



U S S R S T A T E S T A N D A R D

RUBBER-FABRIC CONVEYOR BELTS

SPECIFICATIONS

GOST 20 – 85

Official Edition

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RUBBER-FABRIC CONVEYOR BELTS

Specifications

GOST**20 – 85**In place of
GOST 20 – 76

OKP (All-Union Product Classification Code) 25 6100

Term set by Decree No. 4445, dated December 20, 1985, of the USSR State Committee for Standards**From 01.01.87**

This Standard applies to conveyor belts with rubber-fabric banded traction padding and external rubber coverings with flat surfaces applied for the conveyance of loose, lump and piece loads on belt conveyors with flat or troughed supporting rollers.

This Standard does not apply to conveyor belts with padding and coverings from other materials.

The terms of this Standard are mandatory.

1. KEY PARAMETERS

1.1. Depending on operating conditions and purpose belts are produced of four types: 1, 2, 3, 4 and following varieties: general purpose, frost-resistant, heat-resistant, low combustion ability (for coal and slate mines), low combustion ability frost-resistant and for conveyance of food products. The types and varieties of belts are specified in tab. 1.

Types and varieties of conveyor belts

Type of belt	Basic characteristics	Type of conveyed material, weight	Category of operating conditions
1	Multi-layer, with a double-sided rubber covering and protective or breaker strip under the rubber covering of the working surface and with rubber beads	Ferrous and non-ferrous ores, firm formation rock in pieces of up to 500 mm, logs up to 900 mm and other materials	Extremely adverse
		Fossil rock, dolomite in pieces of up to 500 mm, ferrous and non-ferrous ores in pieces of up to 350 mm and other lump materials, logs up to 900 mm	Adverse
		Coal in pieces of up to 700 mm and rock in pieces of up to 500 mm, anthracite in pieces of up to 700 mm or rock in pieces of up to 500 mm	”
2	Multi-layer, with a double-sided rubber covering and rubber beads	Ferrous and non-ferrous ores, firm formation rock in pieces of up to 100 mm, fossil rock, dolomite, coke, agglomerate, furnace feed, dressed ore and other highly abrasive and abrasive materials in pieces of up to 150 mm and piece loads.	Average
		Raw coal, clay, cement, soft rock and other low abrasive ability and non-abrasive materials in pieces of up to 150 mm	”
		Coal (pieces of up to 500 mm) and rock (pieces of up to 300 mm)	”
		Anthracite in pieces of up to 500 mm or rock in pieces of up to 300 mm	”

Table 1

Type of belt	Designation of belt	Type of fabric of the traction padding with the base strength, N/mm	Class of rubber for external coverings	Thickness of external coverings, mm		Ambient air temperature, °C
				Working surfaces	Idle surfaces	
General purpose	1.1	Synthetic, 400	A	8	2	From -45 to +60
Frost-resistant	1.1M		Б	10*	3	
General purpose	1.2	Synthetic, 200-400	М	10*	3	From -60 to +60
Frost-resistant	1.2M		М	8	2	
Low combustion ability	1.2III	Synthetic (polyamide), 200-400 **	Г-1	6	3.5	From -25 to +60
Low combustion ability frost-resistant	1.2IIIM		Г-2	6	3.5	
General purpose	2, 1* ⁶	Synthetic, 100-300	A	6	2 ***	From -45 to +60
Frost-resistant	2M		И, Б	8	2 ***	
			И, Б	6	2	
General purpose	2.2* ⁸	Synthetic, 100-300* ⁹ or combined (polyester/cotton), 55	М	8	2 ***	From -60 to +60
Frost-resistant	2M		И, Б	5	2	
			И, Б	4.5	3.5	
Low combustion ability	2III*	Synthetic (polyamide), 100-300	М	5	2	From -60 to +60
Low combustion ability frost-resistant	2IIIM*		Г-1	4.5	3.5	From -25 to +60
		Synthetic (polyamide), 100-300	Г-2,	4.5	3.5	From -45 to +60

p. 4 GOST 20-85

Type of belt	Basic characteristics	Type of conveyed Material, cargo	Category of operating conditions
2	Multi-layer, with a double-sided rubber covering and rubber beads	Materials with the temperature up to 100°C*4 Highly abrasive and abrasive Low abrasive ability and non-abrasive	”
		Highly abrasive and abrasive Low abrasive ability and non-abrasive Materials with the temperature up to 150°C*4 Highly abrasive and abrasive Low abrasive ability and non-abrasive	Average
3	Multi-layer, with a double-sided rubber covering, rubber or rifled beads	Materials with the temperature up to 200°C*4 Highly abrasive Abrasive Low abrasive ability and non-abrasive	”
		Low abrasive ability materials, including agricultural products, non-abrasive fine, loose and packaged materials	Favorable
3	Multi-layer, with a one-sided rubber covering and rifled beads	Low abrasive ability and non-abrasive materials, including agricultural products, fine, loose and packaged materials	”

tab. 1 continued

Sort of a belt	Designation of a belt	Type of fabric of the traction padding with the base strength, N/mm	Class of rubber for external coverings	Thickness of external coverings, mm		Ambient air temperature, °C
				Working surfaces	Idle surfaces	
Heat-resistant	2T1	Synthetic (polyamide), 100-300	T-1	8	2	From - 25 to + 60
			T-1	6	2	
			T-1	6	2	
Heat-resistant	2T2	Synthetic (polyamide), 100-200	T-2	6	2	From - 10 to + 60
			T-2	5	2	
			T-2,	8	2	
Heat-resistant	2T2	Synthetic (polyamide), 100-200	T-2	6	2	From - 10 to + 60
			T-2	6	2	
			T-2	6	2	
Heat-resistant	2T3	Synthetic 100-300	T-3	10	3	From - 25 to + 60
			T-3	8	2	
			T-3	6	2	
General purpose frost-resistant For food products	2Л*10	Synthetic, 100-200 or combined (polyester/cotton), 55	И, Б	4	2	From -45 to + 60
			И, Б	3	1*5	
			М	4	2	
General purpose For food products	2ЛМ*10	(polyester/cotton), 55	М	3	1*5	From - 60 to + 60
			М	3	1*5	
General purpose For food products	2ПЛ	Synthetic, 100 or combined (polyester/cotton), 55	П	4	2	From - 25 to + 60
			И, Б	3	0	
			И, Б	2	0	
General purpose For food products	3	Synthetic, 100 or combined (polyester/cotton), 55	И, Б	3	0	From -45 to +60
			И, Б	2	0	
			П	3	0	
General purpose For food products	3П	Synthetic, 100 or combined (polyester/cotton), 55	П	2	0	From -25 to +60
			П	2	0	

p. 6 GOST 20-85

Type of belt	Basic characteristics	Type of conveyed Material, cargo	Category of operating conditions
4	One and two-layer with a double-sided rubber covering and rifled beads	Low abrasive ability and non-abrasive fine and loose materials, including agricultural products only for conveyors with a continuous base floor Packaged materials Fine packaged foodstuffs	”

* Manufacture of belts from 01.07.90,

** For manufacture of belts 1.2III, 1.2IIIM with the strength of one traction padding layer 400

*** For belts with the width of 1 600 mm and more.

*⁴ The temperature of the working surface of the covering of the heat-resistant belts in the place of unloading shall not exceed 80°C for belts of type 2T1, 100°C for belts of type 2T2, and 150°C for 2T3 type.

For heat-resistant belts the operating conditions are determined on the temperature of loads.

*⁵ For belts with the width of 1 200 mm and less.

*⁶ Type 2 is subdivided into subtypes 2.1 and 2.2 depending on the type of conveyed load

*⁷ for Belarussian production association BPO “ Byelarusrezinotekhnika”

*⁸ As agreed by the manufacturer and the customer the belts of 2III and 2IIIM types with the width of 4.5 and 3.5 mm of external coverings manufactured from rubbers of class Γ-1 and Γ-2 may be used as type 2.2 general purpose belts in the temperature range corresponding to the permitted range for Γ-1 and Γ-2 classes.

*⁹ For the manufacture of belts of types 2.2 and 2M with the width exceeding 1 600 mm fabrics with the strength of the base material of 300 N/mm may be used.

*¹⁰ For the manufacture of two-layer belts of types 2JI and 2JIM polyamide fabrics with the strength of base material 100 and 200 N/mm shall be used.

(Amended wording, Amendment Nos. 1, 2, 4)

Tab. 1 continued

Type of belt	Designation of belt	Type of fabric of the traction padding with the base strength, N/mm	Class of rubber for external coverings	Thickness of external coverings, mm		Ambient air temperature, °C
				Working surfaces	Idle surfaces	
General purpose	4	Synthetic, 100 or combined (polyester/cotton), 56	И, Б	2	1	From -45 to + 60
			С*7	2	1	From - 25 to + 60
			С	3	1	From -25 to + 60
For food products	4П		П	3	1	From - 25 to + 60
General purpose	4		И, Б	1	1	From - 45 to + 60
			С	2	1	From - 25 to + 60
For food products	4П		П	2	1	From - 25 to + 60
For food products	4П		П	1	1	From - 25 to + 60

p. 8 GOST 20-85

1.2. Belts of all types shall have a rubber-fabric banded traction padding from fabrics specified in tab. 1.

The padding of belts from synthetic fabrics shall have rubber cushions between the fabric layers.

(Amended wording, Amendment No. 1)

1.3. Belts of type 1 are manufactured with rubber coverings of the working and idle surfaces and with rubber beads.

Depending on operating conditions belts of type 1 are subdivided into two subtypes:

1.1 - for extremely adverse operating conditions. Under the working rubber covering the belts shall be provided with a protective cushion from a fabric ensuring nominal base and weft strength of 200 or 300 N/mm;

1.2 - for adverse operating conditions. Belts shall be provided with a protective cushion from a fabric with the nominal base and weft strength of 200 N/mm or with a breaker strip with the nominal base strength of 40 N/mm and weft strength of 100 N/mm.

Low combustion ability belts 1.2III and 1.2IIIM shall have a breaker strip with the nominal base strength of 40 N/mm and weft strength of 100 N/mm under the working rubber covering.

1.4. Belts of type 2 are manufactured with rubber coverings on the working and idle surfaces.

Belts of low combustion ability and low combustion ability frost-resistant varieties of any width, as well as the belts for food products with the width from 300 up to 800 mm inclusive, and the general purpose and frost-resistant varieties of belts with the width over 1 000 mm are provided with rubber beads. The general purpose and frost-resistant belts of synthetic fabrics with the width up to 1 000 mm inclusive and the heat-resistant belts (2T1, 2T2, 2T3) of any width are provided with rubber or rifled beads.

General purpose belts with width up to 650 mm inclusive those manufactured of fabrics with combined threads (threads from a combination of polyester and cotton fibers) as well as the belts for food products with the width exceeding 800 mm may be provided with rifled beads on agreement between the manufacturer and the customer. General purpose belts manufactured of fabrics from combined threads with the width over 650 mm are provided with rubber beads.

Agreed with the customer the general purpose and frost-resistant belts of type 2 with the width up to 1 400 mm inclusive as well as low combustion ability belts (2III and 2IIIM) with the width up to 750 mm inclusive manufactured of synthetic fabrics may be provided with rifled beads.

(Amended wording, Amendment Nos. 1, 2)

1.5. Belts of type 3 are manufactured with rubber covering of the working surface and with rifled beads. Belts of type 3 may be manufactured with a lower fabric layer wrapped around the bead of the padding and fastened to the working surface of a belt.

Belts of type 4 are manufactured with rubber coverings on both working and idle surface and with rifled beads.

1.6. The cross seams of traction (fabric) layers in the padding of belts of types 1, 2, 3, as well as of the two-layer belts of type 4 shall be located at an angle from 45 up to 70° in relation to the direct axis of the belt. Belts with the length of 80 m and more shall not have more than one seam on one of the external layers and more than two seams on each internal layer of the padding. The cross seams in one and the same layer shall be distanced from each other by at least 5 000 mm, whereas in the adjacent layers the distance between the cross seams shall not be less than the double width of a belt, provided that this distance is not less than 1 500 mm.

Belts of types 1 (subtype 1.2), 2 and 3 with the width of 1 600 mm and more may be manufactured with longitudinal seams of padding layers. In such case the external layers of these belts shall not have more than one longitudinal seam, and each internal layer – more than two longitudinal seams. The distance between the longitudinal seams of adjacent layers shall not be less than 100 mm from each other and from the external crimp of the padding, and not less than 200 mm in the same layer.

The arrangement and the amount of seams is checked in the course of control inspection during the manufacture of belts.

1.7. For the manufacture of conveyor belts fabrics are used ensuring conformity of the belts to the requirements of this Standard. The descriptions of fabrics are specified in the recommended appendix 1.

1.8. The identification number of the belt shall contain letter and digital indexes specifying the type and the sort of a belt, its width in millimeters, number of fabric layers of the padding, abbreviated name of the fabric, the width of rubber coverings on the working and idle sides of a belt in millimeters, the class of rubber of the coverings and designation of this Standard.

For belts of type 2 after the class of rubber of the coverings the type of bead shall be specified: “PB” - rubber bead; “HB” - rifled bead” .

Example identification numbers:

Belt conveyor of type 1, subtype 1.1 general purpose, width 1 600 mm, with four layers from fabric

р. 10 GOST 20-85

МК 400/120-3, with the thickness of the working covering of 8 mm and of the idle covering of 2 mm from rubber of class А:

Лента 1.1-1600-4-МК- 400/120-3-8-2-А ГОСТ 20-85

As above, of type 1, subtype 1.2 low combustion ability for coal mines, width 1 000 mm, with five layers from fabric ТК-200-2, with the thickness of the working covering of 6 mm and of the idle covering of 3.5 mm from rubber of class Г-1:

Лента 1.2Ш-1 000-5-ТК-200-2-6-3.5-Г-1

As above, of type 2, heat-resistant, width 800 mm with six layers from fabric ТК-100, with the thickness of the working covering of 8 mm and of the idle covering of 2 mm from rubber of a class Т-1 with rifled bead;

Лента 2Т1-800-6-ТК -100-8-2-Т-1-НБ ГОСТ 20-85

As above, of type 2, frost-resistant, width 1 200 mm with four layers from fabric ТК-200-2, with the thickness of the working covering of 5 mm and of the idle covering of 2 mm from rubber of class М with rubber bead

Лента 2М-1 200-4-ТК-200-2-5-2-М-РБ ГОСТ 20-85

As above, of type 3, general purpose, width 800 mm with three layers from fabric ТК-100, with the thickness of the working covering of 3 mm from rubber of class Б:

Лента 3 × 800 3 × ТК-100 × 3 × Б ГОСТ 20-85

As above, of type 4, for food products, width 500 mm with two layers from fabric БКНЛ-65, with the thickness of the working covering of 2 mm and of the idle covering of 1 mm from rubber of class Б:

Лента 4П-500-2-БКНЛ-65-2-1-П ГОСТ 20-85

(Amended wording, Amendment No. 1)

2. TECHNICAL REQUIREMENTS

2.1. Belts shall be manufactured according to the requirements of this Standard and production schedules approved in accordance with the established procedure,

2.2. Belts shall meet the requirements specified in tab. 2 with regard to the number of traction layers and width.

Table 2

Width of belt, mm	Amount of traction layers for belts of type										
	1		2			3			4		
	Nominal strength of traction layers, N/mm										
	400	300	200	300	200	100	55	100	55	100	55
100, 200	–	–	–	–	–	–	–	2–5	2–4	1–2	1–2
300, 400	–	–	–	–	2–5	2–5	2–5	2–5	2–4	1–2	1–2
500, (600)	–	–	–	–	2–5	2–5	2–5	2–5	2–4	1–2	1–2
650, (700)	–	–	–	–	2–6	2–5	2–6	2–5	3–5	1–2	1–2
(750), 800	–	3–6	3–6	3–6	2–6	2–6	3–6	3–5	3–5	1–2	1–2
(900), 1 000	3–6	3–6	3–6	3–6	3–6	3–6	3–6	3–5	3–5	1–2	1–2
(1100), 1 200	3–6	4–6	4–6	3–6	3–6	3–6	3–6	3–5	3–5	1–2	1–2
1400	3–6	4–6	4–6	4–6	4–6	4–6	3–6	3–5	3–5	1–2	1–2
1600	3–8	4–8	5–6	3–8	3–6	4–6	3–6	3–5	3–5	–	–
(1 800), 2 000	4–8	4–8	5–6	3–8	5–6	4–6	3–6	3–5	3–5	–	–
(2 250), 2500 2750, 3 000	5–6	5–6	5–6	4–6	5–6	4–6	3–6	–	–	–	–

Notes:

1. Belts with the width specified in brackets shall not be applied at design of the new belt conveyors.

2. For belts of type 2III, 2IIIM the fabric with the strength of 65 N/mm may not be used.

3. The two-layer belts with the nominal strength of traction layers 200 and 100 N/mm shall be applied only in favorable operating conditions corresponding to belts of types 2JI and 2JIM (tab. 1)

(Amended wording, Amendment No. 2)

2.3. Maximum deviations on width of the belts shall not exceed:

±1.0 % for belts of width up to 650 mm inclusive, with open rifled beads;

±2.0 % for belts of width up to 650 mm inclusive, with rubber beads;

±1.5 % for belts of width more than 650 mm.

Agreed with the customer, the manufacturer may establish other maximum deviations, but not exceeding those specified above by ±0.5 %.

(Amended wording, Amendment No. 1)

2.4. The length of belts of subtype 1.1 shall be not less than 220 m, of subtype 1.2 and belts of types 2 and 3 - not less than 80 m, of belts of type 4 - not less than 30 m.

At the customer's request the manufacture of belts of types 1, 2, 3 is permitted with the length not less than 40 m and of belts of type of 4 – with the length not less than 20 m.

(Amended wording, Amendment No. 2)

p. 12 GOST 20-85

2.5. Maximum deviations on length of the belts shall not exceed $\begin{matrix} +2.0 \\ -0.5 \end{matrix}$ %.

2.6. The thickness of external rubber coverings depending on the type and sort of belts shall meet the values specified in tab. 1.

Maximum deviations on width of external rubber coverings are specified in tab. 3.

Table 3

mm		
Type of belt	Nominal width of external rubber coverings	Maximum deviations
All types (except for low combustion ability)	1.0; 2.0	+1.5 -0.3
	3.0; 3.5; 4.0; 4.5;	+2.0
	5.0; 6.0; 8.0; 10.0.	-0.5
Low combustion ability		+2.0
	3.5; 4.5; 6.0	-0.4

(Amended wording, Amendment No. 1, 4)

2.7. Belts of types 1 and 2 are manufactured with the width (design width) of the rubber bead not less than the width of the idle covering and not more than the general width of the belt. The width of bead is ensured by the width of the covering rubber checked in the course of control inspection during the manufacture of belts.

(Amended wording, Amendment No. 1)

2.8. The design thickness of a traction padding for all types and varieties of belts manufactured on the basis of various fabrics is specified in reference appendix 2.

2.9. The thickness (design thickness) of belt shall be equal to the sum of thicknesses of external rubber coverings and the thickness (design thickness) of traction padding.

2.10. The fluctuations of the actual thickness of a belt shall not exceed:

±1.0 mm – for belts with the thickness up to 10 mm,

±10.0 % – for belts more than 10 mm thick.

2.11. The non-uniformity of thickness on the opposite sides of a belt in points, at the maximum distance of 50mm from the beads for belts with the width of 800 mm and more, shall not exceed:

1 mm – for belts with up to five layers;

2 mm – for belts with five and more layers.

For belts with the width less than 800 mm non-uniform thickness is not standardized.

(Amended wording, Amendment No. 2)

2.12. Belts shall be straight. Maximum deviations of the bead of a belt from a straight line on length of 20 m shall not exceed $\pm 5\%$ of the width of a belt.

(Amended wording, Amendment No. 4, 5)

2.13. Belts shall not have damage or delamination of the padding, bond lift-off of rubber coverings and beads from the padding. There shall be no folds or fractures disturbing the solidity of the rubber monolith, or dimples with the depth exceeding 30 % of the thickness of the rubber covering with the thickness of up to 3.5 mm inclusive. If the thickness of the rubber covering is more than 3.5 mm, the depth of the dimples shall not exceed 20 %. Belts shall not have more than two bubbles per square meter of the belt with the diameter more than 20 mm, or sticking out threads, or metal damages or alien inclusions.

The total length of impression of the fabric on the rubber bead of a belt on each side shall not exceed 4.0 m on length of 25 m for belts with padding from fabrics with base and weft threads from synthetic filaments and 1.0 m on length of 25 m - for belts with padding from fabrics with combined threads of base and weft. The traces of spew of the fabric on all length of the rubber bead of a belt are allowed.

For belts 2T1, 2T2, 2T3 with rifled bead, uniform flow of rubber on bead on all length of the belt is allowed.

The general area of longitudinal and cross crimps of rubber coverings shall not exceed 4% of the area of 10 m². On the surface of a belt the traces made by the vulcanizing press are allowed as well as irregularities of the surface due to the dressing of the bead and to the use of vulcanizing equipment in the form of thickening of the rubber covering with the general area not exceeding 10% of the area of 10 m². The traces from the cleaning of press plates, from repair of belts, from antitack agents (talc and emulsion lubricant) are allowed.

It is allowed to determine the appearance of belts on control samples approved in accordance with the established procedure.

(Amended wording, Amendment No. 1, 2, 4, 5)

2.14. The nominal breaking strength of the base and weft of a traction layer depending on the type of fabric of the padding shall meet the values specified in. tab. 4.

Table 4

Type of fabric	Nominal breaking strength of traction layer, N/mm	
	Base	Weft
Fabric with the base and weft from polyamide threads	400	100
	400	75
	300	50
	200	65
	100	60
Fabric with the base from polyester threads and weft from polyamide threads	300	60
	200	55
Fabric with the base and weft from combined threads (polyester/cotton)	56	20

Notes:

1. The identification numbers of fabrics are specified in the recommended appendix 1.
2. The weft strength of 100 N/mm corresponds to fabric MK- 400/120, the weft strength of 75 N/m - to fabric TK-400, TA - 400.

2.15. The indicators of the maximum permitted (design) operating load of traction layer depending on the average angle of installation of the conveyor, of the type of belt and of the number of traction layers of the padding shall meet those specified in tab. 5.

2.16. The maximum permitted (design) operating load on the base of a belt (P_1), N, is calculated under the formula

$$P_1 = P \cdot b \cdot n$$

Where P – the maximum permitted operating load on one traction layer, N/mm;

B – the width of a belt, mm;

N – the number of traction layers of a padding.

2.17. The physical-mechanical indicators of rubbers applied in the manufacture of external coverings of conveyor belts, shall meet the standards specified in tab. 6.

2.18. The external coverings of belts for food products shall be manufactured of rubber compounds in accordance with the requirements of the engineering specifications approved by the USSR Ministry of Health. Agreed with the customer, the belts for food products may be manufactured with external rubber coverings in light colors.

Table 5

Type of belt	Angle of installation of the conveyor (On the axis of end drums), Degree	Number of traction layers	Maximum permitted working (design) load of traction layer at nominal strength of, N/mm				
			400	300	200	100	55
General purpose, frost-resistant, for food products, low combustion ability for coal and slate mines, low combustion ability frost-resistant	From 0 to 10	Up to 5	50	36	25	12	7.0
			45	32	22	11	6.0
Heat-resistant: 2T1 2T2 2T3	From 10 to 18	Over 5 Up to 5	45	32	22	11	6.0
			40	30	20	10	5.5
	From 0 to 1.8	Over 5 From 3 to 6	–	20	13	10	–
			–	20	13	10	–
			–	15	10	–	–

(Amended wording, Amendment No. 1)

Table 6

Physical-mechanical indicators of rubbers for external coverings of belts

The description of an indicator	Standard for rubber of class										
	A	Б	И	C	M	T-1	T-2	T-3	Г-1	Г-2	П
1. Conditional tensile strength, MPa, not less than	24.5	19.6	15.0	10.0	14.7	11.0	10.0	11.0	14.7	14.7	9.8
2. Relative elongation at breaking, %, not less than	450	400	400	150	350	400	300	400	350	300	300
3. Attrition losses in volume, mm ³ , not more than	160	160	100	200	150	160	200	200	200	200*	–
4.. Friction resistance, J/mm ³ , not less than	–	–	–	–	–	–	–	–	–	7.15	–
5. Factor of frost resistance at extension, not less than, at temperature:											
Minus 45°C	–	–	–	–	–	–	–	–	–	0.3	–
Minus 50°C	–	–	–	–	0.2	–	–	–	–	–	–
6. Shore (scleroscope) hardness number	40–60	50–70	55–75	55–75	50–70	45–65	55–75	60–75	55–75	55–75	–
7. Alteration of the conditional tensile strength standard after aging in air, %, at temperature (100±1)°C during 72 h	–	–	–	–	–	–40	–	–	–	–	–
At temperature (125±1)°C during 72, h	–	–	–	–	–	–	–45	–	–	–	–

Tab. 6 continued

Description of an indicator	Standard for rubber of class										
	A	Б	И	С	М	Т-1	Т-2	Т-3	Г-1	Г-2	П
8. Alteration of the relative elongation at breaking after aging in air, %, not less than:											
At temperature (100±1)°C during 24 h	-50	-50	-60	-	-50	-	-	-	-	-	-
At temperature (100±1)°C during 72 h	-	-	-	-	-	-60	-	-	-	-	-
At temperature (125±1)°C during 72 h	-	-	-	-	-	-	-65	-	-	-	-
9. Conditional tensile strength after aging in air at temperature (125±1)°C during 168 h, MPa, not less than	-	-	-	-	-	-	-	10,0	-	-	-
1.0. Relative elongation at breaking after aging in air at temperature (125±1)°C during 168 h. %, not less than	-	-	-	-	-	-	-	300	-	-	-

* The standards are introduced from 01.01.93

(Amended wording, Amendment Nos. 1, 2, 3, 4)

p. 18 GOST 20-85

2.19. The physical-mechanical indicators of a belt shall meet the standards specified in tab. 7.

(Amended wording, Amendment No. 1, 2, 4)

2.20. Belts intended for operation in regions with a tropical climate, shall meet the requirements of GOST 15152-69.

2.21. The basic operating rules for conveyor belts are established in Appendix 3

2.22. The average life of conveyor belts (the secondary use at three-shift operation not taken into consideration) is specified in tab. 8.

The methods for establishment of a category of operating conditions of belts are specified in the recommended Appendix 4.

2.23. The materials for connection of belts by methods of vulcanization are manufactured as agreed by the manufacturer and the customer according to the specifications and technical documentation.

The main rules for connection of belts are specified in the recommended appendix 5.

Table 7

Description of an indicator	Standard for belts with nominal strength of traction layers												
	From fabric with the base and weft from polyamide threads with strength, N/mm					From fabric with base from polyester and base from polyamide threads with strength, N/mm, 200, 300	From fabric with base and weft from combined threads (polyester/cotton)	From fabric with base and weft from polyamide threads with strength, N/mm					From fabric with base from polyester and weft from polyamide threads with strength, N/mm, 200, 300
	100	200	300	400/75	400/100			100	200	300	400/75	400/100	
	Category B						Category K						
1. Relative elongation on base at load comprising 10 % of the nominal strength of a sample, %, not more than	3.5	3.5	3.5	3.5	3.5	2.0	3.5	3.5	3.5	4.0	4.0	3.5	2.0
2. Connection strength, N/mm, not less than:													
a) between the working covering and the protective or breaker cushion in belts of type 1	–	4.0	4.0	4.0	4.5	4.0	–	–	3.5	3.5	3.5	4.0	3.5
b) between the working covering with the thickness more than 3 mm and the padding in belts of:													
Type 2	4.0	4.0	4.0	–	–	–	3.0	3.5	3.5	3.5	–	–	–
Type 3	–	–	–	–	–	3.7	–	–	–	–	–	–	3.5
Type 2, sort 2.T3	–	–	–	–	–	–	–	–	–	–	–	–	–
c) between the working covering with the thickness of 2 mm in belts of types 3 and 4	3.5	–	–	–	–	–	2.8	3.2	–	–	–	–	–

Tab. 7 continued

Description of an indicator	Standard for belts with nominal strength of traction layers												
	From fabric with the base and weft from polyamide threads with strength, N/mm					From fabric with base from polyester and base from polyamide threads with strength, N/mm, 200, 300	From fabric with base and weft from combined threads (polyester/cotton)	From fabric with base and weft from polyamide threads with strength, N/mm					From fabric with base from polyester and weft from polyamide threads with strength, N/mm, 200, 300
	100	200	300	400/75	400/100			100	200	300	400/75	400/100	
Category B						Category K							
d) between the layers of belts: Type 1, 2 and 3	4.5	4.5	4.5	4.5	5.0	4.5	3.2	4.0	4.0	4.0	4.0	4.5	4.0
Type 2, sort 2T3	–	–	–	–	–	3.7	–	–	–	–	–	–	3.5
e) between the layers of two-layer belts of type 4	3.7	–	–	–	–	–	3.0	3.5	–	–	–	–	–
f) between structural elements of a belt 2T3 after aging in air at temperature (125±1)°C during 168 h, N/mm, not less than:													
Between the working covering and the padding	–	–	–	–	–	3.0	–	–	–	–	–	–	3.0
Between layers	–	–	–	–	–	3.0	–	–	–	–	–	–	3.0

Tab. 7 continued

Description of an indicator	Standard for belts with nominal strength of traction layers												
	From fabric with the base and weft from polyamide threads with strength, N/mm					From fabric with base from polyester and base from polyamide threads with strength, N/mm, 200, 300	From fabric with base and weft from combined threads (polyester/cotton)	From fabric with base and weft from polyamide threads with strength, N/mm					From fabric with base from polyester and weft from polyamide threads with strength, N/mm, 200, 300
	100	200	300	400/75	400/100			100	200	300	400/75	400/100	
	Category B						Category K						
3. Alteration of standards of connection strength indicators between the structural elements of a belt after aging in air: a) For belts of type 2T1 and 2T2 at temperature $(125\pm 1)^\circ\text{C}$ during 72 h, %, not less than: Between the working covering and the padding Between the layers b) (Removed, Amendment No. 2) c) For belts of types 1, 2, 3 general purpose and frost-resistant at temperature $(100\pm 1)^\circ\text{C}$ during 24 h, %, not less than:	-40	-40	-40	-	-	-	-	-40	-40	-40	-	-	-
	-30	-30	-30	-	-	-	-	-30	-30	-30	-	-	-

Tab. 7 continued

Description of an indicator	Standard for belts with nominal strength of traction layers												
	From fabric with the base and weft from polyamide threads with strength, N/mm					From fabric with base from polyester and base from polyamide threads with strength, N/mm, 200, 300	From fabric with base and weft from combined threads (polyester/cotton)	From fabric with base and weft from polyamide threads with strength, N/mm					From fabric with base from polyester and weft from polyamide threads with strength, N/mm, 200, 300
	100	200	300	400/75	400/100			100	200	300	400/75	400/100	
	Category B						Category K						
Between the working covering and the padding	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30
Between the layers	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30
4. Combustion time of low combustion ability belts of varieties 1.2III, 1.2IIIM, 2III, 2IIIM, sec, not more than:													
a) Six samples of coverings	45	45	45	45	-	-	-	45	45	45	45	-	-
b) One sample of covering	15	15	15	15	-	-	-	15	15	15	15	-	-
5. Surface electrical resistance of low combustion ability belts of types 1.2III, 1.2IIIM, 2III, 2IIIM, Ohm, not more than	$3 \cdot 10^8$	$3 \cdot 10^8$	$3 \cdot 10^8$	$3 \cdot 10^8$	-	-	-	$3 \cdot 10^8$	$3 \cdot 10^8$	$3 \cdot 10^8$	$3 \cdot 10^8$	-	-

Tab. 7 continued

Description of an indicator	Standard for belts with nominal strength of traction layers													
	From fabric with the base and weft from polyamide threads with strength, N/mm					From fabric with base from polyester and base from polyamide threads with strength, N/mm, 200, 300	From fabric with base and weft from combined threads (polyester/cotton)	From fabric with base and weft from polyamide threads with strength, N/mm					From fabric with base from polyester and weft from polyamide threads with strength, N/mm, 200, 300	
	100	200	300	400/75	400/100			100	200	300	400/75	400/100		
	Category B					Category K								
6. Flammability of low combustion ability belts of types 1.2III, 1.2IIIM, 2III, 2IIIM at friction on a drum	Does not ignite					–	–	–	Does not ignite					–

Notes:

1. Standard set forth in item 1 for belts of 2 type, sort 2III3-not more than 2.5 %. From 01.01.91 for all types of belts of category B - not more than 2.5 %, for category K - not more than 3.5 %, except for belts from fabric with the base from polyester and weft from polyamide threads of strength 200 and 300 N/mm.

2. **(Removed, Amendment No. 5)**

3. For belts of type 2, category B, general purpose, frost-resistant sorts with the width from 650 mm and up to 1 400 mm, except for 2JI and 2JIM, heat-resistant 2T1, 2T2 of all widths and non-combustible 2III, 2IIIM, with the width up to 750 mm inclusive, made with rifled beads, the standard of connection strength between the covering and the padding shall not be less than 5.01 N/mm, and between the layers - not less than 6,0 N/mm.

4. 5. **(Removed, Amendment No. 4)**

(Amended wording, Amendment Nos. 1, 2, 4)

Table 8

Average life of conveyor belts

Type of conveyed material, weight	Category of operating conditions	Designation of a belt	Type of fabric for traction layer of a padding with the base strength, N/mm	Class of rubber for external coverings	Thickness of external coverings, mm		Life of belts at three-shift operation, secondary use disregarded, months
					Working Surfaces	Idle surfaces	
Ferrous and non-ferrous ores, firm formation rock in pieces of up to 500 mm, logs up to 900 mm and other materials	Extremely adverse	1.1	Synthetic 400	A	8.0	2.0	24
		1.1M		Б	10.0	3.0	24
				М	10.0	3.0	24
Fossil rock, dolomite in pieces of up to 500 mm, ferrous and non-ferrous ores in pieces of up to 350 mm, logs up to 900 mm and other lump materials	Adverse	1.2	Synthetic 200-400	A	6.0	2.0	35
		1.2I		Б	8.0	2.0	35
				М	8.0	2.0	35
Coal in pieces of up to 700 mm and rock in pieces of up to 500 mm	-	1.2III*	Synthetic (polyamide) 200-400	Г-1	6.0	3.5	44
		1.2IIIM*		Г-2	6.0	3.5	44
Anthracite in pieces of up to 700 mm or rock in pieces of up to 500 mm	-	1.2III*	As above	Г-1	6.0	3.5	40
		1.2IIIM*		Г-2	6.0	3.5	40
Ferrous and non-ferrous ores, firm formation rock in pieces of up to 100 mm	Average	2.1	Synthetic 100-300	A	6.0	2.0	46
		2M		И, Б	8.0	2.0	46
				М	8.0	2.0	46

Tab. 8 continued

Type of conveyed material, weight	Category of operating conditions	Designation of a belt	Type of fabric for traction layer of a padding with the base strength, N/mm	Class of rubber for external coverings	Thickness of external coverings, mm		Life of belts at three-shift operation, secondary use disregarded, months
					Working surfaces	Idle surfaces	
Fossil rock, dolomite, coke, agglomerate, furnace feed, dressed ore and other highly abrasive materials in pieces of up to 150 mm	Average	2.1 2M	Synthetic 100–300	И, Б М	6.0	2.0	46
					6.0	2.0	46
Raw coal, clay, cement, soft rock and other low abrasive ability and non-abrasive materials in pieces of up to 150 mm	Average	2.2 2M	Synthetic 100–300 or combined (polyester/cotton) 55	И, Б И, Б М	5.0	2.0	40
					4.5	3.5	40
					5.0	2.0	40
Coal (pieces of up to 500 mm) and rock (pieces of up to 300 mm)	–	2III* 2IIIM*	Synthetic (polyamide) 100–300	Г–1 Г–3 Г–2	4.5	3.5	42
					4.5	3.5	42
					4.5	3.5	42
Anthracite by pieces by the dimension up to 500 mm	–	2III*	Synthetic (polyamide)	Г–1	4.5	3.5	30
Anthracite in pieces of up to 500 mm or rock in pieces of up to 300 mm	–	2IIIM*	100–300	Г–2	4.5	3.5	30
Materials with the temperature up to 100°C Highly abrasive and abrasive	–	2T1	Synthetic (polyamide)	T–1	8.0	2.0	24
				T–1	6.0	2.0	16
Low abrasive ability and non-abrasive	–	2T1	100–200	T–1	6.0	2.0	24

Tab. 8 continued

Type of conveyed material, weight	Category of operating conditions	Designation of a belt	Type of fabric for traction layer of a padding with the base strength, N/mm	Class of rubber for external coverings	Thickness of external coverings, mm		Life of belts at three-shift operation, secondary use disregarded, months
					Working surfaces	Idle surfaces	
Highly abrasive and abrasive Low abrasive ability and non-abrasive Materials with the temperature up to 150°C	–	2T2	As above	T–2	6.0	2.0	24
		2T2		T–2	5.0	2.0	24
Highly abrasive Abrasive Low abrasive ability and non-abrasive Materials with the temperature up to 200°C	–	2T2	As above	T–2	8.0	2.0	12
		2T2		T–2	6.0	2.0	10
		2T2		T–2	6.0	2.0	12
Highly abrasive Abrasive Low abrasive ability and non-abrasive	–	2T3	Synthetic 100–300	T–3	10.0	3.0	12
		2T3		T–3	8.0	2.0	12
		2T3		T–3	6.0	2.0	12
Low abrasive ability materials, including agricultural products, non-abrasive fine, loose and packaged materials	Favorable	2JI	Synthetic 100–200 or combined (polyester/cotton), 55	И, Б	4.0	2.0	79
		2JI		И, Б	3.0	1.0	79
		2JIM		М	4.0	2.0	79
		2JIM		М	3.0	1.0	79
		2ИJI		П	4.0	2.0	79
Low abrasive ability and non-abrasive materials, including agricultural products, fine, loose and packaged materials	Favorable	3	Synthetic 100 or combined (polyester/cotton) 55	И, Б	3.0	0.0	70
		3П		П	3.0	0.0	70
		3		И, Б	2.0	0.0	70
		3П		П	2.0	0.0	70

Tab. 8 continued

Type of conveyed material, weight	Category of operating conditions	Designation of a belt	Type of fabric for traction layer of a padding with the base strength, N/mm	Class of rubber for external coverings	Thickness of external coverings, mm		Life of belts at three-shift operation, secondary use disregarded, months
					Working surfaces	Idle surfaces	
Low abrasive ability and non abrasive materials**, including agricultural products, fine and loose materials	Favorable	4	Synthetic 100 or combined (polyester/cotton) 55	И, Б	2.0	1.0	70
		4		С	3.0	1.0	70
		4		С***	2.0	1.0	70
		4П		П	3.0	1.0	70
Packaged materials	Favorable	4	Synthetic 100 or combined (polyester/cotton) 55	И, Б	1.0	1.0	70
		4		С	2.0	1.0	70
		4П		П	2.0	1.0	70
Fine packaged foodstuffs		4П		П	1.0	1.0	70

* Altitude of falling of a weight shall not exceed 1.0 m.

** For conveyors with continuous base floor.

*** For Belarussian production association BPO "Byelarusrezinotekhnika".

(Amended wording, Amendment Nos. 2, 4)

3. ACCEPTANCE PROCEDURE

3.1. Belts are accepted in batches. Belts of one type and sort from fabric of one description with the total length not more than 10 thousand m are considered to constitute one batch. In the event of low combustion ability belts for coal and slate mines the total length of a batch shall not exceed 5 000 m.

(Amended wording, Amendment No. 4)

3.2. For inspection of conformity of the quality of conveyor belts to the requirements of this Standard, the belts are exposed to acceptance/delivery and periodic tests according to tab. 9.

Table 9

Description of an indicator	Volume of sampling, frequency of tests	Type of tests	
		Acceptance /delivery	Periodic
1. Appearance, length, marking	100 %	+	
2. Width, fluctuations of actual thickness of a belt	Not less than one belt from a batch	+	-
3. Thickness of external rubber coverings	At least once per month on any five batches of belts on one belt from each batch	-	+
4. Physical-mechanical indicators of a belt (tab. 7, items 1.2a, b, d, e)	Not less than one belt from a batch	+	-
5. Combustibility (combustion time) of low combustion ability belts (tab. 7, item 4)	On six series of samples from each belt in a batch	+	-
6. Surface electrical resistance of low combustion ability belts (tab. 7, item 5)	Not less than one belt from a batch	+	-
7. Physical-mechanical indicators of traction layer on base (tab. 4)	As above	-	-
8. Physical-mechanical indicators of traction layer on weft (tab. 4)	At least once per year, not less than one belt from a batch	-	+
9. Physical-mechanical indicators of rubber coverings (tab. 6, item 1-6, 9, 10)	At least once per month on three series of samples of rubber of each class	-	+
10. Alteration of standard of conditional tensile strength, relative elongation at breaking of rubbers for external coverings after aging at temperature 100 and 125°C during 72 h, at temperature 126 °C during 168 h (tab. 6, item 7 and 8 for rubbers of classes T-1, T-2)	At least once per quarter on three samples of rubber of each class	-	+

Continued

Description of an indicator	Volume of sampling, frequency of tests	Type of tests	
		Acceptance /delivery	Periodic
11. Alteration of standard of relative elongation at breaking of rubbers for external coverings after aging at temperature 100°C during 24 h (tab. 6, item 8a for rubbers of classes A, Б, И, С, М)	At least once per year on three samples of rubber of each class	–	+
12. Alteration of standard of indicators of connection strength between the structural elements after aging at temperature 125°C (tab. 7, item. 3a for belts of types 2T1, 2T2) and indicator of connection strength for belts 2T3 (tab. 7, item 2f)	At least once per quarter on three belts of each type	–	+
13. Alteration of standard of indicators of connection strength between the structural elements after aging at temperature 100°C during 24 h (tab. 7, item 3c for belts of types 1, 2, 3 general purpose and frost-resistant)	At least once per year, not less than one belt from a batch	–	+

Notes:

1. The sign “+” means holding tests, sign “-” absence of trials.

2. The maximum permitted deviation of bead of a belt from a straight line, if necessary, is checked by the customer before suspending the belt on the conveyor.

(Amended wording, Amendment No. 2)

3.3. At deriving unsatisfactory results at acceptance/delivery tests even on one of the indicators set forth in items 2, 4, 6, 7 tab. 9 repeated testing shall be performed on the double quantity of samples of belts taken from the same batch.

At deriving unsatisfactory results at repeated testing the manufacturer shall perform testing of each belt in a batch.

(Amended wording, Amendment No. 2)

3.4. At deriving unsatisfactory test data for item 5 of tab. 9 repeated testing on the double quantity of samples taken from the same belt shall be performed. The results of repeated testing shall be applied to the given belt in a batch.

3.5. At deriving unsatisfactory results of periodic tests on indicators specified in items 9, 10, 11 tab. 9 repeated tests on the double quantity of samples taken from rubber of the same class shall be performed.

p. 30 GOST 20-85

At unsatisfactory repeated testing on these indicators is performed until deriving positive results at least on three successive series of samples.

3.6. At deriving unsatisfactory results of periodic tests on indicators specified in items 3, 8, 12, 13 tab. 9 repeated testing on the double quantity of samples taken from the same batch shall be performed.

On unsatisfactory results of repeated testing, the belts of this type and sort are transferred into the category subject to acceptance/delivery tests until deriving positive test data not less than on two successive batches testing two belts from a batch.

(Amended wording, Amendment No. 2)

3.7. Flammability of low combustion ability belts at friction on a drum (tab. 7, item 6) is tested by the manufacturer together with the customer in the course of development of new designs of belts, application of new materials or changes in the manufacturing technique.

4. TEST METHODS

4.1. Appearance of belts is inspected visually.

4.2. The dimensions of belts shall be inspected not earlier than 8 hrs after vulcanization.

4.2.1. The length of belts is inspected by the footage meter in a set with VГH-1, certified in accordance with the established procedure, or other instrument with a margin error of $\pm 0.1\%$.

4.2.2. The width of belts is measured by a metal gauge tape of 1st accuracy class meeting the requirements of GOST 7502-89 with a scale interval of 1 mm or other inspection tool ensuring measurement with a margin error ± 1 mm.

The width of a belt is measured at least on three stretches, at the distance from each other not less than 10 m and not less than 5 m from the ends of a belt. The arithmetic mean of three measurements is taken for the measurement result.

4.3. For determination of the area of longitudinal and cross crimps of a rubber covering, the area with crimps is delineated by rectangles enveloping the area of crimps.

The total area of crimps is calculated from the total square area of rectangles.

(Amended wording, Amendment No. 1)

4.4. The thickness of a belt is measured on a finished belt by a caliper meeting the requirements of GOST 11358-89 with a scale interval of 0.1 mm.

4.4.1. For determination of fluctuations in the actual thickness of a belt, thickness is measured in not less than three points at the distance not less than 10 m from each other and not less than 5 m from the ends of a belt. The arithmetic mean of the values obtained at measurement is taken for thickness of a belt.

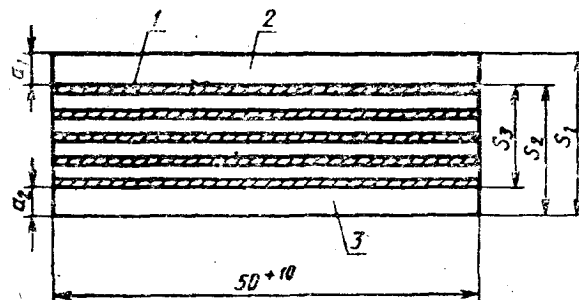
The maximum difference of the calculated indicator and the arithmetic mean value is taken for the value of fluctuation of the actual thickness.

4.4.2. The value of non-uniform thickness on the opposite sides of a belt is determined on at least three stretches in points, not farther than 50 mm from the beads and not closer than 5 m from the end of a belt located on opposite beads on a line perpendicular to direct axis of a belt.

The arithmetic mean of three measurements is taken for the measurement result.

4.5. The thickness of external rubber coverings (working and idle) is determined by method A or B.

In the event of method A, the thickness of external rubber coverings is determined on a sample of a belt without crimps with the length of (50.0 ± 10.0) mm and the width equal to the width of a belt (see the drawing) In the event of method B, thickness is determined with the help of a measuring microscope (Appendix 10)



1 - layer; 2 - rubber covering on the working side;
3 - rubber covering on the idle side

Thickness is measured in eight points evenly distributed along the width of the sample with a caliper meeting the requirements of GOST 11358-89. The results are rounded off to 0.1 mm.

The thickness of a belt s_1 is measured in eight points, then the working external covering is removed and the remaining thickness of a belt s_2 is measured in the same eight points. If the belt is provided with a protective or breaker cushions, they are removed together with the external rubber covering. The idle covering is removed and the remaining core thickness s_3 is measured in the same eight points.

p. 32 GOST 20-85

Thickness of the external working rubber covering a_1 is determined as a difference of measurements in eight points of thickness of belt s_1 and the rest of the belt after removal of the working rubber cover s_2 , i.e. $a_1 = s_1 - s_2$. The average value is determined on the basis of the obtained eight results.

If a belt is provided with a protective or breaker cushion, the difference of obtained thickness of the working covering and the thickness (design) of protective or breaker cushion is taken for the thickness of the working rubber covering.

Thickness of the idle rubber covering a_2 is determined as a difference of measurements in eight points of thickness of a belt without the working rubber cover s_2 and the rest of the core (without coverings) s_3 , i.e. $a_2 = s_2 - s_3$. The average value is determined on the basis of the obtained eight results.

(Amended wording, Amendment No. 2)

4.6. For physical-mechanical tests, a piece of belt (sample) with the length of (500 ± 50) mm and the width equal to the width of the belt is selected not earlier than 8 hours following vulcanization. The sample shall be cut out collateral to the rim of the belt, with an indentation of not less than 50 mm from the rim and not less than 1 m from the end of a belt.

4.7. Samples or blanks of samples of belts carved or cut out from the test sample are cured before the test at temperature $23 (\pm 5)^\circ\text{C}$ for at least 12 hours.

4.8. For determination of the breaking strength of one layer on base and weft samples are cut out from the tested material with the width of not more than 70 mm and the length not less than 400 mm.

4.8.1. For preparation of the samples for testing the carved blank of a sample of a belt with two or more layers is detached into separate layers. The extreme threads shall be removed or trimmed.

4.8.2. A working stretch with the length of $200.0 (\pm 1.0)$ mm is marked with two parallel marks on the prepared sample with the width of $25.0 (\pm 1.0)$ mm.

For belts manufactured on the basis of synthetic fabrics with the strength of 300 and 400 N/mm samples with the width of $25 (\pm 2)$ mm and the length of $200.0 (\pm 2.0)$ mm are permitted.

4.8.3. Samples are tested with a rupture-test machine with the permissible measuring error of effort $\pm 1\%$ ensuring the speed of the moving clamp of $100 (\pm 10)$ mm/min.

4.8.4. The breaking strength of a layer on base and weft is determined on six samples by testing two samples of any layers from each of three blanks of belt samples.

The strength at breaking (P), in N/mm of the width of a layer is calculated under the formula

$$P = \frac{P_1}{b}$$

Where P_1 – strength at breaking of a sample, N;

b - width of a sample, mm.

The mean arithmetic of six indicators is assumed as the test result.

4.9. The relative elongation is determined by applying a load of 10 % of the nominal strength of a sample to the samples carved or cut out from the tested material.

4.9.1. Samples shall have the length not less than 400 mm, and the width of 50 (± 1) mm. The working stretch of a sample shall have the length of 200 (± 1) mm. The samples are tested maintaining the complete number of layers. It is allowed to test the samples without rubber coverings. Tests shall be performed at the rupture-test machine with the speed of the moving clamp clip of 100 (± 10) mm/min.

4.9.2. Elongation of the working stretch of a sample is measured with a margin error of not more than 1 mm at the moment of reaching the preset loading corresponding to 10% of the nominal strength of the tested sample. The permissible margin of error of the preset loading at extension shall be $\pm 1\%$ from the limiting value of the selected scale of loads.

The nominal strength of a sample is calculated by multiplying the nominal strength of one traction layer specified in tab. 4, by the width in millimeters and by the number of traction layers of a sample.

4.9.3. The relative elongation of sample (ϵ) in percents is calculated under the formula

$$\epsilon = \frac{(l_1 - l_0) \cdot 100}{l_0}$$

Where l_0 – the initial length of the working stretch, mm;

l_1 – the length of the working stretch at the moment of measurement, mm.

The mean arithmetic of three indicators is assumed as the test result.

4.10. The connection strength at detachment between the structural elements is determined as set forth in GOST 6768-75 on six samples by the rupture-test machine provided with a recording instrument. The average force of detachment (P_{av}) is determined under the detachment diagram as the mean arithmetic of 50 % of the lowest peak values for each two next layers separately.

p. 34 GOST 20-85

(Amended wording, Amendment No. 1)

4.10.1. Samples shall have the length not less than 175 mm, and the width of 25 (± 1.0) mm. Samples may be carved in any way ensuring the specified tolerance on width. The tests shall be performed making use of the rupture-test machine at the speed of the moving clamp clip 100 (± 10) mm/min.

4.10.2. The connection strength at detachment is determined on six samples from each belt. The working covering is detached on three samples with subsequent detachment of each layer until reaching the middle layer of a sample. On other three samples the idle covering is detached with the subsequent detachment of each layer until reaching the middle layer. In the event of even number of layers, half of the total number of layers is detached.

4.10.3. The mean arithmetic of indicators of three tested samples differing from the average not more than by ± 10 % is assumed as the test result

4.10.4. It is allowed to determine the connection strength at detachment in accordance with the requirements of GOST 6768-75 without the recording instrument with the additions described below. Preparation of the samples for testing shall meet the requirements set forth in items 4.10.1, 4.10.2.

In the course of testing ten pairs of maximum and minimum values of connection strength between every two next elements of belts are registered. The indicator of connection strength for each pair of elements is calculated as the mean arithmetic of the ten pairs of received maximum and minimum values.

The results are calculated as set forth in item 4.10.3.

(Amended wording, Amendment Nos. 1, 4, 5)

4.10.5. A belt is considered as having passed the tests, if the obtained connection strength for each two next layers separately is not lower than the standard established in item 2.19.

(Introduced additionally, Amendment No. 1)

4.11. The conditional tensile strength and the relative elongation at breaking of the covering rubbers is determined in accordance with GOST 270-75 on a sample of type I with the width of 2 mm for rubber of classes T-1, T-2, and on a sample of type II with the width of 2 mm for other classes of rubber.

4.12. The factor of frost resistance at extension is determined in accordance with GOST 408-78, by method A.

4.13. The losses of volume of covering rubbers of all classes at attrition are determined in accordance with GOST 23509-79.

4.14. The attrition resistance is determined in accordance with GOST 426-77.

4.15. Shore hardness test A is performed in accordance with GOST 263-75 on samples selected from rubbers applied in the manufacturing of external coverings of belts.

(Amended wording, Amendment No. 2)

4.16. Alteration of the standards of the conditional tensile strength and of the relative elongation at breaking of rubbers applied in the manufacture of external coverings is determined in accordance with GOST 9.024-74 (method 1) after aging in an air-slaked thermostat at temperature and duration of aging specified in tab. 6.

The conditional tensile strength and the relative elongation at breaking of rubber of class T-3 after aging in an air-slaked thermostat at temperatures and the duration of aging specified in tab. 6, is determined in accordance with GOST 9.024-74, assuming for the result the mean arithmetic of the obtained results of the tests on conditional tensile strength and on relative elongation at breaking performed after aging.

(Amended wording, Amendment No. 1)

4.17. Alteration of standards of connection strength between the structural elements of belts as compared to the established in item 2 of tab. 7 is determined after aging of the blanks of samples with the dimensions $[(400 \times 400) \pm 50]$ mm in an air-slaked thermostat meeting the requirements of GOST 9.024-74, method 1.

4.17.1. Blanks of samples selected from the same belts as for tests in accordance with item 4.10 are placed in a thermostat. The temperature and duration of aging are specified in tab. 7.

After thermal aging the blanks are subject to aging at temperature $23 (\pm 2) ^\circ\text{C}$ for not less than 16 hours and not more than 6 days. Then the samples are carved out as set forth in item 4.10.1 with an indent of not less than 50 mm from the sides of the blank. The tests shall be performed as specified in item 4.10.

Alteration of standard of connection strength between the structural elements of belts after aging (S) in percents for belts of sorts 2T1 and 2T2 as well as for the general purpose and frost-resistant sorts of types 1, 2, 3 is calculated under the formula

$$S = \frac{A_1 - A_0}{A_0} 10$$

Where A_0 - standard of connection strength before aging as specified in tab. 7, item 2, N/mm;

A_1 - connection strength after aging calculated as set forth in items 4.10.3, 4.10.4, N/mm. For belts 2T3 the values of indicators of connection strength after aging (A_1) calculated according to item 4.10.3, 4.10.4 are assumed for the test results.

p. 36 GOST 20-85

A belt is considered as having passed the tests, if the alteration of connection strength for each two next layers separately is not worse than the standard established in item 3, of tab. 7, and not worse than the standard established in item 2f of tab. 7 for belts 2T3.

4.17. 4.17.1. (Amended wording, Amendment No. 2)

4.18. Combustibility (combustion time) in a blowpipe flame of low combustion ability belts for coal and slate mines, and of low combustion ability frost-resistant belts is determined with the help of the technique approved in accordance with the established procedure.

(Amended wording, Amendment No. 1)

4.19. The surface electrical resistance and flammability at friction on a drum of low combustion ability belts for coal and slate mines, and of low combustion ability frost-resistant belts is determined using methods described in mandatory appendixes 6 and 7.

(Amended wording, Amendment No. 1)

4.20. The absence of harmful admixtures in rubbers applied in the manufacture of coverings of belts for foodstuffs is inspected according to the rules approved by the USSR Ministry of Health.

4.21. The maximum deviation of the bead of a belt from the straight line is determined as follows: a belt is unrolled on a flat platform and aged for not less than 12 hours (except for the low combustion ability belts) A thin wire (cord) is pulled connecting two points on the bead of a belt at the distance of 20.00 (± 0.05) m from each other, and the gap between the straight line formed by the stretched wire (cord) and the line of the bead of a belt is measured in five points. The measurement may be performed by any measuring tool with a scale interval of 1 mm.

The maximum deviation of the bead of a belt from the straight-line (X) in percents of the width of a belt b in mm is calculated under the formula

$$X = \frac{Z}{b} 100$$

Where Z - the maximum value of five measurements, mm.

(Amended wording, Amendment No. 1)

5. THE MARKING, PACKING, TRANSPORTATION AND STORAGE

5.1. Belts shall have distinct marking. Belts of types 1, 2 and 3 with the width more than 500 mm shall have relief marking. Belts of type 3 with the width up to 500 mm and the belts of type 4 of all widths shall have marking on the label from any material ensuring preservation of marking at transportation and storage. Belts with relief marking shall also have marking on the label.

5.2. The relief marking shall be located at a distance of not less than 3 000 mm from the ends of a belt, and not farther than 200 mm from the bead through each 10-20 m along the length of a belt.

For belts with the width of up to 650 mm the marking may be applied through 20-30 m.

5.2.1. The relief marking shall contain:

The brand mark or the brand mark and the description of manufacturer;

The type and sort of a belt;

The type of fabric;

The width and the number of layers;

The thickness of rubber coverings and the class of rubber;

The number of a belt;

The year of manufacture.

The instance of marking is specified in the appendix 8.

On the belts with rifled beads the width of a belt may be omitted in relief marking.

(Amended wording, Amendment No. 4)

5.3. The labels are attached to both ends of belts. One of the labels shall be fastened to the inner surface of the last coil of the rolled belt. For belts with relief marking, labels shall be attached to one end of the belt.

5.3.1. Labels shall specify:

The brand mark or the brand mark and the description of the manufacturer;

The identification number and the length of a belt;

The number of a belt;

The year and the month of manufacture;

The type of cushion and covering rubbers recommended for connection by hot cure, the type of glue;

The type of glue recommended for connection by cold vulcanization;

The stamp of the engineering control of the manufacturer;

The stamp of the constant representative of the USSR Coal Mining Ministry for low combustion ability conveyor belts for coal and slate mines;

The designation of this Standard.

It is permitted to indicate the batch number and the square area of the belt in square meters on the labels for belts of type 4 instead of the numbers of the belt.

(Amended wording, Amendment No. 1)

p. 38 GOST 20-85

5.4. Belts for regions with a tropical climate shall be marked, labeled and packed according to the requirements of GOST 15152-69.

5.5. Belts of types 1.2, 2, 3 and 4 shall be winded in rolls and cross-tied and tied on the external surface of a roll by a fabric strip from waste products of conveyor belts. Belts with the width up to 650 mm inclusive shall be cross-tied in at least two places. Belts with the width more than 650 mm shall be cross-tied in at least three places.

Belts with the width of up to 1 000 mm inclusive shall be tied on the external surface of a roll in at least one place. Belts with the width more than 1 000 mm shall be tied on the external surface of a roll in at least two places.

(Amended wording, Amendment No. 1)

5.6. The conveyor belts of type 1.1 shall be reeled up on a spool with the diameter not less than 400 mm and tied with a fabric strip on the external surface of the roll as described in item 5.5.

5.7. The transportation marking shall meet the requirements of GOST 14192-77 and bear a handling sign "Do not handle with hooks".

5.8. Belts are shipped by transport of all types in the covered vehicles and in containers in compliance with the rules of shipment of freight effective for the transport of the given type.

Railway shipments shall be performed in railway cars.

If the weight of one cargo piece (roll of a belt) is not more than 500 kg, the integration of cargo pieces is allowed. The weight (design) of belts is specified in the reference appendix 9.

The gross weight of package shall not exceed 1 ton.

Shipped freight shall be fastened according to GOST by 21650-76 with synthetic belts or belts on the basis of gummed synthetic fabrics from waste products.

5.9. Belts shall be stored in enclosed locations in the temperature range from minus 5 to plus 30 °C not closer than 1 m from the heating devices.

Belts shall be protected from direct solar and heat radiation, acids, alkalis, oils, benzine, kerosene and their vapors as well as from other substances destroying rubber and fabric.

At storage the rolls of belts of types 1, 2 and 3 shall be stacked horizontally in not more than two rows running, and the rolls of belts of type 4 - not more than in four rows.

The storage of rolls of belts on their lateral side (butt) is not allowed.

Short time (not more than 15 days) storage of belts under canvas is permitted.

(Amended wording, Amendment No. 2)

5.10. After transportation and storage at negative temperature the belts shall be cured at the temperature $20 (\pm 5) ^\circ\text{C}$ for at least 24 hours.

(Amended wording, Amendment No. 2)

6. MANUFACTURER'S WARRANTY

6.1. The manufacturer warrants the conformity of belts to the requirements of this Standard at observance of operating conditions, storage and transportation.

6.2. The warranty period of shelf life of belts - 12 months from the date of manufacture.

(Amended wording, Amendment No. 2)

6.3. The warranty period of operation of the general purpose, frost-resistant and low combustion ability belts for coal and slate mines - 12 months, the heat-resistant type 2T1 and belts for food products - 6 months, the heat-resistant type 2T2 - 4 months, the heat-resistant type 2T3 - 3 months from the date of commissioning of belts.

**THE DESCRIPTION OF FABRICS APPLIED IN THE MANUFACTURE
OF CONVEYOR BELTS**

Strength of a fabric on base, N/mm	Designation of synthetic fabrics		Designation of combined fabrics (polyester/cotton))
	Base and weft from polyamide threads	Base from polyester threads, weft from polyamide threads	
65	—	—	БКНЛ-65 GOST 19700-74 БКНЛ-65-2 GOST 19700- 91
100	TA – 100, TK-100 GOST 18215-87	—	—
200	TK-200-2 GOST 18215-87	TLK-200 GOST 226.10-77	—
3.00	TA-300, TK-300 GOST 18215-87	TLK-300	—
400	TA- 400, TK-400 GOST 18215-87 MK – 400/120-3	—	—
200/200*	Protective layer	—	—
300/300*	Protective layer	—	—
40/100*	Breaker cushion TKБ GOST 18215-87	—	—

Strength on base and weft.

(Amended wording, Amendment No. 1)

Thickness (design) of the rubber-textile padding

Number of traction layers of a padding	Thickness (design), mm of the rubber-textile padding from fabrics							
	Combined (polyester/cotton)	Synthetic (polyamide)					Synthetic (polyester/polyamide)	
	Nominal strength of traction layer on base, N/mm							
	55	400/100 **	400/75 **	300	200	100	300	200
1	1.2	–	–	–	–	1.1	–	–
2	2.4	–	–	–	3.2	2.2	–	3.2
3	3.6	9.0	6.0 6.9*	5.7; 6.6*	4.8; 5.7*	3.3; 4.2*	6.3	5.1
4	4.8	12.0	8.0; 9.2*	7; 6; 8.8*	6.4. 7.6 *	4.4; 5.6*	8.4	6.8
5	6.0	15.0	10.0; 11.5*	9.5; 11.0*	8.0; 9.5*	5.5; 7.0*	10.5	8.5
6	7.2	1.8.0	12.0; 13.8*	11.4; 13.2*	9.6; 11.4*	6.6; 8.4*	12.6	10.2

* Thickness (design) of padding for heat-resistant, low combustion ability for coal and slate mines, low combustion ability frost-resistant belts and belts of type 2.2 from rubbers of classes Г-1 and Г-2.

** Strength on base (400) and weft (100 and 75)

Note.

At calculation of the padding thickness for belts of type 1 the thickness of protective and breaker cushions with the rubber interlayer is also taken into account: for protective cushion with the strength of fabric 200/200 N/mm - 3.2 (± 0.4) mm; for protective cushion with the strength of fabric 300/300 N/mm - 4.5 (± 0.4) mm; for breaker cushion TKB- 1.5 (± 0.2) mm.

(Amended wording, Amendment Nos. 1, 2)

**MAIN INSTRUCTIONS FOR THE OPERATION AND APPLICATION
OF CONVEYOR BELTS**

1. For correct selection of the type of conveyor belt and its technical characteristics for the newly designed machines and equipment the application of conveyor belt shall be agreed between the manufacturer and the customer.

2. The main operating instructions for the application of the belts at the customer's enterprises shall be regulated by the engineering specifications agreed with the manufacturer.

3. The type and sort of a belt shall meet the terms of its application specified in tab. 1 of this Standard. Belts of type 4 are applied on conveyors with a continuous base floor.

4. The conveyors working in adverse and extremely adverse operating conditions shall be provided with devices reducing impact load on belts and preventing the longitudinal breaking of a belt.

5. Supervision over the correct operation of a belt shall be carried out by a responsible staff member of the customer enterprise.

6. The account of the operation of belts shall be exercised in a log-book of conveyor operation. The form for the keeping of records is established in the industry branch research and technical documentation. At installation and replacement of a belt the characteristics of the belt according to item 5.2.1 of this Standard, service life and the reasons for dismantling of the belt are recorded in the log.

7. The rubber-fabric belts are connected by the method of hot or cold vulcanization in compliance with the instructions of the developers and manufacturers of belts released not earlier than the year of 1971. Connection and installation of belts 2T2 is performed at the temperature of air not below than 0 °C.

8. Belts are connected making use of cushion and covering rubbers and glues, specified in the label as stipulated in item 5.3.1 of this Standard.

9. Belts of all types from fabrics with the strength not more than 100 N/mm and the width up to 1 200 mm and low combustion ability belts with the width up to 1 200 mm on the basis of fabrics with the strength of 200 N/mm may be connected by mechanical ways in accordance with the engineering specifications of the appropriate ministries and departments agreed with the developer of belts.

10. The surface temperature of the working covering of the heat-resistant belts in places of unloading of conveyed weights is measured by a photoelectronic pyrometer of type ФЭП-8 or any other measuring instrument ensuring precision of measurement $\pm 5^{\circ}\text{C}$

**TECHNIQUE FOR ESTABLISHMENT OF THE CATEGORY OF OPERATING
CONDITIONS OF CONVEYOR BELTS ON SPECIFIC CONVEYORS**

1. The categories of operating conditions of the general purpose conveyor belts on specific conveyors shall be established on the basis of the sum of mark evaluations of the operating factors specified in tab. 1.

Table 1

The description of major operating factors	The degree of the factors or their characteristics	Evaluation of the factor, marks	
The dimensions of pieces of weight, mm	0-80 (small piece weights)	0	
	0-150 (middle size piece weights)	8	
	0-350 (middle size piece weights)	18	
	0-590 (large piece weights)	25	
Abrasive of weight	Non-abrasive	0	
	Low abrasive ability	6	
	Abrasive	15	
	Highly abrasive	25	
Bulk density of weight, t/m ³	Up to 1.0	0	
	From 1.0 up to 1.7	0.2	
	From 1.7 up to 2.3	0.4 ×	Multiplied by the estimated size of pieces
	From 2.3 up to 2.7	0.5	
	From 2.7	0.7	
Altitude of free fall of a weight on a belt, mm	Up to 300	0.2	
	Over 300 up to 800	0.5	Multiplied by the estimated size of pieces
	Over 800 up to 1 500	0.7 ×	
	Over 1 500 up to 2 000	1.0	
Speed and direction of driving of the weight and of the belt in the place of loading	Close	0	
	Considerably differing	0.4 ×	Multiplied by the estimated abrasiveness
Method of unloading	Through the head drum	0	
	By an unloading carriage	10	
	By a plate diverter	1.0 ×	Multiplied by the estimated abrasiveness

Tab. 1 continued

The description of major operating factors	The degree of the factors or their characteristics	Evaluation of the factor, marks
Minimum ambient temperature of air, °C	Above 0	0
	Below 0	10
Effect of atmospheric precipitation or weights with tall damp	Absent	0
	Present	10
Conditions of maintenance service	Good	0
	Hampered	20

If the sum of marks makes:

From 0 up to 20 – the operating conditions are considered favorable;

From 20 up to 50 – the operating conditions are considered average;

From 50 up to 75 – the operating conditions are considered adverse;

From 75 up to 100 – the operating conditions are considered extremely adverse

If the sum of numbers exceeds 100 application of conveyor belts is not allowed.

2 The categories of abrasiveness of some weights are specified in Table 2

Table 2

Category of abrasiveness of load	Type of load
Non-abrasive	Agricultural products, grain, sawdust, wood chips, packaged weights in pieces and other
Low abrasiveness	Brown coal, mineral coal, forming ground, soft stripped rock, lump-graded sulfur, clay, fireclay, dinas, sand, gravel, cement and other
Abrasive	Iron oxide, anthracite, formation rock of average stability (stability up to 10 on Protokyakonov scale), coke, fusion mixture, mining concentrate, fossil rock, magnesite, mining agglomerate, gravel and other
Highly abrasive	Complex ores, ores of non-ferrous metals, firm rock formation (stability more than 10 on Protodyakonov scale), iron oxides with turnings of quartzite and other

3. Instance of establishment of a category of operating conditions for the concrete conveyor.

3.1. Belts are operated on conveyor installed at the crushing factory of metallurgical plant.

Major factors of operation:

Length of the conveyor 80 m
 Width of a belt 1 000 mm
 Productivity 500 t/h
 Weight - iron oxide by coarseness of 0-150 mm and by bulk weight of 2.6 t/m³
 Altitude of free fall of a weight on a belt. 600 mm
 Direction of driving of a weight and belt in the place of loading. Does not coincide
 Unloading. Through the main drum
 Minimum temperature of air..... 10°C
 Conditions of maintenance service..... Good
 Effect of moisture Not present.

3.2. According to tab. 1 and 2 of this appendix the evaluation of the factors of operation is performed as follows (in marks):

Dimensions of pieces 8
 Abrasiveness 15
 Bulk weight $0.5 \times 8 = 4$
 Altitude of free fall $0.5 \times 8 = 4$
 Speed of driving of a weight and the belt
 in both directions does not coincide $0.4 \times 15 = 6$
 Minimum temperature of air 0
 Effect of atmospheric precipitation or damp weights
 Conditions of maintenance service 0

Total 37

3.3. According to item 1.1 the operating condition of the specified conveyor are evaluated as average.

**MAIN RULES FOR CONNECTION OF RUBBER-FABRIC
CONVEYOR BELTS**

1. Connection of rubber-fabric conveyor belts is performed by hot and cold vulcanization and mechanically.

2. In the event of hot vulcanization of seams of the rubber-fabric belts portable cross-linking press ensuring pressure on a belt not less than 1 MPa (10 kgf/cm²) and the temperature 150 °C are used, as well as glue for adhesive dip of the surfaces of seams and cushion rubber, covering and cushion rubber, solvents (benzine ethyl acetate) for dilution of glue in case of its jelling

The cutting of the ends of a belt is performed in steps. The length of the steps is specified in tab. 1.

Table 1

**Length of seam steps for rubber-fabric belts at
cold and hot vulcanization**

Strength of fabric layer, N/mm	55	100	200	300	400
Length of middle steps, mm	100	150	250	300	350
Length of extreme steps, mm	130	200	330	400	470

The length of the connecting seam (L_s) is determined under the formula

$$L_s = l_s \left(i - \frac{1}{3} \right) + 2l_3 + \frac{1}{3}b$$

Where l_s – the length of the middle step, mm (tab. 1);

i - the number of layers;

l_3 - the width of closing up of the seam, mm (tab. 2);

b - the width of a belt, mm.

Width of closing up of the seam of rubber-fabric belts at hot vulcanization

Table 2

	mm					
Width of belt b	Up to 650	Over 650	Up to 800	Over 800	Up to 1 400	Over 1400
The width of closing up of the seam l_3	30		60		75	120

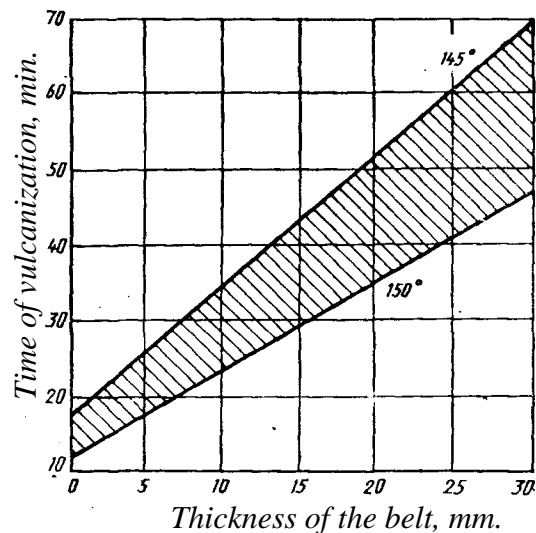
2.1. The average consumption rate of materials at connection of belts is specified in tab. 3.

Table 3

Description of material	Average consumption rate on 1 m ² of the seam, kg
Hot vulcanization	
1. Rubber-based glue*	
3. Glue "Leykonat"	1.5
3. Cushion rubber by width of 0.5+1.0 mm*	0.15
4. Calendered covering rubber by width of 2 mm*	1.0
5. Benzine BP-1 (BP-2)	0.5
6. Ethyl acetate	0.1
Cold vulcanization	
7. Rubber-based glue*	1.0
8. Glue "Leykonat"	0.15
9. Benzine BP-1 (BP-2)	0.5
10. Ethyl acetate	0.1

* Grades of glues and rubbers are specified in the accompanying documents for belts and in the industry branch instructions on connection of belts.

The process of vulcanization of the seams of rubber-fabric belts is specified on the drawing. The plates of the autoclave press are removed from the belt after their cooling to the temperature of 70 °C.



p. 48 GOST 20-85

3. At cold connection of the rubber-fabric belts the length of steps is determined in accordance with tab. 1, and the length of connection seam is determined under the formula

$$L_s = l_s \left(i - \frac{1}{3} \right) + \frac{1}{3} b$$

Where l_s - the length of the middle step, mm (tab. 1);

i - the number of layers;

b - the width of a belt, mm.

The average consumption rate of materials is specified in tab. 3. The seam shall be cured for 24 hours without start-up of the conveyer under load to gain full strength of the seam.

The warranty shelf life of rubbers and glues shall meet the term specified in the reference documents on these materials.

**TESTING OF LOW COMBUSTION ABILITY CONVEYOR BELTS
FOR FLAMMABILITY AT FRICTION ON DRUM**

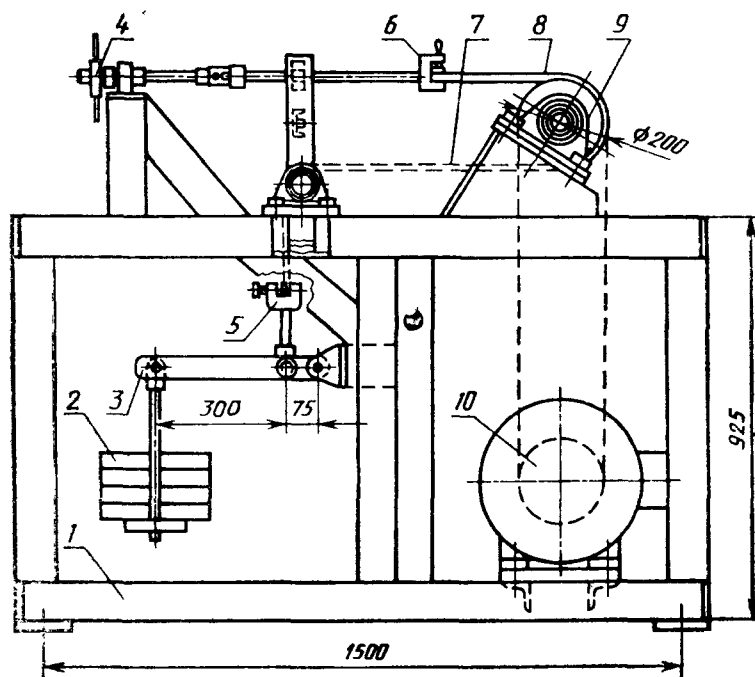
1 Testing on friction on a drum shall be performed on the stand with a rotating drum in the mode of complete frictional sliding of a belt sample against the surface of the drum.

2. The essence of this method consists in the visual study of incombustibility (flammability) of a belt during friction of the surface of a drum against the sample and in the finding of the maximum temperature of the drum during the test.

3. The tests shall be performed on three samples with the length of 1 600 (± 50) mm and the width of 150 (± 5) mm carved from the base of a finished belt.

Samples are carved with an indent not less than 100 mm from the beads of a belt and not less than 1 m from the end of a belt.

4 The design and the principal dimensions of the stand shall meet the drawing.



1 - frame; 2 - weight; 3 - lever; 4 - steering wheel; 5 - lower clamp;
6 - upper clamp; 7 - sample of a belt (leaving branch); 8 - sample of a belt
(entering branch), 9 - drum; 10 - drive

p. 50 GOST 20-85

5. Key parameters of the stand:

Engine capacity	(75±0.5) kw
Speed of rotation of a drive	(1 500±50) min ⁻¹
Diameter of the drum	(200±5) mm
Drum face	(300±5) mm
Linear speed of rotation of the drum	(2.0±0.1 m/sec
General length of the lever.	(375±1) mm
Length of the lever arm up to the load point on a sample of a belt	(75±1) mm
Maximum tension of a sample of a belt in the leaving branch	1 250 N
Angle of a grasp of the drum by a belt	(180±5)°

6. For creation of tension in the leaving branch the stand shall be provided with a set of weights by 3.0 (±0.5), 15.0 (±0.5) and 25.0 (±1.0) kg calibrated in accordance with the established procedure.

7. For the measurement of the temperature of a drum, thermoelectric chromel-copel surface thermometer of type TXKII-541 with a limit of measurement (0-600)°C is applied.

The thermometer shall be built in the body of the shell of a drum.

8. Before the test, one end of the belt sample (the entering branch) is fixed in the upper clamp of the stand, and the other end of the sample (leaving branch) is fixed in the lower clamp.

9. In the leaving branch of a sample of a belt tension sufficient for tight contact of the belt (visual control on absence of a clearance between the drum and the sample of a belt in crosspoints of the drum circumference with its vertical axis) is created by the lever and weights.

10. At loading the leaving branch of a sample at a motionless drum and further on during the whole cycle of the test the lever shall be kept in the horizontal position maintained by movement of the sample of a belt with the help of a steering wheel.

11. Turning on of the engine of the stand makes the drum rotate and provides tight pressing of the surface of a belt at the stretch of contact of the belt with the drum.

12. At the first minute of testing after turning on of the engine the weight with the mass of 3.0 (±0.5) kg is attached to the lever end, at the third minute - the weight with the mass of 15.0 (±0.5) kg, and at the tenth minute - the weight of 25.0 (±1.0) kg, thus ensuring the tension in the sample of a belt respectively (150, 750 and 1 250) N (15, 75 and 125) kgf. The time is measure by a stop watch of the second class of accuracy.

13. The tests continue until catching fire or destruction of the samples of a belt after which the engine is turned off.

14. On destruction of the sample of before the expiry of the tenth minute of a test, the testing shall be performed using weights with the mass of 3.0 (±0.5) and 15.0 (±0.5) kg (attached to the lever on the first and the third minutes of testing respectively)

15. In the course of testing, visual study of flammability (incombustibility) of a sample of a belt shall be conducted and the maximum temperature of the surface of a drum developed as a result of friction of a drum against the sample of a belt is determined by a thermometer. The maximum temperature shall not exceed 300 °C.

16. The belt is considered as having passed the test, if none of the three samples caught fire before destruction of a sample.

17. Safety requirements

17.1. The location for testing shall be equipped with forced ventilation and with the means of fire extinguishing (asbestos blanket, sand, carbon-dioxide fire extinguisher) The use of water is forbidden.

17.2. The stand shall be provided with local exhaust ventilation, which shall be switched on during the whole cycle of a test.

17.3. The electrical equipment of the stand shall be grounded.

17.4. The maximum concentration limit of harmful substances in air during a test shall not exceed:

20 mg/m³ – for carbon monoxide;

5 mg/m³ – for hydrogen chloride.

17.5. Definition of the contents of HCl and CO in the air shall be conducted by methods explained in the book “The methods for definition of harmful substances in air” by M.S.Bykhovskaya, S.L.Ginzburg, and O.D.Khalizova, published in Moscow by “Meditsina Publishers”, 1966, pp. 69, 240-250.

17.6. At increase of the concentration of hydrogen chloride and of the carbon monoxides in air above the maximum permissible level as well as in the event of accidents gas-masks of type CO (white box) or of type M (red box) shall be used.

17.7. At holding tests it is not allowed to put the hands closer than 200 mm to the rotating drum.

17.8. It is categorically forbidden to measure the temperature of a drum during its rotation until the dead stop of a drum.

17.9. During the tests there shall be not less than two persons in the location.

18. The work site shall be provided with instructions on the safety rules and industrial hygienic standards.

**TESTING OF LOW COMBUSTION ABILITY CONVEYOR BELTS ON SURFACE
ELECTRICAL RESISTANCE**

1. The tests shall be performed on three samples of a belt from both sides at the temperature of air $20 (\pm 5) ^\circ\text{C}$ and relative humidity $55 (\pm 5) \%$. The selected samples of belts shall be cured before tests in the specified conditions for not less than 2 hours.

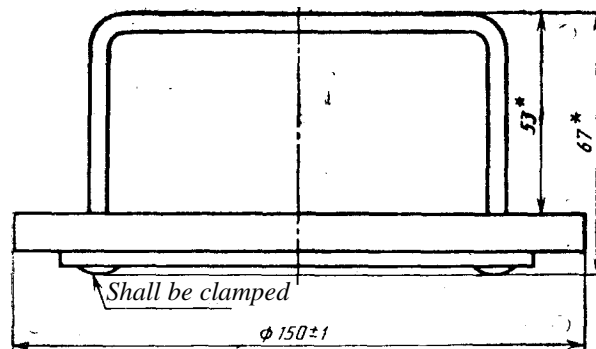
The samples shall have the dimensions not less than 300×300 mm. Samples are carved out with an indent from the end of a belt of not less than 1 m.

2. For removal of talc, traces of oil and other polluting substances from the surface of a belt, samples shall be carefully wiped with benzine of grade БР-1 or БР-2 in accordance with GOST 443-76 or with ethyl alcohol in accordance with GOST 18300-72, GOST 17299-78. A sheet of polyethylene of high or low density (GOST 16337-77 or GOST 16338-77) or other solid insulant with specific surface electrical resistance not less than 1012 Ohms measured in accordance with GOST 6433.2-71 is put under the sample. The sheet of polyethylene shall have the dimensions not less than 360×350 mm and the width not less than 1 mm.

3. Liquid conductor (10% solution of soda ash in accordance with GOST 51100-73) is applied on the metal surface of electrodes which contact the sample.

4. Two brass electrodes are positioned as follows: inside the circular grounded electrode with external diameter $150 (\pm 1)$ mm, internal diameter $125.0 (\pm 0.1)$ mm and the mass $900 (\pm 10)$ g a cylindrical high-voltage electrode with diameter $25.0 (\pm 0.1)$ mm and the mass $115 (\pm 5)$ is placed.

The relative positioning of electrodes is established by a template (see the drawing) with permissible displacement from the center ± 2.0 mm.



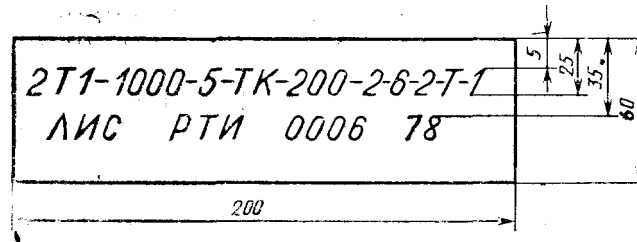
* Reference dimensions.

5. A metering instrument (teraohmmeter of type E6-3, E6-13, E6-10, MOM-4) is connected to the electrodes. The measuring voltage of direct current shall not be less than 100 V. Electrical resistance of a sample is arrested during 2-3 minutes according to the readings of the meter.

6. If the electrical resistance in all of the samples does not exceed the standardized value, the belts are considered as having passed the test.

MARKING OF RUBBER-FABRIC CONVEYOR BELTS

An instance of marking and the principal dimensions of marking of the rubber-fabric conveyor belts are shown on the drawing.



The letter and digital indexes indicate a belt N 0006, of type 2, heat-resistant 2T1 with the width of 1 000 mm of five layers from fabric TK-200-2, with a covering from rubber T-1 with the width of 6 and 2 mm manufactured by Lisitchansk factory ПТИ in 1978.

The dimensions of marking shall be not less than specified on the drawing.

THE MASS (DESIGN) OF CONVEYOR BELTS

The mass (design) of 1 m² of conveyor belts in kg with external coverings of various thickness and the padding from fabrics of various types is specified in the table.

Type of fabric of the traction padding	Thickness of an external covering, mm	Number of fabric layers,			
		3	4	5	6
БКНЛ-65	3.0/1.0	7.3	8.2	9.1	10.0
БКНЛ-65-2	4.0/2.0	9.7	10.6	11.5	12.4
ТА - 100	5.0/2.0	11.6	12.8	14.0	15.2
ТК - 100	6.0/2.0	12.8	14.0	15.2	16.4
	8.0/2.0	15.2	16.4	17.6	18.8
ТК – 200 - 2	4.5/3.5	14.6	16.0	17.2	18.8
	6.0/2.0	13.4	14.8	16.2	17.6
	6.0/3.5	15.8	17.2	18.6	20.0
	8.0/2.0	15.8	17.2	18.6	20.0
ТЖК - 200	6.0/2.0	14.0	15.6	17.2	18.8
	8.0/2.0	16.4	18.0	19.6	21.2
ТА - 300	6.0/2.0	13.7	15.2	16.7	18.2
	6.0/3.5	16.1	17.6	19.1	20.6
	8.0/2.0	16.1	17.6	19.1	20.6
ТЖК - 300	6.0/2.0	14.3	16.0	17.7	19.4
	8.0/2.0	16.7	18.4	20.1	21.8
ТК - 400	6.0/2.0	14.0	15.6	17.2	18.8
	6.0/3.5	15.8	17.4	19.0	20.6
	8.0/2.0	16.4	18.0	19.6	21.2
	10.0/3.0	20.0	21.6	23.2	24.8
МК – 4010 – 120 - 3	6.0/2.0	18.8	21.0	23.2	25.4
	8.0/2.0	21.2	23.4	25.6	27.8
	10.0/3.0	24.8	27.0	29.2	31.4

Note. In the graph “ Thickness of an external covering ” the numerator is the nominal thickness of a rubber covering of the working surface, whereas the denominator specifies the thickness of the idle surface of a belt.

The specified design data serve for the definition of the mass of a belt rolled in a coil and for selection of the load handling mechanisms of the appropriate weight-lifting capacity applied at storage or transportation of a belt.

The maximum mass of 1 m² of one or two-layer belts of type 4 and of two-layer belts of types 2 and 3 from fabrics of any type with an external covering of both the working and the idle surface of the belt with the width of 1.0 mm makes 3.0 kg.

At changing of the width of rubber coverings of belts of all types and sorts by 1 mm the mass (design) of belts varies by 1.2 kg.

**DETERMINATION OF THE THICKNESS OF EXTERNAL RUBBER COVERINGS WITH
A MEASURING MICROSCOPE (METHOD A)**

The essence of the method consists in the measuring of the thickness of external rubber coverings of finished belts with a microscope with small magnification.

1. Method of sampling

1.1. From a finished belt a piece of belt with the length of 10-25 mm and the width equal to the width of a belt is selected not earlier than 8 hours following the vulcanization. The sample shall be carved out from uncorrugated parts of the belt with an indent from the end of a belt of not less than 1 m.

1.2. The surface of the sample shall meet the requirements specified in item 2.1.3 of this Standard.

1.3. Eight specimen (rectangular plates) with the length of not more than 100 mm (see the drawing) are carved from the sample evenly all along its width

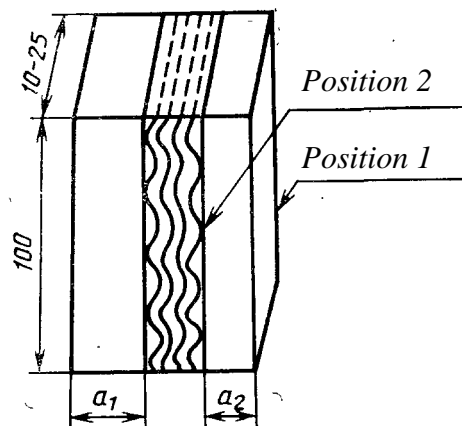
2. Instrumentation

2.1. Measuring microscope of any type ensuring the measurement range from 0 to 10 mm.

Measuring metal tape in accordance with GOST 7502-89 with a scale interval of 1 mm or any measuring tool ensuring measurement with a margin error ± 2 mm.

3. Preparation for a test

3.1. A microscope is positioned on a massive foundation (on a plate, table) in a location, where the vibration does not exceed the standard established for the taken type of a microscope.



p. 56 GOST 20-85

3.2. The specimen is placed on the object stage of the microscope so that the surface of the cut faces the tube.

4. Measuring the thickness of the covering

4.1. Thickness of the covering is measured at the temperature of (28 ± 5) °C in the test location.

4.2. For measuring of the thickness of a covering the sharp view of a sample is achieved first.

4.2.1. Coarse focusing is performed by manual displacement of the tube of a microscope on the rack and fixing it in the necessary position.

4.2.2. With the help of the rack-and-pinion steering the tube is positioned so as to achieve the sharp view of the surface of a sample.

4.2.3. With the help of diopter focusing of an eyeglass the tube is fixed on the vertical optic axis so as to ensure sharp view of the cut of the sample.

4.2.4. By turning the stage of the microscope the vertical axis is fixed collaterally to the external boundary of the working covering of a belt.

4.3. By turning the micrometer adjustment screw the vertical axis is aligned with the external boundary of the work covering (position 1) and the micrometer head readings are registered.

4.4. With the help of the micrometer mechanism the vertical axis is aligned with the external lips of the upper fabric layer (position 2) and the readings are registered.

4.5. The value of the thickness of the working covering a_1 is determined on the difference between the readings in the first and second position.

4.6. The thickness of the idle rubber covering a_2 is measured in the same way on the opposite side of a sample.

4.7. The measurements are performed on eight samples with one amendment of thickness on each sample of a working and idle covering.

5. Processing of results

5.1. The mean arithmetic of results obtained after eight measurements is taken for the test result. At calculation of the mean value the result is rounded off up to the first decimal sign.

DETAILS

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2. APPROVED AND INTRODUCED by Decree No. 4445, dated 20.12.85, of the USSR State Committee for Standards

3. First review period - 1989; review frequency - 5 years

4. This Standard fully complies with the international standards ISO 251-87, ISO 252-88, ISO 282-75, ISO 284-82, ISO 432-75, ISO 433-82, ISO 5285-78

This Standard meets the international standard ISO 583-75 regarding maximum deviations in thickness of belts

5. IN PLACE OF GOST 20-76

6. REFERENCE DOCUMENTATION

Number of the referred to reference document	Number of item, appendix
GOST 9.024-74	4.16; 4.17
GOST 263-75	4.15
GOST 270-75	4.11
GOST 408-78	4.12
GOST 426-77	4.14
GOST 443-76	Appendix 7
GOST 5100-85	Appendix 7
GOST 6433.2-71	"
GOST 6768-75	4.10; 4.10.4

Number of the referred to reference document	Number of item, appendix
GOST 7502-89	4.2.2; appendix 10
GOST 11358-89	4.4; 4.5
GOST 14192-77	5.7
GOST 15152-69	2.20
GOST 16337-77	Appendix 7
GOST 16338-85	”
GOST 17299-78	”
GOST 18215-87	Appendix 1
GOST 18300-87	Appendix 7
GOST 19700-91	Appendix 1
GOST 21650-76	5.8
GOST 22510-77	Appendix 1
GOST 23509-79	4.13

7. The limitation of the term is canceled by the Decree No. 1342, dated 08.10.92, of Gosstandart of Russia

8. REVISED EDITION (March, 1993) with Amendments Nos. 1, 2, 3, 4, 5, approved in April, 1987, January, 1988, February, 1989, February, 1990 and October, 1992 (IUS 7-82, 4-88, 5-89, 5-90, 1-93)

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