STANDARD

ANSI/ASHRAE Standard 78-1985 (RA 2017)
(Reaffirmation of ANSI/ASHRAE Standard 78-1985)

Method of Testing Flow Capacity of Suction Line Filters and Filter-Driers

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NOTE

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FOREWORD

ASHRAE Standard 78 provides a method for measuring the flow capacity of refrigerant suction line filters and filter-driers.

This is a reaffirmation of Standard 78-1985 (RA 2007). This standard was prepared under the auspices of ASHRAE. It may be used, in whole or in part, by an association or government agency with due credit to ASHRAE. Adherence is strictly on a voluntary basis and merely in the interest of obtaining uniform guidelines throughout the industry. This version of the reaffirmation has no changes.

1. PURPOSE

This standard establishes a method for measuring the flow capacity of refrigerant suction line filters and filter-driers.

2. SCOPE

2.1 This test method is intended for use on both sealed and replaceable element type suction line filters and filter-driers of all types.

2.2 The test method is based on using air as the testing medium and calculating the results to refrigerant gas flow under various application conditions.

3. DEFINITIONS

suction line filter: a device installed in the suction line of a refrigerating system for the purpose of removing solid contaminants. The device generally consists of a shell with fittings and an internal filtering element.

suction line filter-drier: a suction line filter-drier consists of a suction line filter with the addition of desiccant for the purpose of removing moisture and other contaminants.

filters: for the purpose of this standard, the difference between a filter and a filter-drier is not significant. Therefore, both will be referred to as filters hereafter.

flow capacity: the refrigerant gas flow that a suction line filter will pass while maintaining a specified pressure drop across the clean filter. The flow capacity is expressed in lb/min (g/s) flow at a specified evaporator temperature and return gas temperature for the given refrigerant.

pressure drop: the difference in pressure between the inlet and outlet of the clean filter being tested, including the pressure drop in the inlet and outlet fittings, and is expressed in psi (kPa).

specific refrigerant flow rate: the refrigerant flow rate in lb/min (g/s) required to produce one ton (one kW) of refrigeration.

4. APPARATUS

4.1 A flowmeter is used to measure the airflow during the test. This flowmeter may be of any generally accepted design that is suitable for measuring flow with an accuracy of ±5%. Acceptable methods of flow measurement are described in *ANSI/ASHRAE Standard 41.7-1984 (RA 2000), Method of Test for Measurement of Flow of Gas.*

4.2 Mercury manometers or other pressure-measuring devices with an accuracy and readability better than 0.1 psi (0.7 kPa) shall be used for measuring pressures and pressure drop across the filter being tested.

4.3 The temperature at the filter inlet and the flowmeter inlet shall be measured with a thermometer or thermocouple. An accuracy of ±0.5°F (0.3°C) is adequate.

4.4 The installation shall be made with line sizes that are convenient for the test being run and that are installed and arranged according to good engineering testing practice. In piping the filter being tested, the line shall be the same size as the filter fittings and shall be straight for a distance of at least 15 diameters upstream and 15 diameters downstream of the test filter. Pressure taps for the manometer shall be located at least 2 diameters upstream of the filter and 10 diameters downstream. The pressure taps shall be 0.062 in. (1.6 mm) diameter burr-free holes.

4.5 A receiver tank is generally part of the air supply system. This tank serves to store an adequate amount of air at a high enough pressure to permit running the test points desired without exhausting the air available at the filter inlet.

5. TEST PROCEDURE

5.1 Several different testing procedures have been found satisfactory. The preferred test setup is illustrated in Figure 1. Clean dry air is supplied to the system. A pressure regulator is used to maintain a constant pressure at the inlet of the filter under test. Downstream of the filter a control valve adjusts the desired flow, which is measured on the flowmeter at the end of the system. The pressure drop across the filter is measured with a manometer.

5.2 The test procedure is as follows:

a. Install the filter under test.
b. Turn on the air supply and adjust the pressure at the inlet of the filter to 50 psig ±0.5 psig (345 kPa ±3 kPa gage). (See Appendix A, paragraph A5.)

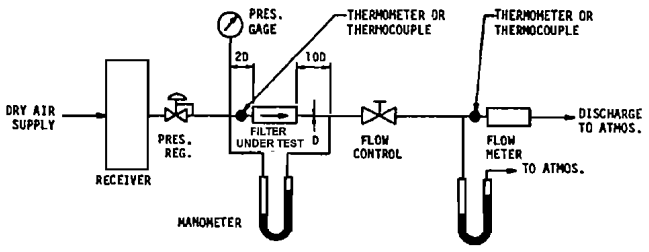


Figure 1 Preferred test setup.