

MOD : BIG-EXPO/LUX-R2

Production code : E4373M0400

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

| | |
|-----------------------------|---|
| Commercial name | R290 |
| Our code | TR290 |
| Chemical description | Propane |
| | EU Index No: 601-003-00-5 |
| | EC No: 200-827-9 |
| | CAS No: 74-98-6 |
| | REACH No: 01-2119486944-21 |
| | Chemical formula: C ₃ H ₈ |

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

| | |
|---------------------------------|--|
| Industrial sector | Refrigeration and air-conditioning |
| Relevant identified uses | Refrigerant gas for refrigeration and air-conditioners systems |
| Application | Industrial and professional. |

1.3. Details of the supplier of the safety data sheet

MARIEL SRL
Via Olubi, 5
28013 Gattico-Veruno (NO) Italy
Telephone: +39 0322 838319
Fax: +39 0322 838813
E-mail: laboratorio@mariel.it

1.4. Emergency telephone number

| | | |
|--|------------------------|--|
| Mariel Srl | +39 0322 838319 | Mon/Fri: 8.30-12.30 / 13.30-17.30 |
| CAV-CNIT Anti-Poison (toxicological) National Information Centre | +39 0382 24444 | Hours: 24 h / 24 h |

SECTION 2: Hazards identification**2.1. Classification of the substance or mixture****Classification according to in Regulation (EC) No 1272/2008**

| | | | |
|------------------|---------------|--------------|------|
| Physical hazards | Flammable gas | Category 1 A | H220 |
| | Liquefied gas | | H280 |

2.2. Label elements**Dangerous pictogram****GHS02****GHS04**

| | | |
|------------------------------|--------|--|
| Signal word | Danger | |
| Hazard statements (H) | H220 | Extremely flammable gas |
| | H280 | Contains gas under pressure; may explode if heated. |
| Precautionary statements (P) | | |
| Prevention | P210 | Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. |
| Response | P377 | Leaking gas fire: Do not extinguish unless leak can be stopped safely. |
| | P381 | In case of leakage, eliminate all ignition sources. |
| Storage | P403 | Store in a well-ventilated place. |

2.3. Other hazards

n.a.

Material safety data sheet according regulation (EU) 2020/878
 Version 6 – Date: 15th November, 2022 (replaces version 5 - 03/2022)

SECTION 3: Composition/information on ingredients

3.1. Substances

| Substance name | % | EU Index No. | EC No. | CAS No. | REACH No. | Classification Regulation (CE) n. 1272/2008 (CLP) |
|----------------|---------|--------------|-----------|---------|------------------|---|
| Propane | ≥ 99,5% | 601-003-00-5 | 200-827-9 | 74-98-6 | 01-2119486944-21 | Flam. Gas 1, H220 Press. Gas (Liq.), H280 |

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

For more information, see section 8, 11, 12 and 16.

SECTION 4: First aid measures



General information: If the person is unconscious, place it in the recovery position and get immediately medical attention. Do not give anything to an unconscious person. If breathing is irregular, give oxygen. If breathing stopped, administer artificial respiration. If symptoms persist, call a physician.

4.1. Description of first aid measures

- Inhalation Remove patient from exposure to fresh air. Administer oxygen if necessary. Obtain immediate medical attention.
- Skin contact In case of contact with skin, wash immediately with plenty of water. Remove contaminated clothing. If irritation or blistering occurs, call a physician.
- Eye contact Remove contact lenses, if present. Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. If symptoms persist, call a physician.
- Ingestion Unlikely route of exposure. As this product is a gas, refer to the section "Inhalation". Do not induce vomiting without medical advice. Obtain immediate medical attention.

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. In low concentrations may cause narcotic effects. Symptoms may include dizziness, headache, nausea and loss of coordination.

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

Do not give adrenaline-ephedrine or similar drugs group. Treat symptomatically.

SECTION 5: Firefighting measures

5.1. Extinguishing media

- Suitable extinguishing media Dry powder, water spray, carbon dioxide (CO2) all known suitable extinguishing media
- No suitable extinguishing media High water jet

5.2. Special hazards arising from the substance or mixture

- Specific hazards
 - Contents under pressure.
 - On heating: heating will cause a rise in pressure with a risk of bursting.
 - Toxic and corrosive vapours are released.
 - Cool down the containers exposed to heat with a water spray.
 - Vapours are heavier than air and can cause rapid suffocation by reducing oxygen available for breathing.
- Hazardous combustion In case of fire, decomposition products may include the following materials: carbonyl fluoride, carbon dioxide and monoxide, hydrofluoric acid.

5.3. Advice for firefighters

- Specific methods
 - Coordinate fire measure to the surrounding fire.
 - Exposure to flames and heat can cause the container to rupture.
 - From protected position, cool endangered containers with water spray jet.
 - Do not discharge contaminated water into drains.
 - If possible, stop flow of the product. If possible, use water spray to knock down the fumes.
 - Explosive re-ignition may occur, turn off all the other fire.
 - Move containers from fire area if this can be done without risk.
- Protective equipment Firefighters must use standard protective equipment including SCBA. Avoid contact with eyes and skin. Do not breathe the fumes.

Material safety data sheet according regulation (EU) 2020/878
Version 6 – Date: 15th November, 2022 (replaces version 5 - 03/2022)

SECTION 6: Accidental release measure

6.1. Personal precautions, protective equipment and emergency procedures

Immediately contact emergency personnel.
Immediately evacuate personnel to safe areas. Unprotected persons must be kept away.
Wear personal protective equipment reported in section 8 “Exposure controls/personal protection”.
Remove all ignition sources.
Avoid contact of the liquid with the skin (possible cold burns).
Ventilate the area/local. In case of insufficient ventilation, wear self-contained breathing apparatus.

6.2. Environmental precautions

Prevent the product from entering sewers or water courses.

6.3. Methods and material for containment and cleaning up

Ventilate / aerate the area or local.

6.4. Reference to other sections

For more information, see section 8 and 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

| | |
|--------------------|--|
| Technical measures | Use only properly specified equipment that is suitable for this product, its supply pressure and temperature. In case of doubt, refer to supplier's handling instructions. Only experienced and properly instructed persons should handle gases under pressure. Service technician must check regularly your entire gas system to ensure that it is leak-free. |
| Safe handling | The substance must be handled in accordance with good industrial hygiene and safety procedures. Refer to supplier's / manufacturer's handling instructions. Handle and open container with care. Caution when opening, pressurized container. Protect from sunlight and do not expose to temperatures exceeding 50° C (122 °F). Do not spray on a naked flame or any incandescent material. Do not use in area without adequate ventilation. Protect containers from physical damage; do not drag, roll, slide or drop. Do not pierce or burn, even after use. Leave valve protection caps in place until the container is ready for use. Close container valve after each use and when empty, even if still connected to equipment. Do not remove or deface labels provided by the supplier for the identification of the container contents. |
| Industrial hygiene | Ensure adequate ventilation of the working area. Do not drink, eat or smoke in the working area and when handling the product. |

7.2. Conditions for safe storage, including any incompatibility

Requirements for storage areas and containers

Keep containers tightly closed in a dry, cool and well-ventilated place, away from any ignition or heat sources. Store in original container.
Container valves or caps should be in place.

Incompatible materials

Avoid storage with oxidizing products, acids and, in general, with chemicals.
Avoid storage with tools or equipment that may cause sparks.

7.3. Specific end use(s)

Only for professional and industrial use.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

OEEL (Occupational Exposure Limit): No data available.

Material safety data sheet according regulation (EU) 2020/878
 Version 6 – Date: 15th November, 2022 (replaces version 5 - 03/2022)

| Components | CAS No. | TLV | Font |
|------------|---------|-------------------|-------|
| Propane | 74-98-6 | Simple asphyxiant | AGCIH |

DNEL and DMEL The substance have no harmful effect on human health.

PNEC The substance have no harmful effect on the environmental.

8.2. Exposure controls

8.2.1. Appropriate engineering controls

Ensure adequate ventilation. In case of insufficient ventilation, wear self-contained breathing apparatus. Wash the hands before and after using the gas. Do not smoke. Personal protective equipment must comply with EU directives: respiratory protective equipment EN 136, 140, 149; eye protection (protective goggles or safety glasses) EN 166; skin protection EN 340, 463, 468, 943-1, 943-2; hands protection (protective gloves) EN374, safety boots EN ISO 20345.

8.2.2. Individual protection measures, such as personal protective equipment

a) Eye/face protection Safety glasses with side-shields (according to directive EN 166).

b) Skin protection

i) Hand protection Thermal-protective gloves resistant to chemical products (EN 374). The penetration time of the gloves must be greater than the period of expected use. Gloves should be replaced immediately if they show signs of wear or deterioration.

ii) Other Evaluate the need for flame resistant workwear.
 EN ISO 14116 Protective clothing - Protection against heat and flame - Limited flame spread materials, material assemblies and clothing.

EN ISO 1149-5 Protective clothing - Electrostatic properties.

Wear safety shoes while handling containers.

EN ISO 20345 Personal protective equipment - Safety shoes.

Apron or protective clothing are not necessary.

c) Respiratory protection

Mask filter for gases and vapours (EN141). To obtain an adequate protection, filter class you should choose according to the type and concentration of contaminants. The breathing apparatus with filters do not operate satisfactorily when the air contains high concentrations of vapours. In case of insufficient ventilation, wear self-contained breathing apparatus (EN529).



8.2.3. Environmental exposure controls

Handling in accordance with good industrial hygiene and safety practice.

Prevent spillage or leakage of the product in watercourse or sewers (explosion danger). Avoid air emissions.

For more information, see section 7 and 13.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

- | | |
|--|--|
| a) Physical state: | Gas |
| b) Colour: | Colourless |
| c) Odour: | Odourless |
| d) Melting point/freezing point: | - 187,6 °C |
| e) Boiling point or initial boiling point and boiling range: | - 42,1 °C |
| f) Flammability: | Flammable gas |
| g) Lower and upper explosion point: | 2,1% Vol. – 9,3% Vol. |
| h) Flash point: | - 104 °C |
| i) Auto-ignition temperature: | > 450 °C |
| j) Decomposition temperature: | n.a. |
| k) pH: | Not applicable to gases and gas mixtures |

Material safety data sheet according regulation (EU) 2020/878
Version 6 – Date: 15th November, 2022 (replaces version 5 - 03/2022)

| | |
|--|--|
| l) Kinematic viscosity: | Not applicable to gases and gas mixtures |
| m) Solubility (in water): | 62,4 mg/l @ 25 °C |
| n) Partition coefficient n-octanol/water (log value): | 2,36 log Pow |
| d) Vapour pressure: | 8,3 bar @ 20 °C 17,13 bar @ 50 °C |
| o) Density and/or relative density; | Not applicable to gases and gas mixtures |
| p) Relative vapour density: | 0,58 (air=1) |
| q) Particle characteristics: | Not applicable to gases and gas mixtures |

9.2. Other information

| | |
|----------------------|-----------------------|
| Molecular mass | 44,1 g/mol. |
| Critical temperature | 96,7 °C |
| Critical pressure | 42,51 bar |
| Critical density | 220 kg/m ³ |
| VOC contents | ≥ 90 % (EU,CH, USA) |

SECTION 10: Stability and reactivity

10.1. Reactivity

Stable under normal handling and storage conditions.

10.2. Chemical stability

Stable under normal handling and storage conditions.

10.3. Possibility of hazardous reactions

May react violently with oxidants.

Can form explosive mixture with air.

10.4. Conditions to avoid

Contains gas under pressure, may explode if heated.

Protect from sunlight and do not expose to temperatures exceeding 50 °C.

Keep away from heat, sparks, open flame or other sources of ignition. Do not smoke.

Do not pierce or burn, even after use.

Do not spray on a naked flame or any incandescent material.

10.5. Incompatible materials

Air, oxidizing agents.

10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced.

In case of combustion, toxic compositions, may be formed: carbon monoxide (CO) and carbon dioxide (CO₂).

SECTION 11: Toxicological information

11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008

a) acute toxicity

| | |
|------------|---|
| Inhalation | LC50: > 800 000 ppm Exposure time: 15 minutes Animal species: Rat |
|------------|---|

b) skin corrosion/irritation Based on available data, the classification criteria are not met.

c) serious eye damage/irritation Based on available data, the classification criteria are not met.

d) respiratory sensitisation Based on available data, the classification criteria are not met.

e) germ cell mutagenicity Based on available data, the classification criteria are not met.

f) carcinogenicity Based on available data, the classification criteria are not met.

g) STOT-single exposure Based on available data, the classification criteria are not met.

Material safety data sheet according regulation (EU) 2020/878
Version 6 – Date: 15th November, 2022 (replaces version 5 - 03/2022)

- h) STOT-repeated exposure** Based on available data, the classification criteria are not met.
j) aspiration hazard Based on available data, the classification criteria are not met.

11.2. Information on other hazards

High concentrations may cause drowsiness, headache and dizziness. If the amount of oxygen in the air drops below 17% may cause unconsciousness, asphyxia and / or CNS depression.
Contact with compressed gas may cause frostbite and serious ocular injury.

SECTION 12: Ecological information

12.1. Toxicity

| | |
|-----------------------|--|
| Fish | LC50: 147,54 mg/l Exposure time: 96 h Species: Various (Remarks: QSAR, key study) |
| Aquatic invertebrates | EC50: 68,43 mg/l Exposure time: 48 h Species: Daphnia Magna (Remarks: QSAR, key study) |
| Algae | EC50: 11,90 mg/l Exposure time: 72 h Species: n.d.a. |

12.2. Persistence and degradability

The substance will be readily biodegradable and it is not expected to persist in the environment.

12.3. Bioaccumulative potential

The substance are not considered to be persistent in the environment due to its low log Kow (log Kow < 4).

12.4. Mobility in soil

Because of its high volatility, the product is unlikely to cause ground or water.

12.5. Results of PBT and vPvB assessment

This product does not meet the PBT or vPvB criteria.

12.6. Endocrine disrupting properties

n.a.

12.7. Other adverse effects

| | |
|---------------------------|------------------|
| Ozone Depletion Potential | ODP (R-11=1) = 0 |
| Global Warming Potential | GWP (CO2=1) = 3 |

SECTION 13: Disposal consideration

13.1. Waste treatment methods

| | |
|---------------------|--|
| General information | Take all necessary measures to prevent the production of residuals, value the possible methods of regeneration or recycling. Do not discharge into drains or environment. Dispose of contents and container in accordance with Directive 2008/98/EC and all local, regional, national or international regulations. |
| Disposal method | Refer to the EIGA Practice Code (Doc. 30 "Gas Disposal", downloadable from http://www.eiga.org) for better guidance on the disposal methods available. Contact the supplier for the correct disposal of the container. Discharging, treatment or disposal may be subject to national, state or local regulations. |

European Waste Code (EWC)

Product 16 05 04* Gases in pressure containers (including halons), containing dangerous substances.

Packaging 15 01 11* Metallic packaging containing a hazardous solid porous matrix (for example asbestos), including empty pressure containers.

Material safety data sheet according regulation (EU) 2020/878
Version 6 – Date: 15th November, 2022 (replaces version 5 - 03/2022)

SECTION 14: Transport information

14.1. UN number or ID number

ADR-RID-ADN-IMDG-ICAO UN 1978

14.2. UN proper shipping name

ADR-RID-AND-IMDG-ICAO PROPANE

14.3. Transport hazard class(es)

ADR-RID-ADN: 2
IMDG-ICAO: 2.1



Label: 2.1

Additional information

Tunnel restriction code (ADR) B/D
EmS (IMDG) F-D, S-U

14.4. Packing group

ADR-RID-ADN-IMDG-ICAO n.a.

14.5. Environmental hazards

Dangerous for the environmental NO
Maritime pollution NO

14.6. Special precautions for user

The transport, including loading and unloading, must be carried out by persons who have received appropriate training concerning required by the modal regulations.

Road transport must be carried out by vehicles authorized for the transport of dangerous goods in accordance with the requirements of the current edition of the ADR Agreement and the applicable national provisions.

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.

Ensure that containers are firmly secured. Ensure there is adequate ventilation.

14.7. Maritime transport in bulk according to IMO instruments

Not applicable.

SECTION 15: Regulatory information

Regulation (EC) No 1272/2008, Part 3 of Annex VI: Included

Regulation (EC) No 649/2012 concerning the export and import of hazardous chemicals (PIC): Not included

Regulation (EU) No 517/2014 on fluorinated greenhouse gases (F-GAS): Propane (GWP 3)

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

Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work: Not included

Directive 2012/18/EU on the control of major-accident hazards involving dangerous substances - Seveso III: Included (P2)

Council Directive 92/58/EEC on the minimum requirements for the provision of safety and/or health signs at work: Included

Council Directive 89/391/EEC on the introduction of measures to encourage improvements in the safety and health of workers at work.

Directive 92/85/EC on the introduction of measures to encourage improvements in the safety and health at work of pregnant workers and workers who have recently given birth or are breastfeeding.

National standards

Adoption of National legislation on working with chemical agents.

15.2. Chemical safety assessment

A Chemical Safety Assessment (CSA) has been made for this product.

Material safety data sheet according regulation (EU) 2020/878
 Version 6 – Date: 15th November, 2022 (replaces version 5 - 03/2022)

SECTION 16: Other information

This Material Safety Data Sheet has been made in compliance with the European Directive in force.

Text of hazard (H) and precautionary (P) statements in section 2 and 3

- H220 Extremely flammable gas.
- H280 Contains gas under pressure; may explode if heated.
- P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
- P377 Leaking gas fire: Do not extinguish unless leak can be stopped safely.
- P381 In case of leakage, eliminate all ignition sources.
- P403 Store in a well-ventilated place.

Text of “Hazard Class and Category Code” in section 2 and 3, according to Regulation (EC) n. 1272/2008 (CLP)

- Flam. Gas 1 Flammable gas, category 1 A
- Press. Gas (Liq.) Gas under pressure: Liquefied gas

| | | | | | | |
|----------------|-------------------------|--------------|---------------|---------------|---------------|---------------|
| History | Version 6 by Mariel Srl | Version 5 | Version 4 | Version 3 | Version 2 | Version 1 |
| | Revision date: 11/2022 | Date:07/2021 | Date: 05/2019 | Date: 11/2015 | Date: 05/2015 | Date: 03/2011 |

b) Abbreviations and acronyms

| | |
|---------------|--|
| ADN | Agreement Dangerous goods by inland waterways |
| ADR | Accord Dangerous Route |
| CAS | Chemical Abstracts Service number |
| CE / EC | European Community |
| CLP | Classification, Labelling, Packaging |
| CSA | Chemical Safety Assessment |
| DNEL | Derived No-Effect Level |
| EC50 | Effective Concentration 50% |
| EIGA | European Industrial Gases Association |
| EmS | Emergency Schedule |
| EWC | European Waste Code |
| GHS | Globally Harmonised System |
| GWP | Global Warming Potential |
| HCFC | Hydro-Chloro-Fluoro-Carbons |
| HFC | Hydro-Fluoro-Carbons |
| ICAO | International Civil Aviation Organization |
| IMDG | International Maritime Dangerous Goods code |
| IMO | International Maritime Organization |
| LC50 | Lethal Concentration 50% |
| LOAEC | Lowest Observed Adverse Effect Concentration |
| Log Koc | Logarithm Partition coefficient Soil/water |
| Log Pow (Kow) | Logarithm Partition coefficient n-Octanol/water |
| n.a. | not applicable / not available |
| NOAEC | No Observed Adverse Concentration Level |
| NOAEL | No Observed Adverse Effect Level |
| ODP | Ozone Depleting Potential |
| OEL | Occupational Exposure Limit |
| PBT | Persistent Bio-accumulative Toxic |
| PNEC | Predicted No Effect Concentration |
| REACH | Registration, Evaluation, Authorisation and Restriction of Chemicals |
| RID | Rail International Dangerous goods transport |
| STOT-RE | Specific Target Effect Concentration-repeated exposure |
| STOT-SE | Specific Target Effect Concentration-single exposure |
| TLV | Threshold Limit Value |
| UE / EU | European Union |
| VOC | Volatile Organic Compounds |



MATERIAL SAFETY DATA SHEET R290 Propane
Code: TR290

Material safety data sheet according regulation (EU) 2020/878
Version 6 – Date: 15th November, 2022 (replaces version 5 - 03/2022)

vPvB very Persistent very Bioaccumulative

Notice of liability

This information should not constitute a guarantee for any specific product properties. This information are only a guidance for safe handling, use, processing, storage, transportation, disposal and release and are not to be considered a warranty or a quality specification.

The information contained in this safety data sheet are based on our current knowledge and EU and national laws; they describe the product only with regard to safety requirements. The conditions of the user are beyond our knowledge and control. The product should not be used for purpose other than those specified. It is always the responsibility of the user to take all the necessary measures to comply with the requirements of current legislation. The information contained in this form should not considered as a guarantee of its properties.
