

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

Commercial name	R290
Our code	TR290
Chemical description	Propane
	CAS No: 74-98-6
	EC No: 200-827-9
	EU Index No: 601-003-00-5
	REACH No: 01-2119486944-21-XXXX
	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 air-conditioning systems
Application	Industrial and professional

1.3 Details of the supplier of the safety data sheet

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28013 Gattico-Veruno (NO) Italy
Telephone: +39 0322 838319
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1.4 Emergency telephone number

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

2. Hazards identification**2.1 Classification of the substance or mixture****Classification according to Regulation (EC) 1272/2008 (CLP)**

Flammable gases – Category 1 – Danger (H220)

Gases under pressure – Liquefied gas – Warning (H280)

Classification according to Directive 67/548/EEC and 1999/45/EC

F+; R12

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

Signal word	Warning - Danger
Hazard statements (H)	H220: Extremely flammable gas H280: Contains gas under pressure; may explode if heated
Precautionary statements (P)	P102: Keep out of reach of children P210: Keep away from heat/sparks/open flames/hot surfaces – No smoking P377: Leaking gas fire - do not extinguish unless leak can be stopped safely P381: Eliminate all ignition sources if safe to do so P403: Store in a well ventilated place

Material safety data sheet according regulation (EU) 2015/830
 Version 4 – Date: 13th May, 2019 (replaces version 3 - 11/2015)

Symbol(s)	F+:	Extremely flammable
List of R-phrases	R12:	Extremely flammable
List of S-phrases	S2:	Keep out of the reach of children
	S9:	Keep container in a well-ventilated place
	S16:	Keep away from sources of ignition - No smoking

2.3 Other hazards

Contact with liquid can cause frostbite and severe damage to the eyes.

3. Composition/information on ingredients

3.1 Substances

Substance name	%	CAS No.	EC No.	REACH No.	Classification Reg. (CE) 1272/2008 (CLP) and Directive 67/548/CEE
Propane	> 97%	74-98-6	200-827-9	01-2119486944-21-XXX	Flam. Gas 1, H220 Press. Gas (Liq.), H280 F+ ; R12

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

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.

Note to physician: Do not give adrenaline-ephedrine or similar drugs group.

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.

5. Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media	Dry powder, water spray, alcohol-resistant foam and carbon dioxide (CO ₂).
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: carbon dioxide and monoxide.

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.
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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 breathe the fumes.

Other information

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
For more information, see section 10.

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 refer to section 8 "Exposure controls/personal protection".
Remove all sources of ignition.
Avoid contact with skin (possible frostbite).
Ventilate the area/local. In case of insufficient ventilation, wear self-contained breathing apparatus.

6.2 Environmental precautions

Do not allow product to spread into the environment.
Avoid spillage and prevent possible losses.

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.

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.

7.2 Conditions for safe storage, including any incompatibility

Material safety data sheet according regulation (EU) 2015/830
 Version 4 – Date: 13th May, 2019 (replaces version 3 - 11/2015)

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)

For professional and industrial use only.

8. Exposure controls/personal protection

8.1 Control parameters

OEL (Occupational Exposure Limit): No data available.

Components	CAS No.	TLV-TWA	Control parameters	Font	Year
Propane	74-98-6	8 h	2500 ppm 4300 mg/m ³	AGCIH	2010

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

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 It is recommended to use protective gloves against cold (EN 511).
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.
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** The vapours are heavier than air and can cause asphyxia caused to an reduction of oxygen level. In case of insufficient ventilation, wear self-contained breathing apparatus (EN 133).



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.

Material safety data sheet according regulation (EU) 2015/830
Version 4 – Date: 13th May, 2019 (replaces version 3 - 11/2015)

9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

a) Appearance	Liquefied gas; under pressure
Colour	Colourless
b) Odour	Odourless
c) Odour threshold	Odour threshold is subjective and is inadequate to warn of over exposure.
d) pH	n.a.
e) Melting point	- 187,6 °C (85,6 K)
f) Initial boiling point	- 187,6 °C (85,6 K)
g) Flash point	- 104 °C
h) Evaporation rate	Not applicable to gas and mixtures
i) Flammability (solid, liquid)	Flammable gas
j) Upper/lower flammability	1,7 – 10,8 vol %
k) Vapour pressure	8,3 bar @ 20 °C 17 bar @ 50 °C
l) Vapour density	0,507 Kg/l @ 15 °C
j) Relative density	1,5 gas (air=1) 0,58 liquid (air=1)
n) Solubility (in the water)	62,4 mg/l @ 25 °C
o) Partition coefficient: n-Octanol/water	2,36
p) Auto-ignition temperature	> 450 °C
q) Decomposition temperature	n.d.a.
r) Viscosity	n.d.a.
s) Explosive properties	n.d.a.
t) Oxidising properties	Not oxidising according with EU criteria

9.2 Other information

Molecular mass	44 mg/mol.
Solubilities (other substances)	Soluble in ether, ethanol and chloroform
Conducibility	n.d.a.
Miscibility	n.d.a.
VOC contents	≥ 90 % (EU,CH, USA)

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.

Material safety data sheet according regulation (EU) 2015/830
Version 4 – Date: 13th May, 2019 (replaces version 3 - 11/2015)

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).

11. Toxicological information

11.1 Information on toxicological effects

a) Acute toxicity	No known effect for this substance
Inhalation	LC50: > 800 000 ppm Exposure time: 15 minutes Animal species: Rat
Oral	n.d.a.
Dermal	n.d.a.
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.
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.

Other information

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.

12. Ecological information

12.1 Toxicity

Fish	LC50: 49,90 mg/l Exposure time: 96 h Species: Various Remarks: QSAR, key study
Aquatic invertebrates	LC50: 27,10 mg/l Exposure time: 48 h Species: Daphnia Magna Remarks: QSAR, key study
Algae	LC50: 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.

Material safety data sheet according regulation (EU) 2015/830
Version 4 – Date: 13th May, 2019 (replaces version 3 - 11/2015)

12.5 Results of PBT and vPvB assessment

This product does not meet the PBT or vPvB criteria.

12.6 Other adverse effects

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

13. Disposal consideration

13.1 Waste treatment methods

Product Take all necessary measures to prevent the production of residuals, value the possible methods of regeneration or recycling. Dispose in accordance with local, state, and federal regulations. Do not discharge into drains or environment.
Packaging Reuse and recycle the packaging after its reclaim. Dispose of non-reusable packaging in accordance with local, state, and federal 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.

Additional information

Waste directives and regulations: Directive 2006/12/CE, Directive 91/689/CE, Regulation (EC) no. 1013/2006.
Dispose of waste product in compliance with EC, state and/or local regulations.
For more information, see section 8.

14. Transport information

14.1 UN Number UN 1978

14.2 UN proper shipping name Propane

Hazard labels

ADR/RID, IMDG, IATA/ICAO



2.1 Flammable gas

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

14.3 Transport hazard class(es)	2
Classification code	2F
Kemler code	23
14.4 Packing group	n.a.
Packing instruction	P200
14.5 Environmental hazards	No
Additional information	
Tunnel restriction code of total load	B/D: Passage forbidden through tunnels of category B & D.

Transport by air (IATA/ICAO)

14.3 Transport hazard class(es)	2
Class/Division	2.1
14.4 Packing group	n.a.
Passengers and cargo flights	Forbidden
Only cargo flights	200
14.5 Environmental hazards	No

Material safety data sheet according regulation (EU) 2015/830
 Version 4 – Date: 13th May, 2019 (replaces version 3 - 11/2015)

Transport by sea (IMDG)

14.3 Transport hazard class(es)	2
Class/Division	2.1
Emergency Schedule (EmS)	F-C, S-V
14.4 Packing group	n.a.
Packing instruction	P200
14.5 Environmental hazards	No

14.6 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.
 Ensure that containers are firmly secured.
 Ensure there is adequate ventilation.

14.7 Transport in bulk according in Annex II of MarPol and the IBC Code

Not applicable.

15. Regulatory information

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

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

Additional regulations/legislations

Regulation (EU) No. 517/2014
 Directive Seveso 96/82/EC: Not included

15.2 Chemical safety assessment

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

16. Other information

This Material Safety Data Sheet has been made according European Directive in force.

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

H220: Extremely flammable gas
 H280: Contains gas under pressure; may explode if heated
 P210: Keep away from heat/sparks/open flames/hot surfaces – No smoking
 P377: Leaking gas fire: Do not extinguish unless leak can be stopped safely
 P381: Eliminate all ignition sources if safe to do so
 P403: Store in a well ventilated place

Text of risk (R) and safety (S) phrases in section 2

R12: Extremely flammable
 S2: Keep out of the reach of children
 S9: Keep container in a well-ventilated place
 S16: Keep away from sources of ignition - No smoking

Text of “Hazard Class and Category Code” in section 2 and 3, according to Regulation (EC) n. 1272/2008 (CLP) and Directive 67/548/EEC

Flam. Gas 1 Flammable gas Category 1
 Press. Gas (Liq.) Pressurized gas : Liquefied gas
 F+ ; R12 Extremely Flammable

History Version 4 by Mariel Srl Version 3 Version 2 Version 1
 Revision date: 05/2019 Date: 11/2015 Date: 05/2015 Date: 03/2011

Material safety data sheet according regulation (EU) 2015/830
Version 4 – Date: 13th May, 2019 (replaces version 3 - 11/2015)

b) Abbreviations and acronyms

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
DMEL	Derived Minimum Effect Level
EC50	Effective Concentration 50%
EmS	Emergency Schedule
EWS	European Waste System
GHS	Globally Harmonized System
GWP	Global Warming Potential
HCFC	Hydro-Chloro-Fluoro-Carbons
HFC	Hydro-Fluoro-Carbons
IATA	International Air Transport Association
IBC Code	International Bulk Chemical code
ICAO	International Civil Aviation Organization
IMDG code	International Maritime Dangerous Goods code
LC50	Lethal Concentration 50%
Log Kow	Logarithm Partition coefficient N-octanol /Water
n.a.	not applicable
n.d.a.	no data available
ODP	Ozone Depletion Potential
OEL	Occupational Exposure Limit
PBT	Persistent, Bioaccumulative, 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
TWA	Time Weighted Average
UE / EU	European Union
VOC	Volatile Organic Compounds
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.
