

ZERO OZONE DEPLETION POTENTIAL ODP
NEGLECTIBLE GLOBAL WARMING POTENTIAL GWP

ENVIRONMENT FRIENDLY

INCUBATOR

I-250 CKA

CLIMATIC CHAMBERS

KK-50DFA

KK-730DFA

R600a - ADVANTAGES



Our pledge:

As a traditional laboratory equipment designer and manufacturer with extensive technical expertise, Kambič is ideally positioned to make a valuable contribution to the protection of our planet.

We have therefore committed ourselves to the responsible use of natural resources, the development of clean technologies and the replacement of harmful substances with more eco-friendly alternatives.

Whether your application uses an incubator or a climatic chamber, we can help you meet environmental regulations.

Our high quality laboratory incubators and climatic chambers equipped with R600a based refrigerant can provide you with a cost efficient solution that perfectly suits your requirements.

Advantages of R600a:

- Zero ozone depletion potential
- Very low global warming potential (~4) Indirect GWP (100 year), IPCC, 2007
- Excellent thermodynamic properties leading to high energy efficiency
- Good compatibility with components
- Low charges allowing smaller heat exchangers and piping dimensions
- Low working pressure thus low noise

Common applications:

R600a has a number of applications. It is most suited to high and medium temperature applications. Most commonly it is used in domestic refrigeration (refrigerators and freezers), with over 250 million units using R600a. It is now available in our laboratory equipment.

Safety:

R600a has some different chemical properties than fluorocarbon refrigerants; the primary difference is its classification as extremely flammable. Therefore the handling and use of R600a requires adequate safety measures. Our engineers found appropriate ways to ensure the highest level of safety during product commissioning as well as during product use and maintenance.

Following international safety standards have long been established:

- IEC / EN 60335-2-24 for household refrigerators and freezers
- IEC / EN 60335-2-89 for commercial refrigerated appliances
- IEC / EN 60335-2-34 for motor compressors

These are the usual electrical safety standards.

Approvals for refrigerated appliances using hydrocarbons as refrigerants have been granted in Europe according to the procedures within these standards since 1994.

The methodology is largely based on the following:

- All electrical components used for switching during normal operation are considered possible ignition sources.
This includes thermostats, door contacts for lighting, on/off and other switches like superfrost, compressor relays, external klaxon and other overload or safety switches, defrost timers and more.
- All system parts containing refrigerant are considered possible refrigerant sources through leaks.
This includes evaporators, condensers, door heaters, tubing and the compressor itself
- The maximum refrigerant charge is set to 150g for most of the above standards (please see specific standard text for reference). By keeping the charge to max. 20 % of the lower explosion level LEL, which is approx. 8 g/m³, the ignition risk is very low.

Safety solutions:

- 1.) All refrigeration system components are designed and specified by the manufacturer for use with R600a or R290.
- 2.) Evaporator coil is installed outside the chamber volume.
- 3.) No possibility of gas leakage inside closed environment of the incubator or climatic chamber.
- 4.) Forced air circulation in refrigeration compartment to avoid potentially dangerous local concentrations
- 5.) Two independent over-temperature safety shut-off devices