
**Conveyor belts — Determination of
strength of mechanical fastenings — Static
test method**

*Courroies transporteuses — Détermination de la résistance des
assemblages agrafés — Méthode d'essai statique*



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Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

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 International Standard may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 1120 was prepared by the European Committee for Standardization (CEN) in collaboration with Technical Committee ISO/TC 41, *Pulleys and belts (including veebelts)*, Subcommittee SC 3, *Conveyor belts*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

Throughout the text of this document, read "...this European Standard..." to mean "...this International Standard...".

This third edition cancels and replaces the second edition (ISO 1120:1984), which has been technically revised.

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Foreword

This document (EN ISO 1120:2002) has been prepared by Technical Committee CEN/TC 188 "Conveyor belts", the secretariat of which is held by BSI, in collaboration with Technical Committee ISO/TC 41 "Pulleys and belts (including veebelts)".

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of an identical text or by endorsement, at the latest by October 2002, and conflicting national standards shall be withdrawn at the latest by October 2002.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard : Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

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1 Scope

This European Standard specifies a static test method for measuring the strength of a conveyor belt mechanical fastening; the mechanical joints can be either of the type employing a connecting rod or of a type which does not employ a connecting rod.

This standard does not cover vulcanized joints.

NOTE The purpose of the test specified in this standard is to eliminate mechanical fastenings of insufficient static strength. A dynamic test will be established at a later date.

The standard is not applicable or valid for light conveyor belts as described in EN 873.

2 Normative references

This European Standard incorporates by dated or undated references, provisions from other publications. These normative references are cited at the appropriate places in the text, and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN ISO 283-1:2000, *Textile conveyor belts - Full thickness tensile testing - Part 1: Determination of tensile strength, elongation at break and elongation at the reference load (ISO 283-1:2000)*.

3 Terms and definitions

For the purposes of this European Standard, the following terms and definitions apply.

3.1

width of fastening

number of units multiplied by the pitch, or number of hooks multiplied by the pitch

3.2

pitch

distance between a point on a unit or hook and the corresponding point on the next unit or hook, according to the type of fastening

NOTE See Figure 1.

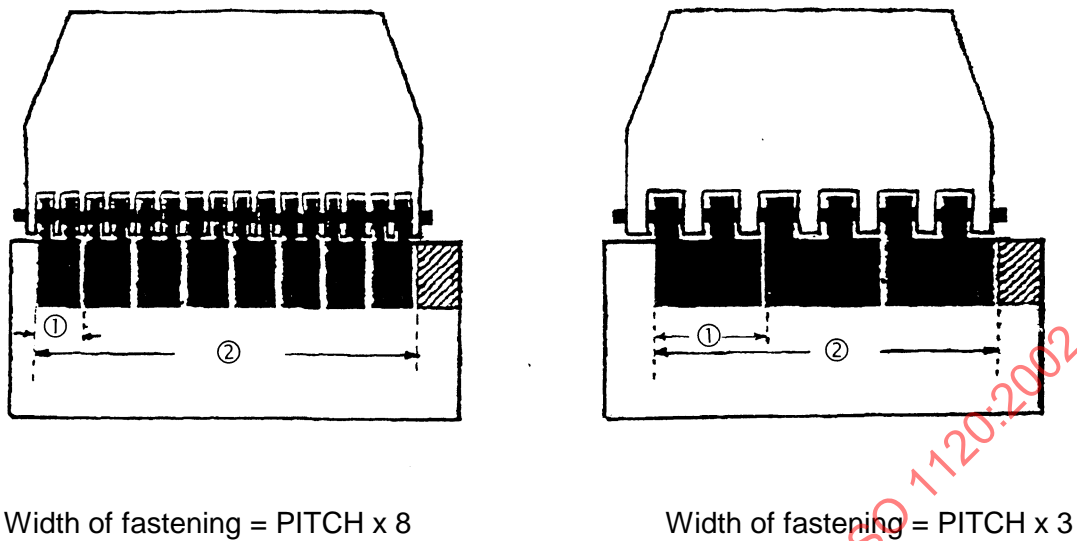


Figure 1 - Pitch and width of fastenings of mechanical fastenings

4 Principle

Application of an increasing tensile force to a test piece until the joint made by the mechanical fastening breaks and comes apart.

5 Apparatus

5.1 Metallic adapter plate for joints which employ a connecting rod that can be disconnected.

5.2 Dynamometer as described in EN ISO 283-1:2000.

6 Test piece

6.1 Selection of test pieces

Test pieces shall be taken parallel to the axis of the belt and at least 50 mm from its edge.

6.2 Shape, dimensions and preparation

6.2.1 Mechanical belt joints with connecting rod

The test pieces shall consist of a full thickness piece of belting cut in the longitudinal direction, with a minimum length of 100 mm plus the gripped length, (see Figure 2), and a width of 150 mm. The test piece shall be connected to the connecting plate by the mechanical fastener. The fastening width shall be at least 100 mm.

6.2.2 Mechanical belt joints without connecting rod

The test piece shall consist of two lengths of belting, each of minimum length of 100 mm plus the gripped length, (see Figure 2), and 150 mm wide, assembled by means of the mechanical fastening to be used, not less than 100 mm wide.

6.2.3 Overall width of fastening/number of hooks

The overall width of fastening shall be not less than 100 mm. To determine the number of hooks use the formula:

$100 / \text{PITCH} = \text{NUMBER}$ rounded to the next whole number.

The overall width of fastening is : $\text{PITCH} \times \text{NUMBER OF HOOKS}$.

EXAMPLE

Pitch of one hook : 14 mm

Determination of the number of hooks:

$100 / 14 \text{ mm} = 7,1$ rounded to 8

Overall width of fastening: $14 \text{ mm} \times 8 = 112 \text{ mm}$.

6.3 Number of test pieces

Three test pieces shall be tested.

6.4 Conditioning and test conditions

The tests shall start not less than 24h after manufacturing. This time includes 8 h for conditioning at one of the temperature specified.

- $(23 \pm 2) ^\circ\text{C}$ or $(20 \pm 2) ^\circ\text{C}$ for temperate temperature control only;
- $(27 \pm 2) ^\circ\text{C}$ for tropical temperature control only.

The tests shall be conducted at the same temperature as used for conditioning. A certain humidity for conditioning and testing is not required.

The temperature at which the test pieces were conditioned and tested shall be reported in the test report.

In the event of dispute, the conditioning period shall be 72 h.

7 Procedure

7.1 For mechanical belt joints with a connecting rod

Fasten the test piece in one of the grips of the dynamometer and attach the adapter plate to the belt at the distance between grips shown in Figure 2.

Exert the tensile force such that it is applied symmetrically, i.e. that there is no tendency to start rupture at one end of the joint.

Separate the grips at a rate of (100 ± 10) mm/min; record the maximum force before the mechanical fastening breaks.

7.2 For mechanical belt joints without a connecting rod

Fasten the ends of the test piece in the grips of the dynamometer as shown in Figure 2.

Exert the tensile force such that it is applied symmetrically, i.e. that there is no tendency to start rupture at one end of the joint.

Separate the grips at a rate of (100 ± 10) mm/min. Record the maximum force before the mechanical fastening breaks.

8 Expression of results

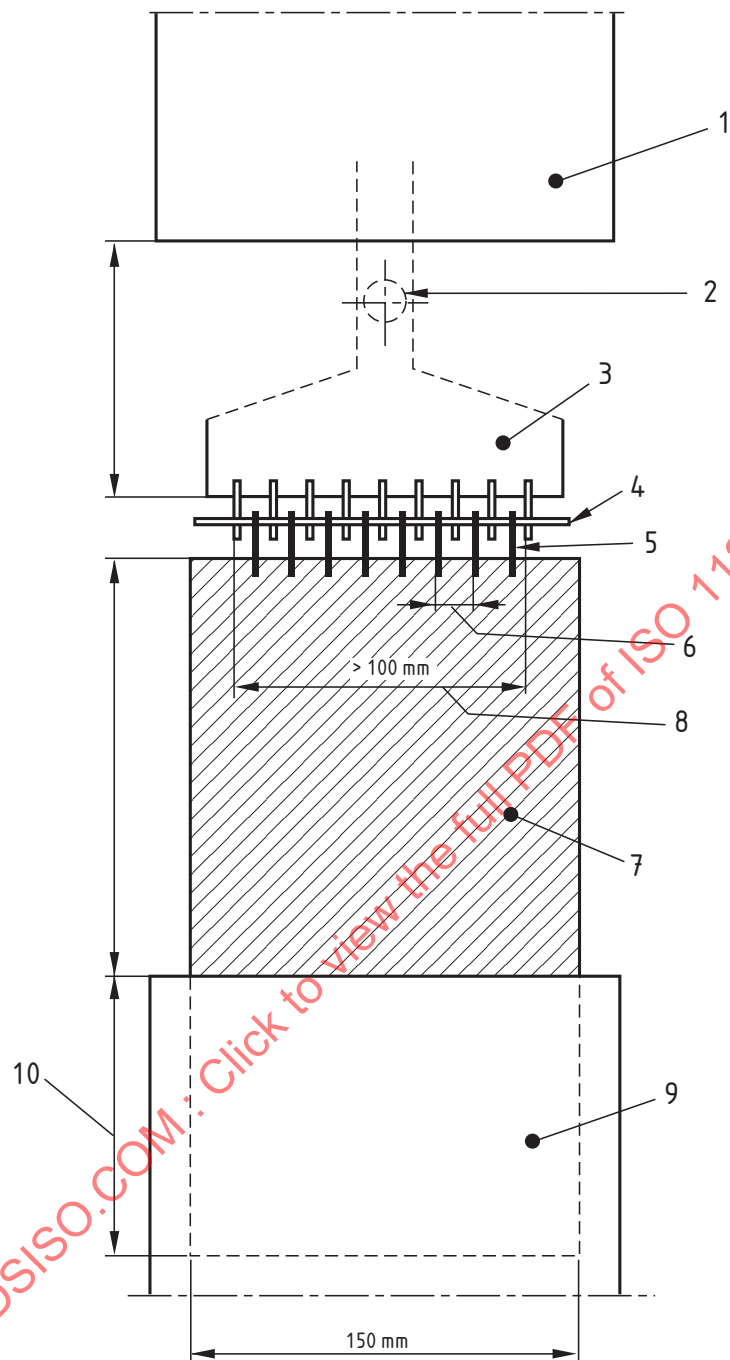
Determine the mean of the values obtained and calculate:

- a) the average breaking strength of the fastening, in newtons per millimetre width of fastening (see Figures 1 and 2);
- b) The strength of the fastening, expressed as a percentage of the full thickness nominal tensile strength, (see EN ISO 283-1:2000).

9 Test report

The test report shall include the following information:

- a) the width of fastening;
- b) the brand and type of fastener;
- c) the brand and the type of conveyor belt;
- d) the results obtained;
- e) the type of failure of the fastening: e.g. whether the belt is torn or whether the fastener is broken;
- f) the temperature of conditioning and testing (see 6.4).

**Key**

- 1 Dynamometer grip
- 2 Pivot (optional)
- 3 Adaptor plate
- 4 Rod
- 5 Half-fastening
- 6 Pitch
- 7 Test piece of belt
- 8 Width of fastening
- 9 Dynamometer grip
- 10 Gripped length

Figure 2 - Lay-out for static test