



Releasing refrigerants into the atmosphere is illegal

Refrigerators, freezers and air-conditioning units contain refrigerants that damage the environment. Synthetic greenhouse gases (SGGs) are now widely used as refrigerants in fridges and air-conditioning units. Under the Climate Change Response Act (CCRA) 2002 it will be illegal to release SGGs into the atmosphere from 1 January 2013.

Refrigerants that are ozone depleting substances are being phased out under the Ozone Layer Protection Act (OLPA) 1996. It is illegal to release these refrigerants into the atmosphere.

The Environmental Protection Authority has enforcement powers under OLPA and the CCRA. If you release SGG or ozone depleting refrigerants into the atmosphere there are serious penalties. It is important you know what refrigerants the appliances you work with contain and that you do not release these into the atmosphere.

SGG refrigerants

SGGs contribute to global warming because they trap heat in the atmosphere. This is reflected by their very high global warming potentials, which are a measure of how much heat a gas traps in the atmosphere compared to carbon dioxide.

SGGs are regulated under the CCRA and include the following substances (see Appendix, page 3, for a full list):

- Perfluorocarbons (PFCs)
- Hydrofluorocarbons (HFCs), and
- Sulphur hexafluoride (SF₆).

You must not knowingly or without lawful reason release SGGs into the atmosphere while installing, operating, servicing, modifying, dismantling, or disposing of any refrigeration or air-conditioning equipment or other heat transfer medium. It is also illegal to release sulphur hexafluoride (SF₆) that is used as an insulant in electrical switchgear.

If you release SGGs to the atmosphere you can be fined up to \$50,000.

Ozone depleting refrigerants

The ozone layer absorbs harmful ultraviolet radiation from the sun. Ozone depleting refrigerants damage this layer, which results in increased levels of sunburn and skin cancer. Ozone depleting refrigerants fall into the following categories (see Appendix, pages 2-3, for a full list):

- Chlorofluorocarbons (CFCs)
- Hydrochlorofluorocarbons (HCFCs)
- Halons
- Hydrobromofluorocarbons (HBFCs)
- Carbon tetrachloride, and
- Methyl chloroform.

You must not knowingly or without lawful reason release these refrigerants into the atmosphere when you are recycling, dismantling or repairing an appliance such as a refrigerator or freezer.

If you release these refrigerants to the atmosphere you can be fined up to \$10,000.

Disposal

If you are working with appliances that contain SGGs or ozone depleting substances you must remove and collect the refrigerants and arrange for proper disposal. When working with electrical switchgear that contains SF₆ ensure that it is captured. You must arrange for a refrigerant or air-conditioning contractor to collect refrigerants and send them to Refrigerant Recovery N.Z Ltd for destruction. A list of certified fillers will be available on the Refrigerant License Trust website from January 2013 (www.rlnz.org.nz). Meanwhile, you can contact the Refrigerant License Manager for fillers in your area.

If you are a certified filler who is approved to fill refrigerants, you can take these refrigerants to a credited collection depot. The minimum quantity you can bring is 10 kg in an approved container that is not disposable. You can find credited collection agents on the Refrigerant Recovery website under 'Contacts' (www.refrigerantrecovery.co.nz).

Collected refrigerants are sent to overseas facilities where they are destroyed in an environmentally sound manner.

Appendix: Ozone depleting refrigerants

Ashrae designations or R-numbers are the standard way that industry categorises chemical refrigerants. The following tables list ozone depleting refrigerants and their ashrae designations. These substances fall into the following categories:

Table 1: Chlorofluorocarbons

Ashrae designation	Chemical formula	Substance
R-11	CFCl ₃	CFC-11
R-12	CF ₂ Cl ₂	CFC-12
R-13	CF ₃ Cl	CFC-13
R-111	C ₂ FCl ₅	CFC-111
R-112	C ₂ F ₂ Cl ₄	CFC-112
R-113	C ₂ F ₃ Cl ₃	CFC-113
R-114	C ₂ F ₄ Cl ₂	CFC-114
R-115	C ₂ F ₅ Cl	CFC-115
R-211	C ₃ FCl ₇	CFC-211
R-212	C ₃ F ₂ Cl ₆	CFC-212
R-213	C ₃ F ₃ Cl ₅	CFC-213
R-214	C ₃ F ₄ Cl ₄	CFC-214
R-215	C ₃ F ₅ Cl ₃	CFC-215
R-216	C ₃ F ₆ Cl ₂	CFC-216
R-217	C ₃ F ₇ Cl	CFC-217

Table 2: Halons

Ashrae designation	Chemical formula	Substance
R-12B1	CF ₂ BrCl	halon-1211
R-13B1	CF ₃ Br	halon-1301
R-114B2	C ₂ F ₄ Br ₂	halon-2402

Table 3: Hydrofluorocarbons

Ashrae designation	Chemical formula	Substance
R-21	CHFCl ₂	HCFC-21
R-22	CHF ₂ Cl	HCFC-22
R-31	CH ₂ FCl	HCFC-31
R-121	C ₂ HFCI ₄	HCFC-121
R-122	C ₂ HF ₂ Cl ₃	HCFC-122
R-123	C ₂ HF ₃ Cl ₂	HCFC-123
R-123a	CHCl ₂ CF ₃	HCFC-123
R-124	C ₂ HF ₄ Cl	HCFC-124
R-124a	CHFClCF ₃	HCFC-124
R-131	C ₂ H ₂ FCl ₃	HCFC-131
R-132	C ₂ H ₂ F ₂ Cl ₂	HCFC-132
R-133	C ₂ H ₂ F ₃ Cl	HCFC-133
R-141	C ₂ H ₃ FCl ₂	HCFC-141
R-141b	CH ₃ CFCl ₂	HCFC-141b
R-142	C ₂ H ₃ F ₂ Cl	HCFC-142
R-142b	CH ₃ CF ₂ Cl	HCFC-142b
R-151	C ₂ H ₄ FCl	HCFC-151
R-221	C ₃ HFCl ₆	HCFC-221
R-222	C ₃ HF ₂ Cl ₅	HCFC-222
R-223	C ₃ HF ₃ Cl ₄	HCFC-223
R-224	C ₃ HF ₄ Cl ₃	HCFC-224
R-225	C ₃ HF ₅ Cl ₂	HCFC-225
R-225ca	CF ₂ CF ₂ CHCl ₂	HCFC-225ca
R-225cb	CF ₂ ClCF ₂ CHClF	HCFC-225cb
R-226	C ₃ HF ₆ Cl	HCFC-226
R-231	C ₃ H ₂ FCl ₅	HCFC-231
R-232	C ₃ H ₂ F ₂ Cl ₄	HCFC-232
R-233	C ₃ H ₂ F ₃ Cl ₃	HCFC-233
R-234	C ₃ H ₂ F ₄ Cl ₂	HCFC-234
R-235	C ₃ H ₂ F ₅ Cl	HCFC-235
R-241	C ₃ H ₃ FCl ₄	HCFC-241
R-242	C ₃ H ₃ F ₂ Cl ₃	HCFC-242
R-243	C ₃ H ₃ F ₃ Cl ₂	HCFC-243
R-244	C ₃ H ₃ F ₄ Cl	HCFC-244
R-251	C ₃ H ₄ FCl ₃	HCFC-251

Releasing refrigerants into the atmosphere is illegal EPA0196

Ashrae designation	Chemical formula	Substance
R-252	$C_3H_4F_2Cl_2$	HCFC-252
R-253	$C_3H_4F_3Cl$	HCFC-253
R-261	$C_3H_5FCl_2$	HCFC-261
R-262	$C_3H_5F_2Cl$	HCFC-262
R-271	C_3H_6FCl	HCFC-271

Table 4: Hydrobromofluorocarbons

Ashrae designation	Chemical formula
R-12B2	CBr_2F_2
R-132bB2	$C_2H_2Br_2F_2$
R-141B2	$C_2H_3Br_2F$
R-22B1	$CHBrF_2$

Other refrigerants include:

- CCl_4 (R-10) (Carbon tetrachloride)
- $C_2H_3Cl_3$ (R-140a) (Methyl chloroform)

Appendix: SGGs

The following table refers to SGGs that are regulated under the CCRA and their ashrae designations.

Table 5: SGGs that you cannot wilfully release

Ashrae designation	Chemical formula
R-23	CHF_3
R-32	CH_2F_2
R-41	CH_3F
R-125	CHF_2CF_3
R-134	CHF_2CHF_2
R-134a	CH_2FCF_3
R-143	CH_2FCHF_2

Ashrae designation	Chemical formula
R-143a	CH_3CF_3
R-152	CH_2FCH_2F
R-152a	CH_3CHF_2
R-161	CH_3CH_2F
R-227ea	CF_3CHFCF_3
R-236cb	$CH_2FCF_2CF_3$
R-236ea	CHF_2CHFCF_3
R-236fa	$CF_3CH_2CF_3$
R-245ca	$CH_2FCF_2CHF_2$
R-245fa	$CHF_2CH_2CF_3$
R-365mfc	$CH_3CF_2CH_2CF_3$
R-43-10mee	$CF_3CHFCHF_2CF_3$
R-14	CF_4
R-116	C_2F_6
R-218	C_3F_8
R-318	$c-C_4F_8$
R-3-1-10	C_4F_{10}
R-4-1-12	C_5F_{12}
R-5-1-14	C_6F_{14}
R-9-1-18	$C_{10}F_{18}$
R-403B	mixture
R-404A	mixture
R-407C	mixture
R-408A	mixture
R-410A	mixture
R-413A	mixture
R-416A	mixture
R-417A	mixture
R-422A	mixture
R-507A	mixture
Sulphur Hexafluoride	SF_6



Visit our website
for more
information:
www.epa.govt.nz