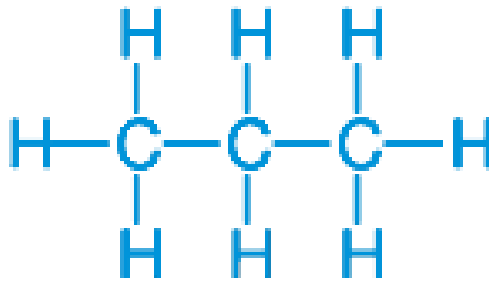


# SAFETY MANUAL

# R290



R290

Refrigerant

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herein after referred to as the **manufacturer**. This restriction also applies to the drawings and diagrams contained in the documentation.

## LEGAL NOTICE

This documentation has been written in all conscience. However, the manufacturer cannot be held responsible, neither for any errors occurring in this documentation nor for their consequences.

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## SYMBOLS USED



### **Danger**

Stands for an immediate danger leading to severe physical injuries or death.

▶ Description for avoiding the danger.

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### **Warning!**

Stands for a potentially dangerous situation leading to severe physical injuries or death.

▶ Description for avoiding the dangerous situation.

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### **Caution!**

Stands for a potentially dangerous situation which could lead to minor physical injuries or damage to property.

▶ Description for avoiding the dangerous situation.

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### **Notice**

Stands for important information that must be observed for the intended use and function of the product.

▶ Description of the required action for the intended function of the product.

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# 1 Safety Instructions R290 refrigerant

## 1.1 R290 specification

### Composition

Propane CH<sub>3</sub>CH<sub>2</sub>CH<sub>3</sub> (R290)

### Molecular mass

44.1 kg/kmol

### Colour

colorless

### Odour

faint

### Decomposition temperature

unknown

### Vapour density

- approx. 1.9 kg/m<sup>3</sup> at 25 °C
- heavier than air
- collects at floor level

### Handling

Ensure good room ventilation at floor level as well. Use only grounded apparatus. Take measures against electrostatic charge. Keep vessels away from electric devices, sparks, heat sources, and open light. Area of explosive danger.

### Dangerous reactions

Explosion risk!

Explosion limit (in air): 1,7 – 10,9 %

**Do not smoke** and avoid contact with heated surfaces!

### Classification group

**L3** (The refrigerants lower explosion limit in air is less than 3.5 %.)

### Safety group

**A3** (no or only insignificant poisonous or caustic effect, high flammability)

### Toxicological details

Significant poisonous is unknown.

The product leads to narcotisation at high concentration. The effect disappears at fresh air. Fast evaporation of the product may cause displacement of breathing air and therefore unconsciousness and asphyxiation. Skin contact may cause frostbite at skin and eyes.

### Environmental details

Water hazard class: Index 560

Not hazardous to waters

### Disposal information

Return to supplier of refrigerant.

### **Exposure controls**

MAK TRGS 900: 1000 ppm,  
Top level restriction class 4

### **General rules of protection**

Ensure good room ventilation at floor level. Permanent survey of impermeability of facilities, fittings, and vessels. Eating, drinking, smoking and storing of food and tobacco products is strictly forbidden. Do not breath refrigerant. Avoid contact with liquid phase.

## **1.2 Personal protective equipment**

Safety shoes, antistatic and non-combustible clothes, protective gloves and eye protection are to be provided for every person concerned with maintenance, repair and recovery and to be used by them. A self contained breathing apparatus should always be used under unclear circumstances.

## **1.3 Emergency equipment**

The following emergency equipment is to be provided in the case of a refrigeration plant with a refrigerant capacity of more than 200 kg of refrigerant and also when a special machinery room is available:

- respiratory protection equipment independent of the ambient air
- first-aid equipment
- emergency shower for eye rinsing.

The respiratory protection equipment must be suitable for that refrigerant. It must consist of at least two independent respirators.

First-aid equipment, medicine and special chemical preparations as well as protective coverings, etc. must be available and stored outside of the special machine room but near the entrance. Special attention should be given to medicines for the immediate treatment of eye injuries. Medicines and other chemical preparations are to be acquired only in consultation with specialists.

The water for eye rinsing must be regulated with a thermostat (mixed warm/cold water), in order to avoid cold shock to the injured person.

## **1.4 First aid when using R290, immediate measures**

If the injured person is unconscious

- Evacuate person at risk from hazard area. Pay attention to wind direction.
- Call a doctor and an ambulance equipped with a respirator immediately.
- The injured person should be brought into a well-ventilated room or outdoors until the arrival of the ambulance, as long as this is safe. The injured person should be placed on his or her side.
- Inform the doctor that the injured person was exposed to the refrigerant R290 (propane). Preferably, the injured person should be given an appropriate label.

- Loosen the clothing around the chest in order to facilitate breathing.
- Mouth-to-mouth resuscitation is to be applied if required.
- Persons who have breathed in a large amount of fumes are to be treated as quickly as possible with oxygen by a knowledgeable person. In addition they should be kept as quiet as possible.
- Water or other fluids should never be administered except as ordered by the doctor.

### 1.5 Eye injuries

- At burns use cold water immediately.
- At frostbite use warm water. Lift the eyelid careful and rinse for at least 20 min. with copious amounts of water.
- Do not rub the eyes.
- Remove contact lenses, if present.
- Loose fitting, amicrobic dressing.
- Then take the injured person immediately to an eye specialist or accident hospital.

### 1.6 Skin contact

- At frostbite warm up person by body heat. Do not rub.
- Do not open blisters from burns. Cover wounds aseptic.
- Take the injured person to a doctor or accident hospital as quickly as possible.

### 1.7 Injuries from swallowing liquid refrigerant

Give the injured person, as long as he or she is conscious, as much water or other warm drink as possible.

#### Notice

For more information see:

- ▶ prEN 378-1
  - ▶ prEN 378-3
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