

TECHNICAL BULLETIN

LEAK CHECKING: DIRECT OR INDIRECT METHODS

1 OBJECTIVE

The objective of this bulletin is to clarify for members the definitions and appropriate leak checking method for stationary RACHP (Refrigeration, Air Conditioning and Heat Pump) systems under the F gas Regulation (EC517/2014).

2 REGULATION EC517/2014

This is the regulation commonly referred to as “The F gas Regulation” as reviewed and adopted in 2014. The implementation of an EU regulation is confirmed by a series of “implementing acts” or “implementing regulations” each covering different aspects of implementation such as training and certification requirements, determination of quota levels, or, in the case of leakage checking requirements, EC1516/2007 which establishes “standard leakage checking requirements for SRACHP equipment”.

2.1 IMPLEMENTING REGULATION (EC) 1516/2007

This implementing regulation relates to the original F gas Regulation EC842/2006. At the time of this Technical Bulletin’s publication we still await European Commission guidance as to whether or not this regulation will be superseded with a new implementing regulation.

2.1 DEFINITIONS

The definition of “direct” methods of leak checking is one or more of the following:

- checking of circuits and components representing a risk of leakage with gas detection devices adapted to the refrigerant in the system
- application of ultraviolet (UV) detection fluid or suitable dye in the circuit
- proprietary bubble solutions/soapsuds
- using oxygen-free nitrogen (OFN) to pressurise the circuit after recovering the refrigerant gas

The definition of “indirect” methods of leak checking is analysis of one or more of the following:

- pressure(s)
- temperatures
- compressor run current
- liquid level checks
- recharge volume where applicable
- visual inspection

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3 CHOOSING THE CORRECT METHOD

3.1 (EC) NO.1516/2007 - ARTICLE 5

This article outlines the choice of measuring method to determine if a leak exists. The text specifies that either method is acceptable as fulfilment of your obligations to carry out leak checks but that “indirect measuring methods shall only be applied where the parameters of the equipment to be analysed, referred to in Article 7(1), give reliable information on the fluorinated greenhouse gas charge indicated in the records of the equipment and the likelihood of leakage.”

Direct checking is always acceptable.

Where indirect checks have proved unsatisfactory, for example where the analysis has raised a suspicion of leakage due to one or more of the parameters being out of sync with what would be expected, then the basic checks shall be followed up with a direct check as specified.

One or more of the following situations arising from a basic indirect check shall constitute a presumption of leakage demanding the further direct checks to be carried out:

- a fixed leak detection system indicates a leak
- the equipment produces abnormal noises or vibration
- ice build up or insufficient cooling capacity
- signs of corrosion, oil leaks or component damage – particularly at possible or likely leak points
- indication of low charge via sight glass, level indicators or other visual aids
- deviations from normal operating parameters indicated during the analysis or by readings from real time monitoring systems/software
- other signs of leakage.

3.2 REPAIRS AFTER LEAKAGE IDENTIFICATION

Where a leak is identified there is now a legal requirement for the contractor to repair “without undue delay” (EC517/2014 Art.3). This is a legal term that ensures the consideration of proportionality. Severe leakage that threatens imminent failure of performance or where the gas has a very high global warming potential (GWP) may, therefore, demand immediate action, whereas a minor leak that is of a low GWP gas or won't be sufficient to cause major loss of performance may be left until a return visit under routine service visits occurs.

When the repair is carried out it must be made by personnel certified to undertake that activity. Prior to the repair a pump down and/or recovery shall be carried out as necessary.

The system shall then be pressure tested using oxygen free nitrogen (OFN) under standard leak testing procedures prior to evacuation, re-charge and leakage test.

A follow up check must be carried out within one month of the repair being carried out. In practical terms this may mean a further indirect check being conducted a short time after the system has been put back into use and normal operating conditions can be analysed.

Further guidance can be found at AREA F Gas Guide and (EC)1516/2007

For more information or technical assistance please contact technical@theBESA.com

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