INTERNATIONAL STANDARD

ISO 3303-2

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Rubber- or plastics-coated fabrics — Determination of bursting strength —

Part 2: Hydraulic method

Supports textiles revêtus de caoutchouc ou de plastique — Détermination de la résistance à l'éclatement —
Partie 2: Méthode hydraulique

Reference number
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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 2.

The main task of technical committees is to prepare International Standards. 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 document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 3303-2 was prepared by Technical Committee ISO/TC 45, *Rubber and rubber products*, Subcommittee SC 4, *Products other than hoses*.

Together with Part 1, it cancels and replaces ISO 3303:1990, which has been split into two parts and technically revised.

ISO 3303 consists of the following parts, under the general title *Rubber- or plastic-coated fabrics — Determination of bursting strength*:

— *Part 1: Steel-ball method*

— *Part 2: Hydraulic method*

Introduction

The bursting strength of coated fabrics is often used as a measure of the multidirectional modulus of the material, as opposed to tensile properties which only provide guidance to the coated-fabric strength in one plane. In addition, bursting strength is more appropriate for testing materials prone to necking, such as coated fabrics with knitted substrates.

The method described in this part of ISO 3303, which employs an elastic diaphragm, is the more common method used in burst testing and is more suitable for the testing of lighter and medium-weight coated fabrics. Two aperture sizes are specified to allow the use of commercially available instruments, although results from the different machines might not be comparable

Rubber- or plastics-coated fabrics — Determination of bursting strength —

Part 2: Hydraulic method

1 Scope

This part of ISO 3303 specifies a method for the determination of the bursting strength of rubber- or plastics-coated fabrics, using one of two types of diaphragm bursting tester, designated type A and B, both operated by hydraulic pressure. The type A test machine is applicable to materials having bursting strengths ranging from 350 kPa to 5 500 kPa and the type B test machine is applicable to materials of bursting strengths ranging from 70 kPa to 1 400 kPa.

2 Normative references

The following referenced documents are indispensable for the application 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 2231, *Rubber- or plastics-coated fabrics — Standard atmospheres for conditioning and testing*

3 Principle

A test piece is securely clamped around its edges between an upper and lower clamp. A diaphragm fitted beneath the lower clamp is gradually stretched into a dome by forcing fluid at a constant rate into a chamber under the diaphragm, thus causing it to make contact with, and apply pressure to, the test piece. The pressure of the fluid and the height of the dome at failure of the test piece are recorded.

4 Apparatus

4.1 Test machine[1)], of type A (see 4.1.1) or type B (see 4.1.2). In the case of materials for which the bursting-strength specification allows either type of test machine to be used, it is recommended that the customer and supplier mutually agree upon the test machine to be employed, as the test result from one type of test machine is not necessarily comparable with that from the other type.

4.1.1 Type A test machine (see Figure 1), measurement range between 350 kPa and 5 500 kPa, comprising the elements specified in 4.1.1.1 to 4.1.1.3.

4.1.1.1 Clamping system, for clamping the test piece firmly and with uniform loading between two plane, parallel, annular surfaces which are smooth (but not polished) and include grooves as shown in Figure 1, which also specifies the dimensions of the clamping system. One clamping plate is held in a swivel joint or similar device so as to ensure that the clamping pressure is distributed evenly. Under the load used for testing, the circular openings in the two clamping faces shall be concentric to within 0,25 mm and the clamping surfaces shall be flat and parallel.

4.1.1.2 Diaphragm, circular in shape, made of natural or synthetic rubber clamped securely, before the test begins, with its upper surface recessed about 5,5 mm relative to the upper surface of the lower clamp The

1) Test machines of this type are often called Mullen burst testers. Such a tester is described in detail in ISO 2759.

material and construction of the diaphragm shall be such that the pressure required to cause the diaphragm to bulge beyond the upper surface of the lower clamp is as follows:

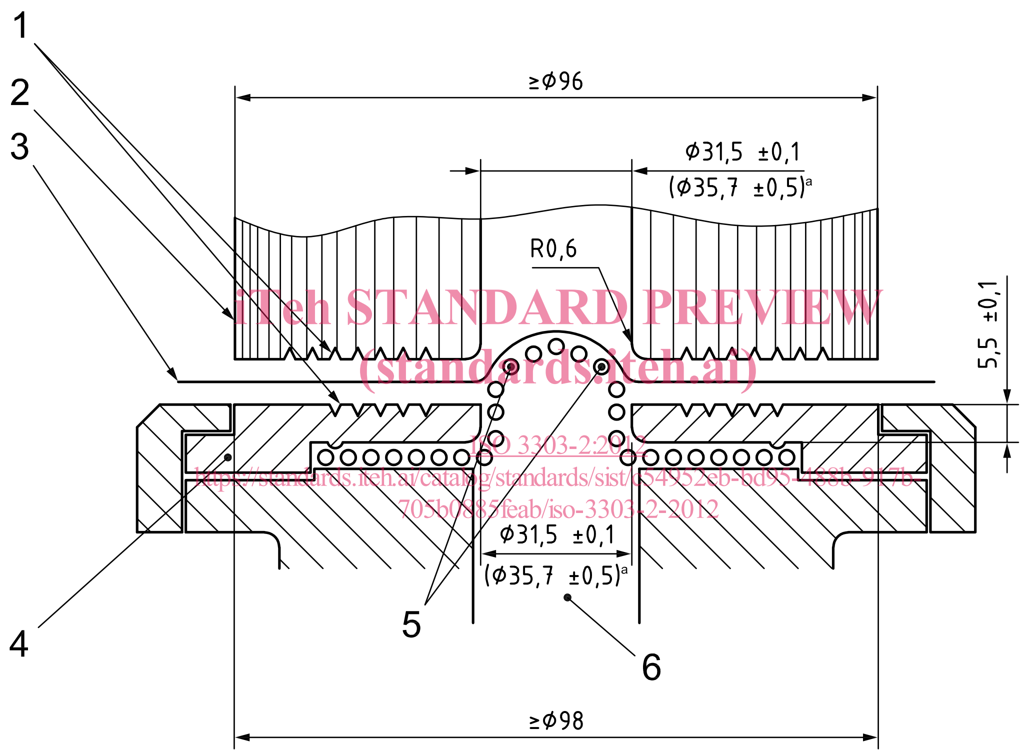
— bulge height 10 mm ± 0,2 mm, pressure range: 170 kPa to 220 kPa;

— bulge height 18 mm ± 0,2 mm, pressure range: 250 kPa to 350 kPa.

Diaphragms in use shall be regularly checked and changed should the bulge-height requirement be no longer met.

4.1.1.3 Hydraulic system, to apply an increasing hydraulic pressure to the inside of the diaphragm until the test piece bursts. The pressure shall be generated by a motor-driven piston forcing a suitable liquid (e.g. pure glycerol, low-viscosity silicone oil or ethylene glycol containing corrosion inhibitor) which is compatible with the diaphragm material against the inner surface of the diaphragm. The hydraulic system and the fluid used shall be free from air bubbles. The pumping rate shall be 170 ml/min ± 20 ml/min.

Dimensions in millimetres



Key

1 continuous-spiral 60° V-groove or series of concentric 60° V-grooves
2 upper clamp
3 test piece
4 lower clamp
5 rubber diaphragm
6 pressure chamber

a In EN 12332-2, the diameter of the cylindrical bore through the upper and lower clamps is 35,7 mm, giving a clamped area of 10 cm^2.

Figure 1 — Type A test machine

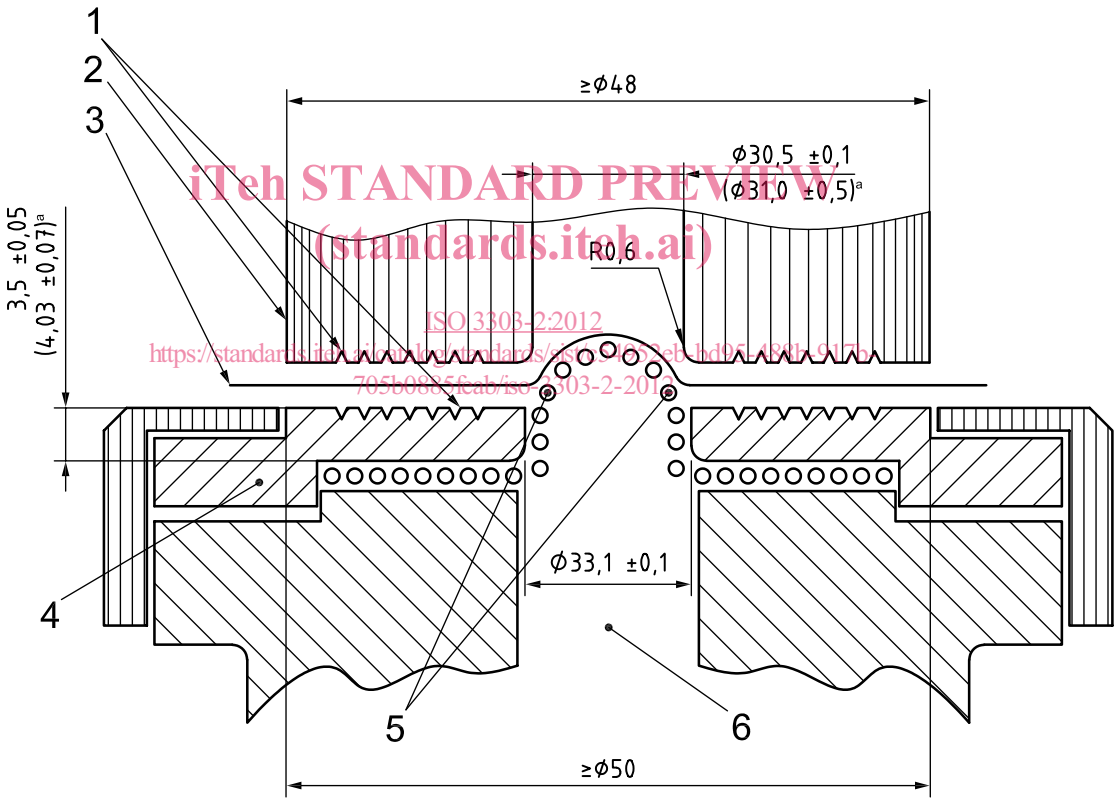
4.1.2 Type B test machine (see Figure 2), measurement range between 70 kPa and 1 400 kPa, comprising the elements specified in 4.1.2.1 to 4.1.2.3.

4.1.2.1 Clamping system, for clamping the test piece firmly and uniformly between two annular, plane, parallel surfaces which shall be smooth (but not polished) and grooved as described in Figure 2, which also gives the dimensions of the clamping system. One clamping plate shall be held in a swivel joint or similar device so as to ensure that the clamping pressure is distributed evenly. Under the load used for testing, the circular openings in the two clamping faces shall be concentric to within 0,25 mm and the clamping surfaces shall be flat and parallel.

4.1.2.2 Diaphragm, circular in shape, made of natural or synthetic rubber and 0,86 mm ± 0,06 mm thick, clamped securely, before the test begins, with its upper surface recessed about 3,5 mm relative to the upper surface of the lower clamp. The material and construction of the diaphragm shall be such that the pressure required to cause the diaphragm to bulge 9,0 mm ± 0,2 mm beyond the upper surface of the lower clamp is 30 kPa ± 5 kPa.

Diaphragms in use shall be regularly checked and changed should the bulge-height requirement be no longer met.

Dimensions in millimetres



Key

1 continuous-spiral 60° V-groove or series of concentric 60° V-grooves
2 upper clamp
3 test piece
4 lower clamp
5 rubber diaphragm
6 pressure chamber

[a] The dimensions given in brackets are those of alternative test machines available commercially (see the introduction, second paragraph).

Figure 2 — Type B test machine