

TECHNICAL BULLETIN

TB/023 REFRIGERANT RECOVERY

1 Objective

The objective of this technical bulletin is to inform members of the importance of effective refrigerant recovery – either during major service or at the end of the service life of a piece of equipment – to highlight the difference between reclaim and recycling and the effect that has on the recovered gas quality and any system it is subsequently used in.

This technical bulletin is not designed to endorse or approve one or more products, systems or gas types above any other but seeks to impartially advise on some of the pitfalls that may be avoided with careful planning and effective control measures in place.



2 Refrigerant Recovery

It is a requirement under EC517/2014 that fluorinated greenhouse gas refrigerants are properly handled: that means that they must be contained, used, recovered and destroyed in an environmentally friendly manner according to strict rules and procedures. The gases coming under this regulation include hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), Sulphur hexafluoride (SF6), and mixtures of these, but this Technical Bulletin is specifically addressing the HFCs and other gases used in the refrigeration, air conditioning and heat pump (RACHP) systems in domestic, residential, commercial and industrial use.

It is an offence to intentionally release fluorinated greenhouse gases to the atmosphere and leakage or release of these gases must be prevented by “all measures that are technically and economically feasible”.¹

Operators of stationary equipment or of refrigerated units of refrigerated trucks or trailers that contain fluorinated greenhouse gases not contained in foams shall ensure that the recovery of those gases is carried out by natural persons that hold the relevant certificates provided for by Article 10, so that those gases are recycled, reclaimed or destroyed.²

There are 3 levels of certification that may apply to recovery of fluorinated greenhouse gases under these regulations:

1. Category 1 certificate holders can carry out all works, including recovery, relating to the systems regardless of charge size;
2. Category 2 certificate holders can carry out these works only on systems that contain less than 3kgs of F Gas
3. Category 3 certificate holders can only recover refrigerant from systems that contain less than 3kgs of F Gas

These certificates can be obtained via [BESA Training](#) or [City & Guilds](#)

In addition, the company (a sole trader is regarded as a company in the context and scope of this regulation) must also be registered with an authorized certification body such as [REFCOM](#). There is also a voluntary REFCOM Elite scheme whose registered members can demonstrate a higher standard of environmental awareness and compliance, as well as maintaining an audit trail of refrigerant use.

1 EC517-2014 Article 3 Prevention of emissions of fluorinated greenhouse gases

2 EC517-2014 Article 8 Recovery

3 Recovery / Reclaim / Recycling / Destruction Definitions³

3.1 Recovery

Recovery means the collection and storage of refrigerant gases from products, including containers where you are transferring gas from one container to another or from a container into a previously leak tested system, and to and from equipment during maintenance, service or repair work, or prior to the disposal of products or equipment at the end of their service life.

It is essential that a suitable proprietary recovery machine is used for this work and, where A2L, A2 or A/B3 refrigerants are being recovered, that a machine marked as suitable and approved for use with the respective gases is used.



Recovery into a bottle must only be made into proprietary recovery bottles marked with a distinctive yellow band around the top.

The maximum fill level will be clearly marked on the bottle and that level should never be exceeded. To do so risks explosion and potential risk to life. Recovered refrigerant is likely to contain oil mixed with the refrigerant and that has a lower density than pure refrigerant, therefore the maximum fill weight will be less than that of pure refrigerant.

Additionally, the safe fill weight for Hydrocarbon (HC) refrigerants is 45% of the safe fill weight for HFCs.



3.2 Reclaim

Reclaim means the reprocessing of a recovered fluorinated greenhouse gas in order to match the equivalent performance of a virgin substance, taking into account its intended use. This process would normally have to be carried out by a gas manufacturer to ensure the correct constituent levels in a blend are maintained or that no foreign substances are left in the gas. (see section 4. Refrigerant Blends for more on this)

3.3 Recycling

Recycling means the re-use of recovered fluorinated greenhouse gases following a basic cleaning process to remove non-condensables, oil, water vapour and particulate matter by means of driers, filters and filter-driers.

3.4 Destruction

Destruction means the process of permanently transforming or decomposing all or most of a fluorinated greenhouse gas into one or more stable substances that are not fluorinated greenhouse gases.

4. Refrigerant Blends

Particular attention needs to be made when dealing with refrigerant blends being recovered for recycling and re-use. If a zeotropic blend has been recovered after leakage, for example, there is the possibility that the components are no longer in their intended mixture. The wider the glide of the blend, the more pronounced this effect will be. The danger of re-using that as a recycled blend is that the gas will no longer perform as expected and will in all likelihood cause operational issues, have a serious effect on equipment efficiency, and may even create a safety issue.

Therefore, zeotropic blends of unknown consistency should always be sent back for proper reclamation by a gas manufacturer.

³ Adapted from EC517-2014 Article 2 Definitions

Note: this document is based on knowledge available at the time of publication and is meant for general purposes, not for reliance on in relation to specific technical or legal issues, in which case you should always seek independent advice. No responsibility of any kind for any injury, death, loss, damage or delay however caused, resulting from the use of the advice and recommendations contained herein, is accepted by the authors or others involved in its publication (including the Building & Engineering Services Association). 12/06/2017