INTERNATIONAL STANDARD

ISO 583-1

First edition
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Conveyor belts with a textile carcass — Total thickness and thickness of elements —

Part 1: Methods of test

Courroies transporteuses à carcasse textile — Épaisseur totale et épaisseur des éléments —

Partie 1: Méthodes d'essai

Reference number
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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 3.

Draft International Standards adopted by the technical committees are circulated to member bodies for voting. Publication as an International Standard requires approval by at least 75 % of member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this part of ISO 583 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 583-1 was prepared by the European Committee for Standardization (CEN) in collaboration with ISO Technical Committee 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 standard, read "...this European Standard..." to mean "...this International Standard...".

This first edition of ISO 583-1 together with ISO 583-2 cancels and replaces ISO 583:1990, which has been technically revised.

ISO 583 consists of the following parts, under the general title *Conveyor belts with a textile carcass — Total thickness and thickness of elements*:

— *Part 1: Methods of test*

— *Part 2: Performance requirements*

Contents

Foreword

The text of EN ISO 583-1:1999 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 supersedes ISO 583:1990.

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 June 2000, and conflicting national standards shall be withdrawn at the latest by June 2000.

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, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This European Standard describes four methods for the measurement of thickness of conveyor belts having a textile carcass.

Method A describes a method for the determination of total belt thickness.
Method B describes a method for the determination of thickness of covers.
Method C describes a method for the determination of thickness of carcass.
Method D describes a method for the determination of the thickness of the interlayers.

This European Standard is applicable only to belts having a textile carcass.

Methods are included which are suitable for belt constructions where the covers can be removed, and for constructions where covers cannot be removed.

This standard is not suitable or valid for light conveyor belts as described in EN 873.

2 Normative references

This European Standard incorporates by dated or undated reference, 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 873	Light conveyor belts- Principal characteristics and applications
ISO 4648:1991	Rubber, vulcanized or thermoplastic - Determination of dimensions of test pieces and products for test purposes.

3 Method A - Determination of total belt thickness

3.1 Apparatus

A dial gauge micrometer, graduated at least every 0,1 mm, with flat feet, a circular foot 10 mm in diameter, and exerting a pressure of (22 ± 5) kPa on the test piece, or of (10 ± 2) kPa according to the material, and as specified in ISO 4648.

3.2 Test Piece

For the measurement of total belt thickness either Test Piece 1 or Test Piece 2 shall be used:

Test Piece 1: cut a rectangular piece of full width belt, with a length of 50 mm (see Figure 1).

Test Piece 2: cut a wedge shaped piece of full width belt, as shown in Figure 2.

Dimensions in millimetres

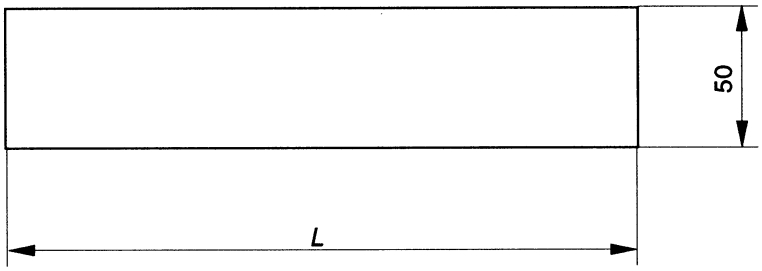


Figure 1 - Test Piece 1 (Rectangular)

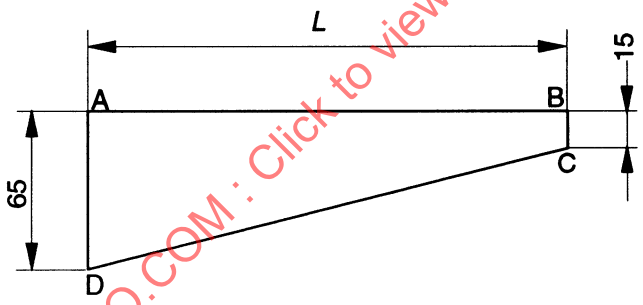


Figure 2 - Test Piece 2 (Wedge shaped)

3.3 Measurement Points

The measurement points shall be spaced equidistantly along the long axis of the test piece (i.e. the belt width) as shown in Figure 3.

Dimensions in millimetres

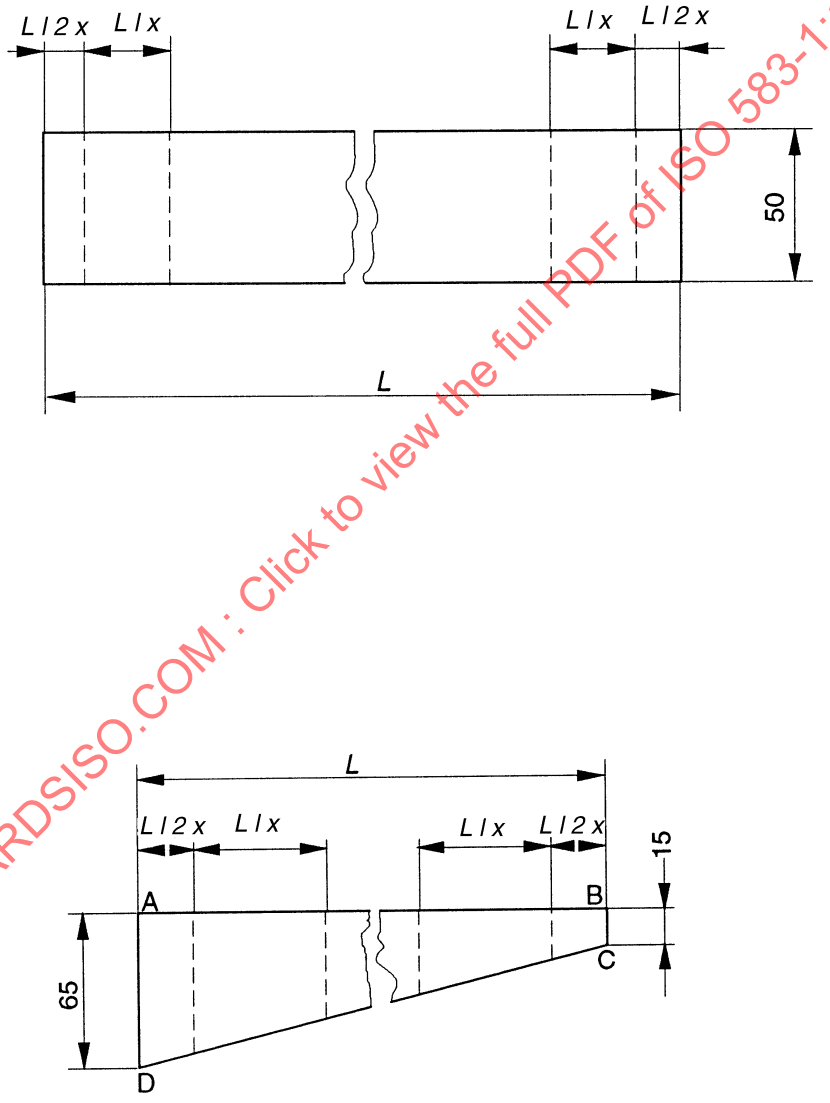


Figure 3 - Measurement Points

Determine the minimum number of measurement points (x) according to the width of the belt (L) as follows:

Belt width, L in millimeters	**Minimum number of measurement points (x)**
$L \leq 650$	3
$650 < L \leq 1200$	5
$L > 1200$	8

3.4 Procedure

Measure the total thickness (d) of the test piece at each of the measurement points specified in 3.3, in accordance with Method A of ISO 4648:1991, using the pressure specified in 3.1.

3.5 Expression of Results

Calculate the arithmetic mean of the individual measurements taken in 3.4 and express this as the total belt thickness in millimetres, to the nearest 0,1 mm.

4 Method B - Determination of thickness of covers

NOTE The thickness of the covers can be obtained by two methods, depending upon whether or not the covers can be removed completely from the carcass.

4.1 Method B1 - for use when covers can be removed completely from the carcass

4.1.1 Principle

The thickness of a test piece is measured at a number of points, according to belt width, before and after each of the covers has been removed. The cover thickness is calculated by subtraction.

4.1.2 Apparatus

A dial gauge micrometer as specified in 3.1.

4.1.3 Test Piece

Test Piece 1 as specified in 3.2 and Figure 1.

4. 1. 4 Measurement Points

As specified in 3.3.

4.1.5 Procedure

Measure the total thickness (d) of the test piece at each of the measurement points specified in 3.3, in accordance with Method A of ISO 4648:1991, using the pressure specified in 3.1.

Remeasure the thickness of the test piece at the same measurement points after complete removal of the top cover and designate this as d_1 (see Figure 4).

Remove the bottom cover completely, remeasure the thickness of the test piece at the same measurement points and designate this as d_2 (see Figure 4).

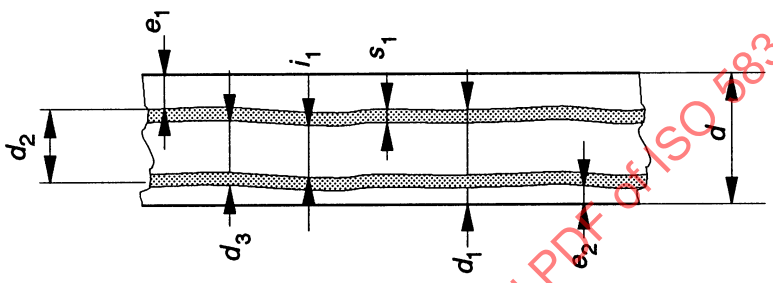
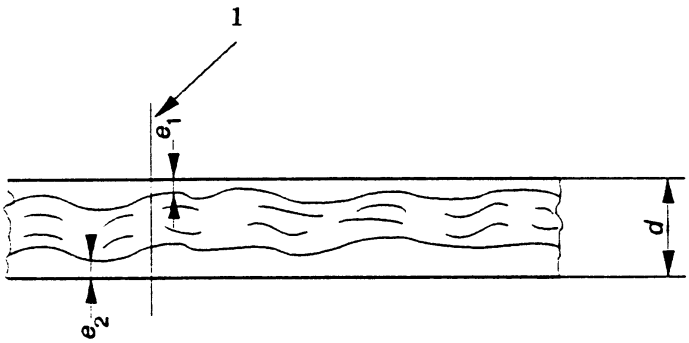


Figure 4 - Interlayer thickness (Plied Fabric Belt)



1 Target measurement point

Figure 5 - Cover thickness (Solid Woven Belt)

NOTE Protective fabrics embedded in the covers, and which do not form an integral part of the textile carcass, are regarded as part of the covers and should be removed with them. Other non-load bearing yarns, which are an integral part of the carcass, are normally regarded as part of the carcass, unless otherwise agreed between supplier and customer. In the latter case, full details should be included in the test report.

4.1.6 Expression of Results

Calculate the thickness of each cover at each of the measurement points as follows:

$e_1 = d - d_1$ where e_1 is the thickness of the top cover;

$e_2 = d_1 - d_2$ where e_2 is the thickness of the bottom cover.

Calculate the arithmetic mean of the individual measurements and express the cover thicknesses in millimetres, to the nearest 0,1 mm.

4.2 Method B2 - for use when covers cannot be removed completely from the carcass

4.2.1 Principle

The thickness of each cover is measured directly on a cut edge of unstripped belt by means of a hand held optical micrometer.

4.2.2 Apparatus

A hand held optical magnifier incorporating a scale graduated in divisions of 0,1 mm.

4.2.3 Test piece

Cut the test piece in accordance with 3.2 (1 or 2). If the conveyor belt is of solid woven construction, test piece 2 shall be used.

4.2.4 Measurement Points

As specified in 3.3.

When test piece 2 is used take measurements along the line DC shown in Figure 2.

4.2.5 Procedure

By use of the optical magnifier (4.2.2) measure the distance between the surface of the belting and the top of the nearest fabric knuckle (see Figure 5) at each of the measurement points specified in 3.3. Ensure that the graduated scale of the optical magnifier is in physical contact with the test piece in order to avoid errors of parallax.

NOTE 1 With certain colours of cover material difficulty can be experienced in determining the outline of the fabric knuckles. In these cases it is permissable to identify the textile fabric with a suitable colour stain.

NOTE 2 Protective fabrics embedded in the covers, and which do not form an integral part of the textile carcass, are regarded as part of the covers and should be removed with them. Other non-load bearing yarns, which are an integral part of the carcass , are normally regarded as part of the carcass, unless otherwise agreed between supplier and customer. In the latter case, full details should be included in the test report.

4.2.6 Expression of results

Calculate the arithmetic mean of the individual measurements for each cover and report the result in millimetres, to the nearest 0,1 mm, as the cover thickness e_1 or e_2, where

e_1 is the thickness of the top cover;

e_2 is the thickness of the bottom cover.

5 Method C - Determination of thickness of carcass

5.1 For belts where the covers can be removed completely, the carcass thickness d_2 is measured in accordance with 4.1.

5.2 For belts where the covers cannot be removed, the carcass thickness is obtained by subtracting the thickness of both covers, measured in accordance with 4.2. from the total belt thickness measured in accordance with clause 3.

5.2.1 Expression of Results

Calculate the carcass thickness d_2 at each of the measurement points as follows:

$$d_2 = d - (e_1 + e_2)$$

where d is total belt thickness;

e_1 is thickness of top cover;

e_2 is thickness of bottom cover.

Calculate the arithmetic mean of the individual measurements and express the carcass thickness d_2 in millimetres, to the nearest 0,1 mm.

6 Method D - Determination of thickness of interlayer

NOTE The thickness of an interlayer (i.e. the elastomeric material between textile fabric layers in a belt of multiply fabric construction) can be obtained in two ways depending upon whether or not the elastomer can be completely separated from the fabric plies.

6.1 Method D1 - for use when the elastomeric material in the interlayer can be removed completely from the adjacent fabric ply

6.1.1 Principle

Thickness measurements are taken at a number of points across the belt width, after the covers have been removed, and again after separation of the fabric and elastomeric layers. The thicknesses of interlayers are obtained by subtraction.

6.1.2 Apparatus

As specified in 3.1.