INTERNATIONAL STANDARD

ISO 6802

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Fourth edition

2018-08

Rubber or plastics hoses and hose assemblies — Hydraulic impulse test with flexing

Tuyaux et flexibles en caoutchouc et en plastique renforcés par des fils métalliques — Essai d'impulsions hydrauliques avec flexions

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

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This document was prepared by Technical Committee ISO/TC 45, *Rubber and rubber products*, Subcommittee SC 1, *Rubber and plastics hoses and hose assemblies*.

This fourth edition cancels and replaces the third edition (ISO 6802:2005), which has been technically revised.

The main changes compared to the previous edition are as follows:

— new Clause 6 on test fluid has been added;

— Clause 8 on procedure has been updated to include an option for a cool down test and leakage classification as defined in ISO/TR 11340;

— new Clause 9 on expression of results has been added;

— new Annex A describing optional cool down leakage test has been incorporated.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

Hydraulic hoses and hose assemblies are frequently flexed in service. As there is a possibility that this needs to be taken into account during testing, this document provides a standard method of flexing during impulse testing.

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1 Scope

This document describes hose impulse testing, with flexing, of rubber or plastics hydraulic hose assemblies at both high and low impulse pressures. The high-pressure testing is carried out at pressures greater than 3 MPa and the low-pressure testing at pressures from 1,5 MPa to 3 MPa. The test procedure is applicable to hydraulic hose assemblies that are subject to pulsating pressures in service which are included in the product requirements.

NOTE Impulse test procedures without flexing can be found in ISO 6803.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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

ISO 6803, *Rubber or plastics hoses and hose assemblies — Hydraulic-pressure impulse test without flexing*

ISO 8330, *Rubber and plastics hoses and hose assemblies — Vocabulary*

ISO/TR 11340, *Rubber and rubber products — Hydraulic hose assemblies — External leakage classification for hydraulic systems*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 8330 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at http://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

4 Test methods

There are two methods of flexing; Method 1 by the use of a revolving manifold as shown in Figure 1, and Method 2, by the use of a horizontally sliding manifold as shown in Figure 2.

Both Method 1 and Method 2 shall follow requirements related to pressure and temperature as specified in ISO 6803.

The above test methods shall have the option to be also run with cool down leakage test (see Clause 8).

5 Apparatus

The apparatus consists of a flex test rig, on which the test pieces can be installed, capable of producing flexing as shown in Figures 1 and 2. The rig comprises a movable manifold and a stationary manifold, and the centreline of the stationary manifold shall be adjusted to the centre of rotation of the revolving manifold, or to the centre of the horizontally sliding manifold. The movable manifold is geared so that it stays parallel to the stationary manifold at all times. The number of revolving cycles or sliding cycles per minute of the movable manifold shall be within the range of 34 % to 38 % of the number of impulse cycles per minute; thus, the number of flex cycles is proportional to the number of impulse cycles.

The vertical centreline of the stationary manifold is positioned at a distance of l from the centre of rotation or the centre of sliding of the movable manifold. The hose is subjected to a back bending motion with the inside radius being smaller than the minimum bend radius and the radius near each fitting being larger than the minimum bend radius.

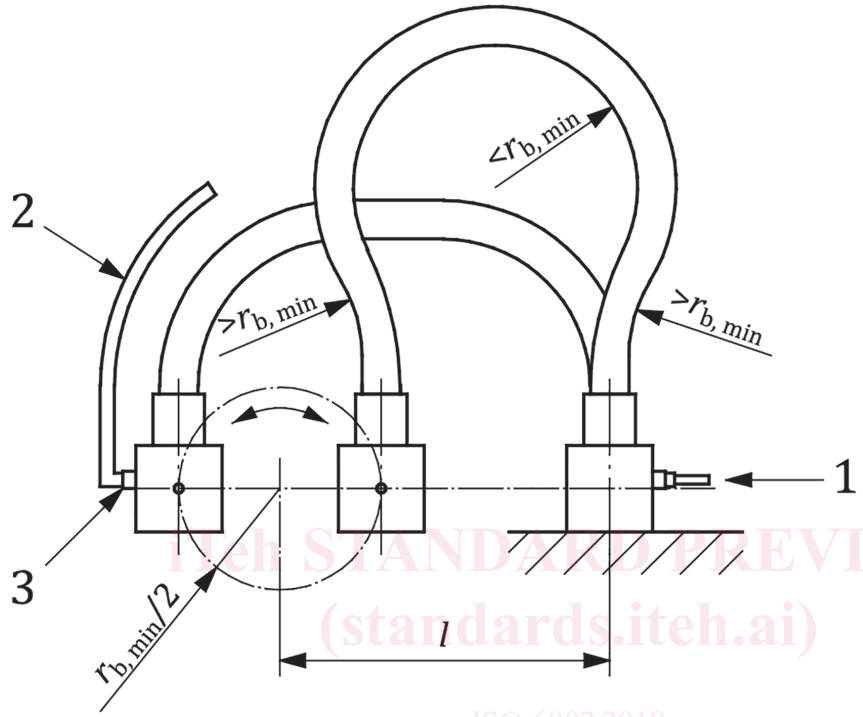
The distance l shall be calculated using the formula:

$$l = 1{,}75 r_{b,min} + d_{ext}$$

with a tolerance of ± 2 mm, where

$r_{b,min}$ is the minimum bend radius;

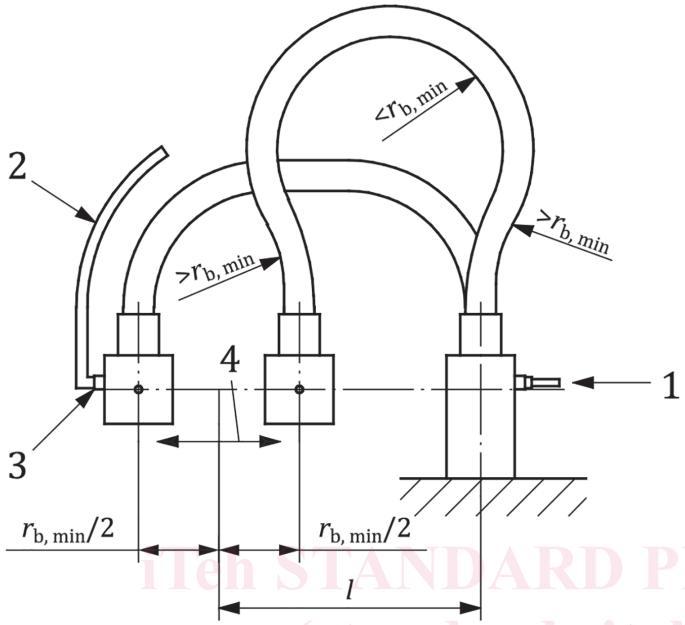
d_{ext} is the external diameter of the hose.



Key

1 test pressure inlet
2 fluid circulation line
3 check valve

Figure 1 — Apparatus for hydraulic impulse test with flexing with a revolving manifold



Key

1 test pressure inlet
2 fluid circulation line
3 check valve
4 manifold sliding direction

Figure 2 — Apparatus for hydraulic impulse test with flexing with a horizontally sliding manifold

6 Test fluid

Select a test fluid preferably with a kinematic viscosity from 32 mm²/s to 100 mm²/s at 40 °C (i.e. from grade ISO VG 32 to ISO VG 100 as specified in ISO 3448), and circulate it at a rate sufficient to maintain a uniform fluid temperature within the test pieces. Other fluids may be used as agreed upon between the customer and the manufacturer.

7 Test piece

7.1 Test pieces shall be complete hose assemblies with suitable end fittings attached. Unless otherwise specified, test four unaged hose assemblies with end fittings which have been attached for not more than 30 days. Where the referring standard requires, also test aged hose assemblies.

7.2 The free length of hose, *L*, measured between the couplings, shall be calculated using the formula;