भारतीय मानक
Indian Standard

IS 15427 (Part 2) : 2022
ISO 15236-2 : 2017

इस्पात डोरी के वाहक पट्टे

भाग 2 अधिमानत: पट्टे के प्रकार वाले

(दूसरा पुनरीक्षण)

Steel Cord Conveyor Belts

Part 2 Preferred Belt Types

(Second Revision)

ICS 53.040.20

भारतीय मानक ब्यूरो
BUREAU OF INDIAN STANDARDS
मानक भवन, 9 बहादुर शाह ज़फर मार्ग, नई दिल्ली - 110002
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI - 110002
www.bis.gov.in www.standardsbis.in

December 2022 **Price Group 7**

Conveyor Belts Sectional Committee, PGD 40

NATIONAL FOREWORD

This Indian Standard (Part 2) (Second Revision) which is identical with ISO 15236-2 : 2017 ‘Steel cord conveyor belts — Part 2: Preferred belt types’ issued by the International Organization for Standardization (ISO) was adopted by the Bureau of Indian Standards on recommendation of the Conveyor Belts Sectional Committee and approval of the Production and General Engineering Division Council.

The standard was first published in 2004 and was first revised in 2017 to align with the revised version of ISO 15236 : 2004. This revision is taken up to align with latest version of ISO standard published in ISO 15236-2 : 2017. Other parts in this series are:

Part 1 Design, dimensions and mechanical requirements for conveyor belts for general use
Part 4 Vulcanized belt joints

The text of ISO Standard has been approved as suitable for publication as an Indian Standard without deviations. Certain conventions are, however, not identical to those used in Indian Standards. Attention is particularly drawn to the following:

a) Wherever the words ‘International Standard’ appear referring to this standard, they should be read as ‘Indian Standard’.
b) Comma (,) has been used as a decimal marker while in Indian Standards, the current practice is to use a point (.) as the decimal marker.

In this adopted standard, reference appears to certain International Standards for which Indian Standards also exist. The corresponding Indian Standards, which are to be substituted in their respective places, are listed below along with their degree of equivalence for the editions indicated:

International Standard	*Corresponding Indian Standard*	*Degree of Equivalence*
ISO 15236-1: 2016 Steel cord conveyor belts — Part 1: Design, dimensions and mechanical requirements for conveyor belts for general use	IS 15427 (Part 1): 2016 Steel cord conveyor belts: Part 1 Design, dimensions and mechanical requirements for conveyor belts for general use (*first revision*)	Identical with ISO 15236-1 : 2016
ISO 15236-4 Steel cord conveyor belts — Part 4: Vulcanized belt joints	IS 15427 (Part 4) : 2015 Steel cord conveyor belts: Part 4 Vulcanized belt joints (*first revision*)	Identical with ISO 15236-4 : 2004

This standard also makes a reference to the BIS Certification Marking of the product, details of which are given in National Annex A.

In reporting the result of a test or analysis made in accordance with this standard, is to be rounded off, it shall be done in accordance with IS 2 : 2022 ‘Rules for rounding off numerical-values (*second revision*)’.

Contents

Page

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).

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).

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.

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 15236-2:2004), which has been technically revised.

A list of all the parts in the ISO 15236 series can be found on the ISO website.

Introduction

Steel cord conveyor belts are mainly long belts which are manufactured by joining several delivery lengths on the site. To achieve joints with a high dynamic capability from belts supplied by various manufacturers, it is necessary to standardize some features, e.g. thickness of carcass or cord pitch and cord diameter.

Indian Standard

STEEL CORD CONVEYOR BELTS

PART 2 PREFERRED BELT TYPES

(Second Revision)

1 Scope

This document specifies preferred types of conveyor belts with steel cords in the longitudinal direction as reinforcement. The belt type series in this document are based on the general requirements for construction given in ISO 15236-1.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition indicated applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 15236-1:2016, *Steel cord conveyor belts — Part 1: Design, dimensions and mechanical requirements for conveyor belts for general use*

ISO 15236-4, *Steel cord conveyor belts — Part 4: Vulcanized belt joints*

3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at http://www.iso.org/obp

4 Symbols and units

For the purposes of this document, the symbols and the units given in Table 1 apply.

Table 1 — Symbols and units

Symbol	Explanation	Unit
B	Belt width	mm
F_{bs}	Breaking strength of the cord taken from the cured belt	kN
K_N	Nominal breaking strength per width of belt	N/mm
b_K	Calculated edge width	mm
d	Cord diameter	mm
n	Number of cords	—
s	Cover thickness	mm
s_6	Carcass thickness	mm

Table 1 *(continued)*

Symbol	Explanation	Unit
t	Cord spacing/pitch	mm
min	Minimum value	—
max	Maximum value	—

5 General remarks

The belt types described in this document are a selection out of the unlimited number of possible constructions; belts of the types A and B have been manufactured and installed in large quantities.

It is the general conception of these belt types that belts of a certain nominal breaking strength have equal cords and cord pitches or at least equal thickness of the carcass.

The requirements regarding belt design, i.e. cord diameter and cord pitch, depend on the mode of joint that will be applied. In accordance with ISO 15236-4, there are three types of vulcanized joints:

— interlaced stepped joints;

— plain stepped joints;

— finger joints.

For high performance stepped joints, it is essential that the belts to be joined have equal cord pitch and cord diameter. For belts to be joined by finger joints, the cord pitch and cord diameter are of less importance; what matters is a similar thickness of the carcass. In Tables 2, 3, 4 and 5, therefore, cord diameter, cord pitch and number of cords are specified only for those types which are usually joined by stepped joints, i.e. belt types A1, A2 and B2.

The cord numbers given in Tables 2, 3 and 5 are for guidance only. They result from Formula (1):

$$n_{\min} = \frac{K_N \times B}{F_{bs} \times 1\,000} \tag{1}$$

and from the requirement that the edge width shall be not larger than 40 mm and not smaller than 15 mm, i.e.

$$15 \leq b_k \leq 40$$

A higher number of cords as well as a smaller number of cords can be applied provided that the requirements for minimum breaking strength specified in ISO 15236-1 and ISO 15236-4 are met. The belt breaking strengths are calculated by Formula (2):

$$K_N = \frac{F_{bs} \times n \times 1\,000}{B} \tag{2}$$

For the purposes of this document, the symbols and units given in Table 1 apply.

6 Belt types A

Belt types A shall be manufactured with steel cords where the individual wires have been zinc coated by a hot dip process. Requirements for belt types A1 and A2 shall be as given in Tables 2 and 3, respectively.

NOTE Belt types A are designed for interlaced stepped belt joints with numbers of steps between 1 and 4. The t/d ratio of the A2 belt types is somewhat lower than that of the belt types A1 resulting in thinner cords for comparable tensile strengths and in most cases a higher number of steps within the joint.

Table 2 — Requirements for belt types A1

Type of belt	**Unit**	**500**	**630**	**800**	**1 000**	**1 250**	**1 400**	**1 600**	**1 800**	**2 000**	**2 250**	**2 500**	**2 800**	**3 150**	**3 500**	**4 000**	**4 500**	**5 000**	**5 400**
Min. breaking strength $K_{N\,min.}$	N/ mm	500	630	800	1 000	1 250	1 400	1 600	1 800	2 000	2 250	2 500	2 800	3 150	3 500	4 000	4 500	5 000	5 400
Max. cord diameter $d_{max.}$	mm	3,0	3,0	3,7	4,2	4,9	5,0	5,6	5,6	5,6	5,6	7,2	7,2	8,1	8,6	8,9	9,7	10,9	11,3
Min. breaking load of the cord $F_{bs\,min.}$	kN	7,6	7,6	10,3	12,9	18,4	20,6	26,2	25,5	25,5	26,2	39,7	39,7	50,0	55,5	63,5	75,0	90,3	96,0
Cord pitch, t	mm	14,0	11,0	12,0	12,0	14,0	14,0	15,0	13,5	12,0	11,0	15,0	13,5	15,0	15,0	15,0	16,0	17,0	17,0
Min. thickness of covers $s_{min.}$	mm	4,0	4,0	4,0	4,0	4,0	4,0	4,0	4,0	4,0	4,0	5,0	5,0	5,5	6,0	6,5	7,0	7,5	8,0
Belt width B in mm	Tole-rance in mm	Number of cords, n																	
500	+10/-5	33	42	39	39	34	34	31	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
650	+10/-7	44	54	51	51	45	45	41	46	52	56	41	46	41	41	41	39	36	N/A
800	+10/-8	54	68	64	63	55	55	50	57	64	69	51	57	51	51	51	48	45	45
1 000	±10	68	84	80	80	68	68	63	71	80	86	63	71	63	64	63	60	56	57
1 200	±10	84	107	97	97	82	82	76	85	96	104	76	85	76	76	76	72	67	68
1 400	±12	96	124	114	113	97	97	90	100	112	122	89	99	89	89	89	84	79	79
1 600	±12	111	142	130	130	111	111	103	114	129	140	102	114	102	102	102	96	90	90
1 800	±14	125	160	147	147	125	125	116	129	145	159	116	128	116	116	116	108	102	102
2 000	±14	139	177	164	163	140	139	130	144	162	177	129	143	129	129	129	121	114	114
2 200	±15	153	195	180	180	154	154	143	159	179	195	142	158	142	142	142	133	126	126
2 400	±15	167	213	197	197	168	168	156	174	195	213	156	173	156	156	156	146	137	137
2 600	±15	181	231	214	213	182	182	170	189	212	231	169	188	169	169	169	158	149	149
2 800	±15	196	249	230	230	197	197	183	203	229	249	182	202	182	182	182	171	161	161
3 000	±15	210	267	247	247	211	211	196	218	245	268	196	217	196	196	196	183	173	173
3 200	±15	224	286	264	263	225	225	210	233	262	286	209	232	209	209	209	196	184	184
N/A = Not applicable because of troughability.																			

Table 3 — Requirements for belt types A2

Type of belt	Unit	1 000	1 250	1 400	1 600	1 800	2 000	2 250	2 500	2 800	3 150	3 500
Min. breaking strength $K_{N\,min.}$	N/mm	1 000	1 250	1 400	1 600	1 800	2 000	2 250	2 500	2 800	3 150	3 500
Max. cord diameter $d_{max.}$	mm	3,7	4,2	4,4	4,7	4,9	5,2	5,6	5,8	6,7	7,2	7,4
Min. breaking load of the cord $F_{bs\,min.}$	kN	10,7	13,3	14,9	17,1	19,2	21,3	24,0	26,6	35,9	40,4	44,9
Cord pitch, t	mm	10,0	10,0	10,0	10,0	10,0	10,0	10,0	10,0	12,0	12,0	12,0
Min. thickness of covers $s_{min.}$	mm	4,0	4,0	4,0	4,0	4,0	4,0	4,0	4,0	5,0	5,0	6,0
Belt width B in mm	Toler-ance in mm	Number of cords, n										
500	+10/-5	47	47	47	47	47	47	47	47	39	39	39
650	+10/-7	61	62	62	61	61	62	61	62	51	51	51
800	+10/-8	76	76	76	75	76	76	76	76	63	63	63
1 000	±10	96	96	96	95	95	95	94	94	78	78	78
1 200	±10	116	116	116	115	115	115	114	114	94	94	94
1 400	±12	136	136	136	135	135	135	134	134	111	111	111
1 600	±12	156	156	156	155	155	155	154	154	128	128	128
1 800	±14	176	176	176	175	175	175	174	174	144	144	144
2 000	±14	196	196	196	195	195	195	194	194	161	161	161
2 200	±15	216	216	216	215	215	215	214	214	178	178	178
2 400	±15	236	236	236	235	235	235	234	234	194	194	194
2 600	±15	256	256	256	255	255	255	254	254	211	211	211
2 800	±15	276	276	276	275	275	275	274	274	228	228	228
3 000	±15	296	296	296	295	295	295	294	294	244	244	244
3 200	±15	316	316	316	315	315	315	314	314	261	261	261

7 Belt types B

Compared with the belt types A, belt types B are built with transverse reinforcements as indicated in ISO 15236-1:2016, 5.2.

Belt types B are divided into two categories:

— belt types B1 with relatively high elongation “warp” cords;

— belt types B2 with standard elongation “warp” cords.

Requirements for belt types B1 and B2 shall be as given in Tables 4 and 5, respectively.

A “weft” of steel cord with highly elastic elongation shall be arranged on top and below the longitudinal cords to form a carcass of the belt type ST S/S.

These belts may have only one weft of steel cords arranged above the longitudinal cords or with one weft of textile yarns arranged above and below the longitudinal cords. Each layer of cords shall be separated from each other by a rubber layer.

Belt types B shall be joined by

— “finger joints” or “plain stepped joints” for belt types B1, and

— “plain stepped joints” or “interlaced stepped joints” for belt types B2.

Table 4 — Requirements for belt types B1

Type of belt	Unit	500	630	800	1 000	1 250	1 400
Min. breaking strength $K_{Nmin.}$	N/mm	500	630	800	1 000	1 250	1 400
Max. cord diameter $d_{max.}$	mm	3,0	3,0	3,0	3,0	3,0	3,0
Thickness of the carcass with							
2 textile wefts type ST T/T	mm	5,6	5,6	5,6	5,6	5,6	5,6
1 metal weft type ST S/-	mm	4,0	4,0	4,0	4,0	4,0	4,0
2 metal wefts type ST S/S	mm	5,6	5,6	5,6	5,6	5,6	5,6
Min. thickness of covers $s_{min.}$	mm	3,0	3,0	3,0	3,0	3,0	3,0

Table 5 — Requirements for belt types B2

Type of belt	Unit	800	1 000	1 250	1 400	1 600	1 800	2 000	2 250	2 500	2 800	3 150	3 500
Min. breaking strength $K_{Nmin.}$	N/mm	800	1 000	1 250	1 400	1 600	1 800	2 000	2 250	2 500	2 800	3 150	3 500
Max. cord diameter $d_{max.}$	mm	3,3	3,3	3,3	3,3	3,3	3,3	3,3	3,3	5,4	5,4	7,1	7,4
Min. breaking load of the cord $F_{bs\ min.}$	kN	10,5	10,5	10,5	10,5	10,5	10,5	10,5	10,5	27,0	27,0	40,7	44,9
Cord pitch, t	mm	12,1	9,7	7,7	6,9	6,1	5,4	4,8	4,4	9,9	9,3	11,0	12,0
2 textile wefts type ST T/T	mm	6,6	6,6	6,6	6,6	6,6	6,6	6,6	6,6	8,6	8,6	10,6	10,6
1 metal weft type ST S/-	mm	5,5	5,5	5,5	5,5	5,5	5,5	5,5	5,5	7,5	7,5	9,5	9,5
2 metal wefts type ST S/S	mm	7,0	7,0	7,0	7,0	7,0	7,0	7,0	7,0	9,0	9,0	11,0	11,0
Min. thickness of covers $s_{min.}$ in mm	mm	3,0	3,0	3,0	3,0	3,0	3,0	3,0	3,0	4,0	4,0	5,0	5,0
Belt width B in mm	Tolerance in mm	Number of cords, n											
650	+10/-7	50	62	78	87	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
800	+10/-8	61	77	96	107	122	138	153	172	75	83	70	64
1 000	±10	77	96	123	134	153	172	193	215	94	104	88	80
1 200	±10	96	119	149	163	185	209	235	258	114	125	105	96
1 400	±12	110	137	175	192	218	246	276	301	134	146	123	112
1 600	±12	129	158	198	221	250	283	318	347	154	166	140	128
1 800	±14	143	178	224	250	283	320	360	392	175	187	158	144
N/A = Not applicable because of troughability.													

8 Belt types C

The tension members of the belt types C shall be fabric-like constructions. For both types C1 and C2 the warp shall consist of brass or zinc coated steel cords.

NOTE The longitudinal steel cords in the belting of the belt types C1 have a higher elastic elongation than belt types C2.

The weft of belt types C1 shall either be of textile yarns or steel cords and be arranged either above or below or above and below the longitudinal cords.

The weft of C2 belting shall be of steel cords which are arranged either above or below or above and below the longitudinal cord.

Belt types C shall be joined by “finger joints” or “plain stepped joints”.

Requirements for belt types C1 and C2 shall be as given in Tables 6 and 7, respectively.

Table 6 — Requirements for belt types C1

Type of belt	Unit	500	630	800	1 000	1 250	1 400	1 600	1 800	2 000	2 250	2 500	2 800
Min. breaking strength $K_{Nmin.}$	N/mm	500	630	800	1 000	1 250	1 400	1 600	1 800	2 000	2 250	2 500	2 800
Max. thickness of the carcass $s_{6max.}$	mm	5,3	5,3	6,1	6,1	8,0	8,0	8,0	8,0	8,0	10	10	10
Min. thickness of covers $s_{min.}$	mm	3,0	3,0	3,0	3,0	4,0	4,0	4,0	4,0	4,0	4	4	4

Table 7 — Requirements for belt types C2

Type of belt	Unit	630	800	1 000	1 250	1 400	1 600	1 800	2 000	2 250	2 500	2 800	3 150
Min. breaking strength $K_{Nmin.}$	N/mm	630	800	1 000	1 250	1 400	1 600	1 800	2 000	2 250	2 500	2 800	3 150
Max. thickness of the carcass $s_{6max.}$	mm	5,3	5,9	5,9	6,7	6,7	7,5	7,5	7,5	8	9,6	9,6	10,5
Min. thickness of covers $s_{min,.}$	mm	3,0	4,0	4,0	4,0	4,0	4,0	4,0	4,0	4	4	4	5

NATIONAL ANNEX A

(*National Foreword*)

A-1 BIS CERTIFICATION MARKING

The product may also be marked with the Standard Mark.

A-1.1 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations made thereunder. The details of conditions under which the license for use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act*, 2016 to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Copyright

Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the website-www.bis.gov.in or www.standardsbis.in.

This Indian Standard has been developed from Doc No.: PGD 40 (17820).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones: 2323 0131, 2323 3375, 2323 9402 *Website*: www.bis.gov.in

Regional Offices:		*Telephones*
Central	: 601/A, Konnectus Tower -1, 6th Floor, DMRC Building, Bhavbhuti Marg, New Delhi 110002	2323 7617
Eastern	: 8th Floor, Plot No 7/7 & 7/8, CP Block, Sector V, Salt Lake, Kolkata, West Bengal 700091	2367 0012 2320 9474
Northern	: Plot No. 4-A, Sector 27-B, Madhya Marg, Chandigarh 160019	265 9930
Southern	: C.I.T. Campus, IV Cross Road, Taramani, Chennai 600113	2254 1442 2254 1216
Western	: Plot No. E-9, Road No.-8, MIDC, Andheri (East), Mumbai 400093	2821 8093

Branches : AHMEDABAD. BENGALURU. BHOPAL. BHUBANESHWAR. CHANDIGARH. CHENNAI. COIMBATORE. DEHRADUN. DELHI. FARIDABAD. GHAZIABAD. GUWAHATI. HIMACHAL PRADESH. HUBLI. HYDERABAD. JAIPUR. JAMMU & KASHMIR. JAMSHEDPUR. KOCHI. KOLKATA. LUCKNOW. MADURAI. MUMBAI. NAGPUR. NOIDA. PANIPAT. PATNA. PUNE. RAIPUR. RAJKOT. SURAT. VISAKHAPATNAM.

Published by BIS, New Delhi