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Quick Start Guide – A2L Refrigerant Systems – Large Cold Room

This short document provides an example of the application of an A2L refrigerant in compliance with EN 378 [1]. You must read this in conjunction with the Quick Start Guide – Design of A2L Refrigerant Systems and EN 378. There are documents with other examples, including a small cold room and a small retail application.

Cold Room Specification

The example cold room will run on R455A and is 20m by 15 m by 2.2 m high. It is cooled by a remote condensing unit located outside the building. In accordance with EN 378:

- Access category is c (authorised access);
- Application is "other applications" (i.e. not human comfort);
- There is potentially more than 1 person per $10m^3$;
- Equipment location is II (compressors and receivers outside or in a machinery room);
- The system is not a sealed system.

Maximum Charge

In accordance with EN 378-1 Table C.2, the maximum charge per system for access category c, other applications and plant location II is:

20% x LFL x room volume, and not more than 25kg [2].

For R455A: LFL = 0.431 kg/m^3

Cold room volume = 20 x 15 x 2.2 = 660 m^3

From the room volume the maximum charge would be 0.2 x 0.431 x 660 = 56.9 kg

But the charge must not exceed 25kg, so the **maximum charge is 25 kg**.

If the interconnecting pipe work is routed through other rooms, their sizes should, also be checked to ensure the maximum charge is not exceeded (unless there are no pipe joints in the room).

[1] EN 378 Refrigerating systems and heat pumps. Safety and environmental requirements.

[2] Note – Table C.2 allows a larger charge size to be used if construction requirements and other safety measures are used. However, one of the requirements is that doors are not close fitting. So for cold rooms this is not practical and therefore the larger charge size is not possible.

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Further Information

This document provides one example of an A2L system. The relevant FETA Guide on the use of A2L Refrigerants will provide more detailed information and you should also read the appropriate standard.