

SVENSK STANDARD

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Slangar av gummi och plast – Bestämning av vidhäftning mellan komponenter (ISO 8033:2016)

Rubber and plastics hoses – Determination of adhesion between components (ISO 8033:2016)

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Denna standard ersätter SS-EN ISO 8033:2006, utgåva 1.

The European Standard EN ISO 8033:2017 has the status of a Swedish Standard. This document contains the official English version of EN ISO 8033:2017.

This standard supersedes the Swedish Standard SS-EN ISO 8033:2006, edition 1.

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Denna standard är framtagen av kommittén för Gummi och gummiprodukter, SIS/TK 154.

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EUROPEAN STANDARD

EN ISO 8033

NORME EUROPÉENNE

EUROPÄISCHE NORM

January 2017

ICS 23.040.70

Supersedes EN ISO 8033:2006

English Version

Rubber and plastics hoses - Determination of adhesion between components (ISO 8033:2016)

Tuyaux en caoutchouc et en plastique - Détermination
de l'adhérence entre éléments (ISO 8033:2016)

Gummi- und Kunststoffschläuche - Bestimmung der
Haftung zwischen den einzelnen Schichten (ISO
8033:2016)

This European Standard was approved by CEN on 24 September 2016.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

SS-EN ISO 8033:2017 (E)

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European foreword

This document (EN ISO 8033:2017) has been prepared by Technical Committee ISO/TC 45 "Rubber and rubber products" in collaboration with Technical Committee CEN/TC 218 "Rubber and plastics hoses and hose assemblies" the secretariat of which is held by BSI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by July 2017, and conflicting national standards shall be withdrawn at the latest by July 2017.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN ISO 8033:2006.

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Endorsement notice

The text of ISO 8033:2016 has been approved by CEN as EN ISO 8033:2017 without any modification.

Rubber and plastics hoses — Determination of adhesion between components

1 Scope

This document specifies methods for the determination of the adhesion between lining and reinforcement, between cover and reinforcement, between reinforcement layers, between cover and outer lamination (thin layer of material outside the cover for protection) and between lining and inner lamination (thin layer of material inside the lining to reduce permeation of fluid into the lining). It covers all bore sizes and the following types of hose construction:

- woven textile fabric;
- braided textile fabric;
- knitted textile fabric;
- circular-woven textile fabric;
- textile spiral;
- textile cord;
- wire braid;
- wire spiral;
- hoses containing a supporting helix.

Adequate adhesion between the various components of a hose is essential if it is to perform satisfactorily in service.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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*

ISO 23529, *Rubber — General procedures for preparing and conditioning test pieces for physical test methods*

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:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

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4 Principle

Using test pieces of standard dimensions, the adhesion strength between lining and reinforcement, between cover and reinforcement, between reinforcement layers, between cover and outer lamination and between lining and inner lamination is measured under specified conditions.

5 Apparatus

5.1 General

A test machine having the following characteristics is required:

5.2 Test machine

The machine shall be power driven, equipped with a suitable dynamometer, capable of maintaining a substantially constant rate of traverse of the moving head during the test and fitted with an autographic recorder. It shall comply with the requirements for class 0,5 or 1 of ISO 5893.

An inertialess dynamometer shall be used.

5.3 Grips

The grips shall be capable of holding the test piece without slippage.

Self-tightening grips are recommended.

For strip test pieces, provision shall be made to maintain the strip in the appropriate plane of the grips during the test, for example, by attaching sufficient weights to the free end of the test piece or by fitting a supporting plate, coated with a low-friction material, such as polytetrafluoroethylene (PTFE), to the non-driven grip.

5.4 Mandrel

For testing ring test pieces (type 6 and type 8), a mandrel shall be provided that is a close sliding fit in the test piece. This mandrel shall be capable of being fitted into the driven head of the machine so that it will rotate freely during the test.

6 Test pieces

6.1 Types of test piece

6.1.1 General

Eight types of test piece are specified to cover the range of hose constructions and bore sizes normally encountered (see [Figures 1 to 8](#)).

6.1.2 Type 1

Strip, cut from the hose as a $25 \text{ mm} \pm 0,5 \text{ mm}$ wide ring which is then cut transversely to form a strip.

6.1.3 Type 2

Strip, $160 \text{ mm} \times$ half the hose circumference.

6.1.4 Type 3

Strip, cut from the hose as a 35 mm ± 2 mm wide ring which is then cut transversely to form a strip.

6.1.5 Type 4

Strip, 160 mm × half the hose circumference or 10 mm, whichever is smaller.

6.1.6 Type 5

Strip, 160 mm long × half the hose circumference.

6.1.7 Type 6

Ring, 35 mm ± 2 mm wide.

6.1.8 Type 7

Strip, cut along a reinforcing helix, 25 mm ± 0,5 mm wide or the maximum obtainable.

6.1.9 Type 8

Ring, 25 mm ± 0,5 mm wide.

6.2 Test piece selection

Unless specified in the particular product standard or otherwise agreed between the interested parties, the type of test piece shall be selected from [Table 1](#). Results obtained with different test pieces and/or hoses of the same construction but of different diameters are not comparable.

Table 1 — Test piece selection

Hose construction	Adhesion between	Hose nominal bore size, <i>d</i> mm		
		<i>d</i> ≤ 20	20 < <i>d</i> ≤ 50	50 < <i>d</i>
Woven textile fabric	Lining and reinforcement	Type 4 or 8	Type 1 or 8	Type 1 or 8
Braided textile fabric	Reinforcement layers	Type 4 or 8	Type 1 or 8	Type 1 or 8
Knitted textile fabric	Cover and reinforcement	Type 4 or 8	Type 1 or 8	Type 1 or 8
Circular-woven textile fabric				
Textile spiral	Lining and reinforcement	Type 2, 6 or 8	Type 3, 6 or 8	Type 3, 6 or 8
Textile cord	Reinforcement layers	Type 2 ^a , 6 or 8	Type 2, 3 ^a , 6 or 8	Type 3 ^a , 6 or 8
	Cover and reinforcement	Type 2, 6 or 8	Type 3, 6 or 8	Type 3, 6 or 8

^a If the determination of adhesion is affected by difficulty in obtaining a cleanly separating interface because of fraying of the yarns, indicate this in the test report.

^b Determination is impracticable below 12,5 mm bore size since insufficient test piece width is available.

^c Determination is impracticable since the wire braid or spiral layers tend to disintegrate and the result is in any case significantly affected by the forces required to bend the wires.