

8.0 Refrigerants

A number of different refrigerants have been used over the years and all have some degree of impact to the environment. It is important to minimise refrigerant leaks because they can damage the ozone layer and increase greenhouse gases.

Early refrigerants used were chlorofluorocarbons (CFCs), but the ozone-depleting nature of these compounds has led to them being phased out and replaced with hydrochlorofluorocarbon (HCFC) compounds such as R-22. These have also been found to have global warming potential (GWP) and are now also being phased out and replaced with blended hydrofluorocarbon (HFC) compounds. Currently, the most commonly used refrigerant in residential heat pumps in New Zealand is a HFC blend called R-410A.

Compliance document

Since 1 January 2008, compliance with the Australia and New Zealand Refrigerant Handling Code of Practice 2007 is mandatory for the handling of fluorocarbon refrigerants by anyone holding a refrigerant handling licence or refrigerant trading authorisation. The Code of Practice is in two parts:

- Part 1 covers self-contained low charge systems that do not require any work on the refrigeration circuit to install and contain less than 2 kilograms of fluorocarbon refrigerant.
- Part 2 covers all other stationary and transport refrigeration and air conditioning systems.

Essential requirements of the code are that:

- heat pump systems must be able to be installed, operated, serviced and decommissioned without loss of refrigerant
- heat pump systems must be installed by an appropriately qualified person with no-loss refrigerant handling certification
- refrigerant must not be intentionally released into the atmosphere.

8.1 Refrigerant charging

The outdoor unit is factory-charged with sufficient refrigerant for the indoor unit and a specific pipe run. Refer to the manufacturer's installation instructions for the pre-charge pipe length. Refrigerant will need to be totally removed and recharged where the pipe run length is longer than that allowed for in the factory. Where shorter, some refrigerant will need to be released and captured. It is an offence to release refrigerant to the air.

Refrigerant charging must be carried out in accordance with AS/NZS 1677.2:1998, Section 6.1: Charging and discharging refrigerant.

Procedure

- Use on the specified refrigerant for charging.
- Measure the additional pipe run length.
- Accurately calculate the amount of refrigerant required according to the manufacturer's instructions.
- Measure the required amount of refrigerant (where additional charge is required) by mass, using electronic scales.
- Keep the charge lines as short as possible.
- Leak test the pipework before charging, by partially opening, then closing the cylinder valve to pressurise the connecting pipework.
- Charge using liquid refrigerant from the cylinder.
- Check for leaks using the bubble test solution.
- Ensure that the cylinder and unit are at the same height to prevent gravity transfer of the refrigerant.

Do not:

- **discharge refrigerant into the atmosphere – under AS/NZS 1677.2:1998, paragraph 6.1.2 Note 2, “it is an offence to deliberately discharge controlled ozone depleting substances into the atmosphere” with a \$5,000 fine**
- **use ultraviolet dye**
- **use reclaimed refrigerant to add additional charge.**

8.2 Labelling as record of service

When a system is charged with refrigerant or lubricant, it must be labelled.

Compressors, systems and liquid refrigerant pumps must be labelled in accordance with AS/NZS 1677.2:1998, clause 5.4.2: Marking of compressors, unit systems, and liquid refrigerant pumps.

Place a permanent label on the unit that identifies:

- refrigerant type
- name of service person and organisation
- date of service
- lubricant type
- gas charge (total including any additional charge).