

R290



PERFORMANCES

The **R290** is a propane used as a refrigerant.

Highly pure (> 99,5 %), the **R290** ensures a long lifespan to any material in contact with the product.

SPECIFICATIONS

Standard characteristics	Limit values
Appearance	clear
Vapor pressure at 20 °C	7,6 ± 0,2 bar
Composition : propane isobutane n-butane C4 unsaturates	≥ 99,5 % volume ≤ 0,40 % volume ≤ 0,15 % volume ≤ 0,01 % volume
Odor	none
Moisture content	≤ 0,0012 % volume

CHARACTERISTICS

		Units	Values
Chemical Formula			CH ₃ -CH ₂ -CH ₃
Molecular weight		g/mol	44,09
Boiling point	at 1,013 bar	°C	-42,1
Liquid density	at 20°C	kg/dm ³	0,500
Vapor density	at 20°C	kg/dm ³	0,018
Absolute pressure	at 20°C	bar	8,5
Critical temperature		°C	96,67
Critical pressure	absolute	bar	42,50
Surface tension (liquid/vapor interface)	at +10°C at -50°C	dyne/cm -1	8,35 13,59
Lower flammability limit	in the air at 20°C	% in volume	2,2
Upper flammability limit	below 1,013 bar		9,5
Auto-ignition temperature		°C	480

THERMODYNAMIC PROPERTIES

Temperature	Absolute pressure	Density Kg/m ³	Volume M ³ /kg	Enthalpy KJ/kg		Entropy kJ/(kg.K)		Heat sp _e c _p	
°C	MPa	liquid	vapor	liquid	vapor	liquid	vapor	liquid	vapor
-70	0.02435	612.6	1.5505	39.06	492.05	0.3253	2.5551	2.131	1.308
-60	0.04261	601.6	0.92303	60.58	504.00	0.4285	2.5088	2.168	1.358
-50	0.07046	590.5	0.57907	82.49	515.97	0.5287	2.4713	2.210	1.412
-40	0.11100	579.0	0.37968	104.86	527.92	0.6265	2.4410	2.257	1.471
-30	0.16770	567.2	0.25840	127.74	539.80	0.7221	2.4168	2.309	1.536
-20	0.24439	555.0	0.18147	151.18	551.55	0.8160	2.3976	2.367	1.607
-10	0.34516	542.4	0.13087	175.24	563.11	0.9086	2.3825	2.432	1.685
0	0.47434	529.1	0.09649	200.00	574.39	1.0000	2.3706	2.506	1.771
10	0.63648	515.2	0.07246	225.54	585.30	1.0907	2.3613	2.590	1.868
20	0.83631	500.4	0.05522	251.96	595.73	1.1810	2.3537	2.687	1.980
30	1.0788	484.6	0.04258	279.39	605.49	1.2714	2.3471	2.802	2.113
40	1.3692	467.4	0.03309	307.97	614.35	1.3621	2.3405	2.942	2.279
50	1.7130	448.6	0.02582	337.92	621.99	1.4539	2.3330	3.122	2.498

Please contact us for more information.

PACKAGING

	Bottles		Container
Capacity (liter)	26	88	930
Tare (kg)	16	38	460
Load (kg)	10	37	390
Diameter (mm)	300	300	860
Height (mm)	630	1530	2330
Outflow external diameter (mm)	21,7	21,7	26,1
Tap : left pitch (mm)	1,814	1,814	1,814
Test pressure (bar)	30	33	33

- Packaging technical characteristics are available upon request to the commercial department.
- Feasibility of filling packaging of the customers if they are in conformity with the legislation.
- Contact us for any other specific packaging.

STORAGE AND SHELF LIFE

Precautions for handling and storage:

French plants are controlled by the regulation of listed Establishments and have to comply with it (or with the local legislation).

- All packaging will be stored in a dry, well-ventilated, easily accessible place, sheltered from sunlight and bad weather, away from any ignition source.
- It is recommended to store all packaging either in a specific place or isolated and sheltered by a fence.
- All packaging and piping will be grounded to discharge static electricity.
- Leak detectors, put at ground level, will be connected to an audible alarm, which will trigger in the event of leaks.
- The whole equipment will be tested with an appropriate leak detector before use.
- Material and electrical equipment in an explosive atmosphere will comply with the regulations (*grounding, equipotential bonding, ATEX material*).

INVENTEC can study the set up and assembling of your storage tanks, piping, and pumps, according to the prevailing regulations.

CONDITIONS OF USE

**Please refer to the Material Safety Data Sheet (MSDS) before using the product.
Workers handling the product should be trained about risks and preventive measures.**

The R290 is compatible with:

- **The following plastics:**
 - Polyurethane
 - Polyvinyl chloride (PVC)
 - Polyamide
- **The following elastomers:**
 - Acrylonitrile butadiene (BUNA)[®]
- **The following metals:**
 - Ordinary steel

The R290 is not compatible with:

- Polyethylene
- Polystyrene
- Polyisobutylene

Handle away from:

- **Heat sources (*flames or hot metallic surfaces*)**
- **In cool and aired premises**

HEALTH SAFETY AND ENVIRONMENT (HSE)

Symbols and warnings:

EXTREMELY FLAMMABLE (F+)

Risks	
R 12	Extremely flammable

Safety	
S9	Keep container in a well-ventilated place.
S 16	Keep away from ignition sources. No smoking.
S 33	Take precautionary measures against static discharges.

Exposure Limit Value USA (TLV-TWA 8 hours)	800 ppm V (calculated)	
CAS number	74-98-6 : propane	
EINECS number	200-827-9 : propane	
ODP (Ozone Depletion Potential)	0	
GWP (Global Warming Potential)	3 (over 100 years CO₂ = 1)	
VOC (Volatile Organic Compound)	yes (according to the European definition)	

As environmental index calculations evolve constantly, the figures above are communicated as an indication only.

This data is based on information that the manufacturer believed to be reliable and offered in good faith. On no account, Inventec will be responsible for special, incidental and consequential damages. The user is responsible, to the Administrative Authorities (Regulation of the listed establishments for the protection of the environment), for the conformity of his installation.