods and material for containment and cleaning up

: 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 : Avoid exposure, obtain special instructions before use.  
The product must be handled in accordance with good industrial hygiene and safety procedures.  
Only experienced and properly instructed persons should handle gases under pressure.  
Consider pressure relief device(s) in gas installations.  
Ensure the complete gas system was (or is regularly) checked for leaks before use.  
Do not smoke while handling product.  
Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt.  
Use only oxygen approved lubricants and oxygen approved sealings.  
Avoid suck back of water, acid and alkalis.  
Do not breathe gas.  
Avoid release of product into atmosphere.

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.

Suck back of water into the container must be prevented.

Open valve slowly to avoid pressure shock.

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

: Observe all regulations and local requirements regarding storage of containers.

Containers should not be stored in conditions likely to encourage corrosion.

Container valve guards or caps should be in place.

Containers should be stored in the vertical position and properly secured to prevent them from falling over.

Stored containers should be periodically checked for general condition and leakage.

Keep container below 50°C in a well ventilated place.

Store containers in location free from fire risk and away from sources of heat and ignition.

Keep away from combustible materials.

### 7.3. Specific end use(s)

: None.

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

### 8.1. Control parameters

<b>Carbon monoxide (630-08-0)</b>		
OEL : Occupational Exposure Limits		
EU	TWA IOELV (EU) 8 h [mg/m <sup>3</sup> ]	23 mg/m <sup>3</sup>
	TWA IOELV (EU) 8 h [ppm]	20 ppm
	STEL IOELV (EU) 15 min [mg/m <sup>3</sup> ]	117 mg/m <sup>3</sup>
	STEL IOELV (EU) 15 min [ppm]	100 ppm
	Notes	SCOEL Recommendations (1995)
ACGIH	ACGIH TWA (ppm)	25 ppm
<b>Carbon dioxide (124-38-9)</b>		
OEL : Occupational Exposure Limits		
EU	TWA IOELV (EU) 8 h [mg/m <sup>3</sup> ]	9000 mg/m <sup>3</sup>
	TWA IOELV (EU) 8 h [ppm]	5000 ppm
ACGIH	ACGIH TWA (ppm)	5000 ppm
	ACGIH STEL (ppm)	30000 ppm

Remark (ACGIH)	Asphyxia
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<b>Carbon monoxide (630-08-0)</b>	
DNEL: Derived no effect level (Workers)	
Acute - local effects, inhalation	100 ppm
Acute - systemic effects, inhalation	100 ppm
Long-term - local effects, inhalation	20 ppm
Long-term - systemic effects, inhalation	20 ppm

PNEC (Predicted No-Effect Concentration) : None established.

**8.2. Exposure controls**

**8.2.1. Appropriate engineering controls**

- : Provide adequate general and local exhaust ventilation.
- Product to be handled in a closed system and under strictly controlled conditions.
- Preferably use permanent leak-tight installations (e.g. welded pipes).
- Systems under pressure should be regularly checked for leakages.
- Ensure exposure is below occupational exposure limits (where available).
- Consider the use of a 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:  
PPE compliant to the recommended EN/ISO standards should be selected.

- Eye/face protection : Wear safety glasses with side shields.  
Standard EN 166 - Personal eye-protection - specifications.
- Skin protection
  - Hand protection : Wear working gloves when handling gas containers.  
Standard EN 388 - Protective gloves against mechanical risk.
  - Other : Wear safety shoes while handling containers.  
Standard EN ISO 20345 - Personal protective equipment - Safety footwear.
- Respiratory protection : Gas filters may be used if all surrounding conditions e.g. type and concentration of the contaminant(s) and duration of use are known.  
Use gas filters with full face mask, where exposure limits may be exceeded for a short-term period, e.g. connecting or disconnecting containers.  
Consult respiratory device supplier's product information for the selection of the appropriate device.  
Gas filters do not protect against oxygen deficiency.  
Standard EN 14387 - Gas filter(s), combined filter(s) and full face mask - EN 136.  
Keep self contained breathing apparatus readily available for emergency use.  
Self contained breathing apparatus is recommended, where unknown exposure may be expected, e.g. during maintenance activities on installation systems.  
Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask.
- Thermal hazards : None in addition to the above sections.

**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 : Mixture contains one or more component(s) which have the following colour(s):  
Colourless.

Odour : Odourless.

Odour threshold : Odour threshold is subjective and inadequate to warn of overexposure.

pH : Not applicable for gases and gas mixtures.

Melting point / Freezing point : Not applicable for gas mixtures.

Boiling point : Not applicable for gas mixtures.

Flash point : Not applicable for gases and gas mixtures.

Evaporation rate : Not applicable for gases and gas mixtures.

Flammability (solid, gas) : Non flammable.

Explosive limits : Non flammable.

Vapour pressure [20°C] : Not applicable.

Vapour pressure [50°C] : Not applicable.

Vapour density : Not applicable.

Relative density, gas (air=1) : No reliable data available

Partition coefficient n-octanol/water (Log Kow) : Not applicable for gas mixtures.

Auto-ignition temperature : Non flammable.

Decomposition temperature : Not applicable.

Viscosity : No reliable data available.

Explosive properties : Not applicable.

Oxidising properties : Not applicable.

**9.2. Other information**

Molar mass : Not applicable for gas mixtures.

Other data : None.

**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**

: Violently oxidises organic material.

**10.4. Conditions to avoid**

: Avoid moisture in installation systems.

**10.5. Incompatible materials**

: For additional information on compatibility refer to ISO 11114.

Consider the potential toxicity hazard due to the presence of chlorinated or fluorinated polymers in high pressure (&gt; 30 bar) oxygen lines in case of combustion.

May react violently with combustible materials.

May react violently with reducing agents.

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.

**SECTION 11: Toxicological information**

**11.1. Information on toxicological effects**

**Acute toxicity** : Classification criteria are not met.

**Carbon monoxide (630-08-0)**

LC50 inhalation rat (ppm)	3760 ppm/1h 1300 ppm/4h
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<b>Skin corrosion/irritation</b>	: No reliable data available.
<b>Serious eye damage/irritation</b>	: No reliable data available.
<b>Respiratory or skin sensitisation</b>	: No reliable data available.
<b>Germ cell mutagenicity</b>	: No reliable data available.
<b>Carcinogenicity</b>	: No reliable data available.
<b>Toxic for reproduction : Fertility</b>	: May damage fertility.
<b>Toxic for reproduction : unborn child</b>	: May damage the unborn child.
<b>STOT-single exposure</b>	: Suppresses the oxygen uptake by red blood cells.
<b>STOT-repeated exposure</b>	: May cause damage to organs through prolonged or repeated exposure.
<b>Aspiration hazard</b>	: No reliable data available.

**SECTION 12: Ecological information**

**12.1. Toxicity**

Assessment	: No data available.
EC50 48h - Daphnia magna [mg/l]	: No data available.
EC50 72h - Algae [mg/l]	: No data available.
LC50 96 h - Fish [mg/l]	: No data available.

**Carbon monoxide (630-08-0)**

EC50 48h - Daphnia magna [mg/l]	Study scientifically unjustified.
EC50 72h - Algae [mg/l]	Study scientifically unjustified.
LC50 96 h - Fish [mg/l]	Study scientifically unjustified.

**12.2. Persistence and degradability**

Assessment	: No data available.
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**12.3. Bioaccumulative potential**

Assessment	: No data available.
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**12.4. Mobility in soil**

Assessment	: Because of its high volatility, the product is unlikely to cause ground or water pollution. Partition into soil is unlikely.
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**12.5. Results of PBT and vPvB assessment**

Assessment	: No data available.
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**12.6. Other adverse effects**

Other adverse effects : No known effects from this product.  
 Effect on the ozone layer : None.  
 Effect on global warming : Contains greenhouse gas(es).

**SECTION 13: Disposal considerations**

**13.1. Waste treatment methods**

Contact supplier if guidance is required.  
 Ensure that the emission levels from local regulations or operating permits are not exceeded.  
 Refer to the EIGA code of practice Doc.30 "Disposal of Gases", downloadable at <http://www.eiga.org> for more guidance on suitable disposal methods.  
 Must not be discharged to atmosphere.  
 Return unused product in original cylinder to supplier.

List of hazardous waste codes (from Commission Decision 2001/118/EC) : 16 05 04 \*: Gases in pressure containers (including halons) containing dangerous substances.

**13.2. Additional information**

: External treatment and disposal of waste should comply with applicable local and/or national regulations.

**SECTION 14: Transport information**

**14.1. UN number**

UN-No. : 1956

**14.2. UN proper shipping name**

**Transport by road/rail (ADR/RID)** : COMPRESSED GAS, N.O.S. (Helium, Carbon monoxide)  
**Transport by air (ICAO-TI / IATA-DGR)** : COMPRESSED GAS, N.O.S.  
**Transport by sea (IMDG)** : COMPRESSED GAS, N.O.S. (Helium, Carbon monoxide)

**14.3. Transport hazard class(es)**

**Labelling**

:



2.2 : Non-flammable, non-toxic gases.

**Transport by road/rail (ADR/RID)**

Class : 2  
 Classification code : 1A  
 Hazard identification number : 20  
 Tunnel Restriction : E - Passage forbidden through tunnels of category E

**Transport by air (ICAO-TI / IATA-DGR)**

Class / Div. (Sub. risk(s)) : 2.2

**Transport by sea (IMDG)**

Class / Div. (Sub. risk(s)) : 2.2  
 Emergency Schedule (EmS) - Fire : F-C  
 Emergency Schedule (EmS) - Spillage : S-V

**14.4. Packing group**

Transport by road/rail (ADR/RID) : Not applicable  
Transport by air (ICAO-TI / IATA-DGR) : Not applicable  
Transport by sea (IMDG) : Not applicable

#### **14.5. Environmental hazards**

Transport by road/rail (ADR/RID) : None.  
Transport by air (ICAO-TI / IATA-DGR) : None.  
Transport by sea (IMDG) : None.

#### **14.6. Special precautions for user**

##### **Packing Instruction(s)**

Transport by road/rail (ADR/RID) : P200  
Transport by air (ICAO-TI / IATA-DGR)  
    Passenger and Cargo Aircraft : 200.  
    Cargo Aircraft only : 200.  
Transport by sea (IMDG) : P200

Special transport precautions : 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.

#### **14.7. Transport in bulk according to Annex II of Marpol and the IBC Code**

: Not applicable.

### **SECTION 15: Regulatory information**

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

##### **EU-Regulations**

Restrictions on use : Restricted to professional users (Annex XVII REACH).  
Seveso Directive : 2012/18/EU (Seveso III) : Not covered.

##### **National regulations**

National legislation : Ensure all national/local regulations are observed.

#### **15.2. Chemical safety assessment**

This product is either exempt from REACH, does not meet the minimum volume threshold for a CSR or CSA has not yet been carried out.

### **SECTION 16: Other information**

Indication of changes : Revised safety data sheet in accordance with commission regulation (EU) No 2015/830.

- Abbreviations and acronyms : ATE - Acute Toxicity Estimate  
 CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008  
 REACH - Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation (EC) No 1907/2006  
 EINECS - European Inventory of Existing Commercial Chemical Substances  
 CAS# - Chemical Abstract Service number  
 PPE - Personal Protection Equipment  
 LC50 - Lethal Concentration to 50 % of a test population  
 RMM - Risk Management Measures  
 PBT - Persistent, Bioaccumulative and Toxic  
 vPvB - Very Persistent and Very Bioaccumulative  
 STOT- SE : Specific Target Organ Toxicity - Single Exposure  
 CSA - Chemical Safety Assessment  
 EN - European Standard  
 UN - United Nations  
 ADR - European Agreement concerning the International Carriage of Dangerous Goods by Road  
 IATA - International Air Transport Association  
 IMDG code - International Maritime Dangerous Goods  
 RID - Regulations concerning the International Carriage of Dangerous Goods by Rail  
 WGK - Water Hazard Class  
 STOT - RE : Specific Target Organ Toxicity - Repeated Exposure
- Training advice : Receptacle under pressure.  
 Ensure operators understand the toxicity hazard.  
 The hazard of asphyxiation is often overlooked and must be stressed during operator training.
- Further information : Classification using data from databases maintained by the European Industrial Gases Association (EIGA).  
 Classification in accordance with the calculation methods of Regulation (EC) 1272/2008 CLP.

Full text of H- and EUH-statements

Acute Tox. 3 (Inhalation:gas)	Acute toxicity (inhalation:gas) Category 3
Flam. Gas 1	Flammable gases, Category 1
Ox. Gas 1	Oxidising Gases, Category 1
Press. Gas (Comp.)	Gases under pressure : Compressed gas
Press. Gas (Liq.)	Gases under pressure : Liquefied gas
Repr. 1A	Reproductive toxicity, Category 1A
Repr. 1A	Reproductive toxicity, Category 1A
STOT RE 1	Specific target organ toxicity — Repeated exposure, Category 1
STOT RE 2	Specific target organ toxicity — Repeated exposure, Category 2
H220	Extremely flammable gas
H270	May cause or intensify fire; oxidizer
H280	Contains gas under pressure; may explode if heated
H331	Toxic if inhaled
H360	May damage fertility or the unborn child
H360D	May damage the unborn child
H372	Causes damage to organs through prolonged or repeated exposure
H373	May cause damage to organs through prolonged or repeated exposure

## DISCLAIMER OF LIABILITY

: Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out.

Details given in this document are believed to be correct at the time of going to press.

Whilst proper care has been taken in the preparation of this document, no liability for injury or damage resulting from its use can be accepted.

**End of document**