

Refrigerant Gases

Factsheet 1

March 2004

Key Points

- * Refrigerant gases can cause ozone depletion
- * Persons installing, servicing or decommissioning vehicle air conditioners that use CFC's or HCFC's must be authorised

Some of the activities in the auto service industry can affect the air quality at the business and can also contribute to bigger problems in the local environment.

Air pollution can be caused by fumes, gases, vapours & dust coming from activities on site or products and equipment that are used.

Possible sources of pollution from automotive and similar businesses are:

- Solvents
- Spray painting
- Air conditioning services
- Parts & vehicle washing
- Surface preparation

▪ Cutting and grinding
If pollution is caused as a result of activities in the auto service industry, it is a breach of the Protection of the Environment Operations Act 1997 and penalties can be imposed.

It is important that any plant or equipment is operated and maintained satisfactorily.

Also under the Protection of the Environment Operations Act 1997 the plant must be operated and maintained in a proper and efficient manner, penalties can apply if this is not the case. This includes the operation of refrigeration gas recovery units.

The issue – Refrigerant Gases

Refrigerant gases released into the atmosphere have the ability to cause long term atmospheric pollution that can lead to ozone depletion, global warming, photochemical smog and acid rain.

Motor Vehicle Air Conditioning systems (MVAC) have historically used the refrigerant CFC-12 (also known as Freon or R-12). R-12 is a chlorofluorocarbon that has been identified as causing damage to the ozone layer, which protects us from harmful ultraviolet radiation.

HFC-134a (also known as R-134a) is now being used in all new vehicles. R-134a is a hydrofluorocarbon, which is less harmful to the stratospheric ozone layer, but does contribute to global warming.

In addition to causing environmental degradation, R-12 and R-134a can present a hazard to human health when they are improperly handled or released into a poorly ventilated area.



These refrigerant gases displace oxygen in the air, which makes breathing difficult and could cause asphyxiation. Therefore, when working with or storing air-conditioning refrigerants, always do so in well ventilated areas in case of accidental release.

Best Management Practices

TRAINING

Appropriate training of all staff who are working on the premises, and accurate and up to date record keeping is important to ensure that equipment is serviced regularly by suitably qualified technicians, and that the people using the equipment are current with their knowledge.

PERSONAL PROTECTION

Personal protection of staff is an important consideration for all staff to comply with WorkCover requirements. Standard work clothes would provide adequate protection of the skin, but lined butyl gloves are recommended when handling the liquid. Chemical goggles and mechanical ventilation (local exhaust) are recommended for most potential exposures.

MANAGEMENT RESPONSIBILITIES

The shop manager or owner should ensure the shop's compliance with regulations by adhering to the following management practices - which will ease regulatory requirements and improve environmental health of the premises.

DO

- not intentionally vent refrigerants to the atmosphere
- recover all refrigerants used in MVAC systems prior to beginning work on the system.
- have all MVAC service technicians trained and certified by an accredited training program in the proper use of refrigerant recovery/recycling equipment.
- visibly inspect hoses, connections and condenser for leaks. Consider purchase of an electronic sniffer to detect leaks.
- encourage customers to have leaking systems repaired rather than merely topped up. Explain to them that refrigerant gases are expensive and continued leaking will contribute to the damage of the ozone layer.
- puncture and label your empty refrigerant tanks and send them to a scrap metal recycler. The label should contain the following information: the business name, address, date the tank was punctured and signed.

DON'T

- mix R-12 and R-134a since contaminated refrigerant must be sent off-site for reclamation.

Gases escaping from your premises can contribute to local pollution.



Mobile gas recovery equipment

Environmental Harm



It's our world
and we all need
to breathe

*You may be
fined or
prosecuted for
deliberately
releasing
refrigerant
gases.*

WHAT IS OZONE DEPLETION?

Ozone is a form of oxygen. In the stratosphere, around 25 kilometres above the Earth's surface, there is a layer of ozone that absorbs ultra-violet light from the Sun. Ultra-violet light is known to cause skin cancer in humans, and to damage plants. The ozone layer forms a protective shield around the Earth, and without it most life on Earth would not be likely to survive.

Ozone depletion is the destruction of the stratospheric ozone layer, which shields the earth from ultraviolet radiation. This destruction is caused by the breakdown of certain chlorine and/or bromine-containing compounds chlorofluorocarbons (CFCs) or halons (HCFCs) that destroy ozone molecules in the stratosphere.

GLOBAL WARMING (THE GREENHOUSE EFFECT)

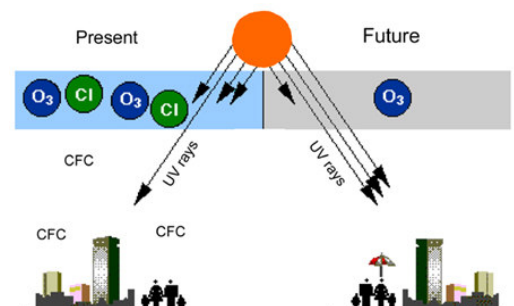
Greenhouse gases are a natural part of the atmosphere. They trap the Sun's warmth, and maintain the Earth's surface temperature at a level necessary to support life. The problem we now face is that human actions—particularly burning fossil fuels (coal, oil and natural gas) and land clearing—are increasing the concentrations of these gases that trap more heat and change the climate. This is the enhanced greenhouse effect.

Water vapour is the most abundant greenhouse gas. Its concentration is highly variable and human activities have little direct impact on its amount in the atmosphere. Humans have most impact on carbon dioxide, methane and nitrous oxide. Various artificial chemicals such as halocarbons also make a small contribution to climate change.

PENALTIES

It is illegal to vent HCFC and Halon gases to the atmosphere under the Federal Government's Ozone Protection and Synthetic Greenhouse Gas Legislation 2003.

Many vehicle manufacturers are changing over to synthetic or perfluorocarbon refrigerant gases, which are a high impact greenhouse gas. These gases are also covered by the new regulation.



Health Effects

INHALATION

The most significant route for overexposure of refrigerant gases is through inhalation of high concentrations of the gas product. Overexposure may cause central nervous system depression and oxygen deficiency. Effects of overexposure may include light-headedness, giddiness, shortness of breath, headaches, and in extreme cases, irregular heartbeats, cardiac arrest, and death. Symptoms of overexposure at lower concentrations may include transient eye, nose, and throat irritation.

SKIN CONTACT

Contact with rapidly released gas may cause frostbite. Other direct dermal contact may result in skin de-fatting, dryness, irritation, or contact dermatitis.

Symptoms of frostbite may include changes in skin color to white or grayish-yellow.

EYE CONTACT

Eye contact with rapidly released gas may cause severe frostbite damage to eyes and lids. Eye irritation may occur with exposure to low concentrations.



Over-exposure to refrigerant gases can cause headaches

For more information contact:

- The City of Ryde (9952 2222)
 - Department of Environment and Conservation (131 555)
 - Motor Vehicle Industry Council (9712 2200)
 - Auto Parts Recycling Association of Australia (03 9587 2194)
- www.apraa.com.au



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A NSW GOVERNMENT INITIATIVE