SLOVENSKI STANDARD
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Naprave za kontinuirni transport - Trakovi tračnih transporterjev s toplotno odporno gumijasto prevleko - Toplotna odpornost prevleke - Zahteve in preskusne metode

Conveyor belts with heat-resistant rubber covers - Heat resistance of covers - Requirements and test methods

Courroies transporteuses avec revêtements caoutchouc résistant à la chaleur - Résistance à la chaleur des revêtements - Exigences et méthodes d'essai

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INTERNATIONAL STANDARD

ISO 4195

Second edition
2012-11-01

Conveyor belts with heat-resistant rubber covers — Heat resistance of covers — Requirements and test methods

Courroies transporteuses avec revêtements caoutchouc résistant à la chaleur — Résistance à la chaleur des revêtements — Exigences et méthodes d'essai

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ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

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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 4195 was prepared by Technical Committee ISO/TC 41, *Pulleys and belts (including veebelts)*, Subcommittee SC 3, *Conveyor belts*.

This second edition cancels and replaces the first edition (ISO 4195:2007), of which it constitutes a minor revision. It also incorporates ISO 4195:2007/Cor 1:2008.

Conveyor belts with heat-resistant rubber covers — Heat resistance of covers — Requirements and test methods

1 Scope

This International Standard specifies requirements and test methods for the relative level of heat resistance of conveyor belt covers made of rubber. It gives the permissible variations of hardness, elongation at break and tensile strength after exposure to heat. It is applicable only to those conveyor belts having a cover thickness greater than or equal to 4 mm. It is not suitable or valid for light conveyor belts as described in ISO 21183-1[1].

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 37, *Rubber, vulcanized or thermoplastic — Determination of tensile stress-strain properties*

ISO 48, *Rubber, vulcanized or thermoplastic — Determination of hardness (hardness between 10 IRHD and 100 IRHD)*

ISO 188, *Rubber, vulcanized or thermoplastic — Accelerated ageing and heat resistance tests*

ISO 18573, *Conveyor belts — Test atmospheres and conditioning periods*

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

3 Performance requirements

When tested in accordance with the method specified in Clause 4, the permissible variations in hardness, elongation at break and tensile strength shall be in accordance with Table 1.

Table 1 — Permissible variations

Cover characteristic	Variation for belt class		
	1	2	3
Hardness (IRHD)			
— variation of initial value — maximum value	+ 20 85	+ 20 85	+ 20 85
Elongation at break (%)			
— variation in percentage of initial value — minimum value	− 50 200	− 50 200	− 55 180
Tensile strength (N/mm^2)			
— variation in percentage of initial value — minimum value	− 25 12	− 30 10	− 40 5

4 Test method

4.1 Principle

The following properties are measured, before and after exposure to heat according to 4.3.1:

— hardness of covers in accordance with ISO 48;

— elongation at break of covers in accordance with ISO 37;

— tensile strength of covers in accordance with ISO 37.

NOTE The temperatures selected for the tests are usually not those corresponding to the temperature of the product to be transported; they are generally lower to take account of:

— the possibility of the conveyor belt cooling, and

— the fact that contact between the product and the conveyor belt will not equalize the temperature.

4.2 Classification

Conveyor belts shall be classified as follows:

— **Class 1**: resistant to test temperatures of up to 100 °C.

— **Class 2**: resistant to test temperatures of up to 125 °C.

— **Class 3**: resistant to test temperatures of up to 150 °C.

These classes do not correspond to the temperature of the transported product as mentioned in the Note to 4.1. Depending on the use for which the belt is intended, the manufacturer should state the class to be used for assessing compliance with this International Standard.

4.3 Procedure

4.3.1 Exposure to heat

Cut a sample of belt of full thickness measuring 400 mm × 400 mm from the centre of the belt at a distance of at least 100 mm from the edges. Place it in an air oven in accordance with ISO 188 for 7 days at a temperature of 100 °C for class 1 belts, 125 °C for class 2 belts or 150 °C for class 3 belts.

After exposure to heat, remove the belt sample from the oven and leave it to cool.

4.3.2 Preparation of test pieces for evaluating properties

4.3.2.1 Test pieces for measuring hardness of covers

The test pieces shall either be the belt sample itself or covers removed from the belt by cutting away the covers from the belt sample. Test pieces shall be lightly buffed on each surface but left at maximum thickness. Condition the test pieces for 24 h at a temperature of (23 ± 2) °C and a relative humidity of (50 ± 5) % (atmosphere B in accordance with ISO 18573).

4.3.2.2 Test pieces for measuring elongation at break and tensile strength

Cut away the covers from the belt samples treated as described in 4.3.1 and bring them to a thickness of (2 ± 0,2) mm by cutting on both faces and finishing off by a light buffing. Condition the test pieces for 24 h at a temperature of (23 ± 2) °C and a relative humidity of (50 ± 5) % (atmosphere B in accordance with ISO 18573).

For belts with a textile carcass, the test results of which can be affected by the humidity, a temperature of (20 ± 2) °C and a relative humidity of (65 ± 5) % (atmosphere A in accordance with ISO 18573) may be selected, by agreement between the parties concerned, provided that this is clearly indicated in the test report.

In the special case of tropical conditions, reference should be made to ISO 23529 [temperature (27 ± 2) °C and relative humidity (65 ± 5) %, atmosphere C in accordance with ISO 18573].

4.3.3 Determination of properties

4.3.3.1 Hardness

Using the test pieces prepared as described in 4.3.2.1, measure the hardness of covers using one of the methods specified in ISO 48, according to the available thickness of the rubber material.

4.3.3.2 Elongation at break and tensile strength

Using the test pieces as described in 4.3.2.2, measure the elongation at break of covers and tensile strength in accordance with ISO 37.

4.3.3.3 Initial values

Determine the initial values of hardness, elongation at break and tensile strength by measuring these properties using test pieces cut from the same belt and prepared as described in 4.3.2, but without exposure to heat.

NOTE Users of this International Standard need to be aware of the limitations of the results obtained in that two measurements do not provide a complete picture of the rate of change of the measured properties with time. The two points obtained do not allow the path of the curve relating the measured properties to time to be determined. Figure 1 illustrates this in that the curve between the two points shown could follow any number of paths; although for the purposes of illustration, three possible paths, A, B and C, are shown.