



**Report of British Refrigeration Association Action Group**

**On**

**Putting into Use Replacement Refrigerants (PURR)**

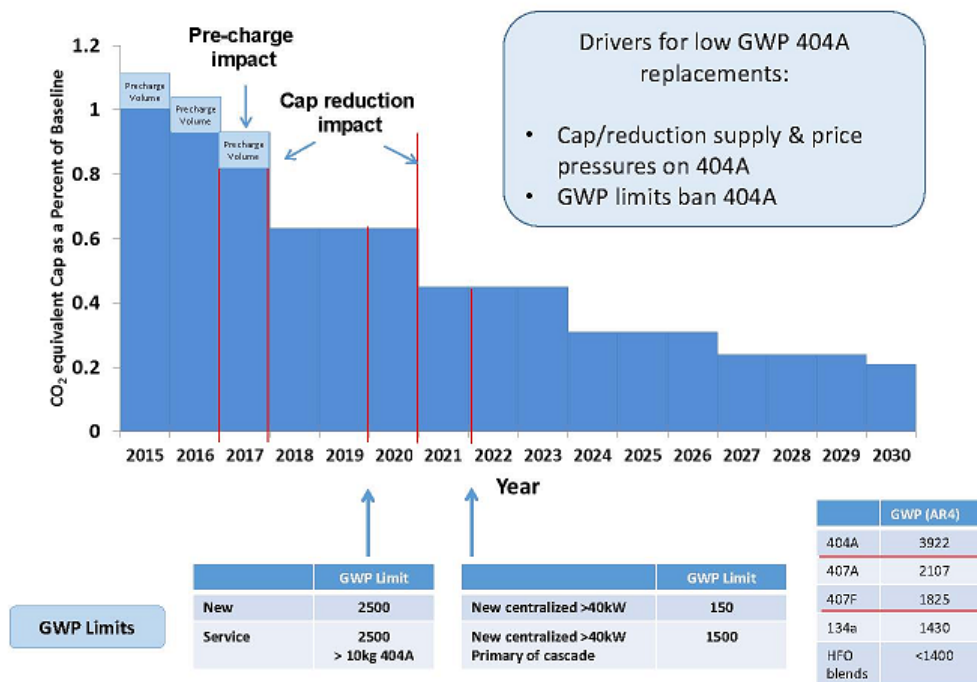
**This study has been produced by an Action Group made up of members of the British Refrigeration Association (BRA). The purpose of the study has been to help people with the task of finding an appropriate response to the F-Gas legislation that has emanated from the EU. The members of the Action Group are shown overleaf.**

# 1. Introduction

Under the EU F Gas regulation there will be a ban on new equipment using refrigerants with a global warming potential (GWP) of more than 2500 from 2020, and a ban on using such refrigerants for servicing from 2020. Reclaim refrigerant can be used until for servicing until 2030.

There will also be a phase down of all global warming refrigerants from the beginning of 2015. [The GWP of a refrigerant is the number of times more damaging the gas is to the climate, compared with Carbon Dioxide.]

The phase down is defined in terms of Carbon Dioxide Equivalent tonnes. The quantities (related to a baseline of the average consumption in 2009-2012) are shown below:-



The phase down applies to Europe as a whole – i.e. it is not applied separately in each country.

There is clear commercial logic for refrigerant manufacturers to want to produce lower GWP refrigerants rather than higher ones. As is obvious from the next section, even before it is banned, R404A is going to be a target. It is generally accepted in the industry that its availability is likely to reduce substantially well before 2020.

## Facing Facts

It is not going to be possible in terms of human resources or money for all the R404A systems, to be replaced or charged with new refrigerants by 2020. These number between 12,000 to 20,000 systems in the UK

Before 2020 systems will be completely replaced, and some will need their R404A replaced by another refrigerant. There are a number of replacement refrigerants on the market suitable for replacing R404A in existing systems.

This report is aimed at helping those involved in managing the changes in refrigerants required by the EU F-Gas legislation. Readers are advised that they need to check with suppliers of any potentially chosen gases, lubricants and physical components before making any definite decisions.

It is crucial that R404A removed from systems is kept for servicing systems that remain in use. Owners of R404A systems should ensure they manage product removed, and ensure it is recycled or reclaimed.

F-Gas legislation gives the following definitions:

Recycling means the reuse of a recovered fluorinated greenhouse gas following a basic cleaning process.

Recycled product can only be used on the same site, or another site owned by the same company. The contractor removing the product is allowed to use the product elsewhere, but they are not allowed to resell it. Any movement of recycled product to another site must be made using waste notes and all cylinders must be labeled as containing recycled product. The basic cleaning process is very unlikely to bring the product back to virgin specification and composition of blends will be unknown, with no guarantee of quality. Anyone thinking of using recycled product should evaluate the risk of using product of unknown quality compared to that of reclaimed product where the quality is guaranteed by the reclamation facility.

Reclamation means the re-processing of a fluorinated greenhouse gas to full AHRI specification i.e. equivalent to virgin product.

Reclaimed and recycled HFCs will play a vital part in the F-Gas phase-down process as they are not included under the quota process.

Reclamation is carried by a number of UK companies (typically, the UK fillers and packers of refrigerant)

It should be noted that all reclaimed or recycled F-Gases need to be labeled as such, with information on the batch number and the name and address of the reclamation or recycling facility. Anyone using reclaimed or recycled product needs to keep a record of how much they use and where the product was reclaimed or recycled in their respective log books.

It is also crucial the leaks are minimized so that the demand for refrigerant, especially R404A, is kept as low as possible.

Integral units are not normally amenable to invasion of their gas circuits. Consequently, if they fail, the sensible solution is likely to be to replace the entire integral unit.

## **Managing Change**

It is clear that:-

- Virgin R404A availability may become limited.
- New systems should use a refrigerant for which the future availability is secure for the life of the new system.
- Existing R404A systems will have to be retired, or have a change of refrigerant. Nevertheless, there are so many R404A systems in use that many of them will remain in service beyond 2020. These can only be serviced with reclaimed or recycled refrigerant.
- Servicing with recycled or reclaimed R404A refrigerant is outside the phase-down quota. There will be a growing market in reclaimed R404A. R404A removed from systems that are being retired, or being charged with a replacement refrigerant, should be reclaimed or recycled and kept to be used as service material for remaining R404A systems.

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- It is important for owners to ensure that they keep track of the amount of refrigerant that has been reclaimed or recycled refrigerant from their system.
- Clearly demand for refrigerant for service needs to be minimized – i.e. leakage must be held to the minimum possible.

Further detail:-

- Careful triangulation of information from the BRA Annual Statistics and further discussions with the information providers for the survey and end users gives an estimate of about 11,000 tonnes of R404A deployed throughout the food chain in the UK. More details on this can be provided on application to BRA/FETA.
- There are 8 000 to 12 000 multi evaporator refrigeration systems in retail premises in the UK. In addition, there are an approximately equal number of single compressor condensing units in commercial and/or retail premises. The majority of these use R404A.
- Migration away from R404A can be done with a new system using a low GWP gas, or by replacing the gas in an existing system.
- Changing 10% of existing systems using R404A each year is the fastest rate at which this can be reasonably achieved. A working hypothesis would be that 5% are replaced by Low GWP systems and the other 5% by change of refrigerant. If this were to be achieved, migration away from R404A systems would be complete in 2025.
- To keep the remaining R404A systems going, it will be necessary to use recycled or reclaimed R404A. The period of maximum stress will be when virgin R404A becomes short and there are still a large number of R404A systems in use. This is likely to be around 2019 to 2021.

[Further information regarding the refrigerants available as replacements for R404A; their properties and characteristics and the impact on system components can be found in the full version of this report]