

Immediate response measures are required

for the air conditioning and refrigeration equipment you are using !

Refrigerants subject to environmental regulations



Prompt modification is recommended.

Refrigerants subject to environmental regulations



| Domestic vessels | Ocean-going vessels |
|---|--|
| Availability difficult due to total phase-out of production in developed countries from 2020 onward | Available in developing countries until 2030 |
| Increasing costs due to deterioration in availability | Availability of refrigerant-related servicing and maintenance difficult in Europe from 2020 onward |



- ① Unit replacement
- ② Partial change (compressor, expansion valve, refrigeration equipment oil, cleaning required)
- Partial change (expansion valve, cleaning required)
- Confirmation of design pressure



No ozone layer depletion

Ozone depletion potential (ODP) = 0

No acceleration of global warming

Global warming potential (GWP) = 1,397

Energy saving performance

COP = Large (COP: Coefficient Of Performance)

Safety

Non-toxic and non-combustible

Reliability

Thermally and chemically stable

Economic efficiency

Low-cost and superior in supply stability

Availability

Easily available at ports of call

Reduction in greenhouse gas (GHG) emission risks

Change to R449A reduces the effect of greenhouse gas emission risks by as much as 102,000kg*.

* In the case of equipment charged with 40kg of R404A



About environmental regulations

The Montreal Protocol and the Act for Protection of the Ozone Layer through Regulation of Designated Substances, etc.

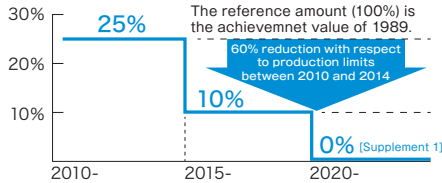
Notice of "reduction/abolition" of domestic production of HCFCs (R22 refrigerant, etc.)

HCFCs, which are ozone-depleting substances, are reduced with respect to annual production limits between 2010 and 2014 as shown below.

60% reduction (to a production limit of 40%) From 1 January, **2015**
Zeroization of production From 1 January, **2020**

▲[Supplement 1]

Reduction in production limits of HCFCs



This reduction/abolition is based on the intergovernmental international agreement (Montreal Protocol:1987) and the Act for Protection of the Ozone Layer through Regulation of Designated Substances, etc. (enacted in 1988), and the production of CFCs (R12, R502, etc.) were abolished in 1996.

Domestic refrigeration and air conditioning equipment manufacturers have already shifted their production and distribution from R22-compatible products to alternative refrigerant products.

In addition, the Ministry of Economy, Trade and Industry (METI) and the Ministry of the Environment (MOE) have begun preparations for recycling fluorocarbons based on the amended law concerning fluorocarbons.

▲[Supplement 2]

(The amounts recycled are restricted by the disposed amounts of fluorocarbons etc.)

[Supplement 1] With the Montreal Protocol, there is an exception to grant the production of HCFCs the use of which is limited to the refilling of the refrigeration and air conditioning equipment existing as of 2020 until the end of 2029. However, in the interim report that was prepared by the Ozone Layer Protection Measures Committee of the Chemical Product Council of the Ministry of International Trade and Industry (MITI)(14 March 1996), the aim was to reduce/abolish the production and consumption of HCFCs, including the above-mentioned refilling uses, in 2020.

[Supplement 2] Act on Rational Use and Appropriate Management of Fluorocarbons (promulgated on 12 June 2013, Act No. 39). Recycled fluorocarbons are not subject to reduction/abolition according to the Montreal Protocol, however, the amounts recycled are restricted by the disposed amounts of fluorocarbons, their recovery rates, recycling facilities, etc.

Source : The Japan Refrigeration and Air Conditioning Industry Association (JRAIA)

EU F-Gas Regulation

Main contents of the Regulation

① Prohibitions regarding products and equipment

Prohibition on the distribution of products and equipment using high GWP (global warming potential) F-gases in the market.

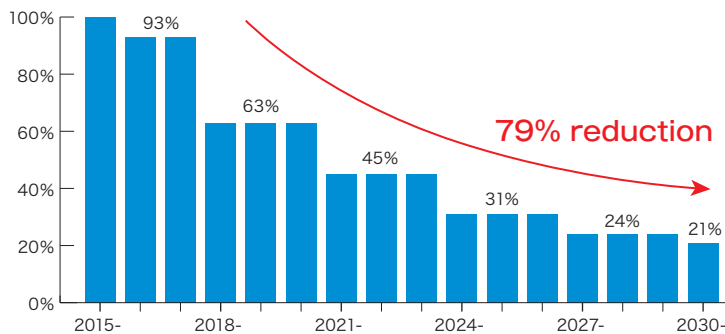
② Prohibition on the use of high GWP gases in servicing and maintenance

Prohibition on the use of high GWP (2,500 or more) gases in servicing and maintenance of existing refrigeration equipment from 2020 onward.

③ Total volume control (gradual reduction) of HFCs and quota system

Total volume control and gradual reduction in HFCs as well as quota system for producers and importers of HFCs.

Reduction schedule in the EU F-Gas Regulation



Applicable Regulation (EU) No.517/2014 (abbreviated as F-Gas Regulation)

[Article 13 Control of use]

3. From 1 January 2020, the use of fluorinated greenhouse gases, with a global warming potential of 2,500 or more, to service or maintain refrigeration equipment with a charge size of 40 tonnes of CO₂ equivalent or more, shall be prohibited.

[Exception]

This shall not apply only to fluorinated greenhouse gases with a global warming potential of 2,500 or more used for the maintenance or servicing of equipment with a charge size of under 40 tonnes of CO₂ equivalent, as well as recycled/recovered refrigerants until 1 January 2030.

*Equipment charged with approximately 10kg or more of R404A is subject to the Regulation.



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