

BS 5173 : Section 102.7 : 1988

ISO 8032:1987

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British Standard

Methods of test for rubber and plastics hoses and hose assemblies

20104

Part 102. Hydraulic pressure tests

26-11-88

Section 102.7 Pressure impulse test with flexing for high pressure hydraulic hoses (half omega configuration)

[ISO title: Rubber and plastics hose assemblies — Flexing combined with hydraulic impulse test (Half omega test)]

Méthodes d'essai des tuyaux et flexibles en caoutchouc et en plastique Partie 102. Essais hydrauliques

Section 102.7 Essai de flexion combiné avec des impulsions de pression (essai demi-oméga)

Verfahren zur Prüfung von Gummi- und Kunststoffschläuchen und -schlauchverbindungen Teil 102, Wasserdruckprüfungen

Abschnitt 102.7 Biegung kombiniert mit Hydraulikimpulsprüfung (Halb-Omega-Prüfung) für Hochdruckschläuche

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National foreword

This Section of BS 5173, prepared under the direction of the Rubber Standards Committee, is an additional part of the revision of BS 5173: Part 2: 1976. The whole of the 1976 edition is to be revised and as each of the tests is revised it is intended to issue it as a separate Part or Section of BS 5173. This Section is identical with ISO 8032: 1987 'Rubber and plastics hose assemblies — Flexing combined with hydraulic impulse test (Half omega test)', published by the International Organization for Standardization (ISO).

Terminology and conventions. The text of the international standard has been approved as suitable for publication as a British Standard without deviation. Some terminology and certain conventions are not identical with those used in British Standards; attention is drawn especially to the following.

The comma has been used as a decimal marker. In British Standards it is current practice to use a full point on the baseline as the decimal marker.

Wherever the words 'International Standard' appear, referring to this standard, they should be read as 'Section of BS 5173'.

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Cross-references

International standard Corresponding British Standard

BS 5173 Methods of test for rubber and plastics hoses and hose assemblies

ISO 6802-1982 Section 102.6: 1985 Pressure impulse test with flexing for high pressure hydraulic hoses

(inverted 'U' configuration)

(Identical)

ISO 6803-1984 Section 102.5: 1985 Pressure impulse test for high pressure hydraulic hoses

(Identical)

Textual error. When adopting the text of the international standard, the textual error given below was discovered. It has been marked in the text and has been reported to ISO in a proposal to amend the text of the international standard.

In 3.1, paragraph 4, line 2, 'the end of the ferrule' should be read as 'the centre of the ferrule'.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

0 Introduction

Hydraulic hose assemblies are frequently flexed in service, especially when used on mobile equipment. This test is designed to give the same type of failure of the test pieces as that which may occur in service.

This International Standard is an alternative method to ISO 6802, which also specifies a method of flexing during impulse testing. This International Standard provides a method including more severe flexing under pressure impulse.

NOTE — It shall be clearly understood that the use in this test method of pressure and bend radius conditions considerably more severe than those specified in the hose product specification does not imply that the assemblies may be used in service under these conditions.

1 Scope and field of application

This International Standard specifies a method of flexing hydraulic hose assemblies during impulse testing.

2 References

ISO 6802, Rubber and plastics hose and hose assemblies — Wire reinforced — Hydraulic impulse test with flexing.

ISO 6803, Rubber or plastics hoses and hose assemblies – Hydraulic pressure impulse test without flexing.

3 Apparatus and materials

3.1 Flex test rig (see figure 1), on which the test pieces can be installed, capable of producing flexing as shown in figure 2, according to the test parameters specified in clause 5.

The test rig comprises a manifold mounted on a revolving arm, and a stationary manifold.

The manifold on the revolving arm is geared so that it stays perpendicular to the stationary manifold at all times (see figure 2).

The vertical centre-line of the stationary manifold is positioned so that the end of the ferrule is at a distance of 2,25 $R_{\rm c}$ $_{\rm min}$ from the centre of rotation of the revolving manifold with a tolerance of $\pm~2$ mm, where $R_{\rm c}$ $_{\rm min}$ is the minimum bend radius in accordance with the International Standard appropriate to the hose concerned.

When necessary, the height of the stationary manifold (pressure inlet end in figure 2) shall be adjusted to ensure that the end of the ferrule is on the same horizontal centre-line as that of the revolving manifold.

- **3.2** Hydraulic equipment, capable of providing the test parameters given in clause 5 by means of oil circulation through the test pieces. The impulse cycle obtained shall conform to figure 2 of ISO 6803.
- 3.3 Test fluid, in accordance with clause 4 of ISO 6803.

4 Test pieces

The test piece shall be a hose assembly with a free length of exposed hose of 4,14 $R_{\rm c\ min}$ + 3,57 $d_{\rm e}$ with a tolerance of \pm 15 mm,

where

 $R_{\rm c,min}$ is as defined in clause 3;

 $d_{\rm e}$ is the external diameter of the hose.

A minimum of four test pieces shall be tested.

5 Procedure

Attach one end of the test piece to the manifold on the revolving arm of the rig and the other end to the stationary manifold.

^{*}See national foreword for details of textual error.

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If not otherwise specified in the hose specification use the following test parameters:

Impulse pressure:

150 % of the working pressure

specified in the International Standard appropriate to the

hose concerned

Test fluid temperature:

93 ± 5 °C

Impulse frequency:

0,84 ± 0,1 Hz

Flexing frequency: Pressure rise rate: $1,00 \pm 0,05 \text{ Hz}$ 400 ± 80 MPa/s

Bring the test fluid to the specified temperature and then start the impulse and the flexing.

Ensure that the frequencies are never even multiples of each other and monitor the test fluid temperature at the inlet of the stationary manifold.

Continue the test until failure or until the specified number of cycles has been completed.

6 Expression of results

The range of impulse and flexing cycles for the four test pieces shall be noted in the test report.

7 Test report

The test report shall include the following information:

- a) a full description of the hose tested;
- b) a reference to this International Standard;
- c) the number of impulse and flexing cycles to failure;
- d) the position and mode of failure of each test piece;
- e) any deviation, by agreement or otherwise, from the procedure specified;
- f) the date of test.

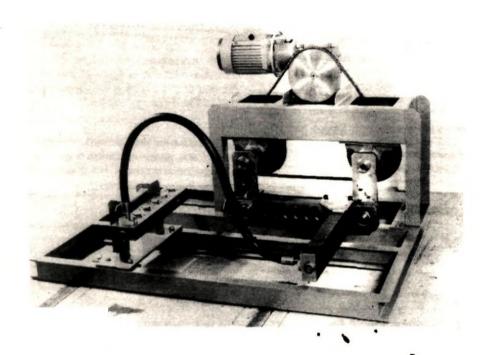


Figure 1 - Typical test rig

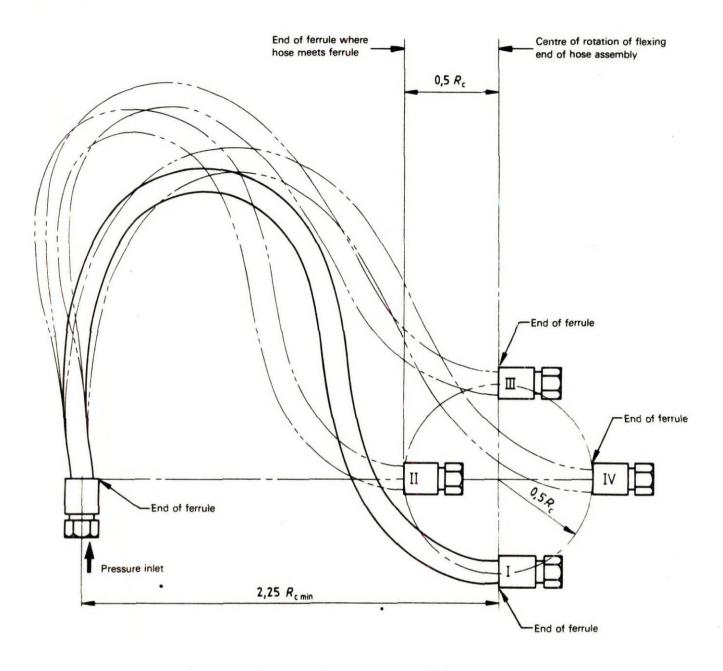


Figure 2 - Schematic arrangement of test piece

Publications referred to

See national foreword.

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This British Standard, having been prepared under the direction of the Rubber Standards Committee, was published under the authority of the Board of BSI and comes into effect on 31 August 1988.

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The following BSI references relate to the work on this standard: Committee reference RUM/9 Draft for comment 83/39085 DC.

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Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Rubber Standards Committee (RUM/-) to Technical Committee RUM/9, upon which the following bodies were represented:

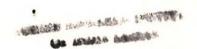
Association of Metropolitan Authorities British Coal British Compressed Gases Association British Gas plc

British Railways Board
British Rubber Manufacturers' Association
Chief and Assistant Chief Fire Officers' Association
Fire Extinguishing Trades Association

Home Office Institution of Fire Engineers Institution of Production Engineers
Liquefied Petroleum Gas Industry Technical Association (UK)
London Fire and Civil Defence Authority
London Regional Transport
Malaysian Rubber Producers Research Association
Ministry of Defence
Society of Motor Manufacturers and Traders Limited
The following bodies were also represented in the drafting of the

standard, through subcommittees and panels:

British Fluid Power Association Energy Industries Council Engineering Equipment and Materials Users' Association



Amendments is	ssued since publica	tion			
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British Standards Institution · 2 Park Street London W1A 2BS · Telephone 01-629 9000 · Telex 266933

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