Rubber- fabric conveyor belts for general purpose

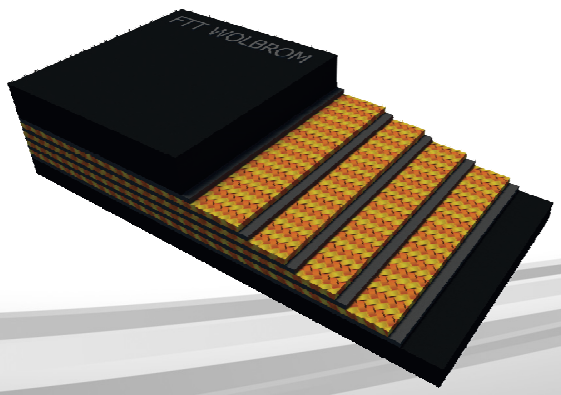
Application

Rubber- fabric conveyor belts for general purpose are used for transport of loose materials in conditions, where special additional requirements towards working conditions and properties of conveyed materials do not apply. These belts are used in almost all branches of industry, agriculture, construction and locations where fire hazard does not occur.
Transport material can be : stones, gravel, sand, cold clinker, neutral chemicals, coke, crops, construction materials and others.

Rubber- fabric conveyor belts for general purpose are applied to convey materials of any grade of granulation but considering safety of conveyor and belt it is recommended to transport materials up to 300 [mm] diameter of the grain.

Structure

Rubber- fabric conveyor belts for general purpose are composed of 2-5-ply fabric and rubber carcass, carrying and running rubber covers and rubber edges.
A layer of carcass rubber is placed between textile plies.
Rubber- fabric conveyor belts for general purpose are produced basing on fabric plies EP (polyester-polyamide) or PP (polyamide-polyamide).



Rubber- fabric conveyor belts for general purpose are produced in accordance with EN ISO 14890 or DIN 22102 standards. The covers and edges may be manufactured in different classes of rubber; acc. to Table 1.
All Rubber- fabric conveyor belts for general purpose are anti-electrostatic and meet the requirements of EN 12882 standard for safety category 1.

Cover Thickness

Minimum thickness of carrying cover (S_1) and running cover (S_2) is 2[mm]
Maximum thickness of carrying cover (S_1) is:
- for types 400/3; 500/3- 8[mm]
- for types 630/3; 630/4; 800/3; 800/4; 800/5; 1000/3-10[mm]
- for higher types- 12[mm]

Recommended maximal thickness of running cover (S_2) is - 6[mm]

Belt thickness

Table 2 shows approximate thickness of carcasses used for rubber- fabric conveyor belts for general purpose.
Approximate total thickness of belt containing covers of any thickness may be calculated from the following equation:

$$S = S_3 + (S_1 + S_2)$$

where:
S – approximate total thickness of the belt [mm]
S_3 – thickness of the belt carcass taken from Table 2 [mm]
S_1 – thickness of carrying cover [mm]
S_2 – thickness of running cover [mm]

Belt weight

Table 2 shows approximate weight of carcasses for rubber-fabric conveyor belts for general purpose.
Approximate weight of belt containing covers of any thickness may be calculated from the following equation:

where:
M – approximate weight of the belt [kg/m²]
m_1 – weight of the belt carcass taken from Table 2 for specific type of the belt [kg/m²]
S_1 – thickness of carrying cover [mm]
S_2 – thickness of running cover [mm]
X – value depending on the type of the belt:
- for class of cover rubber H, X, D60, Y60 – 1,12 [g/cm³]
- for class of cover rubber D and W – 1,125 [g/cm³]
- for class of cover rubber L and Z – 1,155 [g/cm³]
- for class of cover rubber Y – 1,14 [g/cm³]

Minimum diameter of drums

In Table 3 are given recommended minimum diameters of drums [mm] for belts, for the load factor range 60-100%, designated in accordance with DIN 22101:
A - drive pulleys and other pulleys in the range of high belt tensions
B - deflection pulleys and other pulleys in the range of low belt tensions
C - snub pulleys (change in belt moving direction ≤ 30°)

Belt designation used for orders acc. to standard PN-EN ISO 14890

14890 | 200 | 1400 | EP | 1250 | 5 | 6+3 | H | 1

where:
14890 – completion acc. to standard
200 – quantity of the belt [m]
1400 – width of the belt [mm]
EP – ply material
1250 – tensile strength of the belt (type) [N/mm]
5 – number of plies in the carcass
6+3 – thickness of the covers: carrying (S_1) running (S_2) [mm]
H – class of rubber covers
1 – safety category acc. to PN- EN 12882

Belt designation used for orders acc. to standard DIN 22102

DIN 22102 - 800 - EP - 630 / 4 5/2 Y

where:
DIN 22102 – completion acc. to standard
800 – width of the belt [mm]
EP – ply material
630 – tensile strength of the belt (type) [N/mm]
4 – number of plies in the carcass
5/2 – thickness of the covers: carrying (S_1) running (S_2) [mm]
Y – class of rubber covers

Table 1. Physical and mechanical properties of cover rubber for rubber- fabric conveyor belts for general purpose

	Parameter	Unit	Requirements for cover rubber									Testing method²
			Acc. to PN-EN ISO 14890				Acc. to DIN 22102					
			H	D	D60/DY¹	L	W	X	Y	Y60¹	Z	
Tensile strength, min.	TS	[MPa]	24	18	20	15	18	25	20	20	15	PN- ISO 37 (sample type 2)
Elongation at break, min.	E_b	[%]	450	400	450	350	400	450	400	450	350	PN- ISO 37 (sample type 2)
Abrasion resistance, max.		[mm³]	120	100	60	200	90	120	150	60	200	PN- ISO 4649 (method A)
Heat ageing resistance, in air, in condition: +70 [°C] after 168 [h.], max.	ΔTS ΔE_b	[%] [%]	±25 ±25									PN- ISO 188 (method B) PN- ISO 37 (sample type 2)

¹The cover with higher abrasion resistance; ²Tests acc. to current edition of standards.

Table 2. The range of manufactured belts, basic width, weight and thickness of carcasses for rubber- fabric conveyor belts for general purpose.

Type of the belt/number of plies[1]	Standard width of the belt [mm] [1]									Approximate thickness of the carcass S_3 [mm]		Approximate weight of the carcass [kg/m²]	
	500	600	650	800	1000	1200	1400	1600	1800	EP	PP	EP	PP
400 /3	X	X	X	X	X	X	X	-	-	3,6	-	4,9	-
500 /3	X	X	X	X	X	X	X	-	-	3,6	-	4,9	-
630 /3	X	X	X	X	X	X	X	X	X	4,5	4,2	5,4	5,1
630 /4	X	X	X	X	X	X	X	-	-	4,8	-	6,5	-
800 /3	X	X	X	X	X	X	X	X	X	5,1	4,8	5,8	5,5
800 /4	X	X	X	X	X	X	X	X	X	6,0	5,6	7,2	6,8
800 /5	X	X	X	X	X	X	X	-	-	6,0	-	8,2	-
1000 /3	-	-	X	X	X	X	X	X	X	5,4	5,1	6,5	6,0
1000 /4	-	-	X	X	X	X	X	X	X	6,8	6,0	7,8	7,0
1000 /5	-	-	X	X	X	X	X	X	X	7,5	7,0	9,0	8,5
1250 /3	-	-	X	X	X	X	X	X	X	6,9	6,3	8,3	7,5
1250 /4	-	-	X	X	X	X	X	X	X	7,2	6,4	8,7	7,4
1250 /5	-	-	X	X	X	X	X	X	X	8,5	7,5	9,7	8,8
1400 /4	-	-	-	X	X	X	X	X	X	8,4	6,8	10,3	8,0
1600 /4	-	-	-	-	X	X	X	X	X	9,2	8,4	11,1	10,0
1600 /5	-	-	-	-	X	X	X	X	X	9,0	8,5	10,9	10,0
1800 /4	-	-	-	-	-	X	X	X	X	9,6	10,4	11,5	11,5
1800 /5	-	-	-	-	-	X	X	X	X	10,5	10,5	12,9	12,5
2000 /4	-	-	-	-	-	X	X	X	X	9,6	10,4	11,5	11,5
2000 /5	-	-	-	-	-	X	X	X	X	11,5	10,5	13,9	12,5
2500 /4	-	-	-	-	-	X	X	X	X	12,8	11,2	14,5	12,8
2500 /5	-	-	-	-	-	X	X	X	X	13,0	13,0	15,5	14,4

[1] Types and width of the belts, other than determined in Table 2 shall be agreed with manufacturer.

Table 3. Minimum drum diameters [mm]

Type of the belt/number of plies	EP Carcass			PP Carcass		
	A	B	C	A	B	C
400 /3	400	315	250	-	-	-
500 /3	400	315	250	-	-	-
630 /3	500	400	315	400	315	250
630 /4	500	400	315	-	-	-
800 /3	630	500	400	400	315	250
800 /4	630	500	400	500	400	315
800 /5	630	500	400	-	-	-
1000 /3	630	500	400	500	400	315
1000 /4	800	630	500	630	500	400
1000 /5	800	630	500	630	500	400
1250 /3	800	630	500	630	500	400
1250 /4	800	630	500	630	500	400
1250 /5	1000	800	630	800	630	500
1400 /4	1000	800	630	630	500	400
1600 /4	1000	800	630	800	630	500
1600 /5	1000	800	630	800	630	500
1800 /4	1000	800	630	1000	800	630
1800 /5	1250	1000	800	1000	800	630
2000 /4	1000	800	630	1000	800	630
2000 /5	1250	1000	800	1000	800	630
2500 /4	1400	1250	1000	1000	800	630
2500 /5	1400	1250	1000	1250	1000	800

Marking of belts

Typically on the carrying cover at the distance of 1÷3 [m] from the beginning and the ending of the belt and approximately each 15 [m] acc. to PN-EN ISO 14890 or approximately each 10 [m] acc. to DIN 22102, durable stamp in the form of relief is impressed in rubber material of the belt, containing required information acc. to PN- EN ISO 14890 or DIN 22102 standards.

Durable stamp includes following information:

- acc. to PN- EN ISO 14890: name (mark) of the manufacturer, name of the standard, type of the fabric, type of the belt, number of the plies, class of the rubber, safety category, the belt serial number, two digits of the year of manufacture.
- acc. to DIN 22102: name (mark) of the manufacturer, number of the standard, type of the fabric, type of the belt, number of the plies, class of the rubber, the belt serial number, two last digits of the year of manufacture.

Packing

Typically, the belt is rolled up on wooden coil with diameter 450 [mm] which has an internal square hole with side 230 [mm]. Rolled up belts are protected against unwinding during transport by wrapping with polypropylene tape.

Diameter of the roll

Approximate diameter of the roll D [m] with length L [m], and thickness S [mm] may be calculated from the following equation:

$$D = \sqrt{0{,}25 + \frac{1{,}27 \; x \; L \; x \; S}{1000}}$$

Table 4. Physical and mechanical properties of rubber- fabric conveyor belts for general purpose

Parameter		Unit	Type of the belt											Testing method acc. to [1]
			400	500	630	800	1000	1250	1400	1600	1800	2000	2500	
Longitudinal tensile strength, min.		[N/mm]	400	500	630	800	1000	1250	1400	1600	1800	2000	2500	PN-EN ISO 283
Elongation at load equivalent to 10 [%] of nominal strength of the belt, max.	EP	[%]	1,5		2,5				3,0					
	PP		4											
Elongation at break, min.		[%]	10											
Adhesion resistance: - Average results obtained from testing between plies, min. - Average results obtained from testing between covers and carcass, min.		[N/mm]	5,0 4,5											PN-EN ISO 252 (method A)
Change of average adhesion resistance after heat ageing, in air, at 70 [°C] x 168 [h]: - Between covers, max., - Between covers and carcass, max.,		[%]	- 25 - 25											PN-ISO 188 (method B) PN-EN ISO 252 (method A)
Electric resistance, max.		[Ω]	3×10^8											PN-EN ISO 284
Low temperature resistance	H, X, Y, D60, Y60	[°C]	- 40											PN-72/C-05011.06
	D, W		- 60											
	L, Z		- 25											

[1] Testing acc. to current standards

PROCEDURE FOR USED PRODUCTS

Recovery of used products through e.g. combustion or bulk storage in the yard with non-hazard or neutral wastes shall be applied.

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