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## Quick Start Guide – A2L Refrigerant Systems – Small Cold Room

This short document provides an example of the application of an A2L refrigerant in compliance with EN 378<sup>1</sup>. 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 large cold room and a small retail application.

### Cold Room Specification

The example cold room is located in a retail store, will run on R454C and is 3m by 3 m by 2.1 m high. It is cooled by a condensing unit located within the warehouse. In accordance with EN 378:

- Access category is b (supervised access);
- Application is “other applications” (i.e. not human comfort);
- Equipment location is I (refrigeration system in the occupied space);
- 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 b, other applications and plant location II is:

20% x LFL x room volume, and not more than  $m_2 \times 1.5^2$ .

For R454C: LFL = 0.293 kg/m<sup>3</sup>

$1.5 \times m_2 = 1.5 \times 26 \times \text{LFL} = 11.4 \text{ kg}$

Cold room volume =  $3 \times 3 \times 2.1 = 18.9 \text{ m}^3$

$$\text{Maximum charge} = 0.2 \times 0.293 \times 18.9 = 1.11 \text{ kg}$$

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).

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<sup>1</sup> EN 378 Refrigerating systems and heat pumps. Safety and environmental requirements.

<sup>2</sup> 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.

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