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International Standard



7622/1

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INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

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## Steel cord conveyor belts — Longitudinal traction test — Part 1: Measurement of elongation

*Courroies transporteuses à câbles d'acier — Essai de traction dans le sens longitudinal — Partie 1: Mesurage de l'allongement*

First edition — 1984-12-15

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UDC 621.867.21 : 620.172.222

Ref. No. ISO 7622/1-1984 (E)

Descriptors : conveyor belts, tests, tension tests, determination, elongation.

Price based on 2 pages

Preisgr.

## 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 7622/1 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 1: Measurement of elongation

## 0 Introduction

The test method described in this part of ISO 7622 is intended to verify, by destructive testing, the elongation properties 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.

NOTE — Notice should be taken that differences in elongation can occur between raw steel cords and rubber-coated steel cords. For this reason the values determined in accordance with this method and the values stated in a certificate of the cord manufacturer can differ.

## 1 Scope and field of application

This part of ISO 7622 specifies a method for the determination of the elongation of steel cords constituting the carcass of conveyor belts, when subjected to a force corresponding to 10 % and to 60 % of the specified tensile strength.

It applies exclusively to conveyor belts with a steel carcass.

NOTE — A method for the determination of tensile strength is specified in ISO 7622/2.

## 2 Reference

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

## 3 Principle

Traction test on a steel cord, taken from the carcass of the belt. Determination of the elongation, measured using an extensometer, at 10 % and 60 % of the specified tensile strength, using for example a dynamometer the rate of separation of the jaws of which is specified and maintained constant.

## 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 rate of separation of the jaws shall be capable of being set at  $25 \pm 5$  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.

**4.2 Device for holding the test specimen cord**, such that it is impossible for the test specimen to slip during the test.

Two fixed grooved pulleys of diameter at least either 50 mm or ten times the cord diameter,  $d$  (see the figure), constituting the upper and lower holding device, can be used, for example.

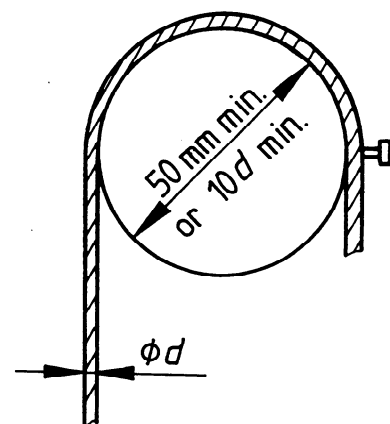


Figure — Device for holding the test specimen cord

**4.3 Extensometer**, accurate to at least 0,01 %.

As the elongation of steel cords is generally very low, accurate, but sensitive, extensometers, which could be damaged if the test specimen should break, have to be used. For this reason, the measurement is limited to 60 % of the specified tensile strength.

**4.4 Device for recording the curve of traction force as a function of elongation**, if available.

## 5 Test specimens

Prepare four test specimens (two S-twist and two Z-twist) as follows:

- take a sample at least 400 mm long from the belt;
- using a knife, cut the compound between the layer of cords and the remainder of the belt;
- then cut the compound so as to isolate the cords from the central part and extract four cords, taking care not to subject them to any tensile stress;
- strip the rubber coating from the whole cord length or at least from the area at the end of each of these cords that is to be placed in the holding device.

## 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  $23 \pm 2$  °C and at  $50 \pm 5$  % relative humidity.

Place the ends of the cord on the holding device, as follows:

- fix one end on the upper device;
- fix the other end on the lower device and apply an initial tractive force equal to 50 times the linear density (mass per metre) of the cord (this is to define the zero point of the registration curve clearly);

- position the two jaws of the extensometer with a separation of between 100 and 300 mm.

Start the dynamometer, with the rate of separation of the jaws maintained constant at  $25 \pm 5$  mm/min.

Record and note the elongations at 10 % and at 60 % of the specified minimum tensile strength of the belt in relation to the number of cords.

## 7 Expression of results

Express the elongation as a percentage of the initial length.

Take as the result the arithmetic mean value of the four measurements made at 10 % and at 60 % of the specified minimum tensile strength.

Express the result to the nearest 0,1 %.

## 8 Test report

The test report shall contain the following information:

- a) reference to this part of ISO 7622;
- b) the mean values of elongation at 10 % and at 60 % of the specified minimum tensile strength, in accordance with clause 7;
- c) 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.