

# Let me introduce you to R-290 compressors

- ▶ **R-290 = propane**
- ▶ **Extremely low GWP hydrocarbon**
- ▶ **High efficient natural refrigerant**



**A3 Safety class**  
(high flammability / low toxicity)

## Flammability main features

• Lower explosion limit	0.038 [kg/m <sup>3</sup> ]
	2.10 [%]
• Upper explosion limit	0.177 [kg/m <sup>3</sup> ]
	9.5 [%]
• Minimum ignition temperature	460 °C

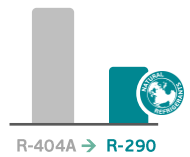
Did you know?

1. With the 5.3oz (150g) charge limit Natural Refrigerants • (R-290 and R-600a) already can cover most household and light commercial applications.



In many case the **refrigerant charge is equivalent to 2 or 3 cigarette lighters.**

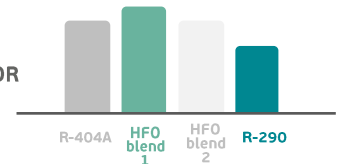
That means a **reduction of refrigerant charge UP TO 50%**



## 2. Reliability

Lower operating temperatures compared to R404A  
Lower shell temperature  
Lower discharge

**LONG COMPRESSOR LIFE**



## 3. Compressor changes

FOR A SAME COOLING CAPACITY, THE R-290 PRESSURES ARE LOWER THAN R-404A AND HIGHER THAN R-134a

SPECIFIC MOTORS DEVELOPMENT IS REQUIRED FOR R-290 MODELS.



R-404A



R-290



R-134a

DISPLACEMENT NEEDED IN A R-290 COMPRESSOR USUALLY IS **BIGGER THAN R-404A AND SMALLER THAN R-134a**

- Polyolester is the recommended **LUBRICANT** for its biodegradability and good viscosity at high temperature.
- Electrical components must be compliant with EN 60079-15 requirements.

## Safety and Practical



### Remember to:

Always conduct a risk assessment.

Always wear safety glasses and gloves.

The work area must be monitored with a hydrocarbon detector.

Good ventilation is essential.

The work area must be free from sources of ignition.

Assure the presence of a fire extinguisher.

Use only tools and equipment certified for use in hazardous areas and wear an antistatic-electricity tag.

Into internal of cabinet all electrical devices must be encapsulated or fire and explosion proof. In the exterior of cabinet, considering small charge the risk is remote, but «built-in» systems inside another structure are more susceptible to this possibility.



## Compressor Replacement



- ▶ Have the **compressor manufacturer's spec sheet on hand** and verify the correct compressor is in the system and be sure to use the new starting components that came with the compressor.
- ▶ Post **safety placard** with no smoking/flammable gas work site.
  - Ensure HC specific **reclaim machine** and **recovery cylinder** are used.
  - Always use refrigerant that is **labeled "R290"** and never just "Propane".

## Key Messages



**Common sense and staying alert** will go a long way towards working safely with flammable refrigerants.

Develop work procedures that **keep in mind the flammable nature of natural refrigerants** and follow them on every job.

Hydrocarbon refrigerants do not have an odorant, so leaks can't be identified by smell.

**A quality combustible gas leak detector is mandatory** for HC service work.

It is a good idea to pass the **combustible gas detector** through every work site a technician goes into.

And for any question or doubt about R-290, remember: the Embraco's technical support is at your service!