INTERNATIONAL STANDARD

ISO 6605

Second edition
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Hydraulic fluid power — Hoses and hose assemblies — Test methods

Transmissions hydrauliques — Tuyaux et ensembles flexibles — Méthodes d'essai

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

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.

Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 6605 was prepared by Technical Committee ISO/TC 131, *Fluid power systems*, Subcommittee SC 4, *Connectors and similar products and components*.

This second edition cancels and replaces the first edition (ISO 6605:1986), which has been technically revised.

Introduction

In hydraulic fluid power systems, power is transmitted and controlled through a liquid under pressure within an enclosed circuit. A hose assembly is a flexible fluid power conductor consisting of a length of hose attached, at both ends, to hose fittings.

Hydraulic fluid power — Hoses and hose assemblies — Test methods

1 Scope

This International Standard specifies uniform test methods for evaluating the performance of hoses and hose assemblies (hoses and attached hose fittings) used in hydraulic fluid power systems.

Specific tests and performance criteria for evaluating hoses and hose assemblies used in hydraulic applications are in accordance with the requirements of the respective product (hoses or hose fitting) specifications.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 471, *Rubber — Temperatures, humidities and times for conditioning and testing*

ISO 1402, *Rubber and plastics hoses and hose assemblies — Hydrostatic testing*

ISO 3448, *Industrial liquid lubricants — ISO viscosity classification*

ISO 4671:1999, *Rubber and plastics hoses and hose assemblies — Methods of measurement of dimensions*

ISO 4957, *Tool steels*

ISO 5598, *Fluid power systems and components — Vocabulary*

ISO 5893, *Rubber and plastics test equipment — Tensile, flexural and compression types (constant rate of traverse) — Specification*

ISO 6133, *Rubber and plastics — Analysis of multi-peak traces obtained in determinations of tear strength and adhesion strength*

3 Terms and definitions

For the purposes of this International Standard, the terms and definitions given in ISO 5598 apply.

4 Visual examination of product

Hose assemblies shall be visually inspected to determine that the correct hose fittings are properly installed.

5 Standard tests

5.1 Dimensional check test

5.1.1 General

NOTE These test methods are technically equivalent to those specified in ISO 4671.

The hoses shall be inspected for conformity with all the dimensions of the relevant hose specification.

5.1.2 Measurement of outside and reinforcement diameters

5.1.2.1 Determine finished outside diameter and reinforcement diameter, where required, by calculation from measurement of the respective circumference. As an alternative, a flexible graduated tape may be used to read the diameters directly.

5.1.2.2 Take outside diameter measurements at a minimum of 25 mm from the hose ends.

5.1.3 Measurement of inside diameter

5.1.3.1 Measure the inside diameter by means of a suitable expanding ball or telescoping gauge in accordance with method 2 given in ISO 4671:1999.

5.1.3.2 Take inside diameter measurements at a minimum of 25 mm from the hose ends.

5.1.4 Measurement of concentricity

5.1.4.1 Measure concentricity over both the reinforcement and the finished outside diameters using either a dial indicator gauge or a micrometer.

5.1.4.2 Take concentricity measurements at a minimum of 15 mm from the hose ends.

5.1.4.3 Round the foot of the measuring instrument to conform to the inside diameter of the hose.

5.1.4.4 Take readings at 90° (1,57 rad) intervals around the hose. Acceptability is based on the total variation between the highest and lowest readings.

5.2 Proof test

5.2.1 Test the hose assemblies hydrostatically to the specified proof pressure in accordance with the relevant product specification using the method specified in ISO 1402, for a period of between 30 s and 60 s for all sizes.

5.2.2 Hose assemblies that exhibit no leakage or other evidence of failure after being subjected to the proof test shall be deemed to have passed the test.

5.3 Change-in-length test

5.3.1 Conduct measurements for the determination of elongation or contraction on a previously unused, unaged hose assembly having a free length between hose fittings of at least 600 mm.

5.3.2 Attach the hose assembly to the pressure source in an unrestricted straight position. If the hose is not straight due to its natural curvature, it may be fastened laterally to achieve a straight position. Pressurize to the operating pressure for a period of 30 s, then release the pressure.

5.3.3 Place accurate reference marks 500 mm (l_0) apart on the outer cover of the hose, midway between hose fittings, after allowing the hose assembly to restabilize for a period of 30 s following pressure release.

5.3.4 Repressurize the hose assembly to the specified operating pressure for a period of 30 s.

5.3.5 Measure the distance between reference marks while the hose is pressurized and record this as l_1.

5.3.6 Determine the change in length using the following formula in accordance with ISO 1402:

$$\Delta l = \frac{l_1 - l_0}{l_0} \times 100$$

where

l_0 is the distance between the reference marks after the hose assembly restabilizes pressurized following the initial pressurization and release of pressure, in millimetres;

l_1 is the distance between the reference marks while the hose assembly is under pressure, in millimetres;

Δl is the percentage change in length, which will be positive (+) in the case of an increase in length and negative (−) in the case of a decrease in length.

5.4 Burst test

5.4.1 General

This is a destructive test. Hose assemblies that have been subjected to this test should be destroyed.

5.4.2 Procedure

5.4.2.1 Subject hose assemblies on which the hose fittings have been attached for less than 30 days to a hydrostatic pressure, increased at a constant rate in accordance with ISO 1402.

5.4.2.2 Reject hose assemblies showing leakage, hose burst or indication of failure below the specified minimum burst pressure.

5.5 Cold bend test

5.5.1 General

NOTE This test is technically identical to method B in ISO 4672:1997.

This is a destructive test. Hose assemblies that have been subjected to this test should be destroyed.

5.5.2 Procedure

5.5.2.1 Condition hose assemblies at a temperature equal to the minimum application temperature of the relevant product specification in a straight position for 24 h.

5.5.2.2 While still at the minimum application temperature, bend the samples once, taking a time of between 8 s and 12 s, over a mandrel having a diameter equal to twice the specified minimum bend radius.

In the case of hose sizes up to and including 22 mm nominal inside diameter, bend them through 180° over the mandrel; in the case of hose sizes larger than 22 mm nominal inside diameter, bend them through 90° over the mandrel.