Grow your business:

Get ready for flammable refrigerants!

WHY SHOULD YOU READ THIS LEAFLET?

In a nutshell:

Because many of the lower GWP refrigerants are flammable and because using flammable refrigerants directly impacts your daily work.

1. **First,** remember that all installers that carry out work on HFC containing stationary refrigeration, air-conditioning and heat-pump systems must be certified according to the F-Gas Regulation.

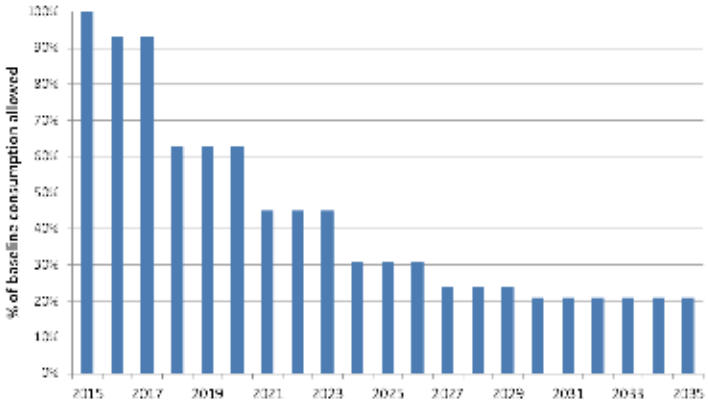
2. **Second,** working with flammable refrigerants requires proper qualification – which is in some countries even mandatory – to ensure safety for installers and users.

3. **Third,** next to compliance with standards, building codes and manufacturers' instructions, you must ensure that service equipment and working conditions are suitable for flammable refrigerants.

WHY IS IT URGENT TO GET READY FOR FLAMMABLE REFRIGERANTS?

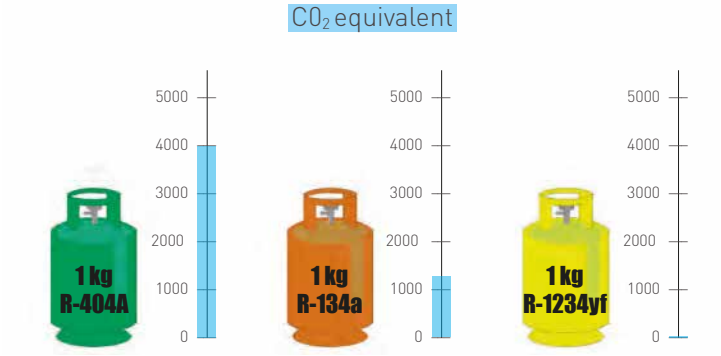
Because many of the lower GWP refrigerants are flammable. If you don't get ready for this reality, sooner or later you will not be able to deal with the consequences of the HFC phase-down!

EU HFC Phase Down Steps



From 2018 onwards, the EU F-Gas Regulation [EU 517/2014] creates massive cuts in the consumption of HFCs in the EU. This reduction scheme, known as the HFC phase-down, is based on a quota system. Quotas are expressed in CO_2 equivalent (kg x GWP).

The higher the Global Warming Potential of an HFC, the higher the quantity of CO_2-equivalent 1 kg of refrigerant represents.



The higher the GWP of a refrigerant, the more it will come under pressure by the HFC phase-down, even though the phase-down does not prohibit any refrigerants.

THE DILEMMA: When moving towards lower GWP refrigerants, flammable fluids will be needed for some applications, but there is a trade-off between flammability and GWP, i.e. the lower the GWP the more likely the refrigerant will be flammable.

FLAMMABILITY ≠ FLAMMABILITY

First of all, and most importantly, all types of flammable refrigerants must ONLY be used in systems designed specifically for them and in compliance with all relevant standard and building code requirements.

Note that the conversion of existing equipment originally designed for non-flammable refrigerants to flammable refrigerants may even result in the loss of the CE marking.

There are different categories of flammability that require different actions. The classification from the ISO 817 standard is used to identify these categories.

The letter indicates the level of toxicity

A = refrigerants with lower toxicity
B = refrigerants with higher toxicity

The number indicates the level of flammability

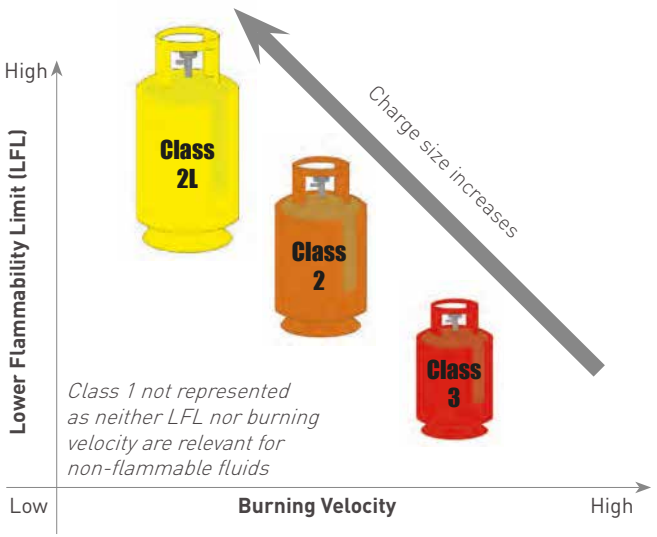
1 = non-flammable
2L = lower flammability ('mildly flammable')
2 = flammable
3 = higher flammability

WHAT DO THESE CATEGORIES MEAN?

- The vast majority of refrigerants that are currently in use are classified as A1, i.e. lower toxicity/non-flammable. For example, R-134a, R-404A and R-410A fall in this category.
- R-32, R-1234yf and R-1234ze(E) are examples for A2L refrigerants, i.e. lower toxicity/lower flammability
- R-152a is an example for an A2 refrigerant, i.e. lower toxicity/flammable
- R-290, R-600a and R-1270 are examples for A3 refrigerants, i.e. lower toxicity/higher flammability
- R-717 is an example for a B2L refrigerant, i.e. higher toxicity/lower flammability
- R-1130(E) is an example for a B2 refrigerant, i.e. higher toxicity/flammable

There are several main parameters that characterize the level of flammability (1, 2L, 2, 3) of a refrigerant including the **burning velocity**, the **upper (UFL)** and **lower flammability limit (LFL)**, the **minimum ignition energy (MIE)** and the **heat of combustion (HOC)**. These parameters have an impact on the way the refrigerant can be used.

EXAMPLE:
For a class 3 refrigerant such as R-290, the LFL (in kg/m³) is significantly lower and its burning velocity is much higher than for a class 2L gas. In practical terms, it means that for example in occupied spaces far higher charge sizes are possible with class 2L refrigerants than with class 3 refrigerants.



WHAT'S THE ROLE OF SAFETY STANDARDS?

Safety standards are important references and are often used as practical guidance, a code of good practice or, if it is a harmonized standard, as a possible method to demonstrate compliance with legislation. Even if they are not binding, an understanding of safety standards is highly recommended.

Installers or users of refrigeration and air conditioning equipment always need to follow the installation and user instructions of equipment manufacturers. They also need to ensure compliance with local legislation (e.g. building codes).

When no such instructions are available, for example when an installer or user modifies equipment, or assembles own equipment, the installer or user becomes a 'manufacturer' and will therefore be liable for the safety of that equipment.

The generic system safety standard EN378:2016 and appliance safety standards such as EN60335-2-40, EN60335-2-89 provide guidelines, for example to ensure that systems do not exceed the maximum amount of refrigerant charge in a specific area.

GENERIC SYSTEM SAFETY STANDARDS AND APPLIANCE SAFETY STANDARDS

EN378:2016 is a generic system standard, whereas EN60335-2-40, EN60335-2-89 and EN60335-2-24 are examples of appliance standards.

Sometimes generic system standards and appliance standards refer to similar requirements, for example allowed charge sizes for specific rooms. In that case, the requirements of the appliance standards prevail over what is mentioned in the generic system standard.

For example, for air conditioners or heat pumps, the flammability charge limits in the standard EN60335-2-40 prevail. But for toxicity, the requirements of EN378:2016 prevail, as these are not included in the appliance standard.

WHAT ARE BUILDING CODES?

Building codes are enshrined in national, regional and sometimes even local rules, often related to fire safety but also to other issues such as access to buildings, health, etc. If a building code prohibits the use of flammable refrigerants, then it is simply not allowed to use those. In some cases, a distinction is made between 2L refrigerants and class 2 and 3 gases, allowing the use of 2L and prohibiting the use of the others. Therefore, it is always important to check the building codes for the specific region before installing equipment with flammable gases.

ALWAYS BUY FROM REPUTABLE SOURCES

As the phase-down moves forward and increases pressure on the pricing and availability of current higher GWP refrigerants, the presence of counterfeit refrigerants is likely to grow. Besides being illegal and violating property rights, this can significantly impact safety – especially in the light of the increased use of flammable gases.

Installers always need to be aware that they are responsible for the refrigerant they are using, and for all the consequences related to illegal or inappropriate use of a refrigerant.

ACT NOW AND GET READY FOR FLAMMABLE REFRIGERANTS!

Don't miss the train and get ready for the use of flammable refrigerants because they are part of the refrigerant landscape – today and tomorrow.

Proper training and qualification are essential for the safe handling of flammable refrigerants – and in some countries even mandatory. The EN13313 standard provides useful guidance about the competence levels required for all types of refrigerants.

All refrigerants must be respected, and common sense, awareness, and careful application of relevant instructions, standards and codes will ensure the safe handling of all refrigerant classes (1, 2L, 2, 3).

AREA is the European association of refrigeration, air conditioning and heat pump contractors. Established in 1989, AREA voices the interests of 25 national associations from 22 countries representing 13,000 companies employing 110,000 people and with an annual turnover approaching € 23 billion.

www.area-eur.be

ASERCOM, the Association of European Component Manufacturers is the platform for dealing with scientific and technical topics and their challenges, promoting standards for performance rating, methods of testing and product safety, focusing on improved environmental protection, serving the refrigeration and air conditioning industry and its customers.

www.asercom.org

Representing the European Fluorocarbons Manufacturers.

www.fluorocarbons.org

The European Partnership for Energy and the Environment (EPEE) represents the interests of the refrigeration, air-conditioning and heat pump industry in Europe. Founded in the year 2000, EPEE's membership is composed of 48 member companies, national and international associations from Europe, the USA and Asia, employing more than 200,000 people in Europe and realising a turnover of over 30 billion Euro.

www.epeeglobal.org

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