

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830

oxygen (refrigerated)

Issue date: 03/06/2016

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Version: 2.1

SDS reference: LIT-O2-097B

Danger



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

1.1. Product identifier

Trade name : oxygen (refrigerated)
 SDS no : LIT-O2-097B
 Chemical description : oxygen (refrigerated)
 CAS-No. : 7782-44-7
 EC-No. : 231-956-9
 EC Index-No. : 008-001-00-8
 Registration-No. : Listed in Annex IV / V REACH, exempted from registration.
 Chemical formula : O₂

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

Relevant identified uses : Industrial and professional uses. Perform risk assessment prior to use.
 Test gas/Calibration gas.
 Welding, cutting, heating and brazing.
 Laboratory use.
 Shield gas for welding processes.
 Water treatment.
 Use for manufacture of electronic/photovoltaic components.
 Contact supplier for more information on uses.
 Laser gas.
 Food applications.

Uses advised against : Consumer use.
 Attention: These products must not be applied to humans or animals unless they are expressly designated as medical or medicinal gases!.

1.3. Details of the supplier of the safety data sheet

Company identification : Elme Messer Lit
 Ateities g.10 B-1
 LT-08303 Vilnius - Lietuva
www.elmemesser.lv
 vilnius@elmemesser.lv

1.4. Emergency telephone number

Emergency telephone number : Apsinuodijimų tarnybos pagalbos telefonas – +370 5 236 20 52, 24 valandas per parą

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

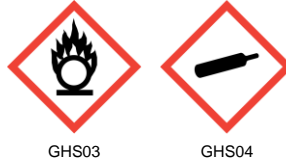
Classification according to Regulation (EC) No. 1272/2008 [CLP]

Physical hazards	Ox. Gas 1	H270
	Press. Gas (Ref. Liq.)	H281

2.2. Label elements

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

Hazard pictograms (CLP) :



Signal word (CLP) :

Danger

Hazard statements (CLP) :

H270 - May cause or intensify fire; oxidiser.
H281 - Contains refrigerated gas; may cause cryogenic burns or injury.

Precautionary statements (CLP)

- Prevention : P220 - Keep away from combustible materials.
P244 - Keep valves and fittings free from oil and grease.
P282 - Wear cold insulating gloves/face shield/eye protection.
- Response : P336+P315 - Thaw frosted parts with lukewarm water. Do not rub affected area. Get immediate medical advice.
P370+P376 - In case of fire: Stop leak if safe to do so.
- Storage : P403 - Store in a well-ventilated place.

2.3. Other hazards

: None.

SECTION 3: Composition/information on ingredients

3.1. Substances

Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
oxygen (refrigerated)	(CAS-No.) 7782-44-7 (EC-No.) 231-956-9 (EC Index-No.) 008-001-00-8 (Registration-No.) *1	100	Ox. Gas 1, H270 Press. Gas (Ref. Liq.), H281

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

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

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

3.2. Mixtures : Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

- Inhalation : Remove victim to uncontaminated area.
- Skin contact : In case of frostbite spray with water for at least 15 minutes. Apply a sterile dressing. Obtain medical assistance.
- Eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes.
- Ingestion : Ingestion is not considered a potential route of exposure.

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

: Continuous inhalation of concentrations higher than 75% may cause nausea, dizziness, respiratory difficulty and convulsion.
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.
Supports combustion.
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.
Exposure to fire may cause containers to rupture/explode.
If possible, stop flow of product.
Use water spray or fog to knock down fire fumes if possible.
If leaking do not spray water onto container. Water surrounding area (from protected position) to contain fire.
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.
Monitor concentration of released product.
Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe.
Eliminate ignition sources.
Use protective clothing.
Ensure adequate air ventilation.
Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.
Act in accordance with local emergency plan.
Stay upwind.

6.2. Environmental precautions

- : Try to stop release.
- Liquid spillages can cause embrittlement of structural materials.

6.3. Methods and material for containment and cleaning up

- : Ventilate area.
- Keep area evacuated and free from ignition sources until any spilled liquid has evaporated (ground free from frost).
- Liquid spillages can cause embrittlement of structural materials.

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

- : 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.
- Consult supplier for specific recommendations.
- 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 no oil or grease.
- 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.
- Use only with equipment cleaned for oxygen service and rated for container pressure.
- Do not breathe gas.
- Avoid release of product into work area.
- Keep equipment free from oil and grease. For more guidance, refer to the EIGA Doc. 33 - Cleaning of Equipment for Oxygen Service downloadable at <http://www.eiga.eu>.
- Avoid suck back of water, acid and alkalis.

Safe handling of the gas receptacle

- : Refer to supplier's container handling instructions.
- Do not allow backfeed into the container.
- 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 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 content of the container.
- Suck back of water into the container must be prevented.
- Open valve slowly to avoid pressure shock.
- Protect containers 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 valve discontinue use and contact supplier.
- Never attempt to transfer gases from one cylinder/container to another.

7.2. Conditions for safe storage, including any incompatibilities

- : For more guidance on the safe storage of liquid oxygen, liquid nitrogen or liquid argon, refer to EIGA Doc.115 "Storage of Cryogenic Air Gases at Users Premises", downloadable at <http://www.eiga.eu> and consult your supplier.
- 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.
- Segregate from flammable gases and other flammable materials in store.
- 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

- OEL (Occupational Exposure Limits) : None available.
- DNEL (Derived-No Effect Level) : None available.
- PNEC (Predicted No-Effect Concentration) : None available.

8.2. Exposure controls

8.2.1. Appropriate engineering controls

- : Provide adequate general and local exhaust ventilation.
- Systems under pressure should be regularly checked for leakages.
- Avoid oxygen rich (>23,5%) atmospheres.
- Gas detectors should be used when oxidising gases may be released.
- 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.
 Protect eyes, face and skin from liquid splashes.

- Eye/face protection : Wear safety glasses with side shields.
 Wear goggles and a face shield when transfilling or breaking transfer connections.
 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.
 Standard EN 511 - Cold insulating gloves.
 - Other : Consider the use of flame resistant safety clothing.
 Standard EN ISO 14116 - Limited flame spread materials.
 Wear safety shoes while handling containers.
 Standard EN ISO 20345 - Personal protective equipment - Safety footwear.
- Respiratory protection : None necessary.

• Thermal hazards : Wear cold insulating gloves when transfilling or breaking transfer connections.
Standard EN 511 - Cold insulating gloves.

8.2.3. Environmental exposure controls

: None necessary.

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 : Bluish liquid.

Odour : No odour warning properties.

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

pH : Not applicable.

Melting point / Freezing point : -219 °C

Boiling point : -183 °C

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, liquid (water=1) : 1.1

Relative density, gas (air=1) : 1.1

Water solubility : 39 mg/l

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

Auto-ignition temperature : Not applicable.

Decomposition temperature : Not applicable.

Viscosity : Not applicable.

Explosive properties : Not applicable.

Oxidising properties : Oxidiser.

9.2. Other information

Molar mass : 32 g/mol

Critical temperature [°C] : -118 °C

- Coefficient of oxygen equivalency (Ci) : 1

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

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

: Risk of explosion if spilt on organic structural materials (e.g. wood or asphalt).
Violently oxidises organic material.

10.4. Conditions to avoid

: None under recommended storage and handling conditions (see section 7).
Avoid moisture in installation systems.

10.5. Incompatible materials

: May react violently with combustible materials.
May react violently with reducing agents.
Consider the potential toxicity hazard due to the presence of chlorinated or fluorinated polymers in high pressure (> 30 bar) oxygen lines in case of combustion.
Keep equipment free from oil and grease. For more guidance, refer to the EIGA Doc. 33 - Cleaning of Equipment for Oxygen Service downloadable at <http://www.eiga.eu>.
For additional information on compatibility refer to ISO 11114.
Consult supplier for specific recommendations.
Materials such as carbon steel, low alloy carbon steel and plastic become brittle at low temperatures and are subject to failure. Use appropriate materials compatible with the cryogenic conditions present in refrigerated liquefied gas systems.

10.6. Hazardous decomposition products

: None.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : No known toxicological effects from this product.
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.
Germ cell mutagenicity : No known effects from this product.
Carcinogenicity : 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

Assessment : No ecological damage caused by this product.
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.

12.2. Persistence and degradability

Assessment : No ecological damage caused by this product.

12.3. Bioaccumulative potential

Assessment : No ecological damage caused by this product.

12.4. Mobility in soil

Assessment : No ecological damage caused by this product.

12.5. Results of PBT and vPvB assessment

Assessment : Not classified as PBT or vPvB.
No data available.

12.6. Other adverse effects

Other adverse effects : Can cause frost damage to vegetation.
Effect on the ozone layer : None.
Effect on global warming : None.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Contact supplier if guidance is required.
Do not discharge into any place where its accumulation could be dangerous.
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.eu> for more guidance on suitable disposal methods.
Consult supplier for specific recommendations.
May be vented to atmosphere in a well ventilated place.
Return unused product in original container to supplier.
List of hazardous waste codes (from Commission Decision 2000/532/EC as amended) : 16 05 04 *: Gases in pressure containers (including halons) containing hazardous substances.

13.2. Additional information

: None.
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. : 1073

14.2. UN proper shipping name

Transport by road/rail (ADR/RID) : OXYGEN, REFRIGERATED LIQUID
Transport by air (ICAO-TI / IATA-DGR) : OXYGEN, REFRIGERATED LIQUID
Transport by sea (IMDG) : OXYGEN, REFRIGERATED LIQUID

14.3. Transport hazard class(es)

Labelling :



2.2 : Non flammable, non-toxic gases.
5.1 : Oxidizing substances.

Transport by road/rail (ADR/RID)

Class : 2
 Classification code : 30
 Hazard identification number : 225
 Tunnel Restriction : C/E - Tank carriage : Passage forbidden through tunnels of category C, D and E. Other carriage : Passage forbidden through tunnels of category E

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

Class / Div. (Sub. risk(s)) : 2.2 (5.1)

Transport by sea (IMDG)

Class / Div. (Sub. risk(s)) : 2.2 (5.1)
 Emergency Schedule (EmS) - Fire : F-C
 Emergency Schedule (EmS) - Spillage : S-W

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) : P203
 Transport by air (ICAO-TI / IATA-DGR)
 Passenger and Cargo Aircraft : Forbidden.
 Cargo Aircraft only : Forbidden.
 Transport by sea (IMDG) : P203

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 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 : None.
 Other information, restriction and prohibition regulations : Ensure all national/local regulations are observed.
 Seveso Directive : 2012/18/EU (Seveso III) : Listed.

National regulations

No additional information available

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 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
 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 : Ensure operators understand the hazard of oxygen enrichment.

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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 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.