



The phase out of R22

The Montreal Protocol on Substances that Deplete the Ozone Layer is widely regarded as the world's most successful environment protection agreement. It is the only treaty with universal ratification, with all 197 member countries of the United Nations having accepted legally-binding obligations to phase out the production and consumption of ozone-depleting substances. The Protocol sets out a mandatory timetable for the phase out of ozone-depleting substances including almost all imports to Australia of hydrochlorofluorocarbons (HCFC), such as R22 by 2016.

As one of the early countries to ratify the Montreal Protocol (1989), Australia continues to be a leader in the phase out of ozone-depleting substances. Australia's approach has been based on a cooperative partnership between industry, community and all levels of government.

The *Ozone Protection and Synthetic Greenhouse Gas Management Act 1989* is the foundation of Australia's commitment to meeting its obligations under the Protocol.

Australia continues to take an active role in ongoing Protocol negotiations, ensuring that further actions to protect the ozone layer are scientifically based and technically feasible, and that developing countries are supported in their efforts to phase out ozone depleting substances.

Phase out of HCFCs

Since ratifying the Protocol, Australia has met or exceeded all of its phase out obligations. For example, Australia will largely phase out the use of hydrochlorofluorocarbons (HCFCs) by 2016, four years ahead of the schedule required under the Protocol.

This accelerated approach was determined by a government and industry initiative agreed in the early 1990s, with the phase out schedule set in a subsequent legislative amendment in 1995.

Australia's HCFC Phase out Schedule	
Year	Import of HCFC (ODP tonnes)
2010, 2011	70
2012, 2013	40
2014, 2015	10
2016 to 2029	2.5

R22

HCFC-22 (also known as R22) has been commonly used in residential heat pump, air conditioning and refrigeration systems since the 1990s following the phase out of chlorofluorocarbons (CFCs) in developed countries in 1995.

Uses for R22 include:

Residential Uses	Commercial and Industrial uses
<ul style="list-style-type: none">• Window air-conditioning units	<ul style="list-style-type: none">• Packaged air conditioners and heat pumps
<ul style="list-style-type: none">• Dehumidifiers	<ul style="list-style-type: none">• Chillers
<ul style="list-style-type: none">• Central air conditioners	<ul style="list-style-type: none">• Retail food refrigeration
<ul style="list-style-type: none">• Air-to-air heat pumps	<ul style="list-style-type: none">• Cold storage warehouses
<ul style="list-style-type: none">• Ground-source heat pumps	<ul style="list-style-type: none">• Industrial process refrigeration
<ul style="list-style-type: none">• Ductless air conditioners	<ul style="list-style-type: none">• Transport refrigeration
<ul style="list-style-type: none">• Chest or upright freezers	

In 2012, R22 accounted for approximately 26 per cent of the total bank of working gases in Australia¹, third to the commonly used synthetic greenhouse gasses R-410a and R-134a.

As releases of R22, including from leaks, contributes to ozone depletion, Australia has a legislated phase out of HCFC, in line with its obligations under the Montreal Protocol. Australia will largely phase out the import of HCFCs from 2016, apart from 2.5 ozone depletion potential tonnes a year (equating to around 45 tonnes of R22) which will be permitted until 2029 to service equipment.

The phase out of R22 will see industry look towards other options as the national bank of this refrigerant reduces. Industry is already well advanced in the transition from R22, including moving away entirely from the import and manufacture of air conditioners that operate on R22.

After 2029, the servicing of remaining R22-based systems will rely solely on recycled or reclaimed refrigerant. It is expected that reclamation and recycling will ensure that existing supplies of R22 will last longer and be available to service a greater number of systems.

Important information for users of R22

- R22 will continue to be available in Australia, although quantities of new R22 imported into Australia are reducing (refer to the HCFC phase out schedule).
- If your R22 system is in good working order, there is no need to transition to an alternative refrigerant/system.
- Regular servicing to minimise leakages is important
- Existing units using R22 can continue to be serviced with R22.
- Some used R22 is being reclaimed to manufacturer's specifications. Contact your refrigerant supplier for further information.
- Conversion (commonly referred to as retrofitting) of your existing system to use a non-ozone-depleting substitute refrigerant. Retrofits are allowed if the substitute refrigerant has been found acceptable for that type of use and it is done in accordance with relevant legislation and Australian Standards. Refer to the 'complying with legislation and regulations' section of this fact sheet.

Alternatives to R22

There are a range of possibilities when considering changing from R22 to an alternative refrigerant with low global warming potential alternatives becoming more available.

Equipment manufacturers, gas suppliers, refrigeration engineers, technicians and state and territory work health safety regulators can provide advice on equipment and refrigerant issues, warranties and safety requirements.

Natural refrigerant

Ammonia - Ammonia is often used in the food industry and large cool stores due to its high energy efficiency. During the last two to three decades ammonia has also been used in smaller systems including low-charge liquid chillers for air conditioning of commercial buildings.

Carbon dioxide - Carbon dioxide (CO₂) is now commonly being used in what are referred to as cascade or secondary loop systems. In these systems CO₂ can be used as the primary or secondary refrigerant.

Hydrocarbons - The hydrocarbons most commonly used as refrigerant are ethane (R170), propane (R290), butane (R600), isobutane (R600a) and propylene (R1270). Hydrocarbon refrigerant has been used widely in petrochemical industries, particularly very large refrigeration systems.

Hydrofluorocarbons (HFCs)

HFCs are classified as synthetic greenhouse gases. These gases generally have a high global warming potential, some in the range of 140 to 3260 times that of carbon dioxide. For example, the most common refrigerant used in Australia, R134a, has a global warming potential of 1300.

HFC refrigerant commonly used as a replacement for R22 include:

- R134a
- R404a
- R407a
- R410a—This is the common replacement for split system air conditioners
- Equipment is also being developed to operate on lower global warming potential HFC alternatives such as R32 and R-1234ze.

Complying with legislation and regulations

Strict regulations, standards and procedures must be followed when handling refrigerants. These vary between states and territories and the relevant authorities should always be consulted to ensure legal requirements are followed.

If you are considering substituting R22 with an alternative refrigerant, check the relevant state and or territory legislation to ensure the use of the alternative gas is permitted and it is safe to do so. This includes the manufacturers' required standards.

Complying with standards for prescribed electrical equipment²

Refrigeration and air-conditioning equipment must comply with relevant Electrical Safety Standards. Equipment intended for conversion to a substitute refrigerant must be re-certified as compliant to the relevant standard by the approval issuer. The approval issuer can be an electrical safety regulator or a third party certifier.

Licensing requirements for the handling of refrigerants

Under the Ozone Protection and Synthetic Greenhouse Gas Management legislation, any individual who handles a fluorocarbon refrigerant (HCFC, HFC or CFC), or works on refrigeration and air-conditioning (RAC) equipment that contains a fluorocarbon refrigerant, must hold a refrigerant handling licence.

This includes decanting the refrigerant, or manufacturing, installing, commissioning, servicing or maintaining RAC equipment, irrespective of whether or not refrigerant is present. It also applies to; decommissioning or disposing of RAC equipment where refrigerant is present.

Any individual or business that acquires, stores or disposes of a fluorocarbon refrigerant must hold a current Refrigerant Trading Authorisation.

Any individual (including a repairer or dismantler) who removes fluorocarbon refrigerant such as HCFCs and HFCs from any refrigeration or air-conditioning system, including for the purposes of substitution with an alternative refrigerant, must hold at a minimum a Restricted Refrigerant Recoverer Licence.

Licences can be obtained from the Australian Refrigeration Council at www.arctick.org

There are licensing requirements for refrigerant handling in some states and territories for working with some or all refrigerants. You should check the relevant requirements in your local state or territory.

More information

For more information on the **Montreal Protocol**, go to

www.environment.gov.au/atmosphere/ozone/legislation/montp.html

Electrical Regulatory Authorities Council: www.erac.gov.au/ for more information on electrical equipment safety.

Safe Work Australia: www.safeworkaustralia.gov.au to find the relevant work health and safety authority in your state or territory.

1 Cold Hard Facts 2, <http://www.environment.gov.au/protection/ozone/publications/cold-hard-facts-2>

2 Prescribed equipment is equipment that is required to be approved prior to being offered for sale e.g. fridges and freezers.