

---

---

**Steel cord conveyor belts —**

**Part 1:**

**Design, dimensions and mechanical  
requirements for conveyor belts for  
general use**

*Courroies transporteuses à câbles d'acier —*

*Partie 1: Exigences de conception, de dimensions et mécaniques des  
courroies transporteuses à usage général*

get full document from [standards.iteh.ai](https://standards.iteh.ai)



Reference number  
ISO 15236-1:2016(E)

© ISO 2016

# Sample Document

get full document from [standards.iteh.ai](https://standards.iteh.ai)



## **COPYRIGHT PROTECTED DOCUMENT**

© ISO 2016, Published in Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office  
Ch. de Blandonnet 8 • CP 401  
CH-1214 Vernier, Geneva, Switzerland  
Tel. +41 22 749 01 11  
Fax +41 22 749 09 47  
[copyright@iso.org](mailto:copyright@iso.org)  
[www.iso.org](http://www.iso.org)

# Contents

|                                                                                        | Page      |
|----------------------------------------------------------------------------------------|-----------|
| Foreword .....                                                                         | iv        |
| <b>1 Scope .....</b>                                                                   | <b>1</b>  |
| <b>2 Normative references .....</b>                                                    | <b>1</b>  |
| <b>3 Terms and definitions .....</b>                                                   | <b>1</b>  |
| <b>4 Symbols and units .....</b>                                                       | <b>2</b>  |
| <b>5 Belt design .....</b>                                                             | <b>3</b>  |
| 5.1 Standard type .....                                                                | 3         |
| 5.2 Conveyor belting having transverse reinforcements .....                            | 3         |
| 5.3 Belt core .....                                                                    | 3         |
| <b>6 Design and construction .....</b>                                                 | <b>4</b>  |
| 6.1 Belt strengths .....                                                               | 4         |
| 6.2 Belt widths .....                                                                  | 5         |
| 6.3 Belt edge and supporting belt width .....                                          | 5         |
| 6.3.1 Edge width .....                                                                 | 5         |
| 6.3.2 Supporting belt width .....                                                      | 5         |
| 6.4 Number of cords .....                                                              | 5         |
| 6.5 Cord pitch .....                                                                   | 5         |
| 6.6 Thickness of covers .....                                                          | 6         |
| 6.7 Belt thickness .....                                                               | 6         |
| 6.8 Belt length .....                                                                  | 6         |
| <b>7 Mechanical requirements .....</b>                                                 | <b>6</b>  |
| 7.1 Breaking strength of the steel cord .....                                          | 6         |
| 7.2 Position of the steel cord in the conveyor belt .....                              | 7         |
| 7.2.1 General .....                                                                    | 7         |
| 7.2.2 Horizontal position .....                                                        | 7         |
| 7.2.3 Vertical position .....                                                          | 7         |
| 7.3 Number and spacing of cord joints .....                                            | 7         |
| 7.4 Cord pull-out force .....                                                          | 7         |
| 7.5 Covers — Quality classification .....                                              | 7         |
| 7.6 Ageing of covers .....                                                             | 9         |
| 7.7 Adhesion .....                                                                     | 9         |
| 7.8 Transverse reinforcements .....                                                    | 9         |
| 7.8.1 Breaker .....                                                                    | 9         |
| 7.8.2 Weft .....                                                                       | 9         |
| 7.9 Troughability .....                                                                | 9         |
| 7.10 Tracking .....                                                                    | 10        |
| 7.11 Safety requirements .....                                                         | 10        |
| <b>8 Sampling .....</b>                                                                | <b>10</b> |
| <b>9 Designation .....</b>                                                             | <b>11</b> |
| <b>10 Ordering data .....</b>                                                          | <b>11</b> |
| <b>11 Marking .....</b>                                                                | <b>11</b> |
| <b>Annex A (informative) Helpful information to be supplied by the purchaser .....</b> | <b>13</b> |
| <b>Bibliography .....</b>                                                              | <b>15</b> |

## 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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

The committee responsible for this document is ISO/TC 41, *Pulleys and belts (including veebelts)*, Subcommittee SC 3, *Conveyor belts*.

This second edition cancels and replaces the first edition (ISO 15236-1:2005), of which it constitutes a minor revision.

ISO 15236 consists of the following parts, under the general title *Steel cord conveyor belts*:

- *Part 1: Design, dimensions and mechanical requirements for conveyor belts for general use*
- *Part 2: Preferred belt types*
- *Part 3: Special safety requirements for belts for use in underground installations*
- *Part 4: Vulcanized belt joints*

# Steel cord conveyor belts —

## Part 1:

# Design, dimensions and mechanical requirements for conveyor belts for general use

## 1 Scope

This part of ISO 15236 specifies the performance and constructional requirements applicable to conveyor belts having steel cords in the longitudinal direction as reinforcement. The requirements for construction given in [Clause 6](#) apply to the design of single belts, as well as the design of complete type series such as those covered in ISO 15236-2.

## 2 Normative references

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

ISO 37, *Rubber, vulcanized or thermoplastic — Determination of tensile stress-strain properties*

ISO 188, *Rubber, vulcanized or thermoplastic — Accelerated ageing and heat resistance tests*

ISO 284, *Conveyor belts — Electrical conductivity — Specification and test method*

ISO 340, *Conveyor belts — Laboratory scale flammability characteristics — Requirements and test method*

ISO 703, *Conveyor belts — Transverse flexibility (troughability) — Test method*

ISO 4649, *Rubber, vulcanized or thermoplastic — Determination of abrasion resistance using a rotating cylindrical drum device*

ISO 7590, *Steel cord conveyor belts — Methods for the determination of total thickness and cover thickness*

ISO 7622-2, *Steel cord conveyor belts — Longitudinal traction test — Part 2: Measurement of tensile strength*

ISO 7623, *Steel cord conveyor belts — Cord-to-coating bond test — Initial test and after thermal treatment*

ISO 8094, *Steel cord conveyor belts — Adhesion strength test of the cover to the core layer*

ISO 10247, *Conveyor belts — Characteristics of covers — Classification*

ISO 15236-2, *Steel cord conveyor belts — Part 2: Preferred belt types*

EN 12882, *Conveyor belts for general purpose use — Electrical and flammability safety requirements*

EN 13827, *Steel cord conveyor belts — Determination of the lateral and vertical displacement of steel cords*

## 3 Terms and definitions

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

### 3.1 edge width

$b_k$   
thickness of rubber between the outer cord and the belt edge

Note 1 to entry: See [Figure 1](#).

### 3.2 breaker

transverse reinforcement in the conveyor belt, normally of a textile material, attached both above and below, or either above or below, the layer of longitudinal cords at a distance of at least 1 mm and considered to be part of the cover

[SOURCE: ISO 7590:2009, 2.1, modified.]

Note 1 to entry: See [Figure 2](#).

### 3.3 weft

transverse reinforcement in the conveyor belt, normally of steel wires, attached both above and below, or either above or below, the layer of longitudinal cords at a distance of less than 1 mm and considered to be part of the belt core

[SOURCE: ISO 7590:2009, 2.2, modified.]

Note 1 to entry: See [Figure 3](#).

## 4 Symbols and units

Table 1 — Symbols and units

| Symbol   | Explanation                                                        | Unit |
|----------|--------------------------------------------------------------------|------|
| $B$      | Belt width                                                         | mm   |
| $F_a$    | Pull-out force of cord per cord length                             | N/mm |
| $F_{bs}$ | Breaking strength of cord taken from cured belt                    | kN   |
| $F_v$    | Pull-out force of cord per cord length — after thermal treatment   | N/mm |
| $K_N$    | Minimum (nominal) breaking strength per width of belt              | N/mm |
| $b_k$    | Calculated edge width                                              | mm   |
| $b_t$    | Supporting belt width                                              | mm   |
| $d$      | Cord diameter                                                      | mm   |
| $F$      | Deflection (troughability)                                         | mm   |
| $h_m$    | Median cord height according to EN 13827                           | mm   |
| $n$      | Number of cords                                                    | —    |
| $s_1$    | Belt thickness                                                     | mm   |
| $s_2$    | Cover thickness carrying side                                      | mm   |
| $s_3$    | Cover thickness pulley side                                        | mm   |
| $s_4$    | Thickness of layer between breaker and layer of longitudinal cords | mm   |
| $s_5$    | Thickness of layer between weft and layer of longitudinal cords    | mm   |
| $s_6$    | Thickness of belt core                                             | mm   |
| $t$      | Cord pitch                                                         | mm   |

Table 1 (continued)

| Symbol       | Explanation                                                                                                                                 | Unit |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------|------|
| $\Delta h_1$ | Number of cords positioned within a range of $h_m \leq 1$ mm as a percentage of the total number of cords                                   | %    |
| $\Delta h_2$ | Number of cords positioned within a range of $h_m$ of from $>1,0$ mm to $1,5$ mm and expressed as a percentage of the total number of cords | %    |
| $\Delta h_3$ | Percentage of cords with $h_m > 1,5$ mm                                                                                                     | %    |

## 5 Belt design

### 5.1 Standard type

Conveyor belts conforming to this part of ISO 15236 contain steel cords surrounded by a layer of core rubber. This belt core is protected on top and bottom by cover layers (see Figure 1).

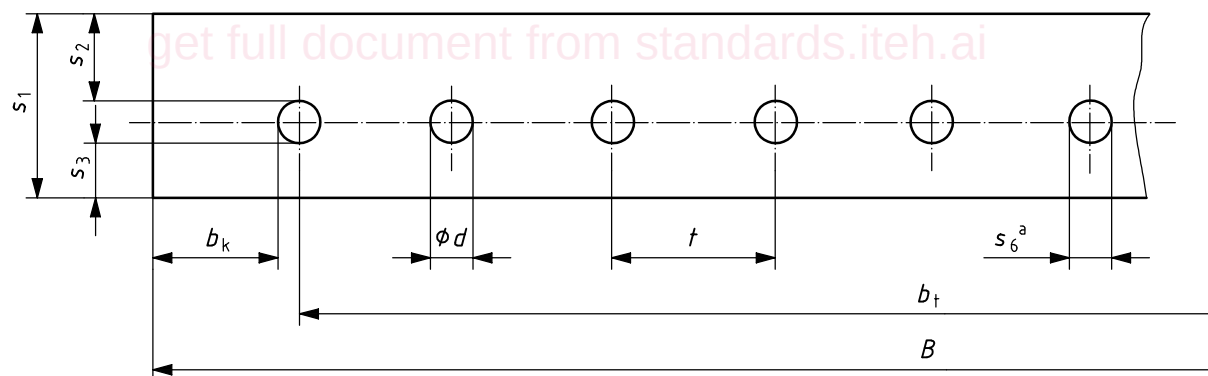
### 5.2 Conveyor belting having transverse reinforcements

Requirements for steel cord conveyor belts having breakers are illustrated in Figure 2 and requirements relating to weft are illustrated in Figure 3.

### 5.3 Belt core

The thickness of the belt core (carcass),  $s_6$ , for all belt types is defined as follows:

$$s_6 = s_1 - s_2 - s_3$$



a  $s_6 = d$ .

Figure 1 — Cross section of standard belt