INTERNATIONAL STANDARD

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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

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

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 document 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 Technical Committee ISO/TC 41, *Pulleys and belts (including veebelts)*, Subcommittee SC 3, *Conveyor belts*.

This fourth edition cancels and replaces the third edition (ISO 1120:2002), of which it constitutes a minor revision.

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

1 Scope

This International 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 International Standard does not cover vulcanized joints.

This International Standard is neither applicable to nor valid for light conveyor belts, as described in ISO 21183-1.

NOTE The purpose of the test specified in this International Standard is to eliminate mechanical fastenings of insufficient static strength. It is intended to establish a dynamic test at a later date.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 283, *Textile conveyor belts — Full thickness tensile strength, elongation at break and elongation at the reference load — Test method*

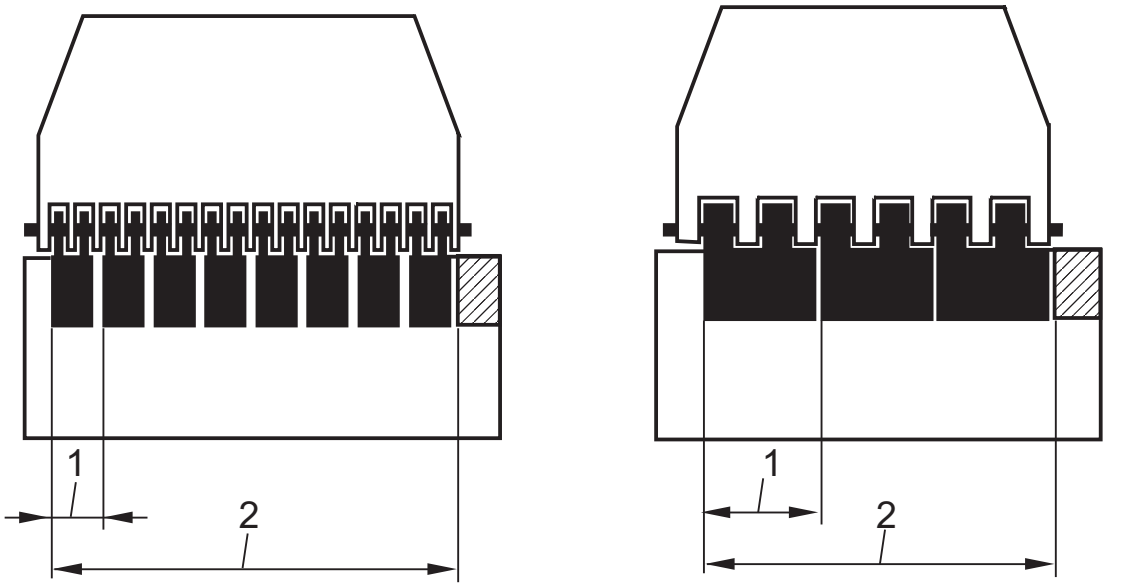
3 Terms and definitions

For the purposes of this document, 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

See Figure 1.



a) Width of fastening equal to the pitch times eight

b) Width of fastening equal to the pitch times three

Key

1 pitch

2 width of fastening

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 ISO 283.

6 Test piece

6.1 Selection of test piece

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 divided by the Pitch equal to the Number, rounded to the next whole number.

The overall width of fastening is: the pitch times the number of hooks.

EXAMPLE

Pitch of one hook: 14 mm

Determination of the number of hooks: 100/14 mm = 7,1 (rounded to 8)

Overall width of fastening: 14 mm × 8 = 112 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 24 h after manufacturing. This time includes 8 h for conditioning at one of the temperatures specified.

— (23 ± 2) °C or (20 ± 2) °C for temperate temperature control only;

— (27 ± 2) °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 recorded 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 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.

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 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;

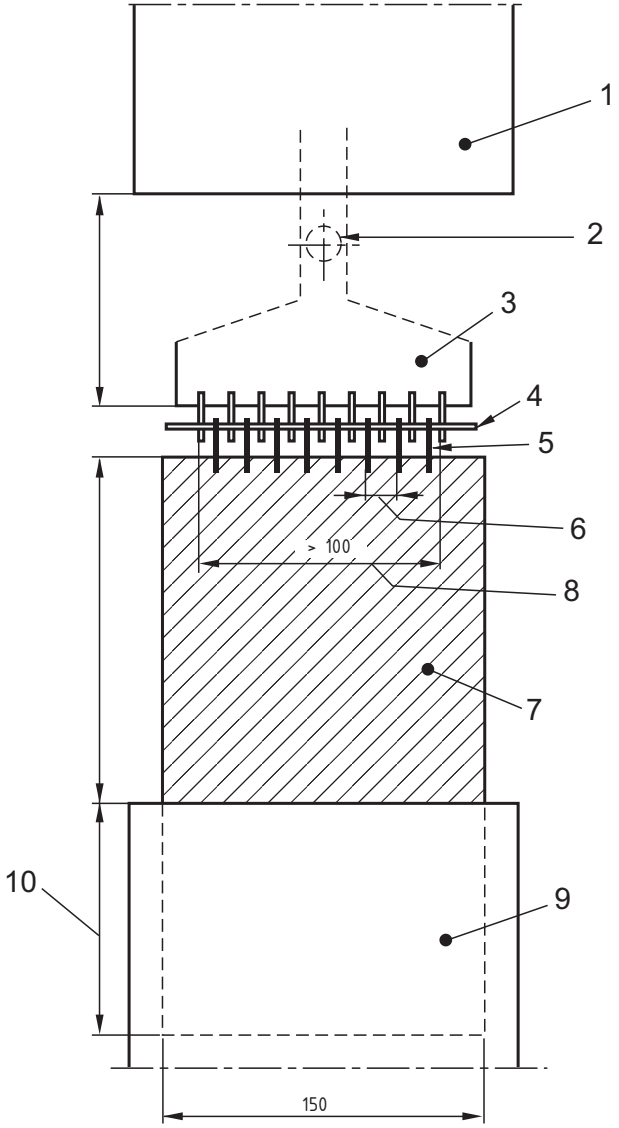
c) the brand and the type of conveyor belt;

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).

Dimensions in millimetres



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 — Layout for static test

Bibliography

[1] ISO 21183-1, *Light conveyor belts — Part 1: Principal characteristics and applications*

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