STANDARD

ANSI/ASHRAE Standard 63.2-2017
(Supersedes ANSI/ASHRAE Standard 63.2-1996)

Method of Testing Liquid-Line Filter Drier Filtration Capability

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NOTE

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FOREWORD

ASHRAE Standard 63.2 prescribes a method for measuring the filtration capability of liquid-line filters and filter driers for use in refrigerant systems.

It is recognized that the test contaminant, the test fluid, the test equipment, and the method in the prescribed test do not fully represent the conditions that can exist in the liquid line of a refrigerant system.

The specified test contaminant was chosen as the most nearly representative controlled-particle-size test contaminant commercially available. The wide range of controlled particle sizes used provides a satisfactory degree of repeatability of test results. However, it is recognized that seldom, if ever, will the composition, particle size, and mix of the test contaminant be duplicated in an actual system. Therefore, the filtration capability of a filter determined by this test does not necessarily predict its exact capability in actual service in a refrigerant liquid line.

This test, however, serves as a useful means of comparing filter capabilities and implementing quality control to maintain uniformity of products.

Changes in the 2017 edition of the standard include improvements to the clarity of the test procedure and associated calculations and the addition of test fluid options.

1. PURPOSE

The purpose of this standard is to prescribe a laboratory test method for evaluating the filtration capability of filters and filter driers used in liquid lines of refrigeration systems.

2. SCOPE

2.1 This laboratory test method evaluates the capability of liquid-line filters and filter driers only for removing and retaining solid particles of a standard test contaminant.

2.2 The test method may be applied to all hermetic refrigerant liquid-line filters and filter driers.

2.3 The technique employed in this standard is the one-pass test method. In this test, a clean-up filter is installed downstream of the test sample and is designed to retain and prevent recirculation of the majority of the contaminant particles that are not collected by the test sample in the first pass.

2.4 Filter driers have the added capability of removing and retaining certain dissolved contaminants. This standard does not provide measurement of this capability.

3. DEFINITIONS

clean-up filter loading (M_{cf}): mass in grams of test contaminant that is retained on the clean-up filter.

contaminant capacity (M_c): mass in grams of test contaminant that is retained by the filter under test.

contaminant loading (M_l): total mass in grams of test contaminant that is added to the test apparatus.

contaminant loading end point (M_e): total mass in grams of test contaminant added that achieved the target end-point pressure drop

end-point pressure drop: the filter pressure drop across the filter under test at the concluding point of the testing.

filter efficiency (E_f): contaminant capacity divided by contaminant loading, expressed as a percent.

filter pressure drop (ΔP): the difference in pressure between the filter inlet and filter outlet, including fittings, expressed in kilopascals.

filter under test: liquid-line filter or liquid-line filter drier that is under evaluation.

liquid-line filter: a device for removing and retaining solid contaminants from the liquid line of a refrigeration system.

liquid-line filter drier: a filter containing a desiccant capable of removing moisture and other dissolved contaminants in the refrigerant stream.

test flow rate: the flow of clean test fluid, expressed in kilograms per second, that is specified for the filter under test.

4. MATERIALS AND APPARATUS

4.1 Test Contaminant

4.1.1 Composition. The test contaminant will be a blend of 50% coarse test dust as received and 50% retained in a 200-mesh screen. Prepare this blend from Society of Automotive Engineers (SAE) coarse test dust, described in ISO 5011.

4.1.2 Preparation of Test Contaminant. To prepare the blend of contaminant, first wet-screen a quantity of coarse test dust on a U.S. (ASTM) or Tyler 200-mesh screen with particle retention equal to 74 μm (0.0029 in.). This is done by placing a portion of the coarse test dust on a 200-mesh screen and running water through the screen while stirring the coarse test dust with the fingers. Discard the fine particles passing through the screen.

The +200-mesh particles collected on the screen are removed and dried for one hour at 110°C (230°F). The test contaminant is prepared by mixing 50% by mass of the coarse test dust as received (after drying for one hour at 110°C) with 50% by mass of the +200-mesh-screened dust.

4.1.2.1 Particle Size Analysis. The coarse test dust as received and the blend used as the test contaminant have the particle sizes listed in Table 1.

4.2 Test Fluid. Permissible test fluids are shown in Table 2. Take appropriate steps to minimize evaporation or loss of test fluid during the test procedure.

4.3 Clean-Up Filter. The clean-up filter shall be a filter membrane of 0.8 μm (3.15×10^{-5} in.) pore size. The filter is used to determine the amount of contaminant that passed through the filter under test.