
International Standard



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Steel cord conveyor belts — Longitudinal traction test — Part 2: Measurement of tensile strength

Courroies transporteuses à câbles d'acier — Essai de traction dans le sens longitudinal — Partie 2: Mesurage de la résistance à la rupture

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Foreword

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Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 7622/2 was prepared by Technical Committee ISO/TC 41,
Pulleys and belts (including veebelts).

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Steel cord conveyor belts — Longitudinal traction test — Part 2: Measurement of tensile strength

0 Introduction

The test method described in this part of ISO 7622 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 should be used only in the event of litigation or where no certificate of compliance is issued by the cord manufacturer.

1 Scope and field of application

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

It applies exclusively to conveyor belts with a steel carcass.

2 Reference

ISO 471, *Rubber — Standard temperatures, humidities and times for the conditioning and testing of test pieces.*

3 Principle

Traction test to breaking of a test specimen prepared in such a way that only one of the warp cords is under stress.

4 Apparatus

4.1 Dynamometric tensile testing machine, complying with the following requirements:

- 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;
- 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;
- the separation between the jaws shall be capable of being set at at least 250 mm;
- 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.

5 Test specimens

5.1 General

Cut three test specimens of the following dimensions:

- length (in the longitudinal direction of the belt): 450 mm min. depending on the strength of the cords;
- width: such that the test specimen contains five warp cords;

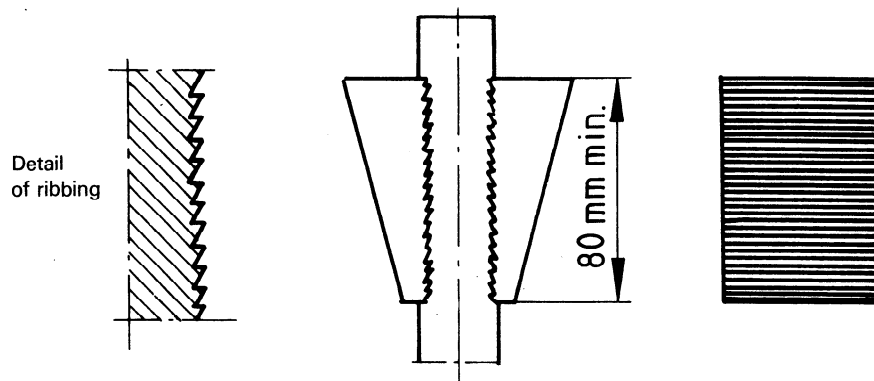


Figure 1 — Jaws

- 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.

The test specimens shall be cut parallel to the axis of the belt and at least 50 mm from the belt edge.

Two types of test specimen (A and B) may be used.

5.2 Test specimen, type A (see figure 2)

Prepare the test specimen type A as follows:

- 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;

- using for example shears, cut the four cords on either side of the centre cord (take care not to damage the latter);

- using a knife, isolate the centre cord and its covering by cutting the compound parallel to this cord.

5.3 Test specimen, type B (see figure 3)

Prepare the test specimen type B as follows:

- remove the two outer cords over a length of 150 mm;
- remove the two cords on either side of the centre cord over a length of 50 mm, taking the precautions cited in 5.2.

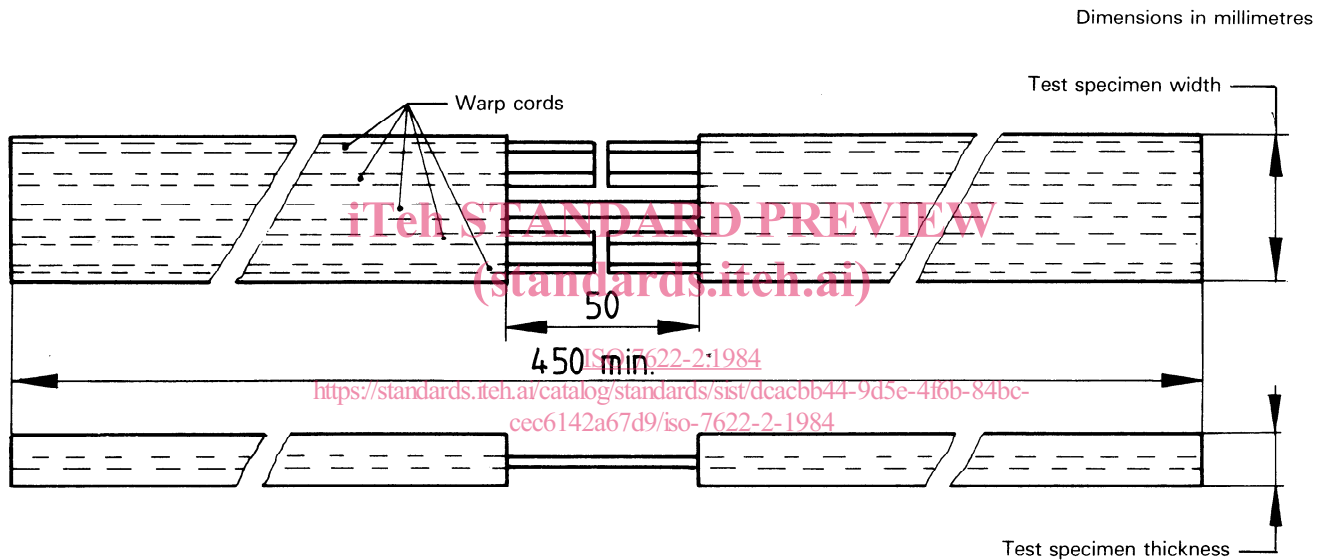


Figure 2 — Test specimen type A

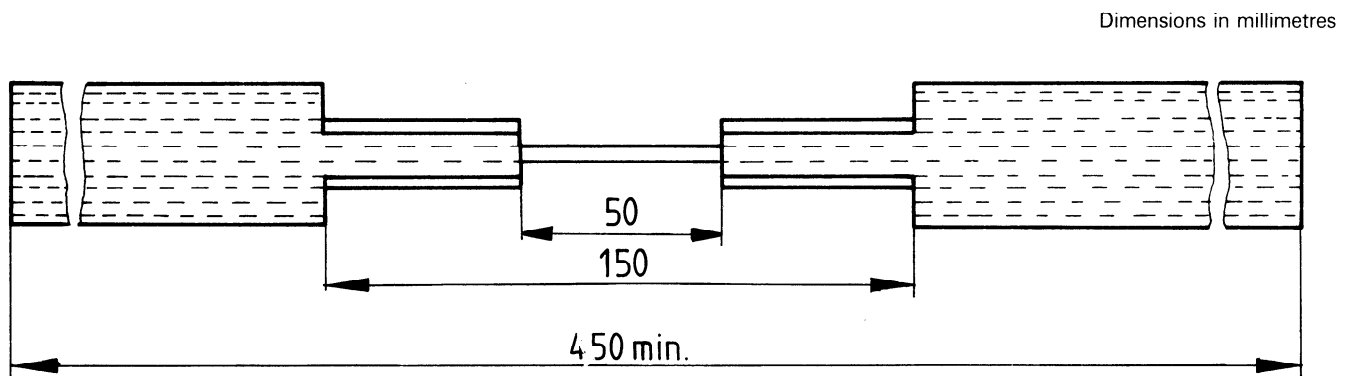


Figure 3 — Test specimen type B

6 Procedure

Carry out four tests at least five days after manufacture of the belt.

Unless otherwise specified, in which case note this fact in the test report, carry out the tests at 23 ± 2 °C and at 50 ± 5 % relative humidity.

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.

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

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

Note the tractive force at the moment of breaking.

NOTE — If the test specimen slips in the jaws, the test is not valid.

7 Expression of results

The tensile strength R of the belt in the longitudinal direction, expressed in newtons per millimetre, is calculated by the formula:

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

where

F is the mean value of the tensile breaking force, in newtons, given by the formula:

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

where

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

C is the number of warp cords in the belt;

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

NOTE — 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.

8 Test report

The test report shall include the following information:

- reference to this part of ISO 7622;
- the test temperature;
- the mean value, F , of the tensile breaking force, together with the individual values for each test specimen;
- the tensile strength, R , calculated in accordance with clause 7;
- 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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