



# Cool50 Data

a better alternative™

PHYSICAL PROPERTIES		Cool50	R22
Molecular weight		108.1	86.5
Boiling point (1 atm)	°C	-38.7 <sup>(1)</sup>	-40.8
	°F	-37.6 <sup>(1)</sup>	-41.4
Critical temperature	°C	88.8	96.1
	°F	191.8	204.8
Critical pressure	bara	40.4	49.9
	psia	586	724
Liquid density at 25°C	kg/m <sup>3</sup>	1169	1191
Density of saturated vapor at 25°C	kg/m <sup>3</sup>	43.6	44.2
Specific heat of liquid at 25°C	KJ/kg°K	1.42	1.26
Vapor pressure at 25°C	bara	9.67 <sup>(1)</sup>	10.4
	psia	140.2 <sup>(1)</sup>	151
Latent heat of vaporization at boiling point	KJ/kg	196 <sup>(1)</sup>	234
Ozone depleting potential	ODP	0	0.055
Flammability limit in air (1 atm)	vol%	none	none
Inhalation exposure (8 hr day & 40 hr week)	ppm	1000	1000

<sup>(1)</sup> Bubble point

## COMPOSITION

HFC 134a = 47%  
 HFC 125 = 50.5%  
 iso-pentane = 0.6%  
 n-butane = 1.0%  
 isobutane = 0.9%

## TYPE

HFC blend

## HCFC REPLACEMENT

R22

## TEMPERATURE GLIDE

Approximately 3°C

## LUBRICANT

MO/AB/POE

## ODP

Zero

## CHEMICAL NAME

1,1,1,2-tetrafluoroethane/  
 pentafluoroethane/iso-pentane/  
 n-butane/isobutane

## TYPE AND DESCRIPTION

Cool50 is a nonflammable blend of HFC 134a, HFC 125, iso-pentane, n-butane, and isobutane which has a zero ODP and is also compatible with both traditional and synthetic lubricants so that a retrofit is not required.

Cool50 is a replacement for R22 providing an easy and at the same time a long-term solution. Because there is no need to use expensive and hygroscopic synthetic lubricants, the risk of moisture ingress into a refrigeration system is completely avoided. Cool50 has significantly lower discharge temperatures and pressures than R22 which removes the problem of oil decomposition and also widens the applications for Cool50.

## APPLICATIONS

Cool50 is suitable for use in the main applications normally occupied by R22 including commercial air conditioning, cold stores, supermarkets, dairy chillers, refrigerated transportation, cellar cooling, and others.

## SERVICE WORK

Because it is a blend, it is recommended that Cool50 be charged into systems in the *liquid* as opposed to the gaseous phase.

30045 FM 2978, Magnolia TX 77354  
 telephone: 1.800.366.1356  
 fax: 281.259.1599  
 email: info@coolgas.com  
 web: www.coolgas.com

Part of the **A-GAS** group

**Coolgas**  
 refrigerants made simple™

Since in most cases there is no need to change the existing lubricant, **Cool50** is straightforward to use as the procedure below outlines.

## LUBRICANTS

**Cool50** is compatible with both mineral and alkylbenzene oils found in R22 systems, and also with the polyol ester lubricants. Therefore, in most cases there is no need to change the lubricant although compressor manufacturers' recommendations regarding lubricity should be followed. However, in systems with extensive and complex piping configurations, or a large volume of liquid in the receiver, POE may need to be added.

## MATERIALS COMPATIBILITY

**Cool50** is compatible with all materials commonly used in refrigeration systems previously charged with R22. In general, materials which are compatible with R22 can be used with **Cool50**. It is recommended to check the equipment manufacturer's retrofit literature and obtain recommendations from equipment manufacturers with regard to materials' compatibility.

In older systems which have been operating on R22 for many years, replacement of some seals may be required due to the different composition of **Cool50** which contains HFCs.

## ENVIRONMENTAL DATA

None of the components of **Cool50** contain chlorine so that it has no ability to deplete the ozone layer.

As with all hydrofluorocarbons (HFCs), **Cool50** does have a direct global warming potential (GWP), but this is counterbalanced by its lower Total Equivalent Warming Impact (TEWI). Tests have shown that **Cool50** has a higher Coefficient of Performance (COP) than R22 in a range of applications including window air conditioners, chilled food, and heat pumps both in the heating and cooling mode.

## CONVERSION PROCEDURE FOR REPLACING R22 WITH COOL50

(1) Ensure the right equipment is available, e.g. recovery unit and cylinders, container for recovered lubricant, vacuum pump, weighing scale, replacement drier, etc.

- (2) Record baseline data to establish the normal operating conditions for the equipment.
- (3) Recover R22 charge and weigh recovered amount of R22 to determine amount of **Cool50** to be charged.
- (4) **Cool50** is compatible with MO/AB and POE. If, however, the oil in the system is being changed to a different type, it is not necessary to remove all of the existing oil in the system.
- (5) Replace the filter/drier.
- (6) Evacuate the system and **liquid charge** with **Cool50**, an amount equal to the original charge of R22.
- (7) Start the system and check baseline data, adjust the expansion device if required. If a low pressure control functions as a temperature control, check space temperature and adjust if necessary.
- (8) If the system is fitted with a refrigerant sight glass and the sight glass is not indicating a full charge, additional **Cool50** may be added.
- (9) Carefully monitor the oil level in the compressor and add more oil if required to maintain the correct level. If the oil level does not stabilize and is erratic, some of the oil should be removed from the system and replaced with POE. Adopt the procedure in (10) below.
- (10) In systems where oil return could be an area of potential concern, e.g. containing a liquid receiver, flooded evaporators, or long and complex pipelines, the replacement of up to 25% of the oil charge with a POE is recommended starting with an initial 10% followed by increments of 5% until the oil level stabilizes and returns to normal.
- (11) Avoid overcharging the system.
- (12) Check system thoroughly for leaks.
- (13) Clearly label system as charged with **Cool50** and type of oil used.
- (14) On larger systems with an oil sight glass check oil level after several hours of operation and add oil if necessary.

**NOTE:** SYSTEMS WITH INHERENT POOR OIL RETURN, OFTEN WITH UNUSUALLY LONG SUCTION LINES AND/OR LOW TEMPERATURE SYSTEMS, MAY HAVE IMPROVED **Cool50** OIL RETURN CAPABILITIES WITH ALKYL BENZENE OR POLYOL ESTER OILS.

30045 FM 2978, Magnolia TX 77354

telephone: 1.800.366.1356

fax: 281.259.1599

email: [info@coolgas.com](mailto:info@coolgas.com)

web: [www.coolgas.com](http://www.coolgas.com)

Part of the **A-GAS** group

# Coolgas

refrigerants made simple™