

Pol01

Impact of refrigerants

Actions:

- i. Specify any refrigerants used on site
- ii. Install leak detection

i. Refrigerants

If there are no refrigerants, then three credits are automatically achieved. If there are refrigerants installed, three credits may still be achieved, depending on the specification/strategy implemented.

Pre-requisite

All systems with electric compressors **must comply** with the requirements of BS EN 378:2016 (parts 2 and 3). Refrigeration systems containing ammonia comply with the Institute of Refrigeration Ammonia Refrigeration Systems code of practice.

Refrigerant impact

Common refrigerants used for cooling buildings are potent greenhouse gases that contribute to global warming and climate change. It is therefore important to reduce their impact by limiting the weight and volume of gases used. **Direct effect life cycle CO₂ equivalent (DELCO₂)** is a measure of the effect on global warming that arises from emissions of refrigerants from the equipment to the atmosphere over its lifetime (units: kgCO₂-eq). The calculation involves estimating the **total refrigerant release** over the period of operation and subsequent conversion to an equivalent mass of carbon dioxide.

To achieve **two credits**, the DELCO₂ should be **≤100 CO₂-eq/kW**. For systems which provide cooling and heating, the **worst performing** output based on the lower of kW cooling output and kW heating output should be used to complete the calculation. Or all refrigerants should have a global warming potential (GWP) of ≤10.

To achieve **one credit**, systems using refrigerants should have a DELCO₂ of **≤1000kgCO₂-eq/kW** cooling and heating capacity.

ii. Leak detection

By specifying systems which **detect and control leakage** of gas to the atmosphere, the impact of refrigerants can be further reduced. Where any type of **non-solid refrigerant is present**, the following criteria is applicable:

All systems should be **hermetically sealed** or only use environmentally benign refrigerants.

Where the systems are **not** hermetically sealed, systems should have either a **permanent automated refrigerant leak detection system**, that is robust and tested, and capable of **continuously** monitoring for leaks, or an inbuilt automated diagnostic procedure for detecting leakage.

Note: This document is intended as guidance only. Consult your BREEAM AP or Assessor to ensure compliance is achieved.

In the **event of a leak**, the system must be capable of automatically responding and managing the remaining refrigerant charge to limit loss of refrigerant

Where **natural and environmentally benign** refrigerants are used, such as air and water (e.g. lithium bromide or water absorption chillers) and installations of small multiple hermetically sealed systems. These types of system or refrigerants will achieve the leak detection credit by default.

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