



SLOVENSKI STANDARD
oSIST prEN ISO 22721:2022

01-december-2022

Naprave za kontinuirni transport - Trakovi tračnih transportejev - Zahteve za tračne transportne trakove z gumeno ali plastično oblogo ter tekstilnim vložkom za podzemno rudarstvo (ISO/DIS 22721:2022)

Conveyor belts - Specification for rubber- or plastics-covered conveyor belts of textile construction for underground mining (ISO/DIS 22721:2022)

Fördergurte - Anforderungen an Textilfördergurte mit Gummi- oder Kunststoff-Deckplatten für Anwendungen unter Tage (ISO/DIS 22721:2022)

Courroies transporteuses - Spécification pour courroies transporteuses à structure textile recouvertes de caoutchouc ou de plastique, pour utilisation dans les mines souterraines (ISO/DIS 22721:2022)

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53.040.20	Deli za transporterje	Components for conveyors
73.100.40	Oprema za vleko in dviganje	Haulage and hoisting equipment

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Conveyor belts — Specification for rubber- or plastics-covered conveyor belts of textile construction for underground mining

Courroies transporteuses — Spécification pour courroies transporteuses à structure textile recouvertes de caoutchouc ou de plastique, pour utilisation dans les mines souterraines

ICS: 73.100.40; 53.040.20

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Contents

	Page
Foreword.....	iv
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
4 Construction	2
5 Length	2
6 Width	3
7 Rubber cover	4
8 Tolerances on total belt thickness and cover thickness	4
8.1 Tolerance on total belt thickness.....	4
8.2 Tolerance on cover thickness.....	4
9 Transverse fabric joints in multi-ply belting	5
9.1 General.....	5
9.2 Outer plies.....	5
9.3 Inner plies.....	5
9.4 Adjacent plies and non-adjacent plies.....	5
9.5 Joints in same ply.....	5
9.6 Mono-ply, duo-ply and solid woven belting.....	5
10 Longitudinal fabric joints	5
10.1 Multi-ply belting.....	5
10.1.1 Spacing of joints.....	5
10.1.2 Number of joints.....	5
10.2 Fabric joints in duo-ply belting.....	6
10.3 Longitudinal joints in solid woven and mono-ply belting.....	6
11 Elongation	6
12 Full thickness tensile strength	6
13 Adhesion	6
14 Troughability	7
15 Sampling	7
16 Designation	7
17 Identification	9
Annex A (informative) Items to be agreed between manufacturer and purchaser	10
Annex B (informative) Helpful information to be supplied by the purchaser	11
Annex C (informative) Lateral drift (straight running)	13
Bibliography	14

ISO/DIS 22721:2022(E)

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).

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For an explanation of the voluntary nature of standards, 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 www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 41, *Pulleys and belts (including veebelts)*, Subcommittee SC 3, *Conveyorbelts*.

This second edition cancels and replaces first edition (ISO 22721:2007), which has been technically revised.

The main changes compared to the previous edition are as follows:

The part of warning was deleted as there is a reference to EN 14973 in [Clause 2](#), [16.1](#), [16.2](#), [17](#), [B2](#) and [B3](#).

Take out the comment and related widths from [Table 3](#).

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Conveyor belts — Specification for rubber- or plastics-covered conveyor belts of textile construction for underground mining

1 Scope

This document specifies requirements for rubber- or plastics-covered conveyor belting of textile construction for underground mining on flat or troughed idlers. It is not applicable to light conveyor belts as described in ISO 21183-1.

This document does not include requirements for plastics covers. These will need to be agreed upon by the manufacturer and purchaser, taking into account the type of plastics to be used.

Related items that are not requirements of this document, but which it is recommended be agreed upon by the manufacturer and purchaser, are included in [Annex A](#).

Details recommended to be supplied by the purchaser of belting with an enquiry are given in [Annex B](#).

The ability of a belt to run straight cannot be assessed until the belt is installed. Requirements for this are, therefore, outside the scope of this document; nevertheless, recommendations for lateral drift are given in [Annex C](#).

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

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

ISO 252, *Conveyor belts — Adhesion between constitutive elements — Test methods*

ISO 282, *Conveyor belts — Sampling*

ISO 283, *Conveyor belts — Full thickness tensile strength, elongation at break and elongation at the reference force — Test method*

ISO 583, *Conveyor belts with a textile carcass — Total belt thickness and thickness of constitutive elements — Test methods*

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

ISO 1120, *Conveyor belts — Determination of strength of mechanical fastenings — Static test method*

ISO 4649:2002, *Rubber, vulcanized or thermoplastic — Determination of abrasion resistance using a rotating cylindrical drum device*

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

ISO 16851, *Textile conveyor belts — Determination of the net length of an endless (spliced) conveyor belt*

EN 14973:2015, *Conveyor belts for use in underground installations — Electrical and flammability safety requirements*

ISO/DIS 22721:2022(E)

3 Terms and definitions

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

3.1

slab belting

conveyor belting made in wide widths and long lengths for subsequent slitting and cutting into narrower widths and shorter lengths to suit individual conveyor installations

3.2

solid woven belting

conveyor belting consisting of a carcass of more than one ply, the plies being interlocked in the weave or bound together by binding threads in the course of weaving

3.3

mono-ply belting

conveyor belting with a carcass consisting of one ply of woven textile fabric

3.4

duo-ply belting

conveyor belting with a carcass consisting of two plies of woven textile fabric bonded together by an intermediate layer of elastomer of sufficient thickness to allow the incorporation of a tension element in the joint

3.5

multi-ply belting

conveyor belting with a carcass of two or more plies of woven textile fabric, the adjacent plies being bonded together by an intermediate layer of elastomer

3.6

primary yarn

load-carrying yarn which contributes more than 50 % of the full thickness tensile strength

3.7

secondary yarn

load-carrying yarn which contributes less than 50 % of the full thickness tensile strength

4 Construction

The carcass shall consist either of one or more plies of woven fabric, or of solid woven fabric, and shall be impregnated or coated with a rubber or plastic.

If a breaker consisting of open mesh fabric or cord fabric or cord layer is placed between the cover and carcass, or is embedded in the cover for the purpose of carcass protection, such a layer shall be considered to be part of the cover thickness and shall not be counted as a fabric ply.

If a fabric ply is integrally woven with the carcass on either one or both surfaces of the carcass, it shall be considered to be part of the carcass thickness.

NOTE The external surfaces of the conveyor belt will generally consist of a defined thickness and quality of elastomeric material.

5 Length

5.1 Belting that is ordered to an open-ended length shall be supplied subject to the tolerances in accordance with [Table 1](#).

5.2 The length of belting supplied in the spliced endless form shall be described by the term *net endless length*. The net endless length shall be supplied subject to the tolerances in accordance with [Table 2](#), when measured in accordance with ISO 16851.

It is recommended that, when placing orders for belting, purchasers specify a length of belting that includes such lengths as are required for testing and any additional lengths necessary for vulcanized joints.

Table 1 — Tolerances on open-end lengths of belting

Belt delivery condition	Maximum permissible difference between delivered length and ordered length %
Slab belting	± 5
As one length	+2,5 0
In several lengths: for each single length	± 5
for the sum of all lengths	+2,5 0

Table 2 — Tolerances on net endless lengths of belting

Length of belt	Tolerance
≤ 15 m	± 50 mm
> 15 m and ≤ 20 m	± 75 mm
> 20 m	± 0,5 %

6 Width

The width of the belting and its associated tolerance shall be in accordance with [Table 3](#).

Table 3 — Widths and tolerances on width of conveyor belting

Nominal width of belting mm	Tolerance on width
300	± 7,5 mm
400	
500	
600	± 1,5 %
650	
800	
1 000	
1 200	
1 400	
1 600	
1 800	
2 000	

ISO/DIS 22721:2022(E)

7 Rubber cover

7.1 If the rubber cover is designated as class H, D or L, it shall conform to the appropriate requirements given in [Table 4](#), and, after ageing for 168 h at 70 °C in accordance with ISO 188, the values obtained for tensile strength and elongation at break shall not vary from the original unaged values by more than 25 % of those values.

7.2 If the thickness of the rubber cover, measured in accordance with ISO 583, is between 0,8 mm and 1,6 mm, the thickness of the test piece used, in accordance with ISO 37 shall be the maximum obtainable and a tolerance of – 15 % shall be permitted on values of tensile strength and elongation at break given in [Table 4](#).

Table 4 — Classification of conveyor belt rubber covers

Cover class	Minimum tensile strength of rubber cover N/mm ²	Minimum elongation at break %	Maximum abrasion loss in relative volume mm ³
H	24	450	120
D	18	400	100
K	20	400	200
L	15	350	200
V	17	350	175
Test method	ISO 37	ISO 37	ISO 4649:2002, Method A

These values will help to determine the appropriate cover compound for the application or for the materials carried. Other values, such as tear resistance, may be considered, if required. Reliable assessment of the behaviour of the covers in service for wear and cut resistance cannot be determined from tensile strength, elongation and abrasion values alone. The cover grades H, D and L are in accordance with ISO 10247.

If other cover materials or qualities are required for a particular application (e.g. safety, oil resistance or heat resistance), the cover properties need to be agreed between the purchaser and the manufacturer.

8 Tolerances on total belt thickness and cover thickness

8.1 Tolerance on total belt thickness

If the mean of the 3, 5 or 8 values of total belt thickness, measured in accordance with ISO 583, is 10 mm or less, the maximum permissible difference between the maximum thickness and the minimum thickness shall not be greater than 1 mm. For solid woven belting, the maximum permissible difference shall be not greater than 1,5 mm.

If the mean of the 3, 5 or 8 values of the total belt thickness, when measured by the method described in ISO 583, is greater than 10 mm, the maximum permissible difference between the maximum thickness and the minimum thickness shall be not greater than 10 % of the mean value. For solid woven belting the maximum permissible difference shall be less than 15 %.

8.2 Tolerance on cover thickness

When measured by one of the methods described in ISO 583, the mean value of the cover thickness shall not be less than the specified thickness by more than the amounts given in [Table 5](#).

Table 5 — Tolerance on cover thickness

Property	Requirements		
	Plus	Minus	
		Specified thickness < 4 mm	Specified thickness > 4 mm
Maximum permissible deviation of specified thickness of each cover	1 mm	0,2 mm	5 % of specified thickness

9 Transverse fabric joints in multi-ply belting

9.1 General

Transverse joints shall be at an angle of between 45° and 70° to the centre line of the belt.

9.2 Outer plies

Neither outer ply shall have more than one transverse joint per 100 m length of belt.

9.3 Inner plies

No inner ply shall have more than two transverse joints per 100 m length of belt.

9.4 Adjacent plies and non-adjacent plies

Transverse joints in adjacent plies and non-adjacent plies shall be not less than 3 m apart.

9.5 Joints in same ply

Transverse joints in the same ply shall be 5 m apart or more.

9.6 Mono-ply, duo-ply and solid woven belting

Transverse joints are not permitted in mono-ply, duo-ply or solid woven belting.

10 Longitudinal fabric joints

10.1 Multi-ply belting

10.1.1 Spacing of joints

Longitudinal joints shall be at least 100 mm from the edge of the carcass. Each longitudinal joint shall be at least 100 mm from the joints in the other plies. The longitudinal joints in one ply of any piece of belting shall be separated by at least 300 mm where the width of the belting permits two joints in the same ply.

10.1.2 Number of joints

Except for folded edge constructions, the maximum number of longitudinal joints in the plies shall be in accordance with [Table 6](#).