BS EN ISO 7622-2:2015

BSI Standards Publication

# Steel cord conveyor belts — Longitudinal traction test

## Part 2: Measurement of tensile strength

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**National foreword**

This British Standard is the UK implementation of EN ISO 7622-2:2015. It supersedes BS EN ISO 7622-2:1996 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee PRI/67, Conveyor belts.

A list of organizations represented on this committee can be obtained on request to its secretary.

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

# EN ISO 7622-2

November 2015

ICS 53.040.20

Supersedes EN ISO 7622-2:1995

English Version

# Steel cord conveyor belts - Longitudinal traction test - Part 2: Measurement of tensile strength (ISO 7622-2:2015)

Courroies transporteuses à câbles d'acier - Essai de traction dans le sens longitudinal - Partie 2: Mesurage de la résistance à la rupture (ISO 7622-2:2015)

Stahlseilfördergurte - Zugversuch in Längsrichtung - Teil 2: Messung der Zugfestigkeit (ISO 7622-2:2015)

This European Standard was approved by CEN on 31 October 2015.

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## European foreword

This document (EN ISO 7622-2:2015) has been prepared by Technical Committee ISO/TC 41 “Pulleys and belts (including veebelts)” in collaboration with Technical CEN/TC 188 “Conveyor belts” the secretariat of which is held by SNV.

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of an identical text or by endorsement, at the latest by May 2016, and conflicting national standards shall be withdrawn at the latest by May 2016.

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**Endorsement notice**

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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.

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 second edition cancels and replaces the first edition (ISO 7622-2:1984), of which it constitutes a minor revision.

ISO 7622 consists of the following parts, under the general title *Steel cord conveyor belts — Longitudinal traction test:*

— *Part 1: Measurement of elongation*

— *Part 2: Measurement of tensile strength*


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# Introduction

This test method is intended to verify, by destructive testing, the tensile strength of steel cords constituting the carcass of conveyor belts. As it is a destructive test, it is used only in the event of litigation or where no certificate of compliance is issued by the cord manufacturer.

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INTERNATIONAL STANDARD ISO 7622-2:2015(E)

# Steel cord conveyor belts — Longitudinal traction test —

# Part 2: Measurement of tensile strength

## 1 Scope

This part of ISO 7622 specifies a method for the determination of the tensile strength, in the longitudinal, of steel cords constituting the carcass of conveyor belts.

It applies exclusively to conveyor belts with a steel carcass.

NOTE A method for the determination of elongation is specified in ISO 7622-1.

## 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*

## 3 Principle

The traction test for breaking a test specimen is prepared in such a way that only one of the warp cords is under stress.

## 4 Apparatus

**Dynamometric tensile testing machine**, complying with the following requirements.

a) The force exerted by the machine shall be adaptable to the strength of the test specimen. The testing machine capacity shall be such that the maximum testing load is 15 % to 85 % of the capacity of the machine.

b) The rate of separation of the jaws shall be capable of being set at (100 ± 10) mm/min and shall be capable of being maintained constant.

c) The separation between the jaws shall be capable of being set at least 250 mm.

d) The form of the jaws shall be such that the test specimen is held perfectly and all possibility of slipping during the test is eliminated. For this purpose, cross-ribbed jaws (see Figure 1), with the length of the ribbed part at least 80 mm, are recommended. A small amount of slippage is allowed for rubber elongation.

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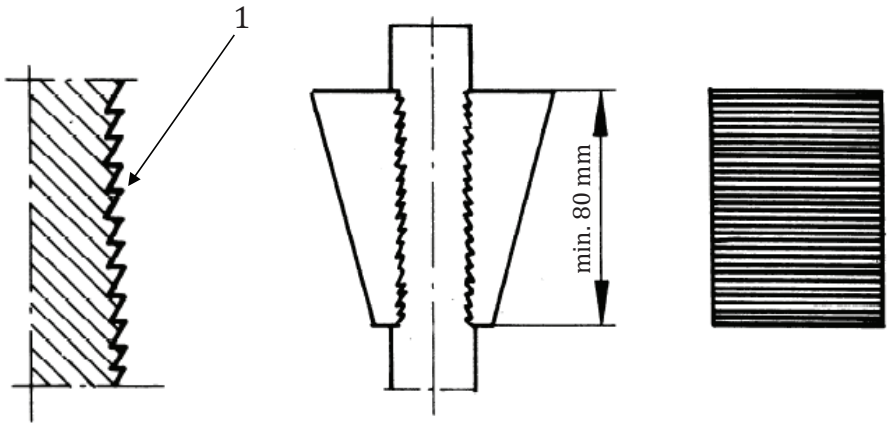


**Key**

1 detail of ribbing

**Figure 1 — Jaws**

## 5 Test specimens

### 5.1 General

Cut three test specimens of the following dimensions.

a) Length (in the longitudinal direction of the belt): length shall be given as in Table 1.

**Table 1 — Cord diameter and length**

Dimensions in millimetres

| Cord diameter | Length |
|---|---|
| ⌀0 to ⌀3,9 | 500 |
| ⌀4,0 to ⌀5,9 | 700 |
| ⌀6,0 to ⌀8,4 | 900 |
| ⌀8,5 to ⌀10,4 | 1 200 |
| ⌀10,5 to ⌀13,0 | 1 400 |
| ⌀13,1 to ⌀15,0 | 1 500 |

b) Width: such that the test specimen contains five warp cords.

c) Thickness: that of the belt, including both covers (the ends may be buffed so that they are held more securely in the jaws). If the belt is too thick to be gripped in the jaws, some part of the cover can be cut off.

d) Test specimens shall be cut parallel to the axis of the belt and at least 50 mm from the belt edge.

e) Three types of test specimen (A, B, and C) may be used.

### 5.2 Test specimen, type A

Prepare the test specimen type A shown in Figure 2 as follows.

a) Remove the covers and weft, if any, along 50 mm in the centre of the sample, so that the five warp cords are laid bare on both sides.


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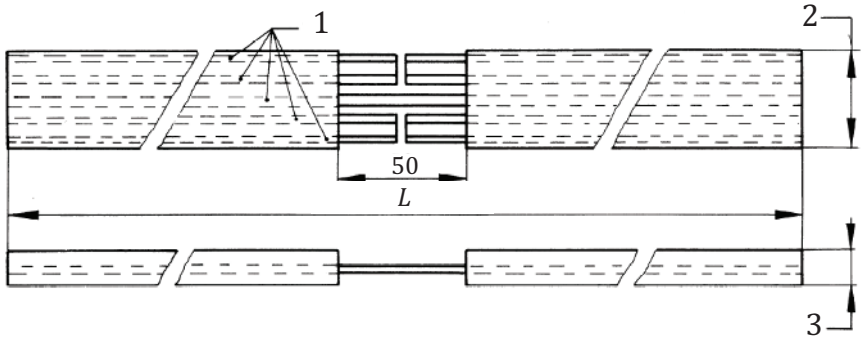
b) Using, for example, shears, cut the four cords on either side of the centre cord (take care not to damage the latter).

c) Using a knife, isolate the centre cord and its covering by cutting the compound parallel to this cord.

Dimensions in millimetres




**Key**

1 warp cords
2 test specimen width
3 test specimen thickness
*L* length of test specimen

**Figure 2 — Test specimen type A**

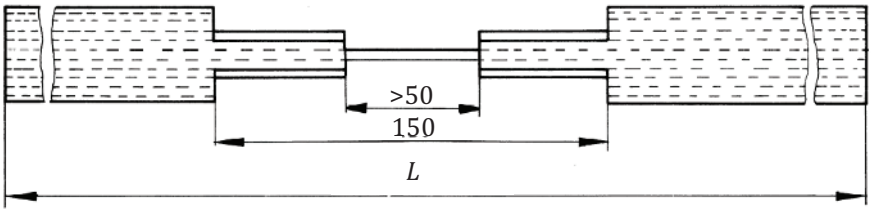
## 5.3 Test specimen, type B

Prepare the test specimen type B shown in Figure 3 as follows.

a) Remove the two outer cords over a length of 150 mm.

b) Remove the two cords on either side of the centre cord over a minimum length of 50 mm, taking the precautions cited in 5.2.

Dimensions in millimetres




**Key**

*L* length of test specimen

**Figure 3 — Test specimen type B**

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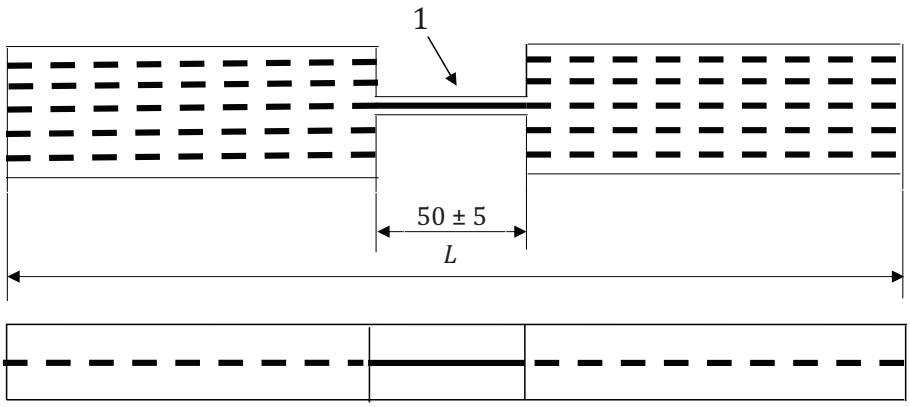
### 5.4 Test specimen, type C

Prepare the test specimen type C shown in Figure 4 as follows.

a) Using, for example, shears, cut the four cords on either side of the centre cord (take care not to damage the latter).

Dimensions in millimetres




**Key**

1 cutting points across the warp cords

*L* length of test specimen

**Figure 4 — Test specimen type C**

## 6 Conditioning of test specimens

Condition the test specimens in accordance with ISO 18573, using atmosphere A or B, and carry out the tests immediately after completion of the conditioning period.

## 7 Procedure

The procedure shall be as follows.

a) Place the ends of the test specimen (approximately 100 mm on either side) between the jaws. The five cords shall all be gripped. If the jaws have self-tightening corners, check that the various parts of these jaws move freely and smoothly.

b) Also check that the test specimen is correctly positioned in relation to the traction plane.

c) Start the dynamometer, with the rate of separation of the jaws maintained constant at (100 ± 10) mm/min.

d) Note the tractive force at the moment of breaking.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## 8 Expression of results

The tensile strength, $R$, of the belt in the longitudinal direction, expressed in newtons per millimetre, is calculated by Formula (1):

$$R = \frac{F \times C}{b} \tag{1}$$

where

$F$ is the mean value of the tensile breaking force, in newtons, given by Formula (2):

$$F = \frac{F_1 + F_2 + F_3}{3} \tag{2}$$

where

$F_1$, $F_2$, and $F_3$ are the tractive forces, at the moment of breaking, of the three test specimens, in newtons;

$C$ is the number of warp cords in the belt;

$b$ is the nominal width of the belt, in millimetres.

The result of the calculation is the maximum theoretical value for the belt tested, not the effective tensile strength of this belt, which will be lower. The effective tensile strength can be determined by using a corrective term taking into account the combined action between the cords in the belt.

## 9 Test report

The test report shall include the following information:

a) reference to this part of ISO 7622, i.e. ISO 7622–2;

b) identification of the belt tested;

c) type of test specimen used;

d) temperature and relative humidity during the test;

e) mean value, *F,* of the tensile breaking force, together with the individual values for each test specimen;

f) tensile strength, *R,* calculated in accordance with Clause 8;

g) any operating details not specified in this part of ISO 7622, or regarded as optional, together with any incidents likely to have influenced the results.

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