INTERNATIONAL STANDARD

ISO 7623

Third edition
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Steel cord conveyor belts — Cord-to-coating bond test — Initial test and after thermal treatment

Courroies transporteuses à câbles d'acier — Adhérence des câbles dans l'enrobage — Essais à l'état original et après traitement thermique

Reference number
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Foreword

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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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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 41, *Pulleys and belts (including veebelts)*, Subcommittee SC 3, *Conveyor belts*.

This third edition cancels and replaces the second edition (ISO 7623:1996), which has been technically revised.

Steel cord conveyor belts — Cord-to-coating bond test — Initial test and after thermal treatment

1 Scope

This International Standard specifies a method for determining the bond strength of metal cords to their surrounding coating, either in the initial state or after thermal treatment.

It applies exclusively to metal-carcass conveyor belts.

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

ISO 7622-2, *Steel cord conveyor belts — Longitudinal traction test — Part 2: Measurement of tensile strength*

3 Principle

Measurement of the force required to tear one of the steel warp cords out of the carcass by applying tensile stress along the axis of the cord.

4 Apparatus

4.1 Dynamometric tensile testing machine with jaws, in accordance with that described in ISO 7622-2.

4.2 Press, having two heated platens, temperature controlled to 145 °C ± 5 °C, and capable of applying a pressure on the specimen (see Clause 6) of between 1 MPa and 5 MPa.

5 Test conditions

Unless otherwise specified and cited in the test report, the tests shall be carried out at a temperature of 23 °C ± 2 °C and at a relative humidity of (50 ± 5) %, in accordance with ISO 18573, Atmosphere B.

5.1 Test in the initial state, carry out the test described in Clause 8 at least five days after manufacture of the belt.

5.2 Test after thermal treatment, carry out the test described in Clause 8 after thermal treatment of a sample of the belt by heating it between the two platens of the press (4.2) for 150 min ± 1 min, at a temperature of 145 °C ± 5 °C and at a surface pressure of about 1 MPa but not exceeding 5 MPa.

If different temperatures or pressures or the duration of their application are used, details should be specified in the test report.

NOTE An adequate surface pressure can be obtained using spacers of a thickness of the belt test piece minus 1 mm ± 0,5 mm between the platens of the press.

6 Specimens

Take from the sample of the belt piece undergoing thermal treatment, or not, three specimens of the following dimensions:

a) length in the longitudinal direction of the belt, SL_{min}: 350 mm for cords up to 5 mm in diameter, or 450 mm for cords over 5 mm in diameter;

b) width: such that the specimen contains five warp cords;

c) thickness: thickness of the belt including both covers.

In the centre of the specimen, trace the limits of the test length *L*, defined in Table 1.

Table 1 — Test length, *L*, corresponding to the diameter, *D*, of the warp Cords

Dimensions in millimetres

D		
$D \leq 2$	$2 < D \leq 5$	$5 < D$
L		
25 ± 1	50 ± 2	100 ± 2

Using a knife, remove the cover and weft, if any, along at least 10 mm on either side of the test length *L*, so that the five warp cords are laid bare on both sides.

On one side, cut the centre cord as close as possible to the test area (see Figure 1 or Figure 2).

On the other side, cut the four cords on either side of the centre cord, as close as possible to the test area (see Figure 1 or Figure 2).

With a knife, detach the coating at the ends of the cut cords.

Take care not to damage the cord to be bond-tested.

7 Conditioning

Condition the test specimens, selected in accordance with Clause 6, for a period of not less than 3 h at 23 °C ± 2 °C and (50 ± 5) relative humidity, immediately prior to testing in accordance with Clause 8.

8 Procedure

Set the distance between the jaws of the testing machine (4.1) at 250 mm ± 10 mm.

Place the ends of the specimens between the jaws and, for jaws with self-tightening wedges, check that the various Parts of these jaws move freely and smoothly.

Apply a continuous tensile stress to the specimen (with no pauses) at a speed of (100 ± 10) mm/min.

Maintain the tractive force until the steel cord is completely torn out.

NOTE The highest tractive force, which is defined as the tear-out force.

Repeat the test on the two other specimens.

9 Expression of results

Calculate the arithmetical mean value of the tear-out force, expressed in newtons, of the three specimens tested in Formula (1)

$$F = \frac{F_1 + F_2 + F_3}{3} \quad (1)$$

The cord-to-coating bond strength, A, is expressed in newtons per millimetre by Formula (2)

$$A = \frac{F}{L} \quad (2)$$

where

L is the test length in millimetres.

10 Test report

The test report shall contain the following information:

a) reference to this International Standard, i.e. ISO 7623;

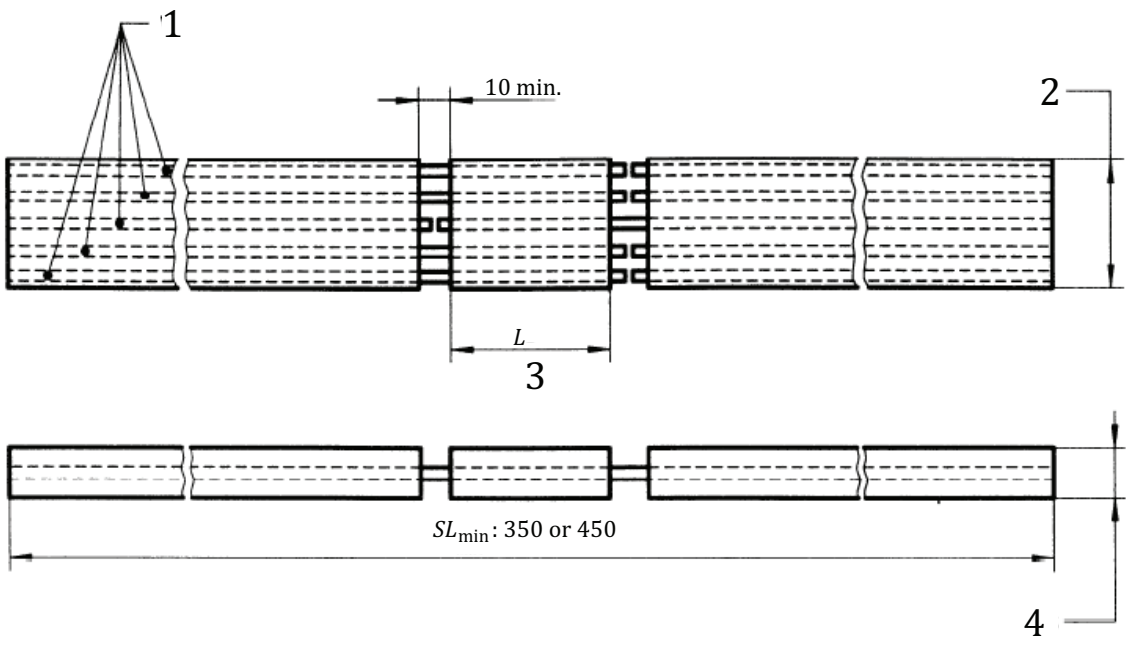
b) identification of the belt tested and whether it is in the initial state or thermally treated state, or another state [see e)];

c) cord-to-coating bond strength, expressed as indicated in Clause 9;

d) the test temperature if other than 23 °C, and the test relative humidity if other than 50 %;

e) details of any departure from the Standard thermal treatment specified in 5.2.

Dimensions in millimetres

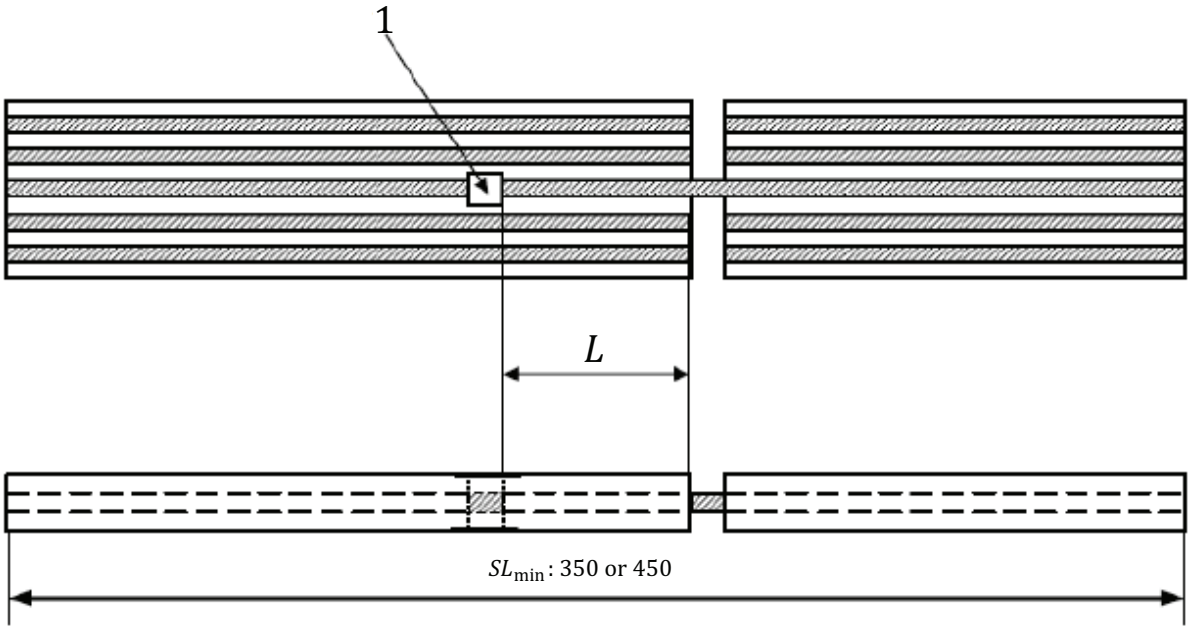


Key

1 warp cords
2 test specimen width
3 test length
4 test specimen thickness

Figure 1 — Specimen for the bond test of the steel cord to its coating

Dimensions in millimetres



Key

1 cutting point at the centre cord

Figure 2 — Simple test specimen