INTERNATIONAL STANDARD

ISO 5782-2

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Pneumatic fluid power — Compressed air filters —

Part 2:
Test methods to determine the main characteristics to be included in supplier's literature

Transmissions pneumatiques — Filtres pour air comprimé —

Partie 2: Méthodes d'essai pour déterminer les principales caractéristiques à inclure dans la documentation des fournisseurs

Reference number
ISO 5782-2:1997(E)

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 5782-2 was prepared by Technical Committee ISO/TC 131, *Fluid power systems*, Subcommittee SC 5, *Control products and components*.

ISO 5782 consists of the following parts, under the general title *Pneumatic fluid power — Compressed air filters*:

— *Part 1: Main characteristics to be included in supplier's literature and product-marking requirements*

— *Part 2: Test methods to determine the main characteristics to be included in supplier's literature*

Annex A of this part of ISO 5782 is for information only.

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Introduction

In pneumatic fluid power systems, power is transmitted and controlled through air under pressure within a circuit. Where mechanical filtration of the air media is desired, filters are components designed to remove solid and liquid contaminants from compressed air.

Pneumatic fluid power — Compressed air filters —

Part 2:
Test methods to determine the main characteristics to be included in supplier's literature

1 Scope

This part of ISO 5782 specifies tests, procedures and a method of presenting the results concerning the parameters which define the main characteristics to be included in the supplier's literature of filters conforming to ISO 5782-1.

The scope of this part of ISO 5782 is

— to facilitate the comparison of filters by standardizing test methods and presentation of test data;

— to assist in the proper application of filters in compressed air systems.

The tests specified are intended to allow comparison between the different type of filters; they are not production tests to be carried out on each filter manufactured.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 5782. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 5782 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 3:1973, *Preferred numbers — Series of preferred numbers.*

ISO 2944:1974, *Fluid power systems and components — Nominal pressures.*

ISO 3448:1992, *Industrial liquid lubricants — ISO viscosity classification.*

ISO 5598:1985, *Fluid power systems and components — Vocabulary.*

ISO 5782-1:1997, *Pneumatic fluid power — Compressed air filters — Part 1: Main characteristics to be included in supplier's literature and product-marking requirements.*

ISO 6358:1989, *Pneumatic fluid power — Components using compressible fluids — Determination of flow-rate characteristics.*

3 Definitions

For the purposes of this part of ISO 5782, the definitions given in ISO 5598 and ISO 5782-1 apply.

4 Units

Units from ISO 1000 are generally used in pneumatic fluid power systems, in particular:

— gauge pressure, expressed in kilopascals (bars);

— temperature, expressed in degrees Celsius;

— flow rate, expressed in cubic decimetres per second (ANR).

5 Test conditions

5.1 Temperature

The temperature of the processed air, the equipment and the ambient air temperature shall be maintained at 25 °C ± 10 °C for all tests.

5.2 Pressures

The specified pressures shall be held to within ± 2 %. The preferred test pressures are those given in 4.2.1 of ISO 5782-1:1997 or in ISO 2944. Where other test pressures are required, the values shall be chosen from series R5 of preferred numbers, according to ISO 3.

6 Test procedure to verify rated pressure

6.1 Perform this test on three random samples with a proposed rated pressure for the product.

6.2 In this test, the product-sealing means can be modified to prevent leakage and allow structural failure to occur; but modifications must not increase the structural strength of the pressure-containing envelope.

6.3 Fill samples with a liquid of viscosity that does not exceed ISO VG 32, according to ISO 3448, and install them in the temperature environment described in 5.1.

6.4 After stabilizing the temperature, pressurize slowly to a level of 1,5 times the proposed rated pressure. Hold at this level for 2 min and observe for leakage or failure (as defined in 6.6).

6.5 If there is no leakage or failure, increase the pressure by approximately half of its proposed rating. Hold at this pressure for 2 min and observe for leakage or failure (as defined in 6.6).

If there is still no leakage or failure, in terms of the following units:

a) units constructed of light alloys, brass and steel,

continue raising the pressure as above until a level of 4 times the proposed rated pressure has been reached;

b) units constructed of zinc diecast alloys or plastics,

— operating temperatures up to 50 °C,

continue raising the pressure as above until a level of 4 times the proposed rated pressure has been reached,

— operating temperature between 50 °C and 80 °C,

continue raising the pressure as above until a level of 5 times the proposed rated pressure has been reached.

6.6 Criteria for a failure are a fracture, a separation of parts or a crack, or any phenomenon which can pass liquid across the pressure-containing envelope sufficiently to wet the outer surface. Leakage across the port threads may not constitute a failure unless caused by a fracture or crack.

6.7 The proposed rated pressure will be verified if all three samples pass the test.

6.8 Where a unit or sub-assembly in the unit (e.g reservoir/sight-glass) is constructed of different materials, the highest appropriate factor should be used. The applied pressure may be restricted to the area of the interface between the different materials.

6.9 Where the design of the pressure-containing envelope is covered by a pressure vessel code in the country of sale, the requirements of that code take precedence over the requirements stated in this part of ISO 5782.

7 Flow-rate tests

7.1 The test circuit shall comply fully with the one described in ISO 6358:1989, figure 1, table 3 and 5.3.

7.2 The measuring tubes shall comply fully with those described in ISO 6358:1989, figure 3, table 4 and 5.4 and 5.5.

7.3 Each series of results obtained for a specified test condition shall be recorded as soon as a steady-state condition has been reached. Recording shall be carried out with care and with a sufficiently slow period of change in conditions to avoid a drift in the steady-state characteristic. A periodic check shall be made to verify that no pressure intakes of the measuring instruments are blocked by solid or liquid particles.

7.4 Set the inlet pressure to test levels of 250 kPa; 630 kPa; 1 000 kPa (2,5 bar; 6,3 bar; 10 bar) or apply the rated pressure if different from 1 000 kPa (10 bar). Adjust the inlet pressure during the flow-rate test to maintain it constant.

7.5 Begin circulating air through the test circuit, recording flow rate and pressure drop, up to a maximum flow-rate corresponding to a pressure drop equal to the lesser of 80 kPa (0,8 bar) or 20 % of the inlet pressure.

7.6 The results shall be presented in accordance with ISO 5782-1:1997, 4.2.1, figure 2, recording the size of port and the type of filter element used in the test, or according to table 1, where the flow at which the pressure drop is 5 % of the inlet pressure is tabulated.

8 Useful-retention-capacity measurement of the reservoir

8.1 This test method determines the capacity of a filter reservoir with a manually operated drain and is also applicable to semi-automatic drains.

8.2 Select three random samples of complete filters from normal production units, for each size of filter-reservoir element.

8.3 With the drain closed and the filter completely assembled, measure the amount of liquid necessary to fill the reservoir to a point where the liquid touches the bottom extremities of the baffle. Where there is no baffle, the maximum level of admissible liquid, and the specified volume corresponding to this mark, shall be marked on the reservoir.

8.4 Determine the average for each group of samples. This will be the rated reservoir capacity for the given reservoir/element combination size.