

# CONTAINMENT OF CO<sub>2</sub> REFRIGERATION INSTALLATIONS

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## ABSTRACT

A project has been carried out on the containment, and more specifically the leak tightness, of installations using CO<sub>2</sub>.

The objectives are to define a test procedure for the qualification, regarding containment, of components used on installations working with CO<sub>2</sub>.

The three stages of the project are : a) to define a test procedure in collaboration with a group of refrigeration companies, b) to test the sealing ability of components following the newly built procedure, and c) to detect and measure leaks on installations in service in order to observe the feasibility of the detection method and to measure the real leaks.

This article describes the test procedure for CO<sub>2</sub> components, the results of the lab tests and the results and observations of the on-site detections.

## 1. CONTEXT

Certain refrigeration applications come back with the use of CO<sub>2</sub> as a refrigeration fluid. The components have to be specifically adapted to this fluid and particularly prove to be tight enough for security reasons and to avoid loss of energetic performance of the system at these high pressures.

## 2. AIMS OF THE STUDY

The first aim of this study is to set a procedure for testing the components that are most commonly used in refrigeration installations using CO<sub>2</sub>. The selection of components, as well as the definition of the testing parameters, are carried out with the collaboration of some of the industry players so as to insure a better representation of real use conditions. Tests include CO<sub>2</sub> and helium leak measurements. Helium is chosen as it is a reference gas for leak testing.

The second aim is to perform tests on different components (e.g. valves, hoses, filters) following this new procedure and to determine their leakage rate at their maximum service pressure.

On-site leakage measurements are also performed to collect data in operating conditions.

## 3. IN-LAB TESTS

### 3.1. Testing procedure

The procedure is based on work done for the elaboration of the XP E35424-1 and -2 standards.

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