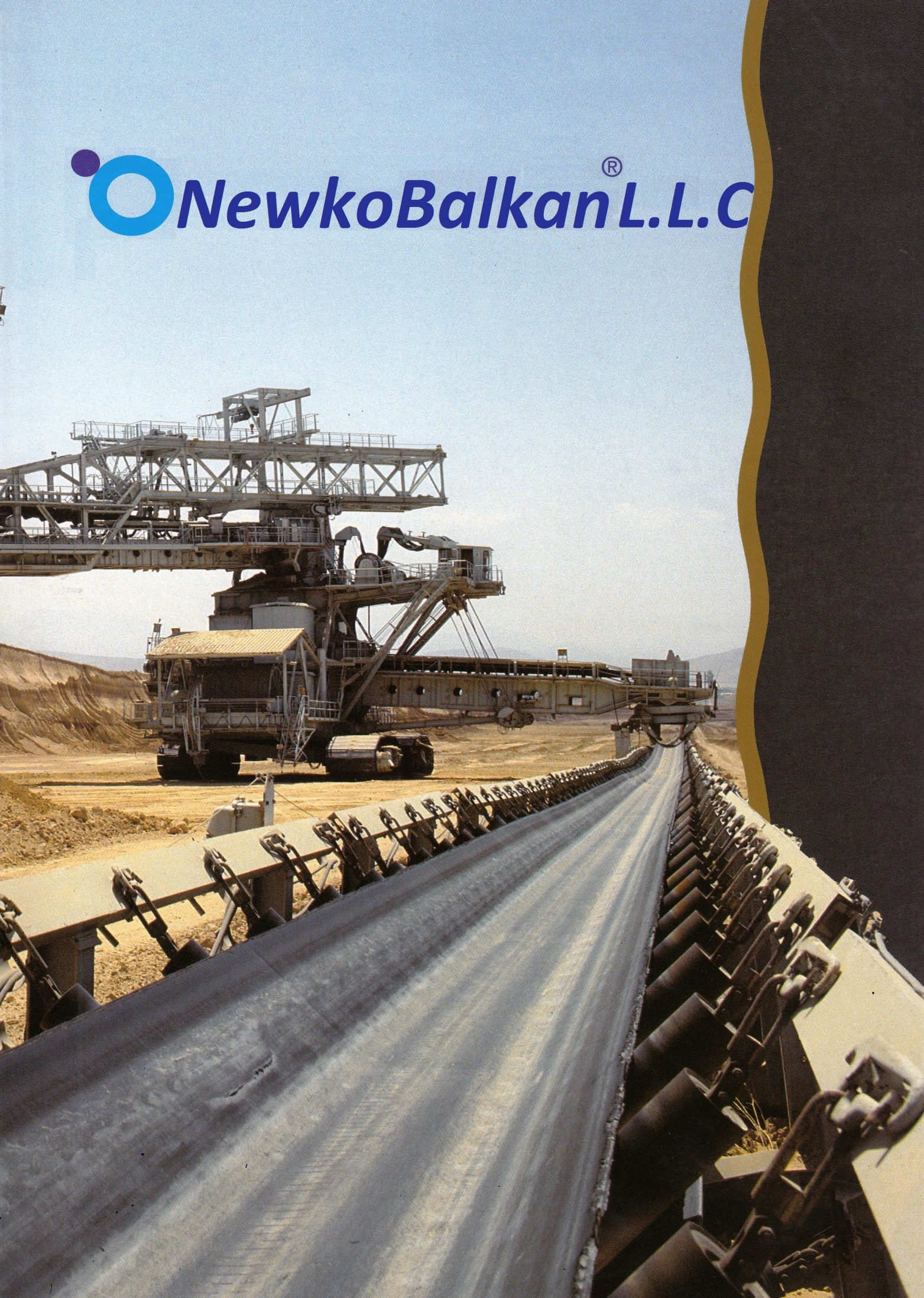
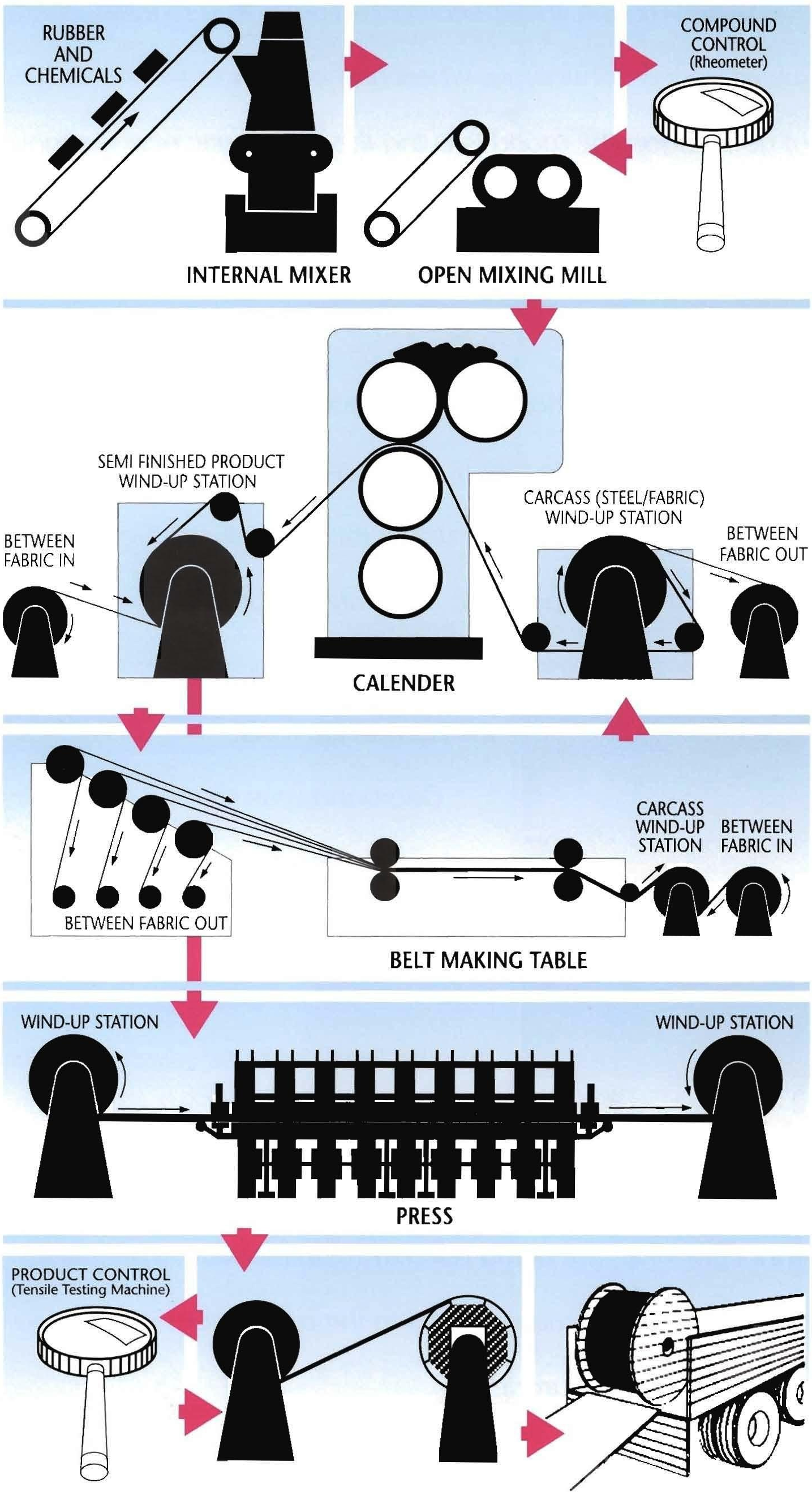
NewkoBalkan® L.L.C



FLOW CHART



❶ Compound Preparing Unit

❷ Calendering Unit

❸ Carcass Prepaing Unit

❹ Vulcanization Press

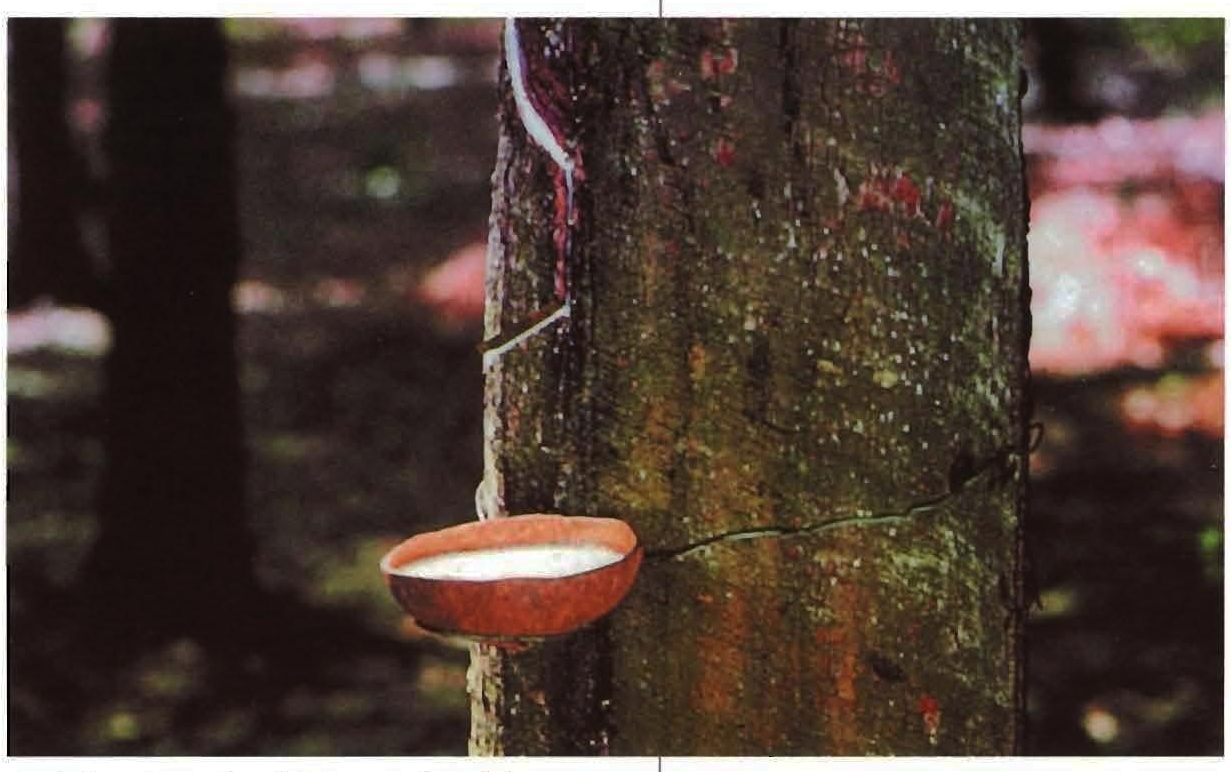
❺ Packing and Shipping Unit

F O R E W O R D

NewkoBalkan® L.L.C.

While writing these sentences I've started to think where we are in the technology. Wheel had been invented thousands of years ago. The world is living the enformatic period today. Technologies are continously improving and developing. Everything has been produced in order to easy the human life.

Conveyor belt has very close and common relations with the necessities of life today. The main purpose of the foundation of Özerband which is under the umbrella of the Özerler Holding A.Ş. is to produce the material for the support of country development and to improve the human life level.



▲ Obtained of Natural Rubber

Özerband was founded in 1976 and started production in 1977. Belt production needed an expensive investment and a high technology. Today the level we have reached as far as the production and marketing are conrserned, courage us to meet the future. Knowing that the steel and the textile cord conveyor belts are being used in Afşin-Elbistan, Tunçbilek, Seyitömer and in many plants in the world from America to Pakistan still encourage us.

Özerband, has got its place in the world market after supplying the whole demand of our country. We hoped such a development level from the very beginning. With continous new investments we renewed our technology and improved our quality. Applying world norms we produced 2550 mm. width belts we reached 454 836 m2 production capacity in a single shift. At the same time we continued to research and develop. At the end of these studies we produced ÖZER SY-2000 cold vulcanized adhesive.

You will recognize and have knowledge about ÖZERBAND and ÖZERBAND's productions in the following pages of this booklet which will be a guide to whole sectors needing conveyor belts.

What proves a country's development is to produce and to sell internationally. To be a country producing and marketing more... Certainly it is possible with presenting good quality productions with competitive prices. I can easily say that; we are producing conveyor belts using the highest technology.

We are producing for the world.

With our prices, quality and service understanding we are in the world markets.

Yours sincerely.

Yusuf ÖZER
Chairman


SMR 20
SMR 20
Özerband
Özerband

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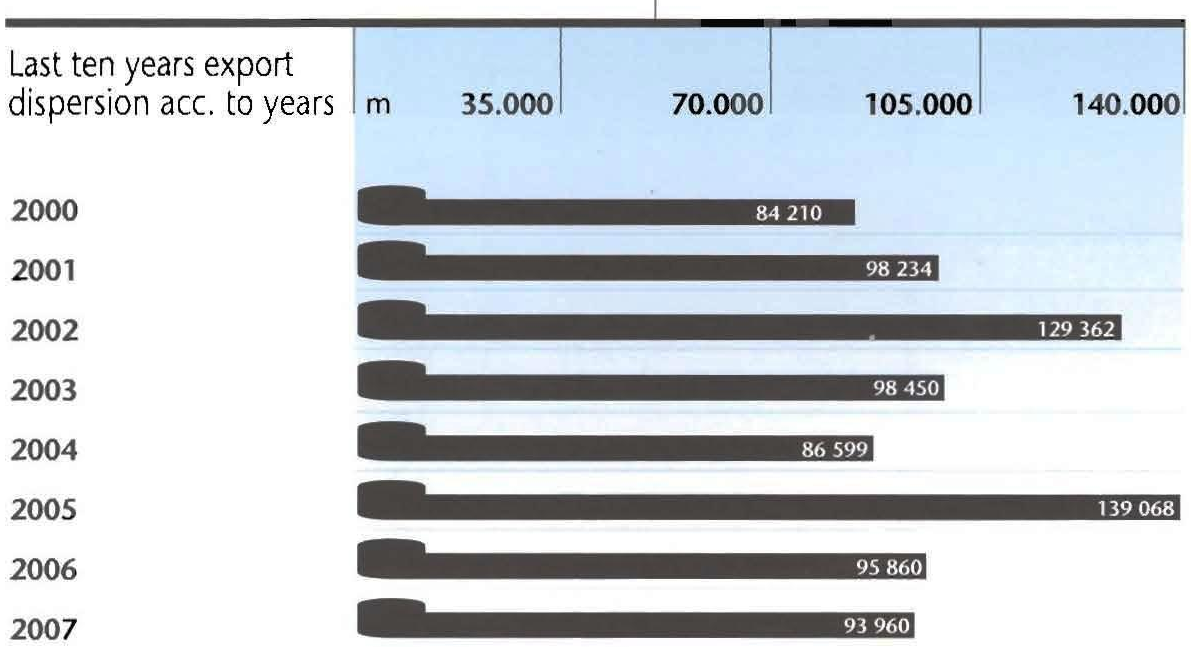
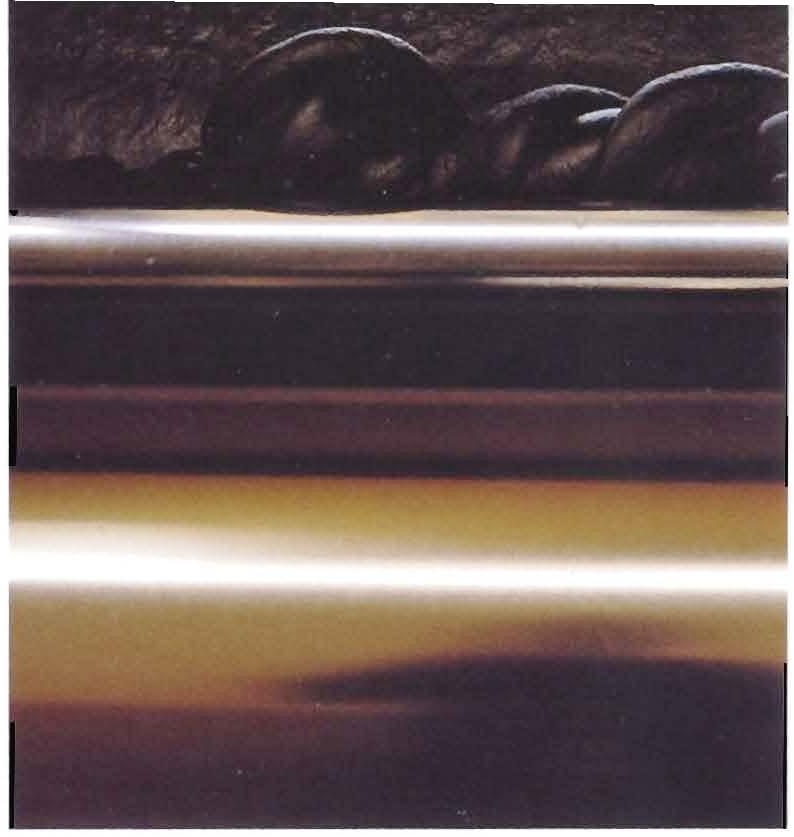
Ö Z E R B A N D

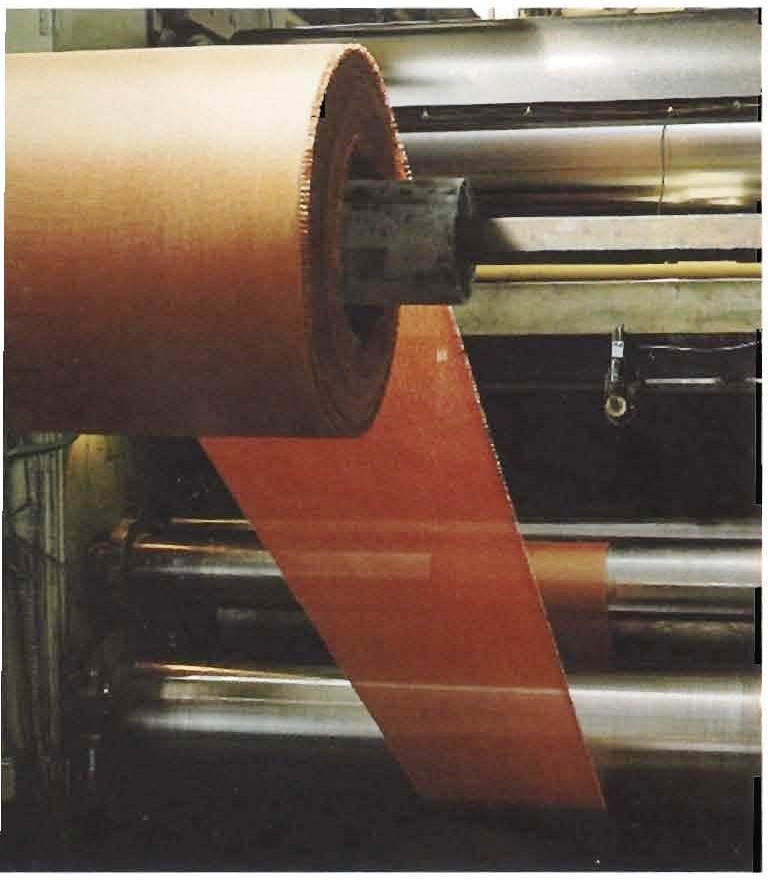
ÖZERBAND is founded in 1976 and began production in 1977. Initially, cotton fabric transmission belts formed the most part of the production and in a short period of time, production of cotton and nylon fabric conveyor belts were realized. Özerband became the first in a short time due to her quality and services presented to the customers, realizing production of steel cord fabric belts in Turkey in 1982 for the first time. In the same year she realized Turkey's first conveyor belt exportation to Pakistan. This success was followed by exportations to Iraq, Iran, Libya, Romania, Jordan, Germany, Italy, Netherland, Serbia, Avusturia, Sweden, Russia, England and U.S. America. At the same time, continuing her research and develepment works, Özerband realized production of ÖZER SY - 2000 cold vulcanized adhesive for the first time in Turkey and offered to the customers. Özerband continously following renovations of world technology and still in investment period reached the level to be able to produce 454 836 m² steel and fabric cord conveyor belts which are used in our country in a single shift. Özerband has been able to produce belt up to 2550 mm. width, then she saved our country from wide belt dependence to abroad. Özerband, with belt repair workshop presents a service to the customers for the repairment of old belts.

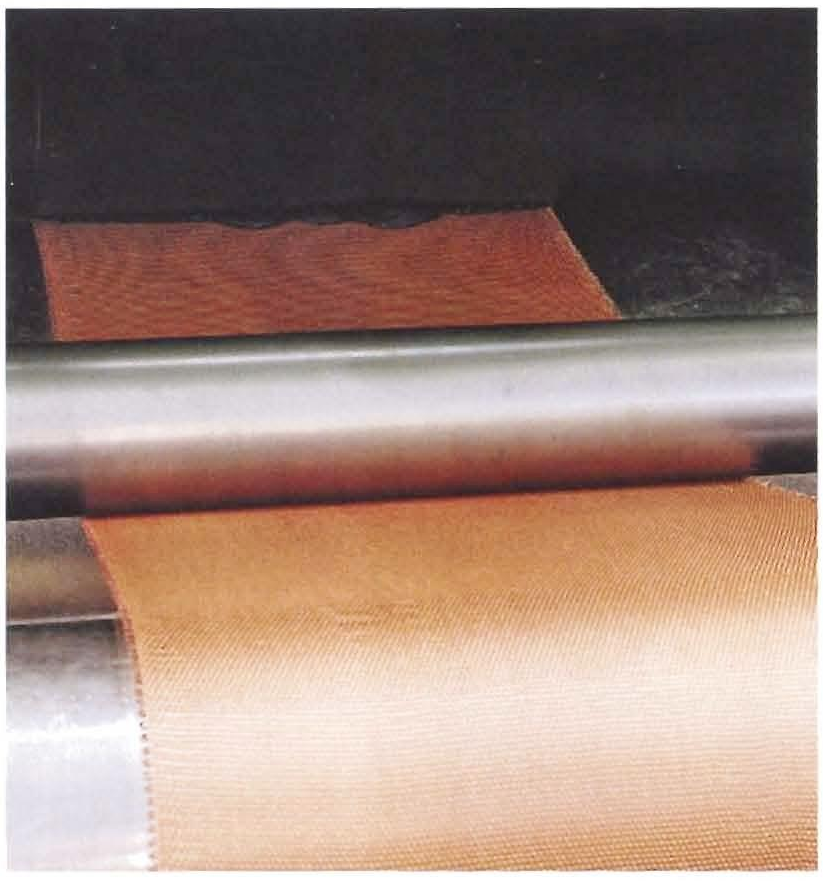


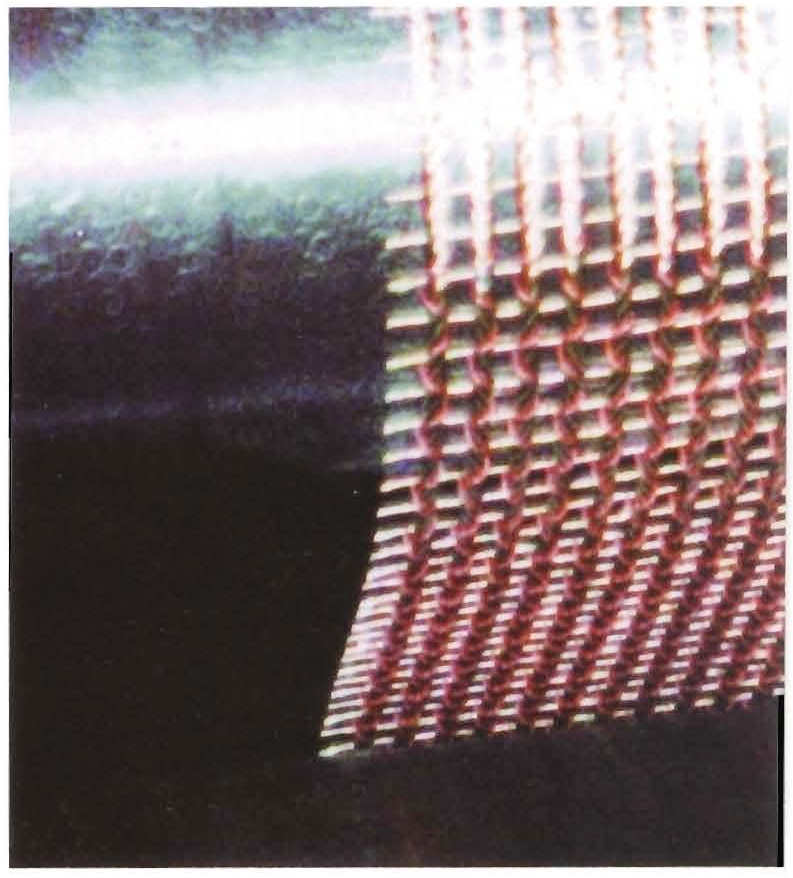
Özerband's whole belts are produced according to the conformity of national and international norms, fabric cord coveyor belts up to 2550 mm. width having **TS 547 EN ISO 14890** conformity certificate and steel cord conveyor belts up to 2000 mm. width having **TS EN ISO 15236** conformity certificate.

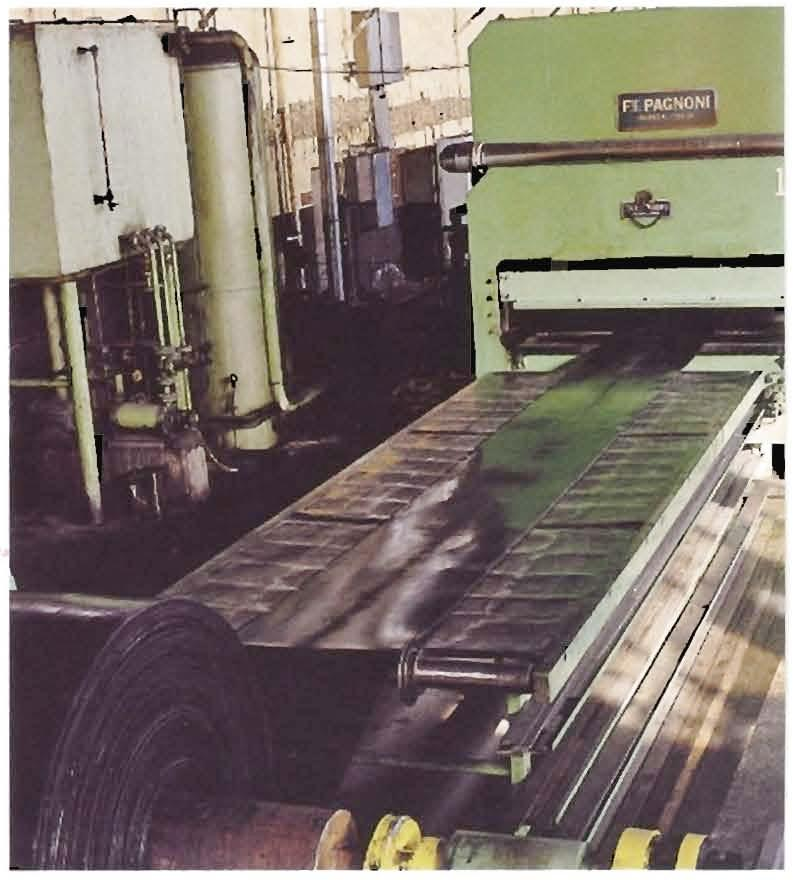

TIRA test 2300







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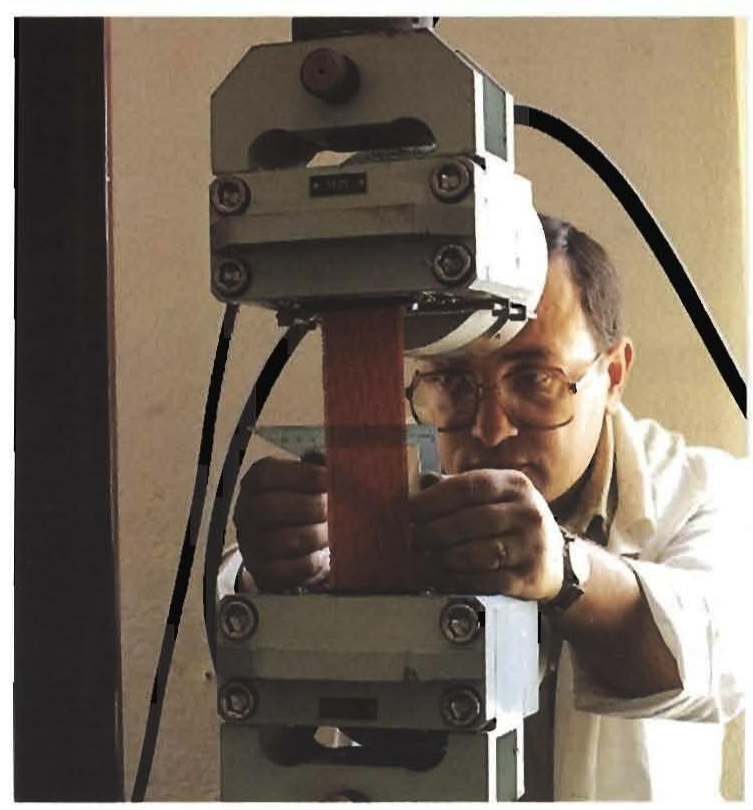
During 2005, Özerband bought Newko Balkan L.L.C. Company located at Kosovo by privatization. At Newko Balkan L.L.C. Company we are ready to produce conveyor belt fabric 2 000 000 000 m^2/year from EP70 to EP630 according to ISO 9001 standart. Newko Balkan L.L.C. Company satisfies all Özerband's conveyor belt fabric demand and her exess need is exported to Ukraine, Russia and EU countries.

You can obtain ÖZER SY - 2000 cold vulcanized adhesive from Özerband any time which was developed for using on belt splicing. Also you can immediately contact with Özerband if you have met some problems during the splicing operation. Özerband; with her urgent service and specialist staff will be near you. Özerband has established 16.600 m^2 closed area on 85.000 m^2 open space and together with its staff of 7 engineers, 12 technicians and 140 workers will be pleased to give you the best service.

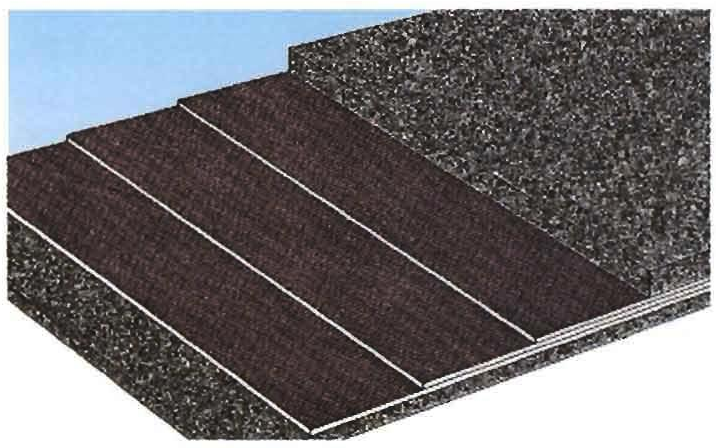
Özerband, is an establishment of the Özerler Holding A.Ş. and a partner of Fastaş Fabricated Shoes Ind. Inc., Özerler Ayakkabı ve Lastik Ind. Inc., Özeks Marble Ind. Inc., Özer Lastik Kaplama Konveyör Band ve Tekstil Ind. Inc., Afyon Santaş Marble Tile Ind. Inc., and Kosova Newko Balkan L.L.C.

Vulcanizing Press	Width: 2600 mm	Length: 1600 mm	Pagnoni	1 pc.
	Width: 2150 mm	Length: 10500 mm	Breda	1 pc.
	Width: 2150 mm	Length: 10500 mm	Siempelkamp	1 pc.
	Width: 1700 mm	Length: 5500 mm	Pagnoni	1 pc.
	Width: 1200 mm	Length: 6400 mm	Mentaschi	1 pc.
	Width: 900 mm	Length: 10500 mm	Siempelkamp	1 pc.
	Width: 600 mm	Length: 7200 mm	Siempelkamp	1 pc.
Calender				
3 Vertical Roll Cal.	Width: 1500 mm	Ø : 500 mm	Mec. Moderne	1 pc.
4 Roll Calender	Width: 1800 mm	Ø : 650 mm	Berstorff	1 pc.
3 Vertical Roll Cal.	Width: 2180 mm	Ø : 810 mm	Repiquet	1 pc.
4 Roll Calender	Width: 2150 mm	Ø : 800 mm	Berstorff	1 pc.
Open mixing mill	Width: 1500 mm	Ø : 500 mm	Farrel	1 pc.
	Width: 2100 mm	Ø : 700 mm	Pomini	5 pc.
	Width: 2100 mm	Ø : 700 mm	Berger	2 pc.
Internal mixer	Chamber Capacity	80 Lt.	Mec. Moderne	1 pc.
		200 Lt.	Farrel	1 pc.
		200 Lt.	Werner & Pfleiderer	2 pc.
Extruder			Luici Bandera	1 pc.
Cutting machine			Mec. Moderne	5 pc.
Belt Buffing Mac.	Width: 2000 mm			1 pc.
Labaratory Instruments:	Tensile Testing Machine	Max: 10000 Kg.	Tira Test 2300	1 pc.
	Tensile Testing Machine	Max: 2000 Kg.	Zwick 1454	1 pc.
	Tensile Testing Machine	Max: 200 Kg.	Santam	1 pc.
	Hardness Tester		Zwick	1 pc.
	Abrasion Tester		Gibitre	1 pc.
	Specific Gravity Balance		L'Homargy	1 pc.
	Rheometer		Monsanto 100 S	1 pc.
	Thermostatic Oven / 0 – 300°c		Ceast	1 pc.
	Precision Scale / 0.001 Gr.		Ceast	1 pc.
	Specimen Cutting Press		Ceast	1 pc.
	Muffle Furnace / 0–1200°c		Electro-Mag	1 pc.
	Dispergrader		Optigrade	1 pc.
	Condition Machine		Mas Laborteknik	1 pc.



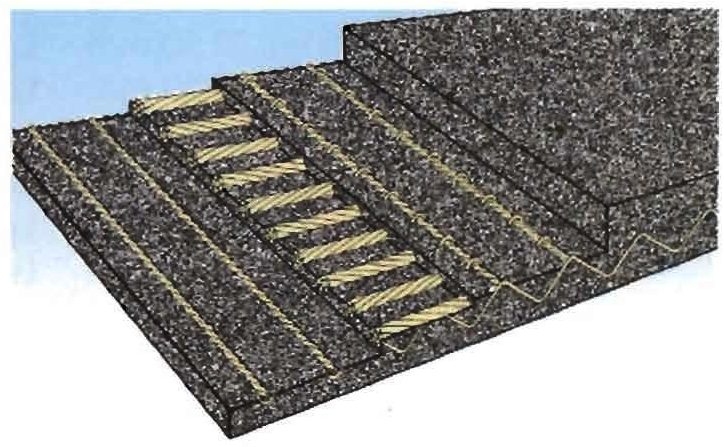
TYPES OF CONVEYOR BELTS

Belts According to Carcass



❶ Textile Belts

❶ Cotton Fabric Belts
❷ Polyamide Fabric Belts
❸ Polyester Fabric Belts
❹ Aramid Fabric Belts



❷ Steel Belts

❶ Steel Rope Belts
❷ Steel Cord Fabric Belts

Belts According to Cover

❶ Type A - Abrasion Resistant

Cement Works: Quarries, open storage and reclamation, preblending. **Ports:** Ship loading or unloading installations . **Quarries:** Primery and secondary conveyors. **Public Works:** Boring, tunneling earthmoving. **Electricity Generating Stations:** Pre-blending, feed to hoppers, open storage and reclamation. **Sugar Mills:** Handling of raw beets. **Pulp Mills:** Handling of logs. **Coal Mines:** Tipping, refilling, washing. **Steel Works:** Iran ore hanling, open storage and reclamation, sinter plant, blast furnace feed, slag recovery.

❷ Type F - Flame Resistant

Underground Coal Mines.

Belts According to Steep Angle

❶ Conveyor belts with no surface partitioning.
❷ Piece goods conveyor belts with cover patterning.
❸ Belts with chevron cleats.
❹ Box – section belts with corrugated sidewalls.
❺ Conveyor belts in sandwich design.
❻ Elevator belts.

Rubbers Most Commonly Used In Belting

Astm Designation D 1418 - 79	Common Name	Composition	General Propertles
NR	Natural	Isoprene, natural	Excellent resistance to cutting, gouging, and abrasion. Good elasticity and resiliency. Not oil resistant.
SBR	SBR	Styrene-butadiene	Excellent abrasion resistance and good resistance to cutting, gouging, and tearing. Good heat resistance. Not oil resistant.
EPDM	Ethlene-Propylene Rubber	Ethylene-propylene diene terpolymer	Excellent resistance to heat, ozone, and aging. Very good resistance to abrasion.
CR	Neoprene	Chloroprene	Good ozone and sun-checking resistance. Good resistance to petroleum-based oils and to abrasion. Also good flame resistance.
NBR	Buna N	Nitrile-butadiene	Excellent resistance to vegetable, animal, and petroleum oils.
IR	Polysoprene	Isoprene, synthetic	Same properties as natural rubber.
BR	Polybutadiene		A general purpose synthetic rubber. Generally used in blends with natural or styrene-butadiene rubber. Provides excellent abrasion resistance and high resillency. Excellent low temperature flexibility.
IIR	Butyl	Isobutylene - Isoprene	Excellent resistance to heat. Very good resistance to ozone and aging. Good resistance to abrasion.

Nomenclature of Özerband belts

❖ Textile Rubber Belts

EP –160–1200 – 5-4/2– A1–D

- **E** - Type of warp yarn polyester
- **P** - Type of weft yarn polyamide
- **160** - Min. warp fabric tensile strength (kg/cm)
- **1200** - Belt width (mm)
- **5** - Number of plies
- **4** - Top cover thickness (mm)
- **2** - Bottom cover thickness(mm)
- **A1** - Cover rubber grade
  - **A1** - High abrasion resistance
  - **A2** - Medium abrasion resistance
  - **F** - Flame resistance
  - **T1** - Heat resistance up to 200° C
  - **T2** - Heat resistance up to 120 °C
  - **O** - Oil resistance
- **D** - Belt type
  - **D** - Cut end
  - **N** - Endless
  - **P** - With profiles

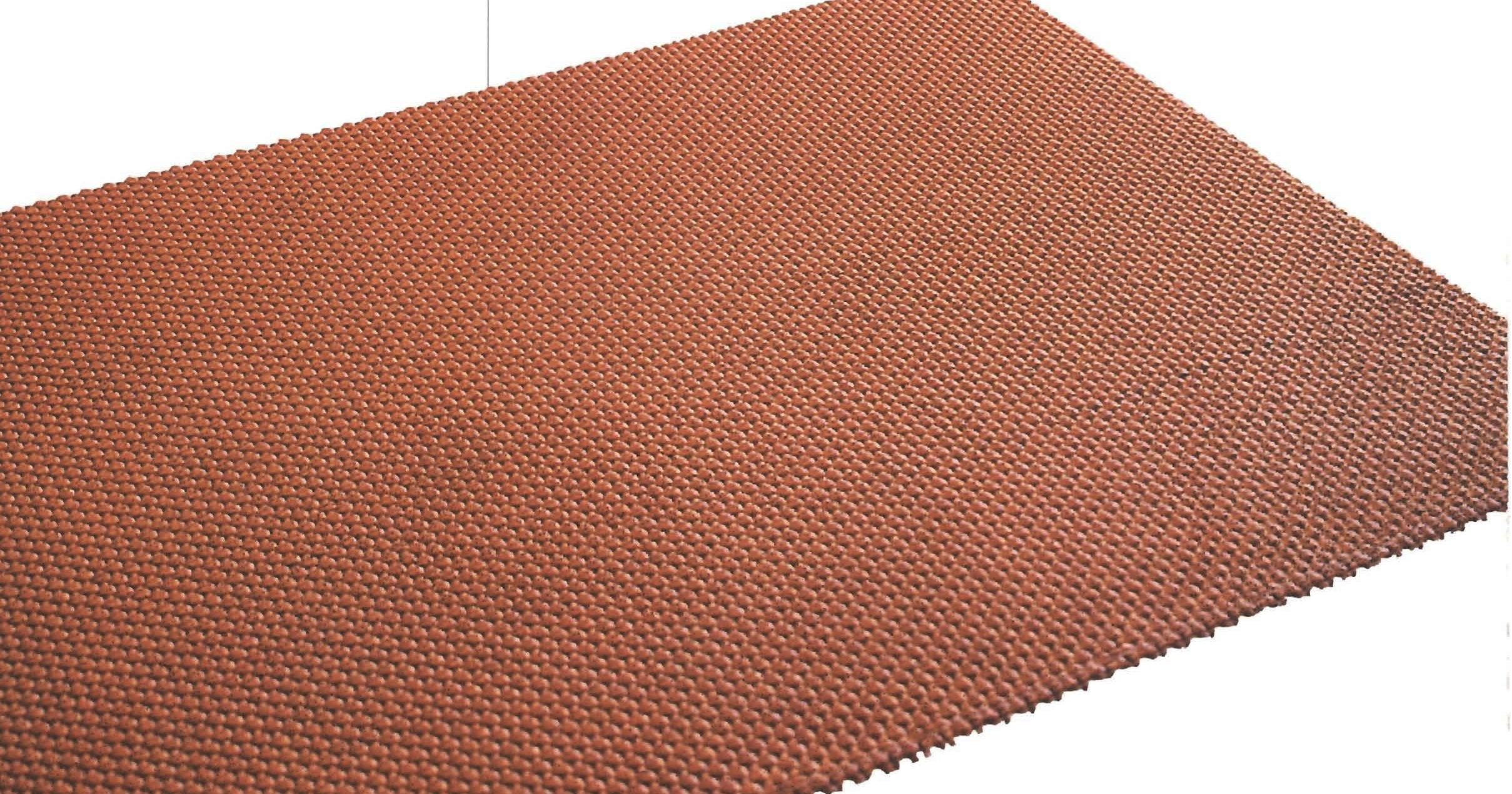
❖ Steel Cord Fabric Belts

IW –1600–1000 – 8/4 – A1–D

- **IW** - Type of steel cord fabric
  - **TW** - Textile weft steel cord fabric
  - **IW** - Impact weft steel cord fabric
  - **SW** - Straight warp steel cod fabric
  - **IWR** - Impact weft steel rope
- **1600** - Belt breaking strength (kg/mm)
- **1000** - Belt width (mm)
- **8** - Top cover thickness (mm)
- **4** - Bottom cover thickness (mm)
- **A1** - Cover rubber grade
- **D** - Belt type

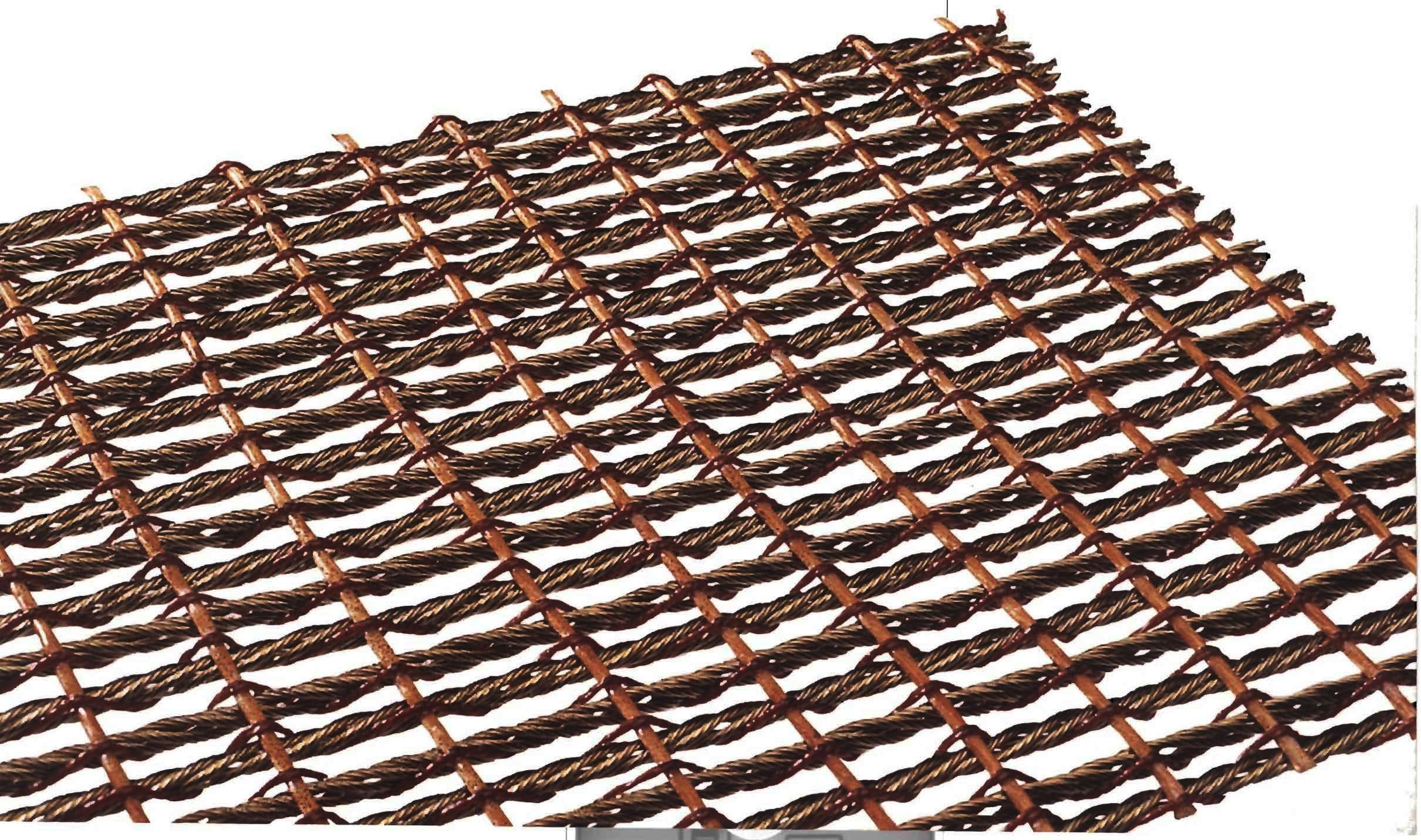
TECHNICAL SPECIFICATIONS OF **(EP)** (Polyester-Polyamide) FABRIC

	FABRIC TYPE	EP - 70	EP - 100	EP - 125	EP - 160	EP - 200	EP - 250	EP - 315	EP - 400	EP - 500	EP - 630
	FABRIC WEIGHT (g/m2)	260	355	430	560	690	860	1050	1300	1600	2100
	FABRIC THICKNESS (mm)	0,50	0,55	0,70	0,90	1,05	1,20	1,40	1,60	2,1	2,8
	ELONGATION AT 10 % LOAD	2	2	2	2	2	2	2	2	3	3
	CRIMP (%)	2,5	3,0	3,5	3,5	3,5	3,5	3,5	3,5	4	5
WARP CORDS	Material	Polyester	Polyester	Polyester	Polyester	Polyester	Polyester	Polyester	Polyester	Polyester	Polyester
WARP CORDS	Breaking Load (kg/cm)	85	125	165	210	250	310	400	480	630	760
WARP CORDS	Yarn Construction (dtex)	1100 x 1	1100 x 1	1100 x 2	1100 x 3	1100 x 4	1100 x 6	1100 x 6	1100 x 6	1100 x 6	1100 x 6
WARP CORDS	Twist (tpm)	150	150	120	120	100	80	80	80	80	80
WARP CORDS	Density (cords/dm)	140	195	120	110	100	87	110	141	172	216
WARP CORDS	Elongation At Break (%)	18	19	20	20	20	20	20	20	30	37
WEFT CORDS	Material	NY-66	NY-66	NY-66	NY-66	NY-66	NY-66	NY-66	NY-66	NY-66	NY-66
WEFT CORDS	Breaking Load (kg/cm)	44	60	65	75	100	100	100	100	100	100
WEFT CORDS	Yarn Construction (dtex)	940x1	940x1	940x2	940x3	940x4	940x4	940x4	940x4	1400 x 4	1400 x 5
WEFT CORDS	Twist (tpm)	160	160	120	120	100	100	100	100	90	90
WEFT CORDS	Denstiy (cords/dm)	72	95	58	43	40	40	40	40	32	27
WEFT CORDS	Elongation At Break (%)	30	30	30	30	30	30	30	30	40	40



TECHNICAL SPECIFICATIONS OF
(TW) TEXTILE WEFT STEEL CORD FABRIC

	FABRIC TYPE	TW-350	TW-500	TW-630	TW-800	TW-1000	TW-1250	TW-1400	TW-1600	Tolerans
	BELT RANGE (N/mm)	350	500	630	800	1000	1250	1400	1600	0, +
	TRANSVERSE (N/mm)	50	50	50	50	50	50	50	50	0, +
	MASS (kg/m2)	1,50	2,15	2,65	3,60	4,45	5,60	6,30	7,15	± 2,5 %
	FABRIC THICKNESS (mm)	3,2	3,2	3,2	4,1	4,1	4,9	4,9	4,9	± 0,3
WARP CORD	Cord Constructions	4 x 7 x 0,25			4 x 7 x 0,35		4 x 7 x 0,45			
	Diameter (mm)	2,00	2,00	2,00	2,85	2,85	3,70	3,70	3,70	± 5,0 %
	Breaking Load (N)	3075	3075	3075	5600	5600	9600	9600	9600	0, +
	Lineer Density (g/m)	11,4	11,4	11,4	22,9	22,9	37,9	37,9	37,9	± 5 %
	Breaking Elongation (%)	5	5	5	5	5	5	5	5	± 2,5
	Pitch (mm)	8,33	5,81	4,63	6,67	5,38	7,04	6,25	5,50	
	Density (Cords/m)	120	172	216	150	186	142	160	182	± 2,0 %
WEFT YARNS	Yarn Constructions	NY-66 1400 x 8 RFL								
	Diameter (mm)	1,20	1,20	1,20	1,20	1,20	1,20	1,20	1,20	± 0,2
	Breaking Load (N)	800	800	800	800	800	800	800	800	– 10 %
	Lineer Density (g/m)	1,25	1,25	1,25	1,25	1,25	1,25	1,25	1,25	± 5,0 %
	Breaking Elongation (%)	15	15	15	15	15	15	15	15	± 2,5
	Pitch (mm)	15	15	15	15	15	15	15	15	
	Density (Cords/m)	66	66	66	66	66	66	66	66	+ 5,0 %



TECHNICAL SPECIFICATIONS OF **(IW)** IMPACT WEFT STEEL CORD FABRIC

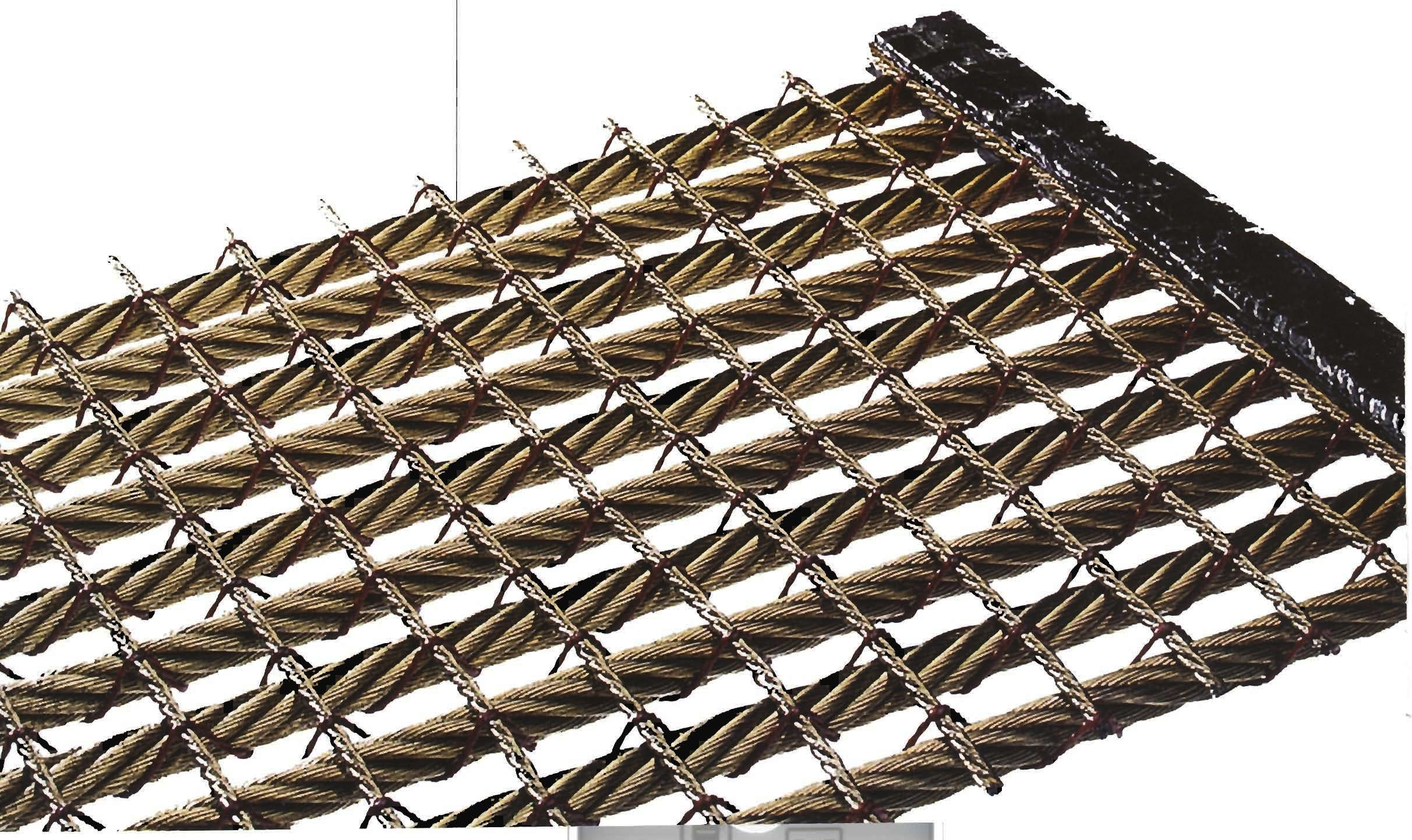
	FABRIC TYPE	IW-350	IW-500	IW-630	IW-800	IW-1000	IW-1250	IW-1400	IW-1600	Tolerans
	BELT RANGE (N/mm)	350	500	630	800	1000	1250	1400	1600	0, +
	TRANSVERSE (N/mm)	90	90	90	125	125	175	175	175	0, +
	MASS (kg/m²)	1,85	2,45	2,95	4,15	5,00	6,35	7,05	7,90	± 2,5 %
	FABRIC THICKNESS (mm)	3,2	3,2	3,2	4,5	4,5	6,0	6,0	6,0	± 0,3
WARP CORDS	Cord Constructions	4 x 7 x 0,25			4 x 7 x 0,35		4 x 7 x 0,45			
	Diameter (mm)	2,00	2,00	2,00	2,85	2,85	3,70	3,70	3,70	± 5,0 %
	Breaking Load (N)	3075	3075	3075	5600	5600	9600	9600	9600	0, +
	Lineer Density (g/m)	11,4	11,4	11,4	22,9	22,9	37,9	37,9	37,9	± 5,0 %
	Breaking Elongation (%)	5	5	5	5	5	5	5	5	± 2,5
	Pitch (mm)	8,33	5,81	4,63	6,67	5,38	7,04	6,25	5,50	
	Density (Cords/m)	120	172	216	150	186	142	160	182	± 2,0 %
WEFT CORDS	Cord Constructions	3 x 7 x 0,22			4 x 7 x 0,25		4 x 7 x 0,30			
	Diameter (mm)	1,52	1,52	1,52	2,02	2,02	2,40	2,40	2,40	± 5,0 %
	Breaking Load (N)	1720	1720	1720	2900	2900	3775	3775	3775	0, +
	Lineer Density (g/m)	6,95	6,95	6,95	12,1	12,1	17,2	17,2	17,2	± 5,0 %
	Breaking Elongation (%)	7,5	7,5	7,5	7,5	7,5	7,5	7,5	7,5	± 2,5
	Pitch (mm)	17,5	17,5	17,5	20	20	20	20	20	
	Density (Cords/m)	57	57	57	50	50	50	50	50	+ 5,0 %

TECHNICAL SPECIFICATION OF
(SW) STRAIGHT WARP STEEL CORD FABRIC

	FABRIC TYPE	SW-350	SW-500	SW-630	SW-800	SW1000	SW 1250	SW 1400	SW 1600	SW 1800	SW 2000	Tolerance
	BELT RANGE (N/mm)	350	500	630	800	1000	1250	1400	1600	1800	2000	0,+
	TRANSVERSE (N/mm)	125	125	125	125	125	175	175	175	200	200	0, +
	MASS (Kg / m²)	2,00	2,60	3,15	4,10	4,95	6.30	7,00	7,85	8,70	9,25	± 2,5 %
	FABRIC THICKNESS (mm)	4,7	4,7	4,7	5,4	5,4	7,1	7,1	7,1	7,1	7,1	± 0,3
WARP CORDS	Cord Constructions	4 x 7 x 0,25			4 x 7 x 0,35		4 x 7 x 0,45					
	Diameter (mm)	2,0	2,0	2,0	2,85	2,85	3,7	3,7	3,7	3,7	3,7	± 5 %
	Breaking Load (N)	3075	3075	3075	5600	5600	9600	9600	9600	9600	9600	0, +
	Lineer Density (g/m)	11,4	11,4	11,4	22,9	22,9	37,9	37,9	37,9	37,9	37,9	± 5 %
	Breaking Elongation (%)	5	5	5	5	5	5	5	5	5	5	± 2,5
	Pitch (mm)	8,33	5,81	4,63	6,67	5,38	7,04	6,25	5,50	5,00	4,65	
	Density (Cords / m)	120	172	216	150	186	142	160	182	200	215	± 2 %
WEFT CORDS	Cord Constructions	3 X 7 X 0,22					4 X 7 X 0,25					
	Diameter (mm)	1,52	1,52	1,52	1,52	1,52	2,02	2,02	2,02	2,02	2,02	± 5 %
	Breaking Load (N)	1720	1720	1720	1720	1720	2900	2900	2900	2900	2900	0, +
	Lineer Density (g/m)	6,95	6,95	6,95	6,95	6,95	12,1	12,1	12,1	12,1	12,1	± 5 %
	Breaking Elongation (%)	7,5	7,5	7,5	7,5	7,5	7,5	7,5	7,5	7,5	7,5	± 2,5
	Pitch (mm)	12,5	12,5	12,5	12,5	12,5	15	15	15	12,5	12,5	
	Density (Cords / m)	80	80	80	80	80	67	67	67	80	80	± 5 %

TECHNICAL SPECIFICATIONS OF **(IWR)** IMPACT WEFT STEEL ROPE

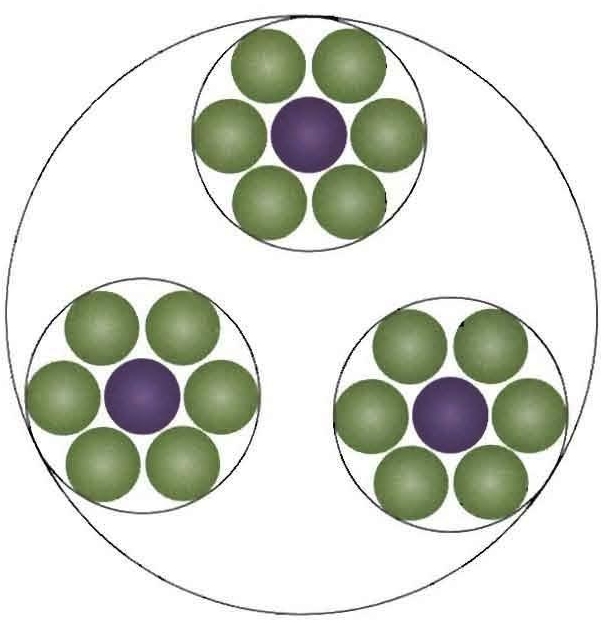
FABRIC TYPE		IWR 630	IWR 800	IWR 1000	IWR 1250	IWR 1400	IWR 1600	IWR 1800	IWR 2000	IWR 2500	IWR 3150	Tölerans
BELT RANGE (N/mm)		630	800	1000	1250	1400	1600	1800	2000	2500	3150	0,+
TRANSVERSE (N/mm)		200	200	200	200	200	200	200	200	200	200	0,+
MASS (Kg / m^2)		3,45	4,35	5,20	6,40	6,90	7,90	9,10	9,80	12,78	16,25	± 2,5 %
FABRIC THICKNESS (mm)		5,0	5,6	5,6	6,4	6,4	7,2	7,2	7,2	8,8	9,6	± 0,3
WARP CORDS	Cord Constructions	7X7	7X7	7X7	7X7	7X7	7X7	7X7	7X7	7X19	7X19	
	Diameter (mm)	3,0	3,6	3,6	4,4	4,4	5,2	5,2	5,2	6,8	7,6	± 5 %
	Breaking Load (N)	9700	13500	13500	19800	19800	26700	26700	26700	42700	53000	0, +
	Lineer Density (g/m)	34,7	51,0	51,0	76,5	76,5	105	105	105	177	220	± 5,0 %
	Breaking Elongation (%)	2,5	2,5	2,5	2,5	2,5	2,5	2,5	2,5	2,5	2,5	± 1
	Pitch (mm)	14	15	12	14	13	15	13	12	15	15	
	Density (Cords / m)	71,4	66,7	83,3	71,4	76,9	66,7	76,9	83,3	66,7	66,7	± 2,0 %
WEFT CORDS	Cord Constructions	4X7	4X7	4X7	4X7	4X7	4X7	4X7	4X7	4X7	4X7	
	Diameter (mm)	2,0	2,0	2,0	2,0	2,0	2,0	2,0	2,0	2,0	2,0	± 5,0 %
	Breaking Load (N)	2900	2900	2900	2900	2900	2900	2900	2900	2900	2900	0, +
	Lineer Density (g/m)	12,1	12,1	12,1	12,1	12,1	12,1	12,1	12,1	12,1	12,1	± 5.0 %
	Breaking Elongation (%)	7,5	7,5	7,5	7,5	7,5	7,5	7,5	7,5	7,5	7,5	± 2,5
	Pitch (mm)	14	14	14	14	14	14	14	14	14	14	
	Density (Cords / m)	71,4	71,4	71,4	71,4	71,4	71,4	71,4	71,4	71,4	71,4	± 5,0 %



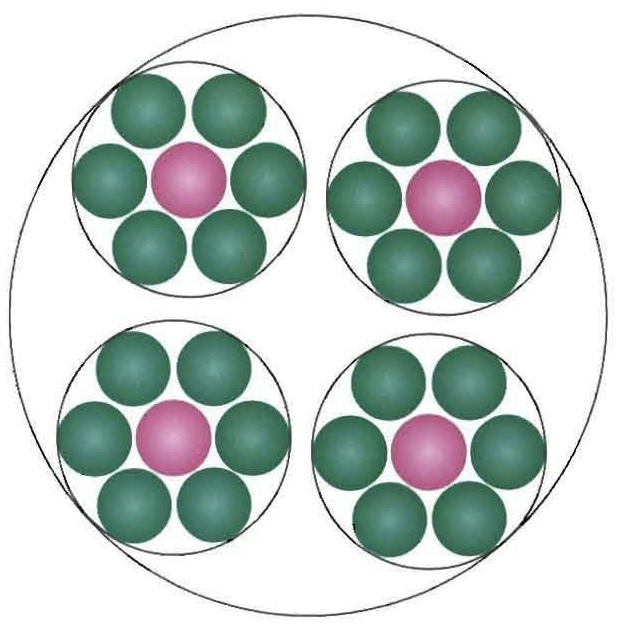
SOME COMPERATIVE PHYSICAL AND CHEMICAL PROPERTIES OF CARCASS

Material Types ▶ / ▼ Specifications	COTTON	RAYON	POLYAMİDE	POLYESTER	ARAMİD	STEEL CORDS
Density (g/cm³)	1,54	1,53	1,14	1,38	1,44	7,85
Decomposition temp./Melting Point °C	230	200	P.6. : 215 P.6.6. : 255	260	500	1600
Tenacity (mN/tex)	150	500	820	820	1950	330
Elongation At Break (%)	7	14	20	13	3,3	1,9
Hot Air Shrinkage (4 min. 160°C) (%)	0	1	4	5,5	0,1	0
Heat Resistance (48 h, 200°C) (%)	0	20	45	55	90	100
Resistance To Acids	poor	poor	fair	good	fair	fair
Resistance To Alkalis	good	fair	good	fair	good	very good
Resistance To Solvents	good	good	good	good	very good	very good

Steel Cord Constructions (for TW – IW – SW types)

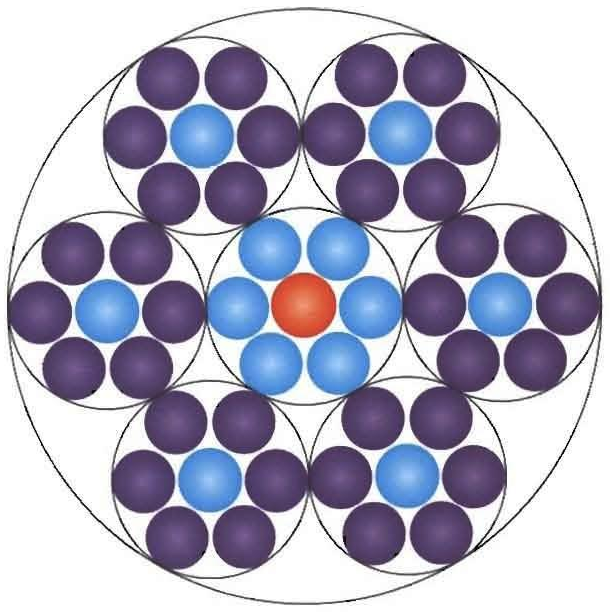


3 x 7

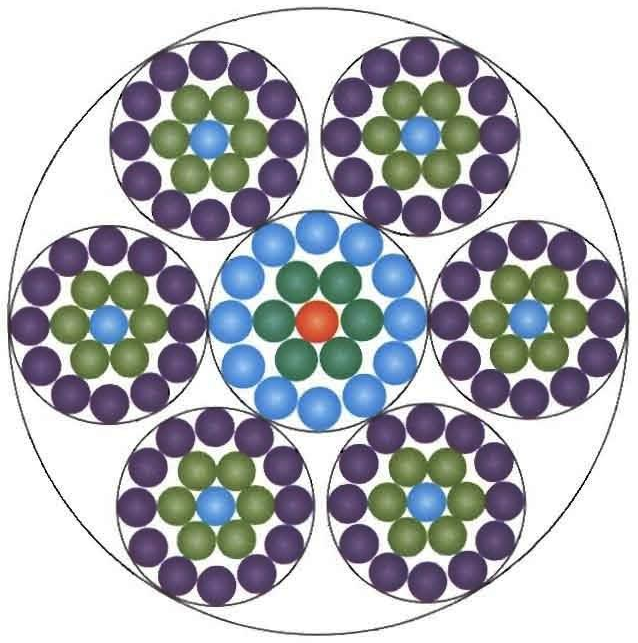


4 x 7

Steel Rope Constructions (for IWR type)

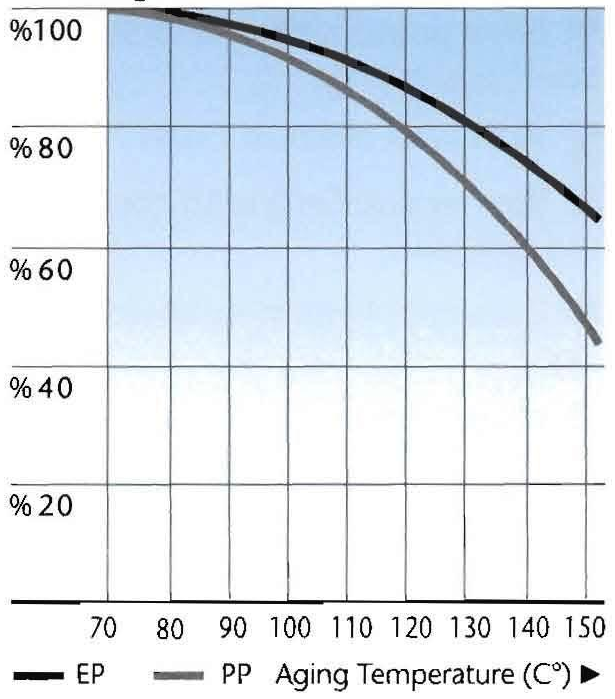


7 x 7

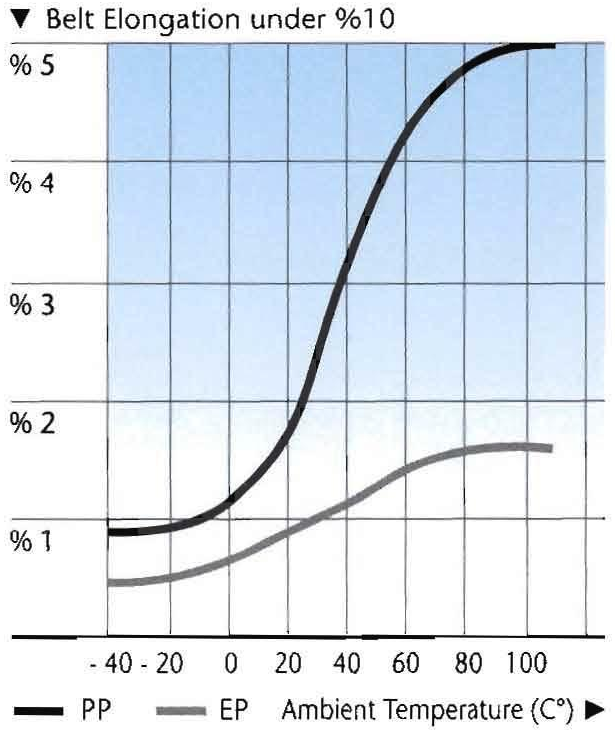


7 x 19

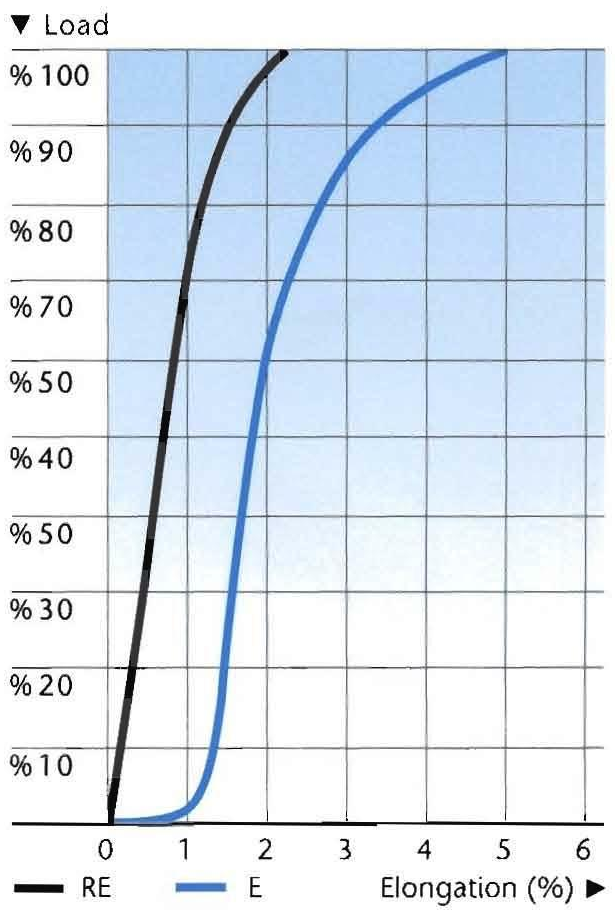
Effect of Elevated Temperature on Belt Strength



Effect of Elevated Temperature on Belt Elongation



Steel Cord Elongation Diagram



TYPES OF CONVEYOR BELTS ACCORDING TO STEEP ANGLE

❶ Conveyor belts with no surfarce partitioning

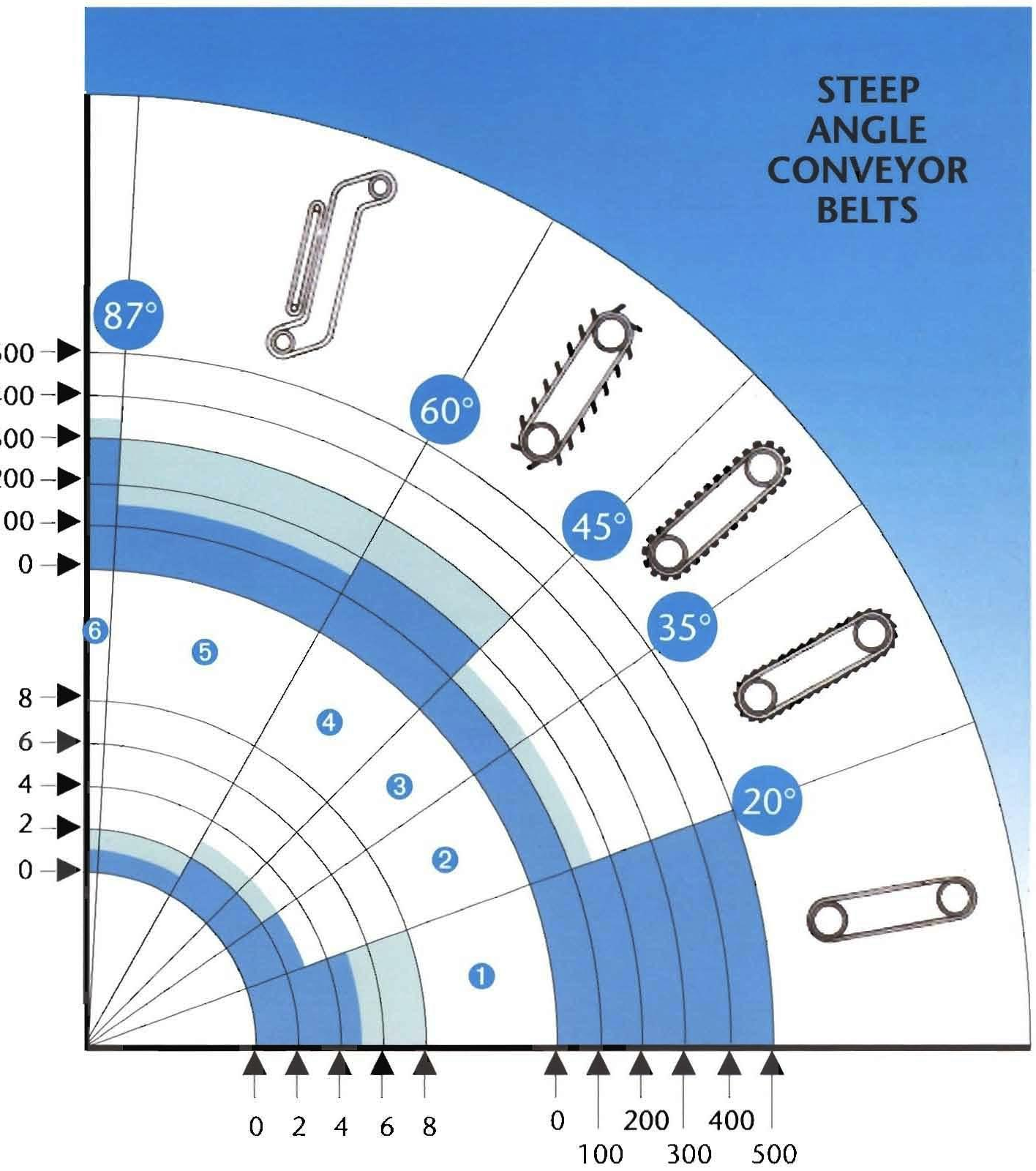
❷ Piece goods conveyor belts with cover patterning

❸ Belts with chevron cleats

❹ Box-section belts with corrugated sidewalls

❺ Conveyor belts in sandwich design

❻ Elevator Belts



TYPE A
ABRASION RESISTANT BELTS

❶ Generally natural rubber based material.
❷ Recommended for conveying large lumps, abrasive material under hard working conditions.
❸ Manufactured in compliance with DIN 22102, TS 547, TS 4464, BS 490, UNI 3718.
❹ Resistant to high impact energy.
❺ Max. 70 °C working temperature.
❻ Elektrostatic conductivity according to TS 547, TS 4464 and DIN 22104 *(Resistance < 3x10^8 ohm)*
❼ Not recommended for oily, acidic, alcali media but resistant to oxygen, ozone, impacts and abrasion.

SPECIFICATIONS	TS 547 EN ISO 14890			METHOD OF TES
Rubber Grade	H	D	L	
Tensile Strength (kg/cm^2)	24	18	15	ISO 37
Elongation at Break (%)	450	400	350	ISO 37
Abrasion (mm^3)	120	100	200	ISO 4649
Hardness (Shore A)	63±5	63±5	63±5	ISO868

* Recommended for heavy, sharp edged and large lumps (> 100 mm) in difficult working conditions
\+ Recommended for less heavy, rounded, smaller lumps (< 100 mm)

▲ Afşin/Elbistan Lignite Establishments Clay Belt 1800 mm/ST 2500

Application Places:

Cement works: Quarries, open stroge and reclamation, preblending. **Ports:** Ship loading or unloading installations. **Quarries:** Primary and secondary conveyors. **Public works:** Boring, tunneling, earthmoving. **Steelworks:** Iron are handling, open storage and reclamation, sinter plant, blast furnace feed, slag recovery. **Electricity Generating Stations:** Preblending, feed to hoppers, open storage and reclamation. **Sugar mills:** Handling of raw beets. **Pulp mills:** Handling of logs. **Coal Mines:** Tipping, refilling, washing.

TYPE F
FLAME RESISTANT BELTS

SPECIFICATIONS	ÖZERBAND SPECIFICATIONS	COMPERATIVE NORMS	
		TS 547 F	TS. 4464 F
Tensile Strength (kg/cm²)	≥ 175	≥ 175	≥ 175
Elongation at Break (%)	≥ 400	≥ 400	≥ 400
Abrasion (mm³)	≤ 225	≤ 225	≤ 225
Hardness (Share A)	63±5	63±5	63±5

▲ Central Anatolian Lignite Establishments underground Mine Belt 1200 mm/ST 1000

❶ Chloroprene rubber based, flame resistant covers.
❷ Generally used in underground mine pits.
❸ Manufactured according to TS 4464 ve DIN 22103.
❹ Suitable for difficult working conditions as type A
❺ Max. 100 °C working temperature.
❻ Electrostatic conductivity according to TS 547, TS 4464 and DIN 22104 *(Resistance < 3 x 10^8 ohm)*

Aplication Places:

Underground coal mines

TYPE T
HEAT RESISTANCE BELTS

❶ Generally EPDM based covers.
❷ Used in conveying high temperatured materials
❸ Temperature of the material
100 °C – 400 °C
Belt surface temperature
60 °C – 200 °C
❹ Resistant to acids, oxygen, water and ozone.
❺ Electrostatic conductivity according to TS 547, TS 4464 and DIN 22104 *(Resistance < 3 x 10^8 ohm)*

Application Places:

Foundries: Knock - out sand
Cement Works: Clinker
Steelworks: Hot sinter
Lime Kilins: Kilin discharge
Brickworks.

SPECIFICATIONS	ÖZERBAND SPECIFICATIONS	COMPERATIVE NORMS	
		TS 547 T	TS. 4464 T
Tensile Strength (kg/cm²)	≥ 150	≥ 130	≥ 130
Elongation at Break (%)	≥ 350	≥ 350	≥ 350
Abrasion (mm³)	≤ 250	≤ 250	≤ 250
Hardness (Shore A)	65±5	70±5	70±5

▲ Clinker Belt 650 mm / EP 630

TYPE O
OIL RESISTANT BELTS

SPECIFICATIONS	ÖZERBAND SPECIFICATIONS	COMPERATIVE NORMS	
		TS 547 O	TS 4464 O
Tensile strength (kg/cm2)	≥ 130	≥ 100	≥ 100
Elongation at break (%)	≥ 300	≥ 300	≥ 300
Abrasion (mm3)	≤ 225	≤ 300	≤ 300
Hardness (Shore A)	65 ± 5	70 ± 5	70 ± 5

▲ Oily Fertilizer Belt 650 mm/EP 500

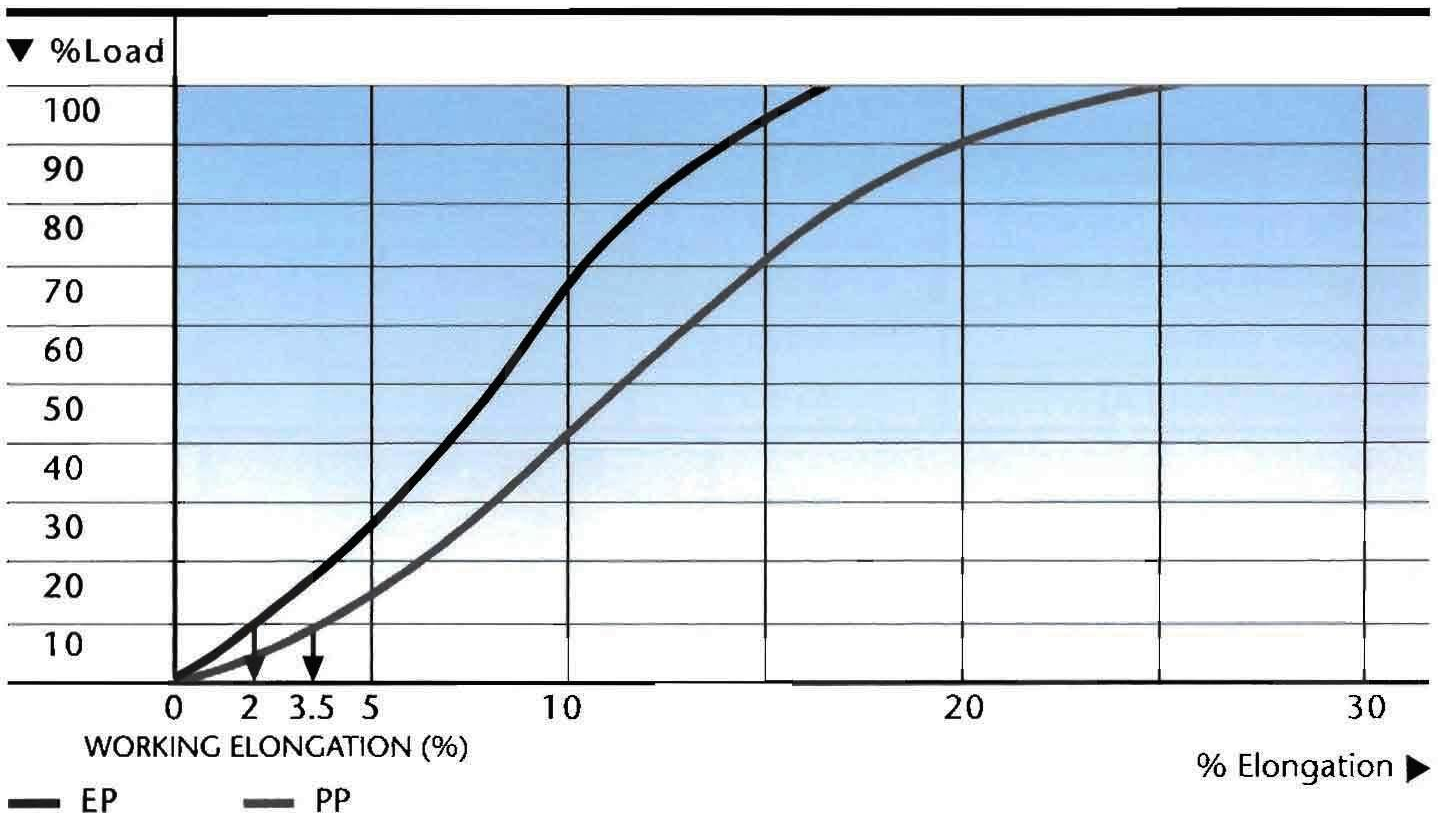
❶ Generally Nitrile based covers.
❷ Resistant to oil and grease and used in conveyors working under these environments.
❸ Max. 90°C working temperature.
❹ Resistant to acids, aliphatic and aromatic hydrocarbons.
❺ Electrostatic conductivity according to TS 547, TS 4464 and DIN 22104 *(Resistance < 3 x 10^8 ohms).*

Aplication Places:

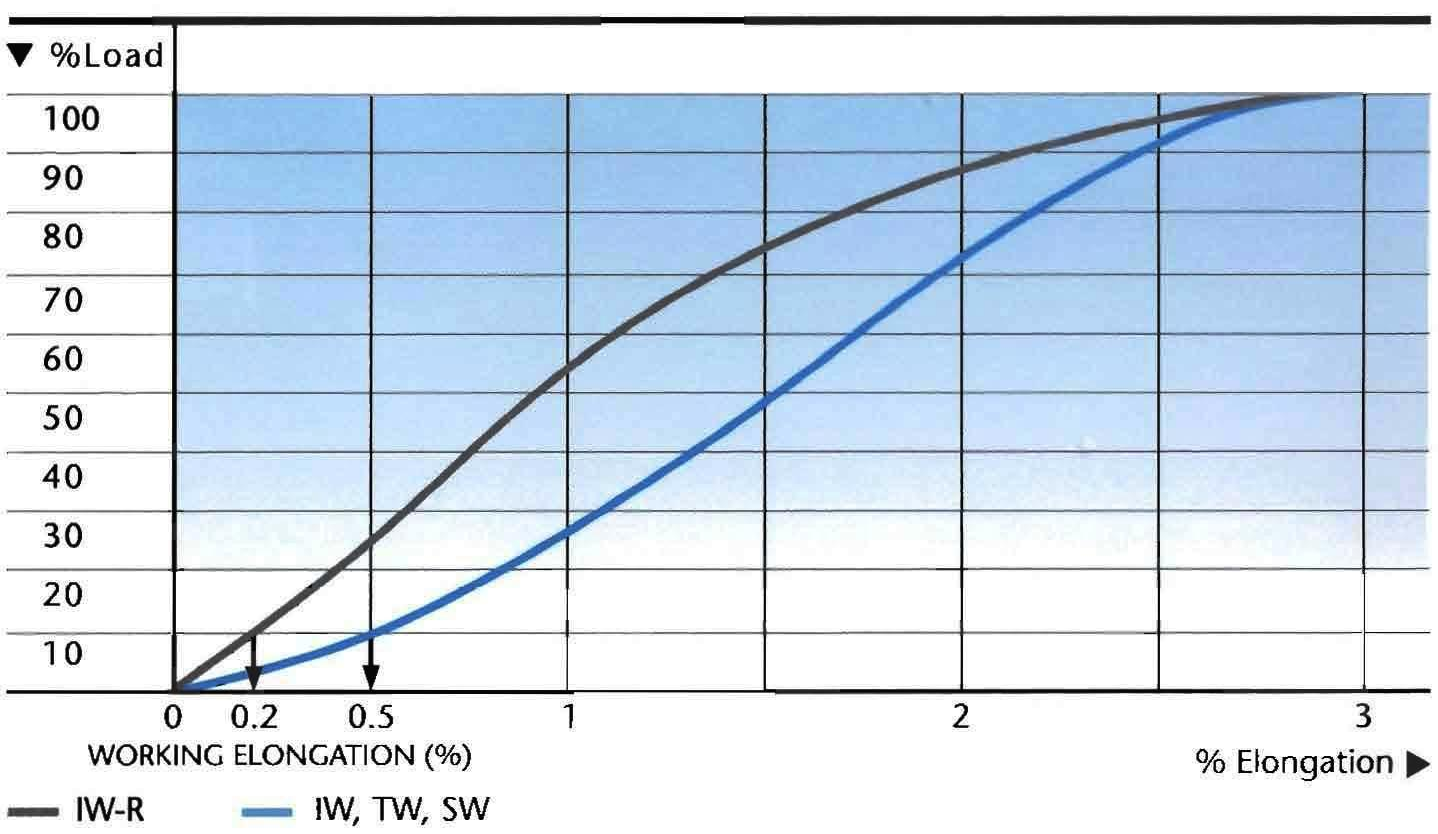
Glass works: Oil imprengnated glass waste
Fertilizer plants: Complex treated fertilizers.

ELONGATION DIAGRAMS

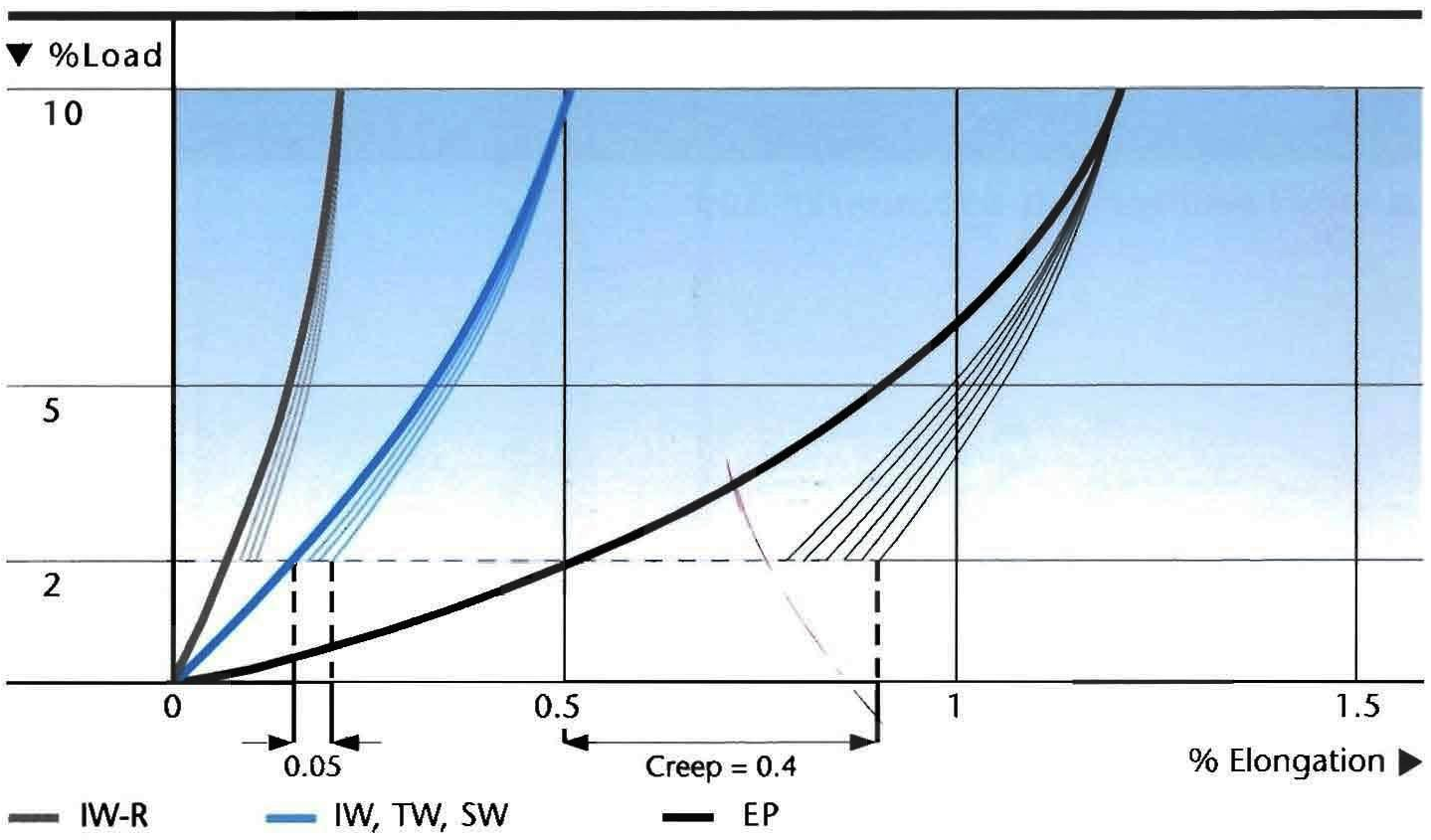
Elongation Diagram of Textile Belts

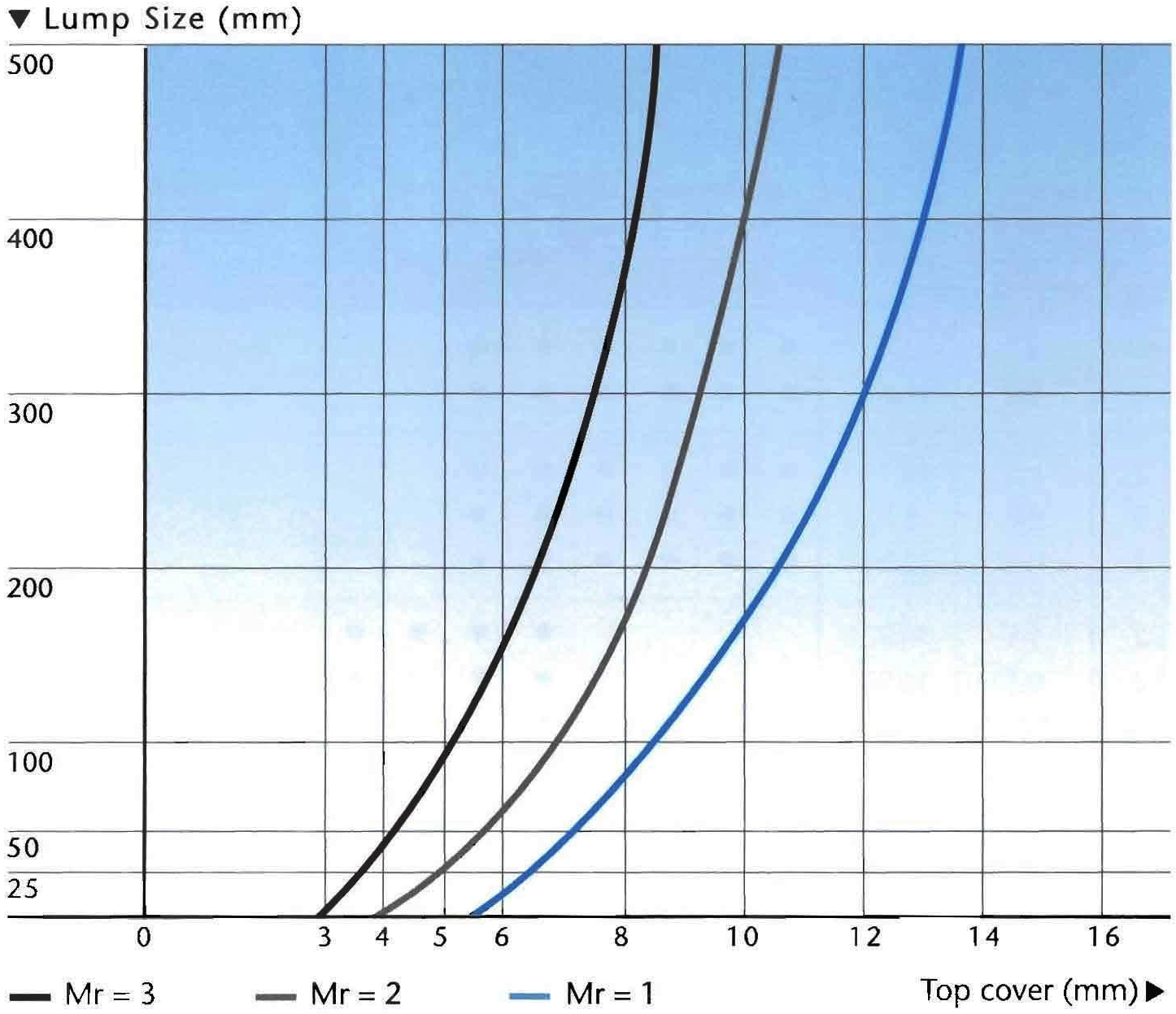


Elongation Diagram of Steel Cord Fabric Belts



Belt Creep Elongation Diagram





Selection of Top Cover Thickness

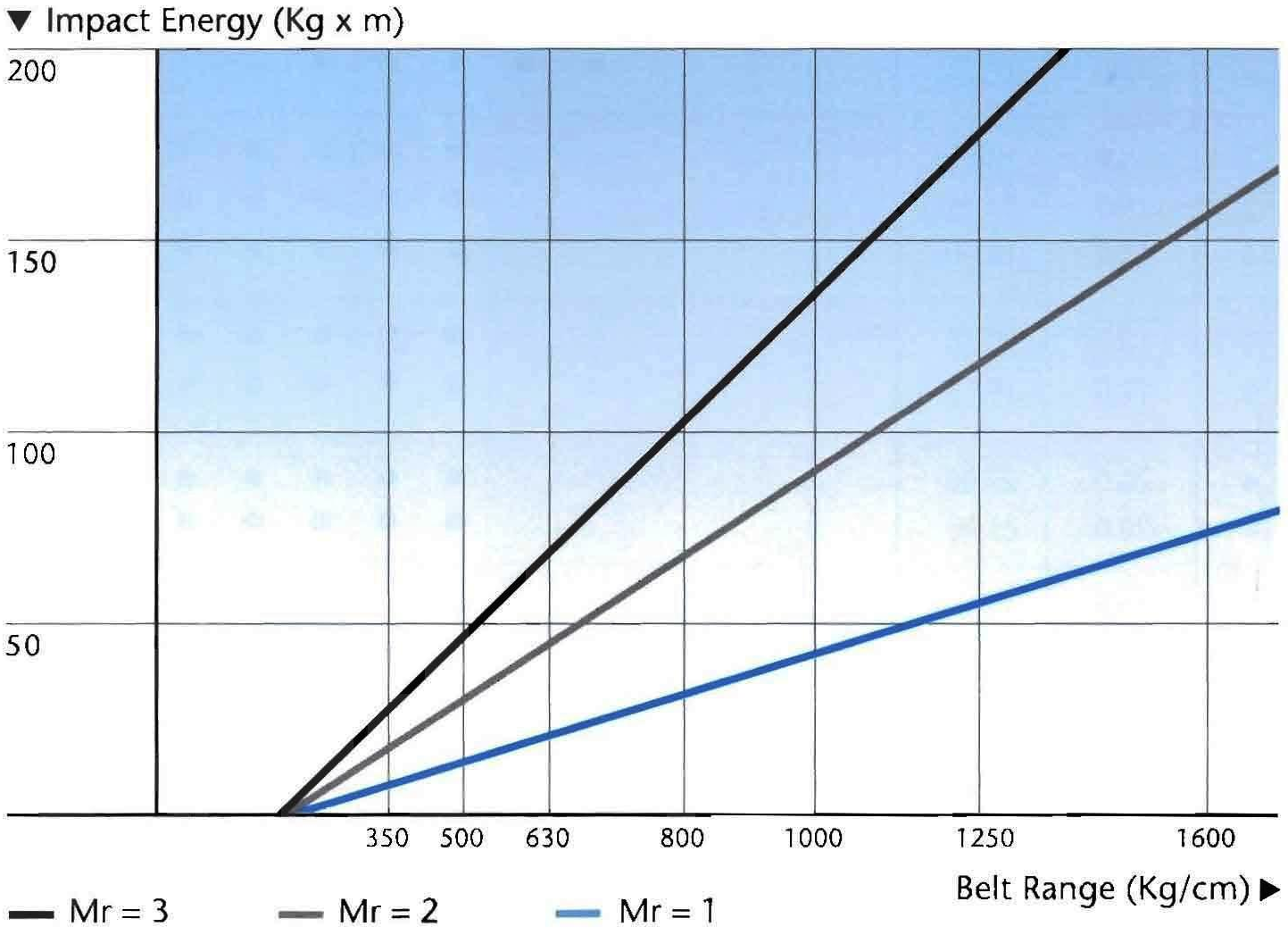
T = Top Cover Thickness (mm)

Mr = Material Rating 1, 2 and 3

1 = Very Sharp, hard (e.g. granite)
2 = Angular, irregular(e.g. liemstone)
3 = Round, light (e.g. coal)

L = Lump Size (mm)

$$T = (6–mr)+30\ (1– e^{L/250})/(Mr+ 2)$$



Selection of Belt Strength as a Function of Impact Energy

$$R = 200 + (1.6x1) / Mr$$

R = Required Belt Range (kg/cm)

I = Impact Energy (kg x m)

= Lump weight (kg) x Drop Height (m)

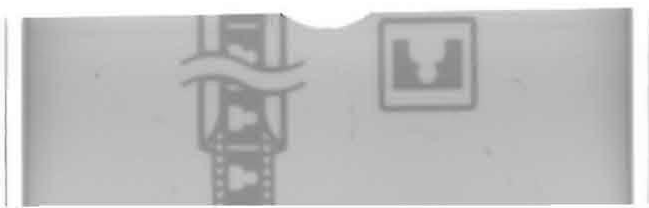
Mr = Material Rating 1,2 ve 3

1 = Very Sharp, hard (e.g. granite)
2 = Angular, irregular(e.g. liemstone)
3 = Round, light (e.g. coal)

RECOMMENDED BELT SERIES FOR TEXTILE BELTS

BELT RANGE (kg/cm)	MAXIMUM PERMISSABLE BELT TENSION (kg/cm)	FABRIC TYPE (N/mm)	NUMBER OF PLIES	COVERS		BELT THICKNESS (mm)	BELT WEIGHT (kg/m²)	BELT WIDTH (mm)													
				TOP (mm)	BOTTOM (mm)			500	600	650	750	800	1000	1200	1400	1600	1800	2000	2200	2550
EP 250	25	EP 125	2	4	2	8,5	9.77	●	●	●	●	●	●							
		EP 70	3	3	2	8.0	9.20	●	●	●	●	●	●							
EP 315	31.5	EP 160	2	4	2	9.0	10.35	●	●	●	●	●	●							
		EP 100	3	3	2	8.0	9.20	●	●	●	●	●	●							
		EP 70	4	4	2	10.0	11.50	●	●	●	●	●	●							
EP 400	40	EP 200	2	4	2	9.5	10.92					●	●	●	●					
		EP 125	3	4	2	9.5	10.92					●	●	●	●					
		EP 100	4	4	2	10.0	11.50					●	●	●	●					
EP 500	50	EP 160	3	5	2	11.0	12.65					●	●	●	●					
		EP 125	4	4	2	10.5	12.07					●	●	●	●					
		EP 100	5	5	2	12.0	13.80					●	●	●	●					
EP 630	63	EP 200	3	5	2	11.5	13.22					●	●	●	●	●				
		EP 160	4	6	3	14.0	16.10					●	●	●	●	●				
		EP 125	5	5	3	13.5	15.52					●	●	●	●	●				
EP 800	80	EP 250	3	5	2	12.0	13.80					●	●	●	●	●				
		EP 200	4	6	2	14.0	16.10					●	●	●	●	●				
		EP 160	5	6	3	15.0	17.25					●	●	●	●	●				
EP 1000	100	EP 315	3	6	2	13.0	14.95							●	●	●	●	●		
		EP 250	4	6	3	15.0	17.25							●	●	●	●	●		
		EP 200	5	6	3	16.0	18.40							●	●	●	●	●		
EP 1250	125	EP 315	4	7	4	18.0	20.70							●	●	●	●	●	●	●
		EP 250	5	6	3	17.0	19.55							●	●	●	●	●	●	●
EP 1600	160	EP 315	5	8	4	20.0	23.00							●	●	●	●	●	●	●
		EP 400	4	8	4	20.0	23.00							●	●	●	●	●	●	●
EP 2000	200	EP 400	5	8	4	22.0	25.30							●	●	●	●	●	●	●
		EP 500	4	8	4	22.0	25.30							●	●	●	●	●	●	●
EP 2500	250	EP 500	5	8	4	24.0	27.60							●	●	●	●	●	●	●
		EP 630	4	8	4	24.0	27.60							●	●	●	●	●	●	●
EP 3150	315	EP 630	5	8	4	26.0	29.90							●	●	●	●	●	●	●

- *PP code must be used when textile type polyamide/polyamide is demanded.*
- *In addition, different ply number, textile resistance, thicknesses and widths of belts can be manufactured upon request.*
- *Our belts are guaranteed for one year against defective production and workmanship.*
- *In belt weight calculation, density of covering rubber has been taken as 1.15 kg/mm/m².*



RECOMMENDED BELT SERIES FOR STEEL CORD FABRIC BELTS

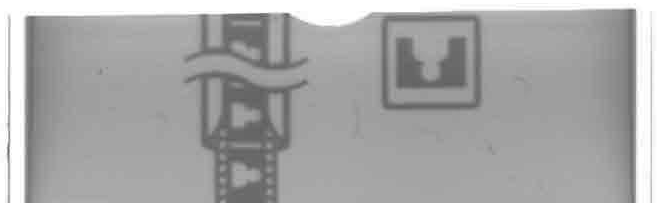
BELT RANGE (N/mm)	MAX. PERMISSABLE BELT TENSION (N/mm)	FABRIC TYPE	COVERS (mm)		TOTAL THICKNESS (mm)	BELT WEIGT (kg/m^2)	BELT WIDTH (mm)							
			TOP (mm)	BOTTOM (mm)			650	800	1000	1200	1400	1600	1800	2000
ST 350	35	TW	6	3	11.0	14.15	●	●						
		IW	6	3	11.0	14.50	●	●						
		SW	6	4	12.0	15.80	●	●						
ST 500	50	TW	6	3	11.0	14.80	●	●						
		IW	6	3	11.0	15.10	●	●						
		SW	6	4	12.0	16.40	●	●						
		Steel Cord	6	4	13.0	16.95	●	●						
ST 630	63	TW	6	3	11.0	15.30	●	●						
		IW	6	3	11.0	15.60	●	●						
		SW	6	4	12.0	16.90	●	●						
		IW - R	6	3	12.0	17.25	●	●						
		Steel Cord	6	4	13.0	17.44	●	●	●	●				
ST 800	80	TW	8	4	14.9	20.73		●	●	●				
		IW	8	4	14.9	21.28		●	●	●				
		SW	8	4	14.9	21.23		●	●	●				
		IW - R	8	4	15.6	22.29		●	●	●				
		Steel Cord	8	4	15.6	22.01		●	●	●				
ST 1000	100	TW	8	4	14.9	21.58			●	●				
		IW	8	4	14.9	21.13			●	●				
		SW	8	4	14.9	22.08			●	●				
		IW - R	8	4	15.6	23.14			●	●				
		Steel Cord	8	4	16.6	23.28			●	●				
ST 1250	125	TW	10	5	18.7	27.10			●	●	●			
		IW	10	5	18.7	27.85			●	●	●			
		SW	10	5	18.7	27.80			●	●	●			
		IW - R	10	5	19.4	28.71			●	●	●			
		Steel Cord	10	5	19.4	28.38			●	●	●			
ST 1400	140	TW	10	5	18.7	27.80			●	●	●			
		IW	10	5	18.7	28.55			●	●	●			
		SW	10	5	18.7	28.50			●	●	●			
		IW - R	10	5	19.4	29.21			●	●	●			
		Steel Cord	10	5	20.0	28.60			●	●	●			
ST 1600	160	TW	10	5	18.7	28.65			●	●	●	●		
		IW	10	5	18.7	29.40			●	●	●	●		
		SW	10	5	18.7	29.35			●	●	●	●		
		IW - R	10	5	20.2	31.13			●	●	●	●		
		Steel Cord	10	5	20.5	30.20			●	●	●	●		
ST 1800	180	SW	10	5	18.7	30.20			●	●	●	●		
		IW - R	10	5	20.2	32.33			●	●	●	●		
		Steel Cord	10	5	20.5	31.30			●	●	●	●		
ST 2000	200	SW	10	6	19.7	31.90						●	●	●
		IW - R	10	6	21.2	34.18						●	●	●
		Steel Cord	10	5	20.5	31.30						●	●	●
ST 2500	250	IW - R	11	7	24.8	41.30						●	●	●
		Steel Cord	10	5	20.5	31.30						●	●	●
ST 3150	315	IW - R	12	8	27.6	47.99						●	●	●
		Steel Cord	10	5	20.5	31.30						●	●	●

- *Covering thicknesses and widths in the table are recommended values, in addition, required widths and thicknesses of belts can be manufactured upon request.*
- *In the belt weight calculation, abrasion resistant cover rubber having density of 1.15 kg/mm/m2 (A) has been taken as base.*
- *Belts are guaranteed for one year against defective productions and workmanship.*

TECHNICAL SPECIFIATION OF STEEL CORD BELT

TS EN ISO 15236																			
TYPE OF BELT	UNIT	500	630	800	1000	1250	1400	1600	1800	2000	2250	2500	2800	3150	3500	4000	4500	5000	5400
Min. Breaking strength K_{Nmin}	N/mm	500	630	800	1000	1250	1400	1600	1800	2000	2250	2500	2800	3150	3500	4000	4500	5000	5400
Max. Cord Diameter d_{max}	mm	3	3	3,7	4,2	4,9	5	5,6	5,6	5,6	5,6	7,2	7,2	8,1	8,6	8,9	9,7	10,9	11,3
Min. Breaking Load of the Cord F_{bsmin}	KN	7,6	7,6	10,3	12,9	18,4	20,6	26,2	25,5	25,5	26,2	39,7	39,7	50	55,5	63,5	75	90,3	96
Cord Pitch t	mm	14	11	12	12	14	14	15	13,5	12	11	15	13,5	15	15	15	16	17	17
Min. Thickness of Covers S_{min}	mm	4	4	4	4	4	4	4	4	4	4	5	5	5,5	6	6,5	7	7,5	8
Belt width B in mm	Tole-rance in mm	Number of Cords, n																	
500	+10/-5	33	42	39	39	34	34	31	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
650	+10/-7	44	54	51	51	45	45	41	46	52	56	41	46	41	41	41	39	36	n/a
800	+10/-8	54	68	64	63	55	55	50	57	64	69	51	57	51	51	51	48	45	45
1000	±10	68	84	80	80	68	68	63	71	80	86	63	71	63	64	63	60	56	57
1200	±10	86	110	97	97	82	82	76	85	96	104	76	85	76	76	76	72	67	68
1400	±12	96	124	114	113	97	97	90	100	112	122	89	99	89	89	89	84	79	79
1600	±12	111	142	130	130	111	111	103	114	129	140	102	114	102	102	102	96	90	90
1800	±14	125	160	147	147	125	125	116	129	145	159	116	128	116	116	116	108	102	102
2000	±14	139	177	164	163	140	139	130	144	162	177	129	143	129	129	129	121	114	114
2200	±15	153	195	180	180	154	154	143	159	179	195	142	158	142	142	142	133	126	126
2400	±15	167	213	197	197	168	168	156	174	195	213	156	173	156	156	156	146	137	137
2600	±15	181	231	214	213	182	182	170	189	212	231	169	188	169	169	169	158	149	149
2800	±15	196	249	230	230	197	197	183	203	229	249	182	202	182	182	182	171	161	161
3000	±15	210	267	247	247	211	211	196	218	245	268	196	217	196	196	196	183	173	173
3200	±15	224	286	264	263	225	225	210	233	262	286	209	232	209	209	209	196	184	184

N/A = Not applicable because of troughability

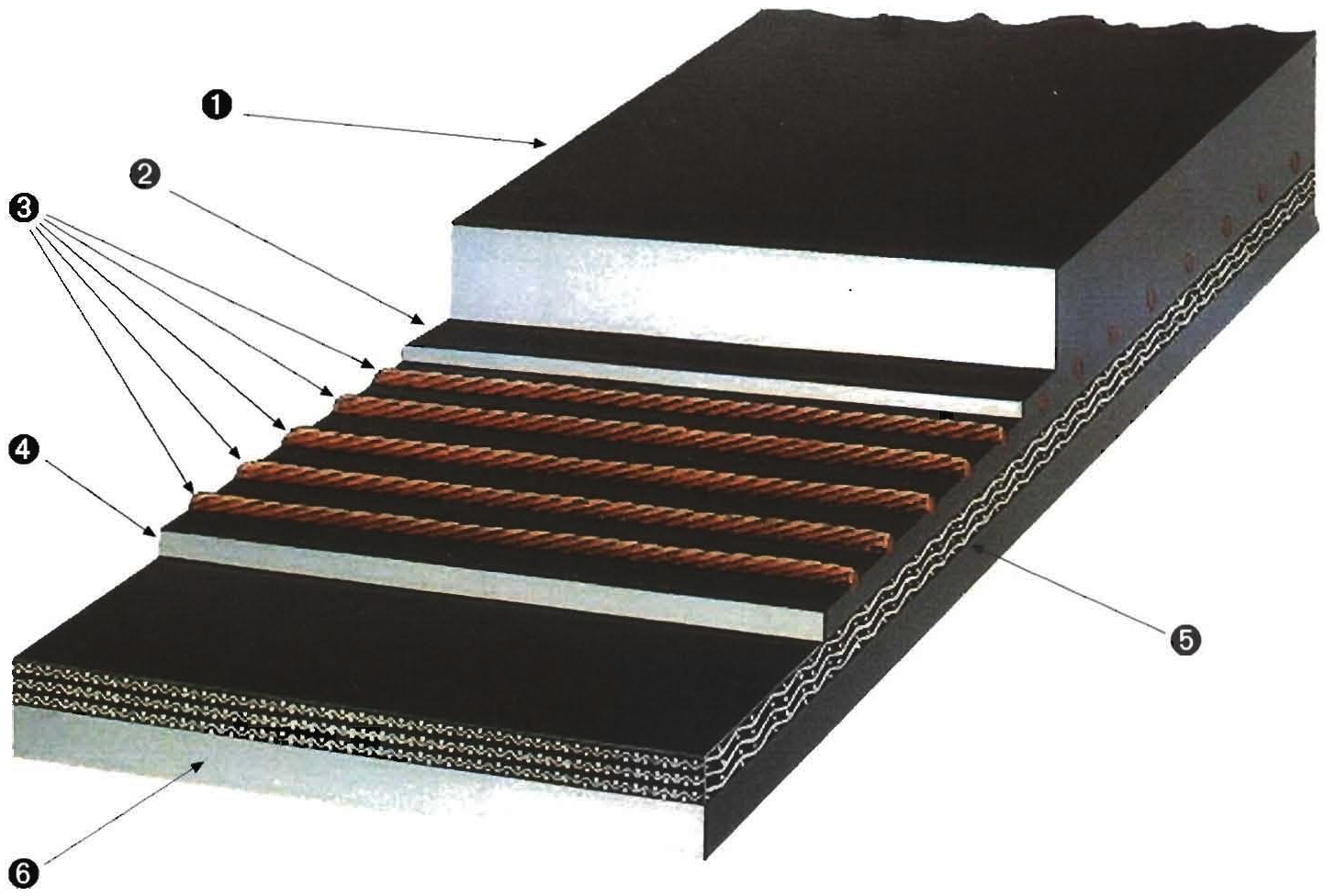


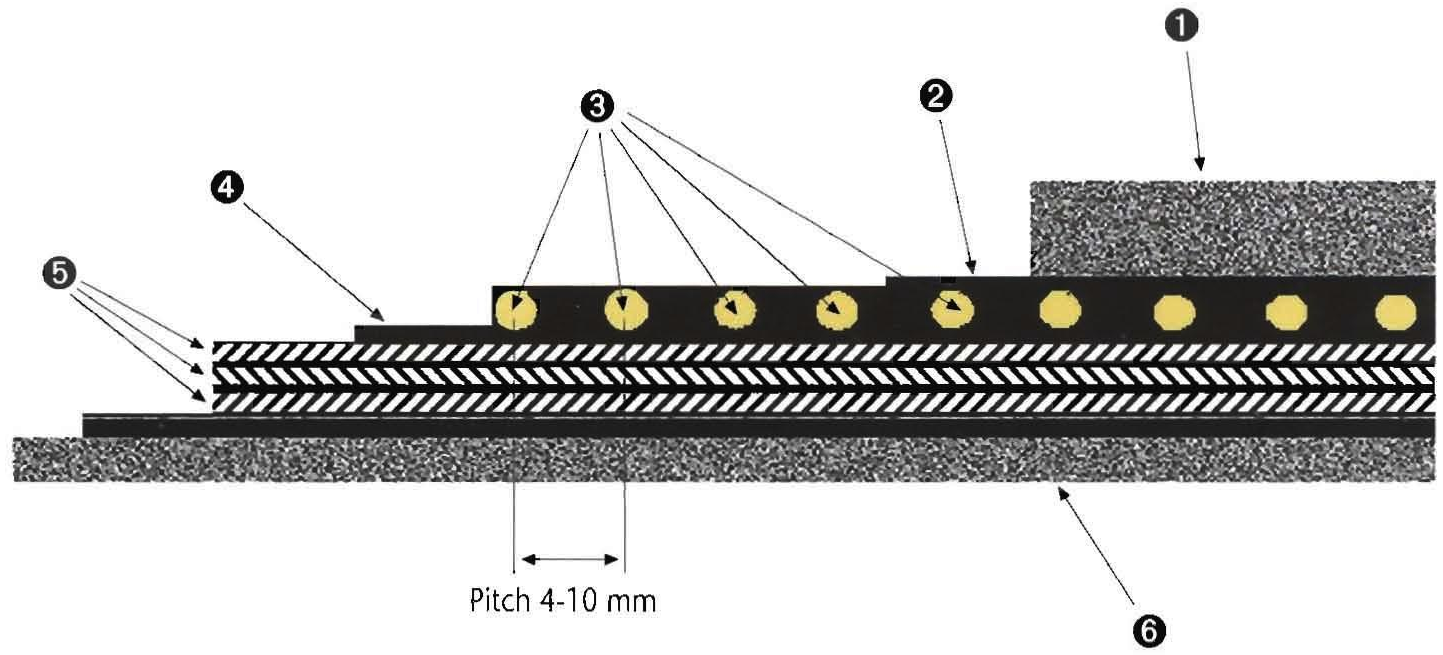
STEEL
CORD BELT

RIP STOP BELTS

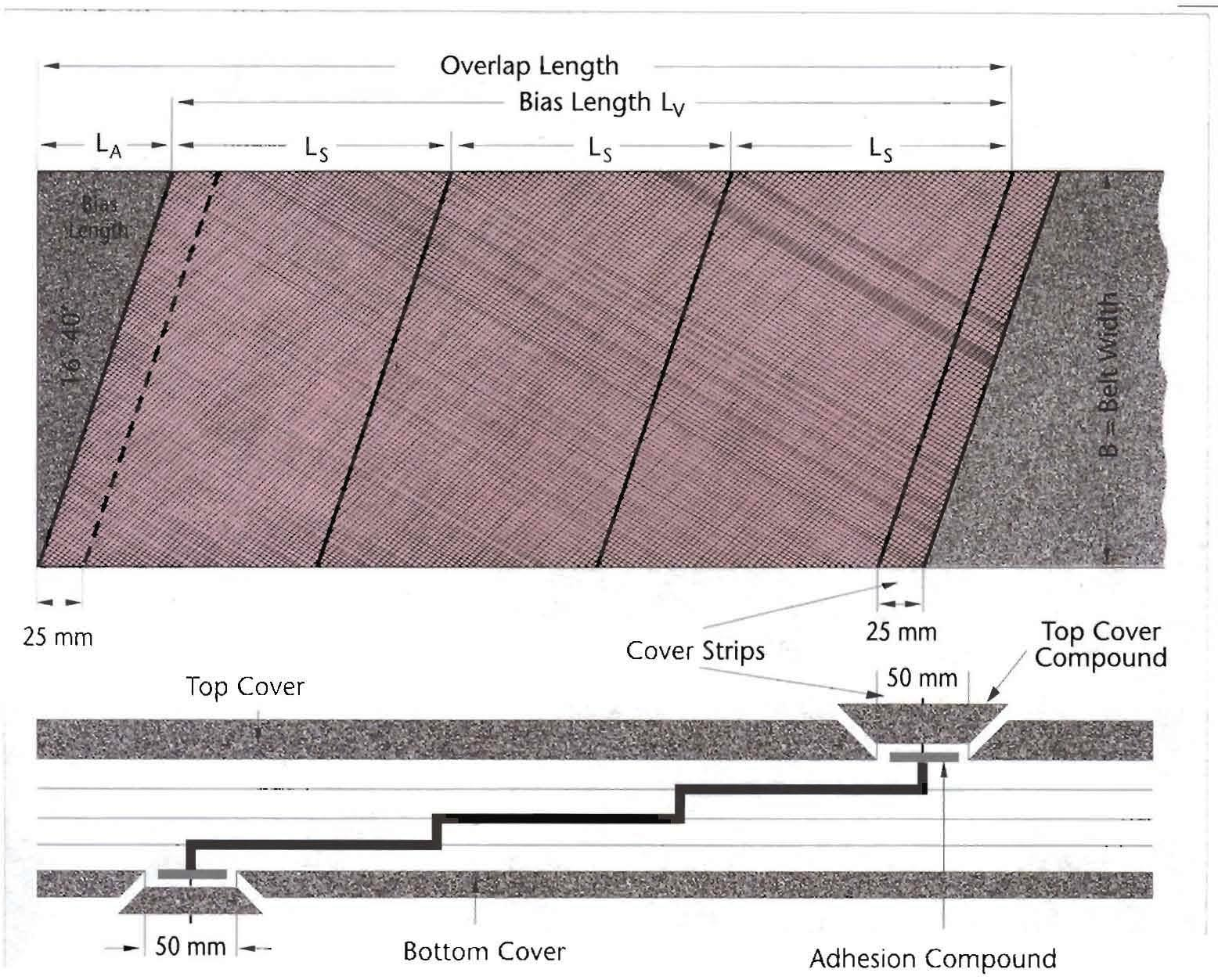
❶ Top cover thickness: 2-12 mm
❷ Skim compound: Min. 1 mm
❸ Steel cord: 1,35 - 2,4 mm
❹ Skim compound: Min. 1 mm
❺ Conveyor belt fabric: EP or PP
No of ply: 2-6
Tensile strength:100-630 N/mm
❻ Bottom cover thicknes: 1-8 mm

Not: Patent is owned by ÖZERBAND A.Ş.

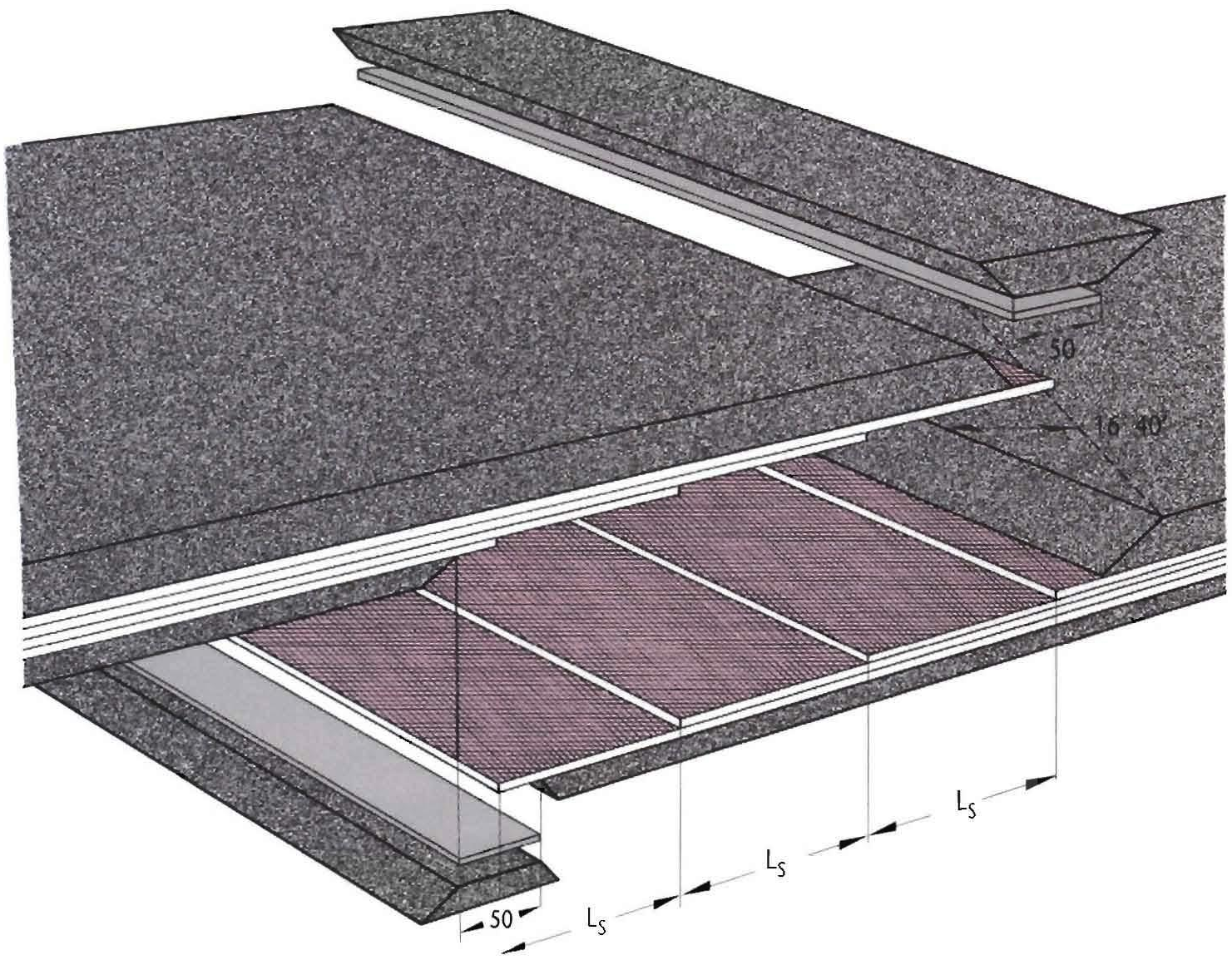




SPLICING OF TEXTILE BELTS
HOT VULCANIZATION



Bias Length : $L_A = 0.3 \infty$ Belt Width
Splice Length : L_V = (No. of fabric plies -1) ∞ Step Length L_S
Overlap Length = Splice Length (L_V) + Bias Length (L_A)



Minimum Recommended Step Lengths To the Strength of the Fabric

Strength of the fabric (kg/cm)	Belt Type	LS Step Length (mm)	LV Splice Length (mm)
70	200/3	100	200
	250/4	100	300
100	250/3	150	300
	315/3	150	300
	315/4	150	450
	400/4	150	450
125 - 160	400/3	200	400
	500/3	200	400
	500/4	200	600
	630/4	200	600
200 - 250	800/4	250	750
	1000/4	250	750
	1000/5	250	1000
	1250/5	250	1000
315 - 400	1250/4	300	900
	1600/5	300	900
	1600/5	300	1200
	2000/5	300	1200

In vulcanizing processes following points should be taken into consideration:

❶ Mould height should be 1 mm lower than belt thickness.

❷ Pressure is not applied immediately after press in closed. Temperature should be reached 70 or 80°C. Then initial pressure is applied.

❸ Pressure is increased gradually as temperature rises. After temperature is reached 145°C, vulcanization begins.

❹ Belt Should be held under pressure for the duration of vulcanization at this temperature.

Vulcanisation Time For Özerband Belts:

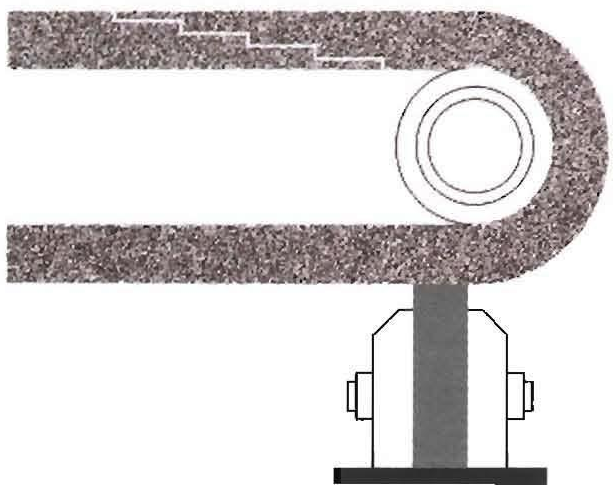
For belts up to 20 mm. thickness;
[Belt thickness (mm) + 10] min.

For belts thicker than 20 mm.;
[Belt thickness (mm) + 15] min.

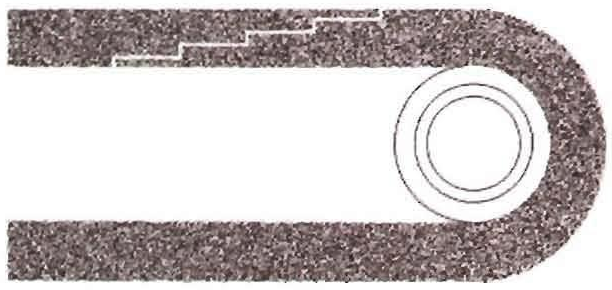
SPLICING OF TEXTILE BELTS BY COLD VULCANIZATION

Splicing Lengths of conveyor belts can be found in the chart below as per fabric type and number of plies

Strength of the fabric (kg/cm)	No. of plies	Step Length (mm)	Splice Length (mm)
70 - 100	3	150	300
	4	150	450
125 - 160	3	200	400
	4	200	600
200 - 250	4	250	750
	5	250	1000
315 - 400	4	300	900
	5	300	1200

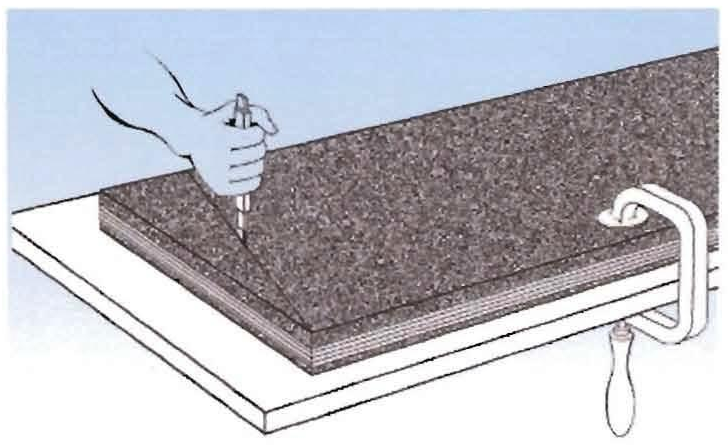


Splicing when system incorporates scraper.

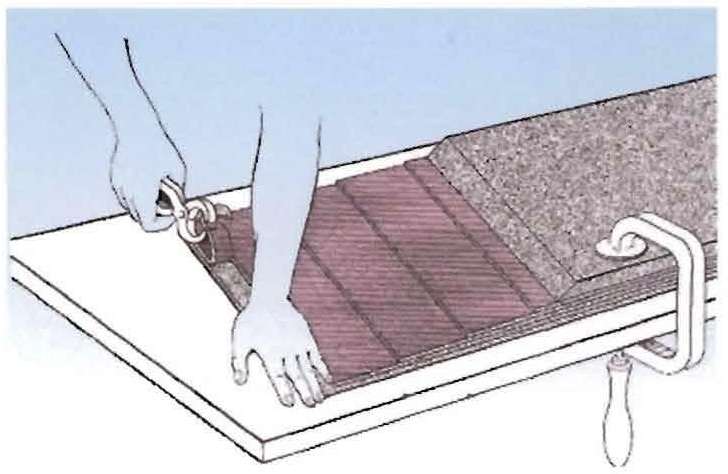


Splicing when system does not incorporate scraper.

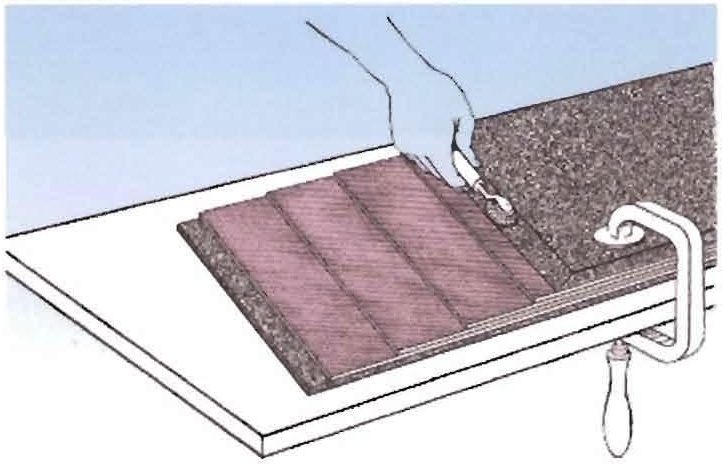
Belt ends are cut as angular shape. Belt witdh multiplied by factor 0,3 formes 16° 40' angle. For the belts passing smaller pulleys, narrower angles are recommended.



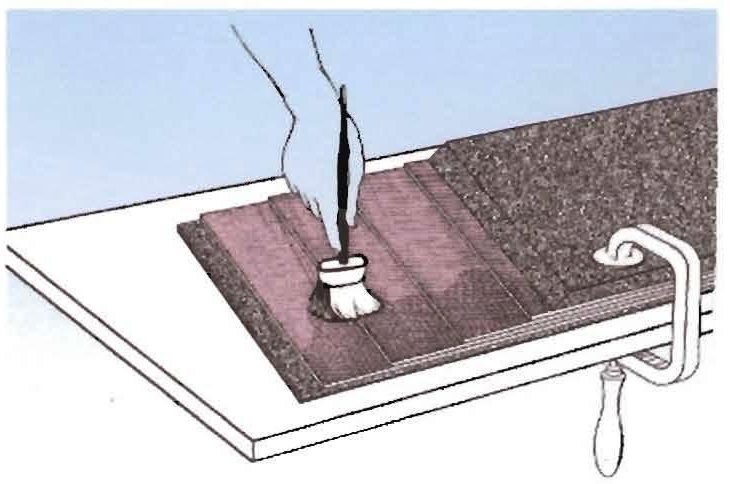
Plies are opened at lengths specified in the chart as per fabric resistance. Cover is removed from 30 mm inwards of the utmost fabric layer. Similarly, lowest fabric is removed leaving 50 mm bottom cover.



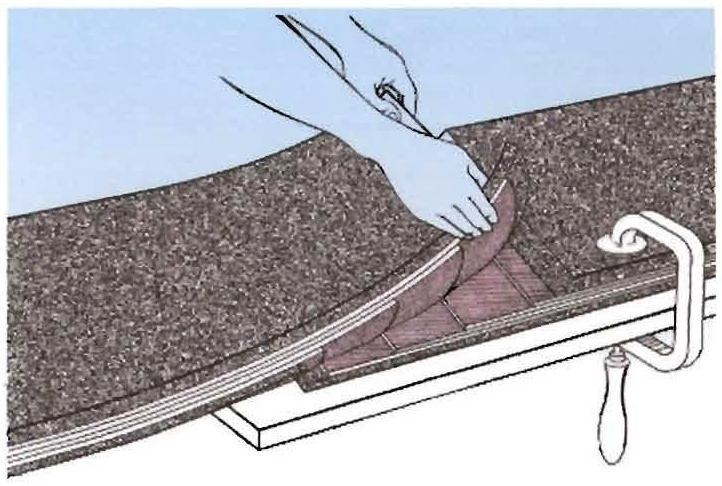
Sharp edge, where top cover and fabric overlaps, is abraded at an angle of 45° with wire brush or spiral abrasive.



Cold vulcanized adhesive mixed with hardener is applied both surfaces prepared for splicing. Adhesive should be provided to penetrate throughly into the fabric. While the compound is applied, brush should be pressed towards rotation powerfully and a homogeneous layer should be formed on splicing surfaces. Compound should be well distributed. Otherwise air bubbles to be formed would not dry completely. Each layer to be applied should be dried throughly. Duration might change depending on climate conditions. Approximately two hours waiting is required. It's not recommended to use an instrument like rays or fans in drying out process.

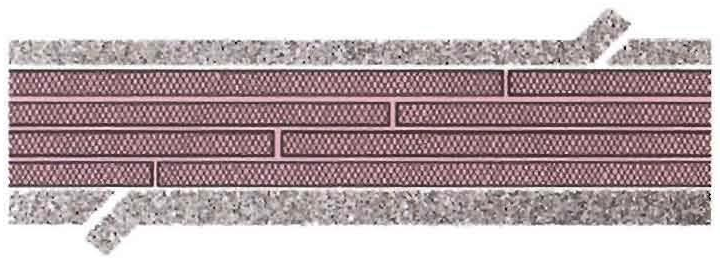


SPLICING OF TEXTILE BELTS BY COLD VULCANIZATION

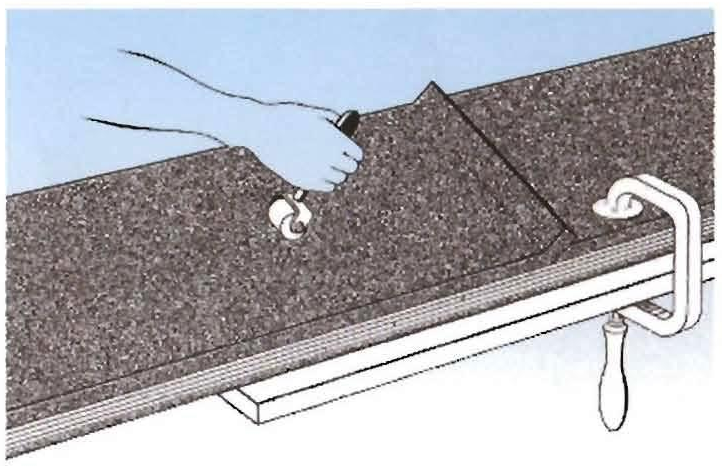


To provide synchoronized drying of both parts of splicing, it is recommended that the last layer must be applied on both parts at the same time by two assemblers. Rubber surfaces dry more quickly than adhesive applied fabric surfaces. For this reason, a tiny layer should be applied to these parts before the last fabric layer dries.

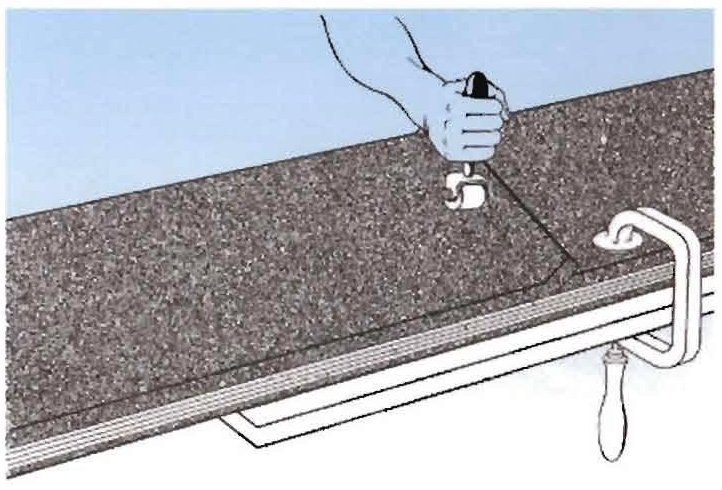
Great care is required in gathering two belts and all the steps should be coincided together. Gathering should be done carefully. Because in contrary to the hot vulcanization, subsequent adjustment is not possible. Otherwise adhesion film which is extremely important for adhesion will be damaged. In case of gathering is regular for any reason and removal is required, a thin layer of compound should be applied again and waited for drying.



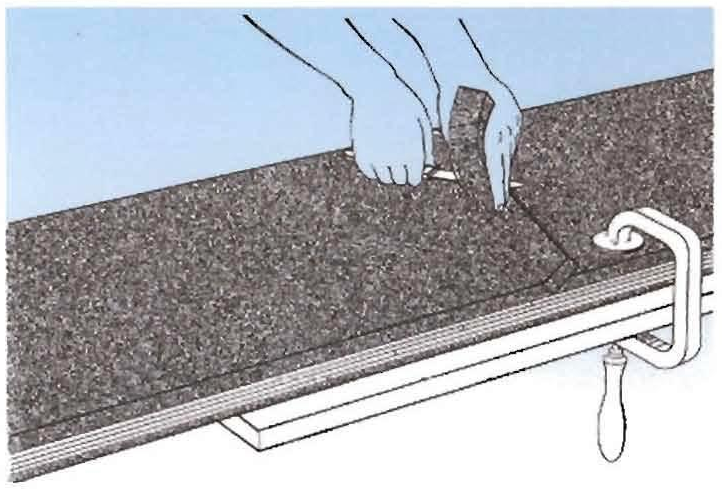
Rubber projections are formed on top and bottom surfaces as shown in the figure.



Adhered parts should be pressed by using a roller. Roller should be directed from center to the edges (Removing air from the edges.)



Subsequently joint juncture place is pressed more powerfully along the juncture place with a roller.



Then excess rubbers are cut carefully using a sharp knife. If any pores are observed, a paste formed by mixing rubber dust and cold adhesive is applied and filled. A better result is obtained in adhesion by placing a heavy object onto the joint place until belt is operated for service. Adhesion power increases in time. Belt should not be operated before two hours. 4 or 6 hours waiting is required for belt to operate in full capacity.

Application Instructions of Cold Vulcanised Adhesive

Cold vulcanization provides belt splicing without requiring vulcanization heater equipment. Formed by two components as adhesive and hardener. Mixture should be prepared when to be used since the time required for using is limited after adhesive and hardener is mixed. Mixture should be used within maximum of 3 hours. Cold adhesives should be stored in cool and dry places. Recommended storage period is 6 months. It's recommended that container should be placed upside down since it prevents air entering.

Cold Vulcanised adhesive provides great facility not only in belt splicing but rubber covering of pulleys, rubber covering of internal surfaces of tanks and bunkers, adhering rubber floor surface covering materials. (Wood, reinforced concrete, metal surfaces.)

SPLICING OF STEEL CORD FABRIC BELTS

A - Classicl Splicing

After the preparation of both belt ends, the underside of the joint is filled up with adhesion compound ❸ and cover compound ❷; the carcass is then covered with the insertion strips ❶, surrounded by adhesion compound ❸ and finally completely covered with cover compound ❷ in one or more layers.

❶ Insertion Strip

❷ Cover Compound

❸ Adhesion Compound

❹ Warp Cord

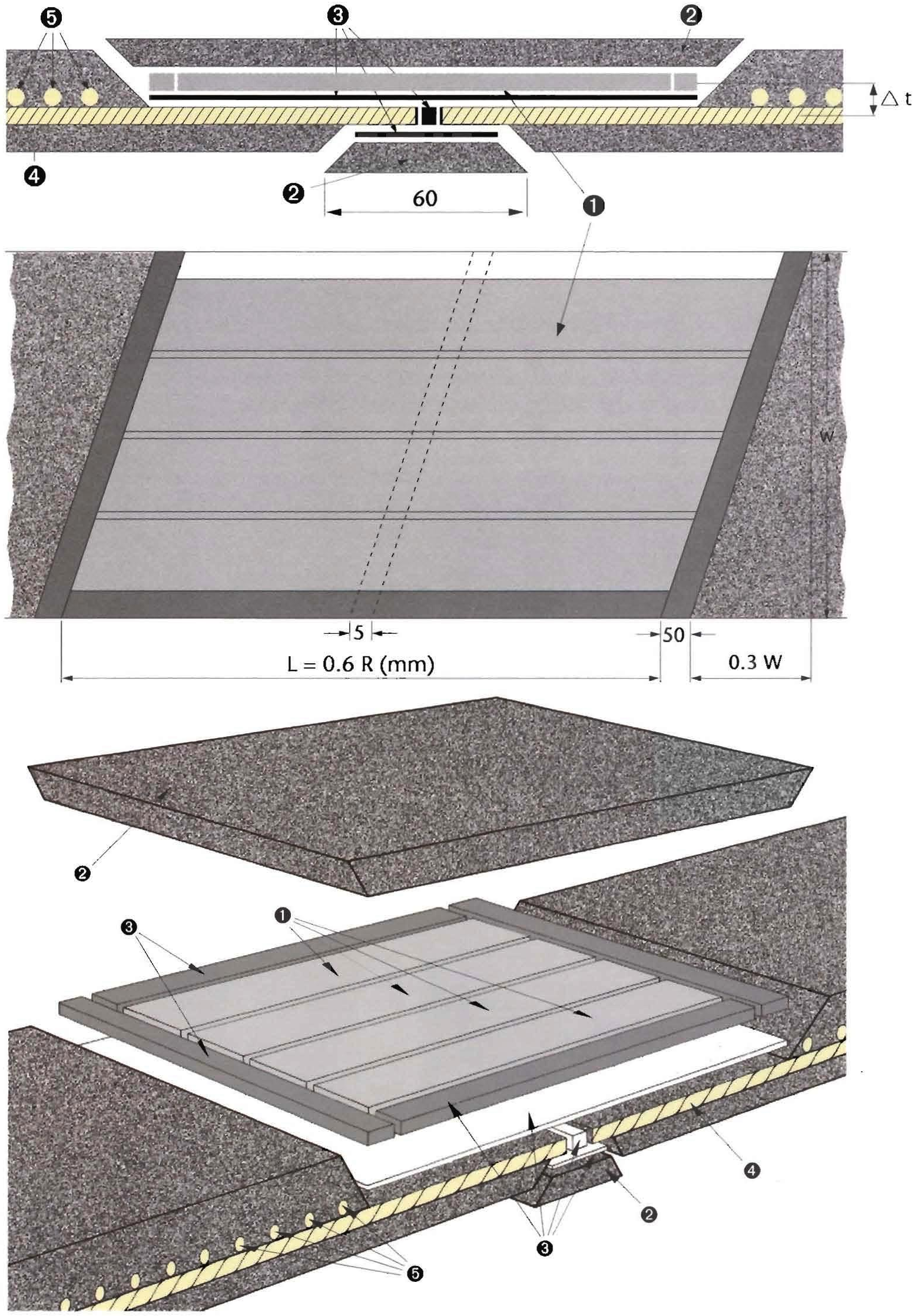
❺ Weft Cords

R = Belt Range

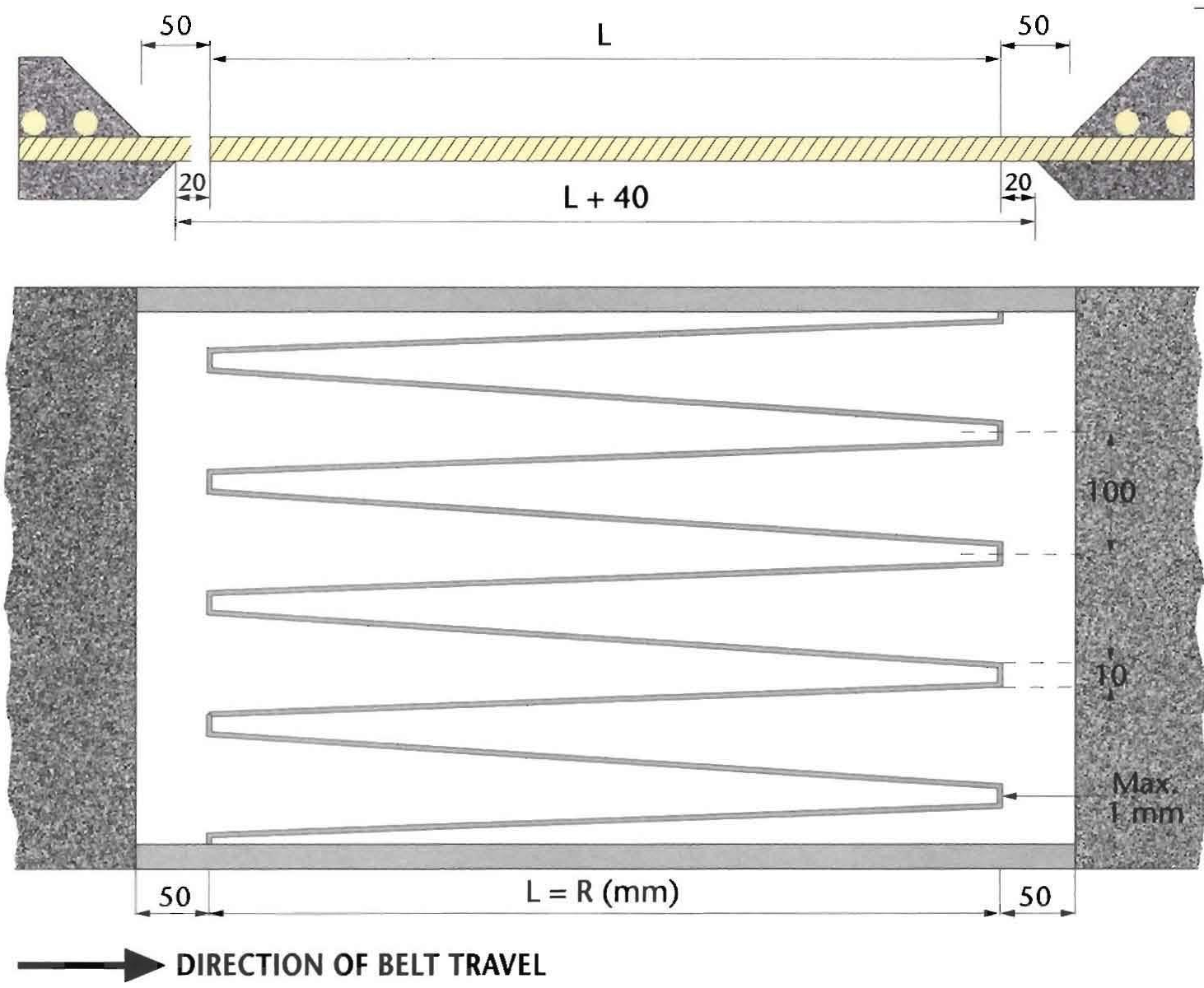
L = Splice Length

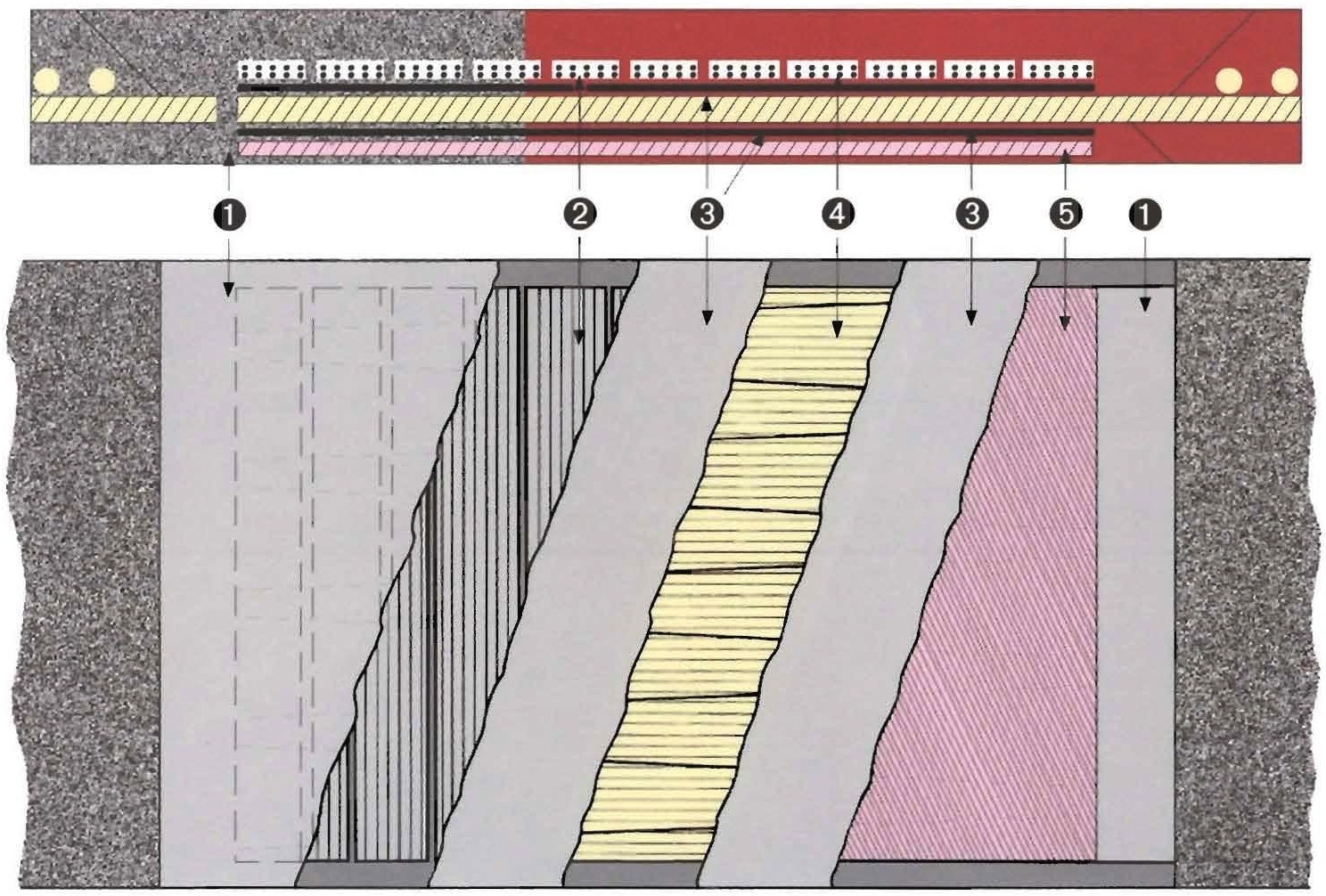
Δ_{ta} = Max. center distance between Insertion Strip and warp cords

W = Belt width



Belt Range	Kg/cm	350	500	630	800	1000	1250	1600
Splice Length (L)	mm	210	300	375	480	600	750	960
Insertion Strip	mm	IS 630	IS 630	IS 630	IS 1000	IS 1000	IS 1250	IS 1600
△ Max.	mm	3	3	3	4	4	4.8	5.1





B – Finger Splice

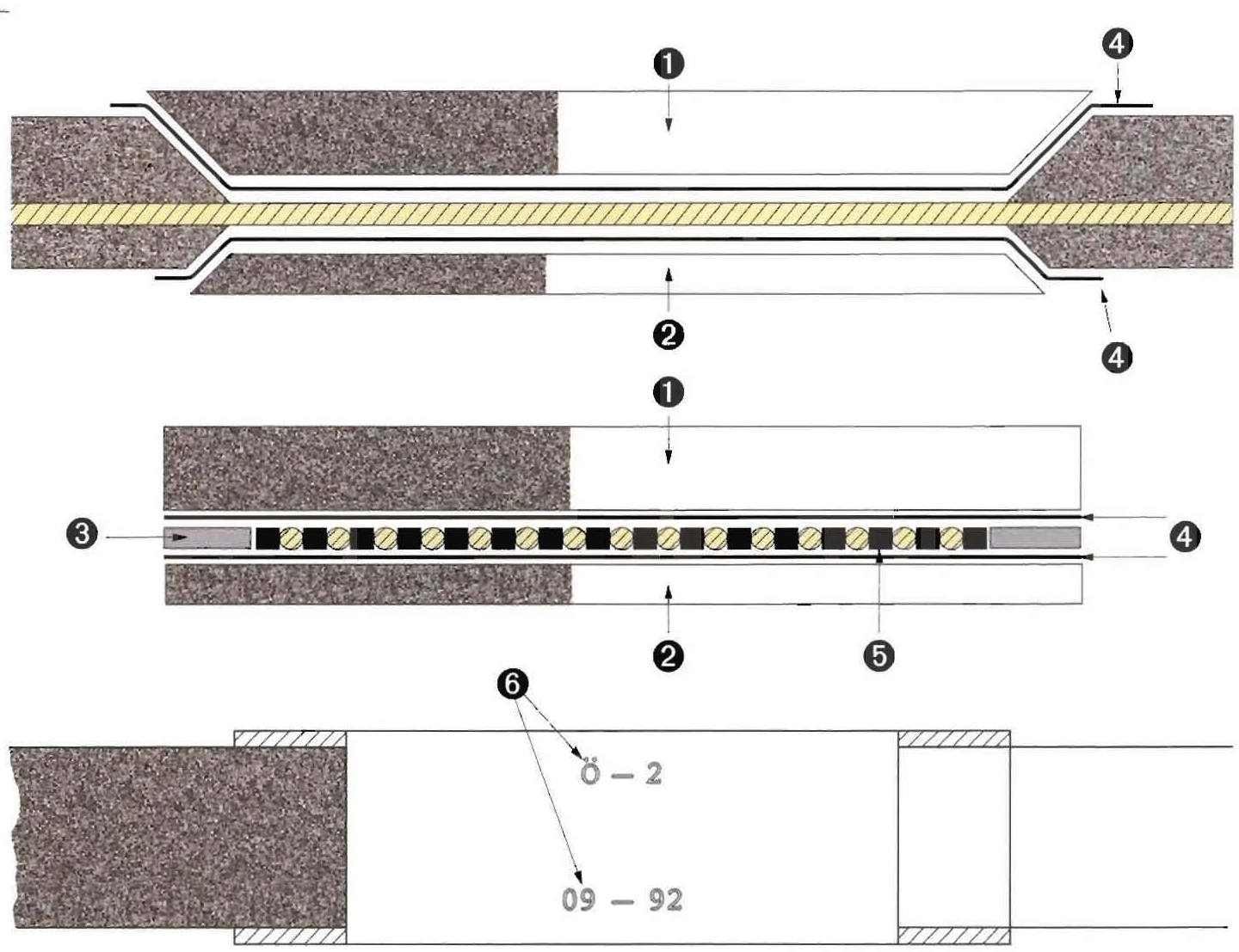
L = Splice Length
R = Belt Range

1. Cover Rubber
2. Insertion Strip IS 630
3. Adhesion Compound
4. Steel Cord Fabric
5. Rubber Coated Fabric (EP 125)

Attension! The splice Length can be made 20% shorter If Insertion Strips IS 630 are used transverse wise in top and bottom cover.

SPLICING OF STEEL CORD FABRIC BELTS

C - Steel Rope Splice

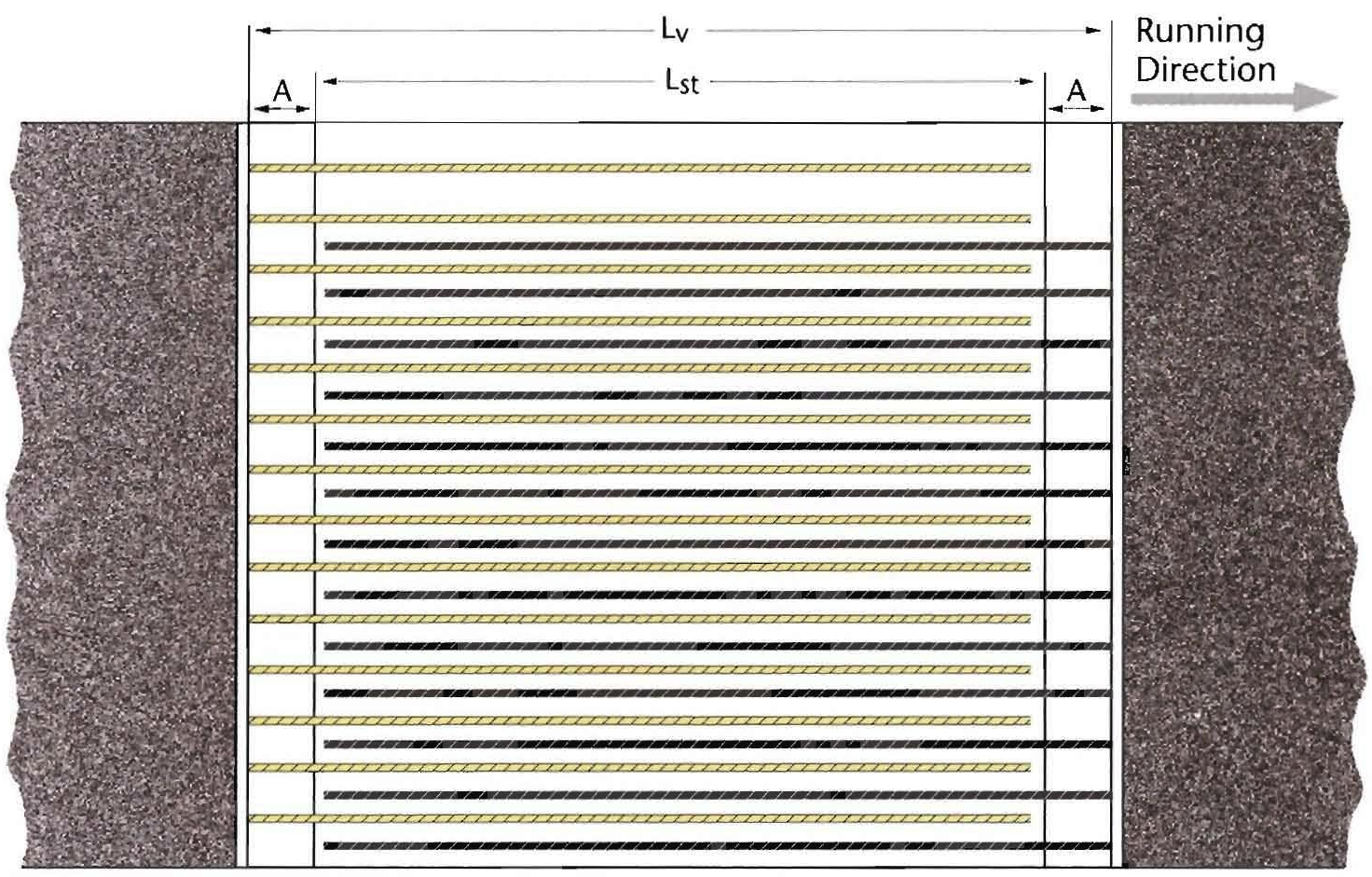


❶ Top Cover Rubber
❷ Bottom Cover Rubber
❸ Edge Rubber
❹ Skim Coast (STG)
❺ Square Fill Rubber
❻ Mark Rubber

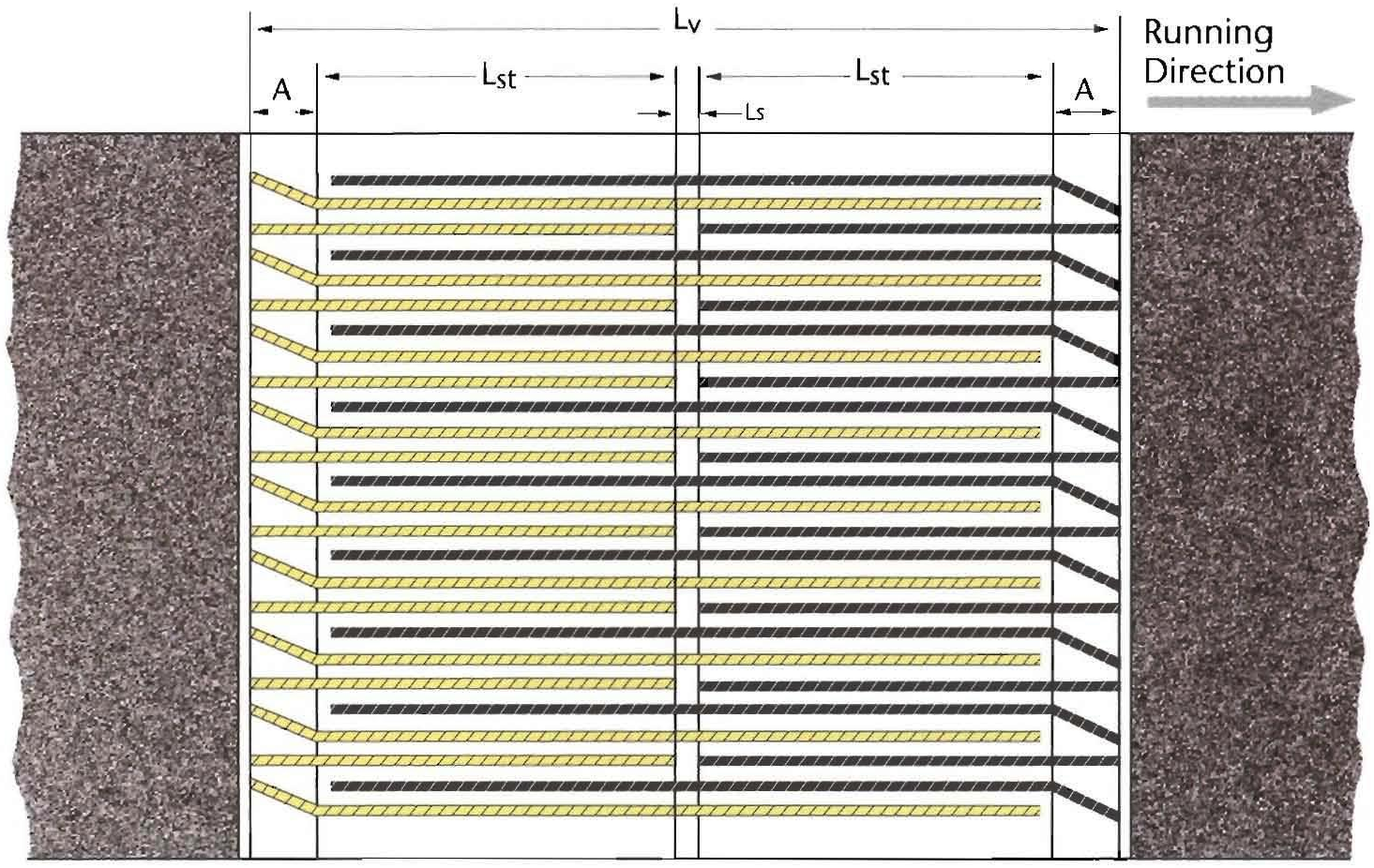
L_v = Total Splice Length
L_{st} = Step Length

Belt Range	630	800	1000	1250	1400	1600	1800	2000	2500	3150
Number of Steps	1	1	1	1	1	2	2	2	2	2
L_s (mm)	–	–	–	–	–	20	20	20	20	30
L_{st} (mm)	400	450	500	550	600	550	550	600	650	750
A (mm)	50	50	50	50	50	50	50	50	50	75
L_v	500	550	600	650	700	1220	1220	1320	1420	1680

ONE AND TWO STEPS SPLICING PATTERN (RECTANGLE)



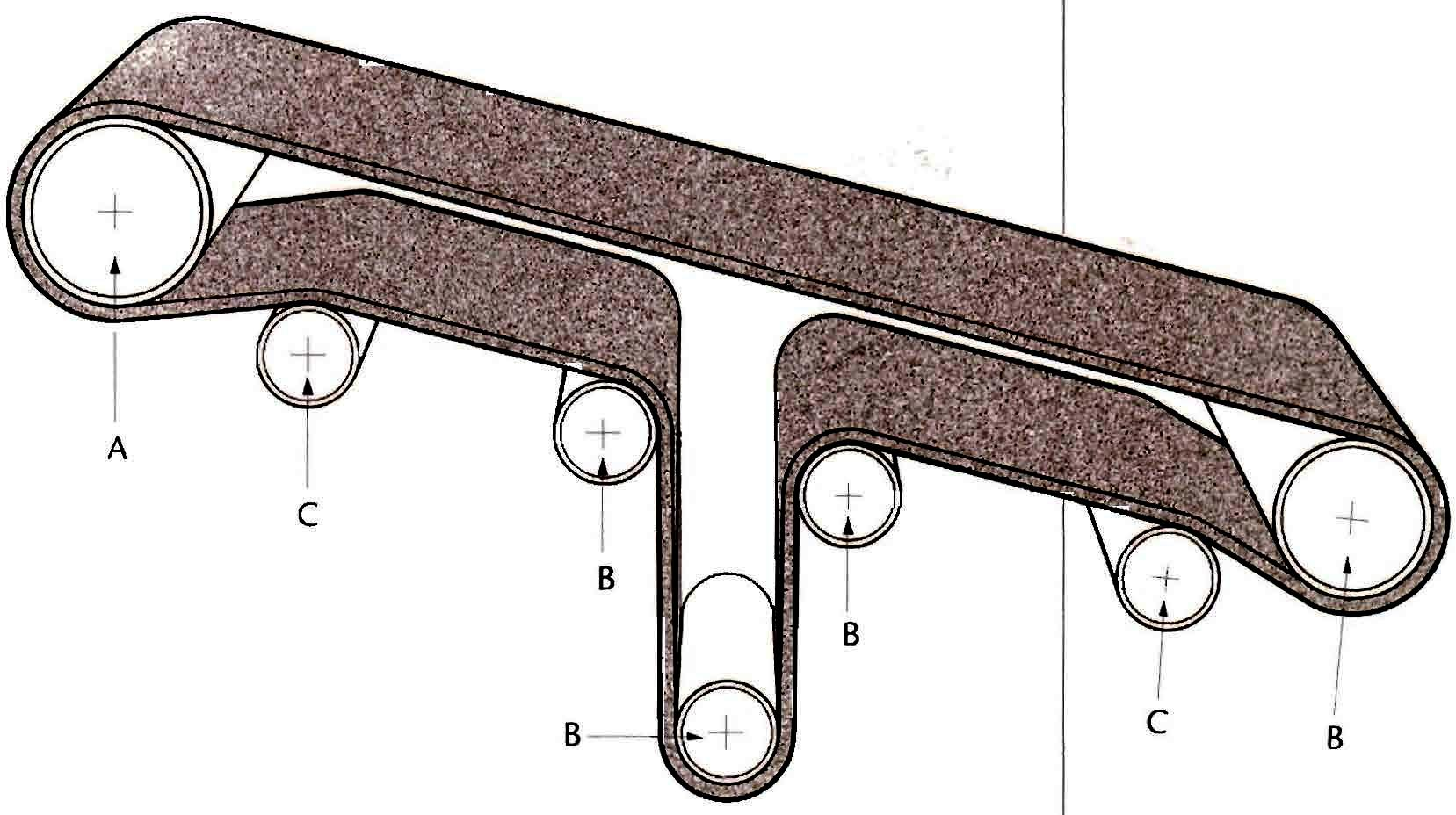
One Step Splicing Pattern (Rectangle)



Two Steps Splicing Pattern (Rectangle)

MINIMUM PULLEY DIAMETERS FOR TEXTILE AND STEEL CORD FABRIC BELTS (mm)

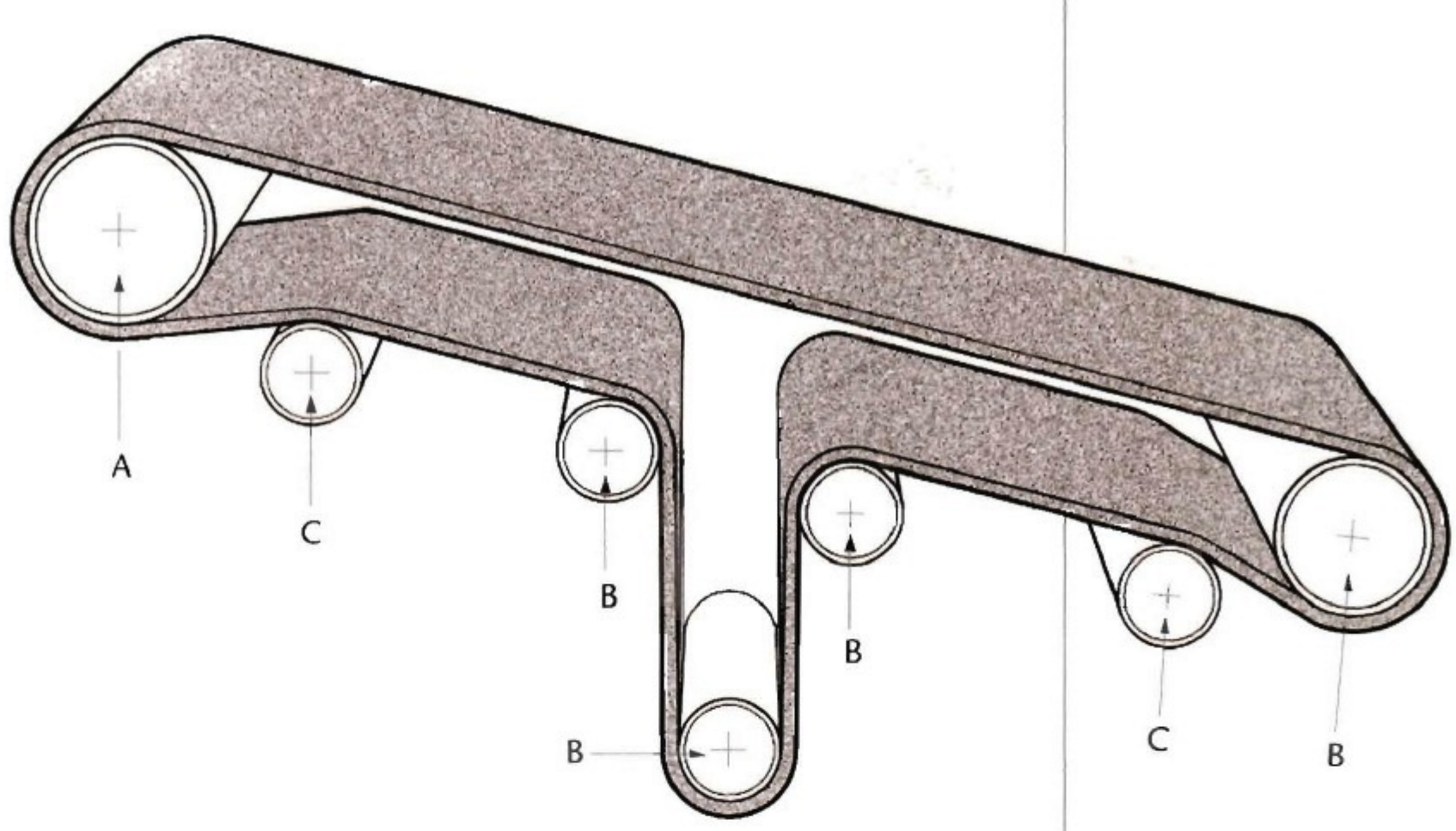
Max Load	TEXTILE BELTS / FABRIC TYPE														
	No. of. plies	EP 100			EP 125			EP 160			EP 200			EP 250 - 315		
		A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
%65 - 100	2	160	160	125	200	160	160	250	200	160	315	250	200			
	3	200	200	160	315	250	200	400	315	250	500	400	315	630	500	400
	4	315	250	200	400	315	250	500	400	315	630	500	400	800	630	500
	5	400	315	250	500	400	315	630	500	400	800	630	500	1000	800	630
	6				630	500	400	800	630	500	1000	800	630	1250	1000	800
%30 - 64	2				200	160	160	200	160	160	250	200	160			
	3	160	125	125	250	200	160	315	250	200	400	315	250	500	400	315
	4	200	160	160	315	250	200	400	315	250	500	400	315	630	500	400
	5	250	200	160	400	315	250	500	400	315	630	500	400	800	630	500
	6	315	250	200	500	400	315	630	500	400	800	630	500	1000	800	630
%30 bellow	2	125	125	125	160	160	160	160	160	160	200	200	160			
	3	160	160	160	200	160	160	250	200	160	315	250	200	400	315	250
	4	200	160	160	250	200	200	315	250	200	400	315	250	500	400	315
	5	250	200	200	315	250	250	400	315	250	500	400	315	630	500	400
	6				400	315	315	500	400	315	630	500	400	800	630	500



STEEL CORD FABRIC BELT TYPES	Classical Splice			Finger Splice			Steel Rope Splice		
	A	B	C	A	B	C	A	B	C
350 - 500 - 630	500	400	315	400	315	250	500	400	315
800 - 1000	630	500	400	500	400	315	630	500	400
1250 - 1400 - 1600	800	630	500	630	500	400	630	500	400
1800 - 2000				800	630	500	800	630	500
2500							1000	800	630
3150							1250	1000	800

MINIMUM PULLEY DIAMETERS FOR TEXTILE AND STEEL CORD FABRIC BELTS (mm)

Max Load	TEXTILE BELTS / FABRIC TYPE														
	No. of. plies	EP 100			EP 125			EP 160			EP 200			EP 250 - 315		
		A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
%65 - 100	2	160	160	125	200	160	160	250	200	160	315	250	200			
	3	200	200	160	315	250	200	400	315	250	500	400	315	630	500	400
	4	315	250	200	400	315	250	500	400	315	630	500	400	800	630	500
	5	400	315	250	500	400	315	630	500	400	800	630	500	1000	800	630
	6				630	500	400	800	630	500	1000	800	630	1250	1000	800
%30 - 64	2				200	160	160	200	160	160	250	200	160			
	3	160	125	125	250	200	160	315	250	200	400	315	250	500	400	315
	4	200	160	160	315	250	200	400	315	250	500	400	315	630	500	400
	5	250	200	160	400	315	250	500	400	315	630	500	400	800	630	500
	6	315	250	200	500	400	315	630	500	400	800	630	500	1000	800	630
%30 bellow	2	125	125	125	160	160	160	160	160	160	200	200	160			
	3	160	160	160	200	160	160	250	200	160	315	250	200	400	315	250
	4	200	160	160	250	200	200	315	250	200	400	315	250	500	400	315
	5	250	200	200	315	250	250	400	315	250	500	400	315	630	500	400
	6				400	315	315	500	400	315	630	500	400	800	630	500



STEEL CORD FABRIC BELT TYPES	Classical Splice			Finger Splice			Steel Rope Splice		
	A	B	C	A	B	C	A	B	C
350 - 500 - 630	500	400	315	400	315	250	500	400	315
800 - 1000	630	500	400	500	400	315	630	500	400
1250 - 1400 - 1600	800	630	500	630	500	400	630	500	400
1800 - 2000				800	630	500	800	630	500
2500							1000	800	630
3150							1250	1000	800

TAKE - UP TRAVEL

Take - up Travel of Textile Belts

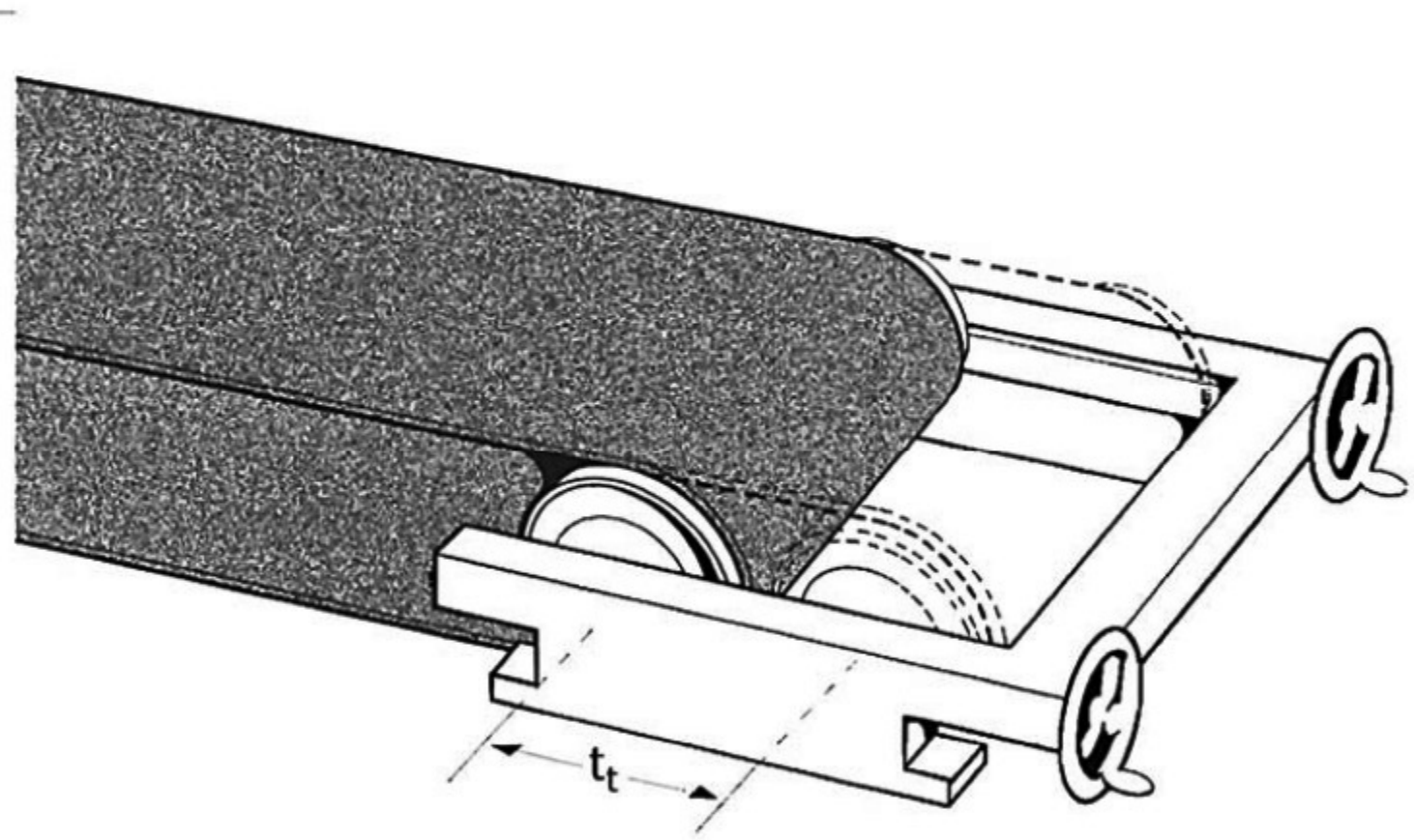
in EP Fabric Belts t_t = % 1,5 Lc

in PP Fabric Belts t_t = % 2,4 Lc

Take - Up Travel of Steel cord Fabric Belts

$$t_t = 0{,}5\ \%\ L_c + \frac{n \times Ls}{2}$$

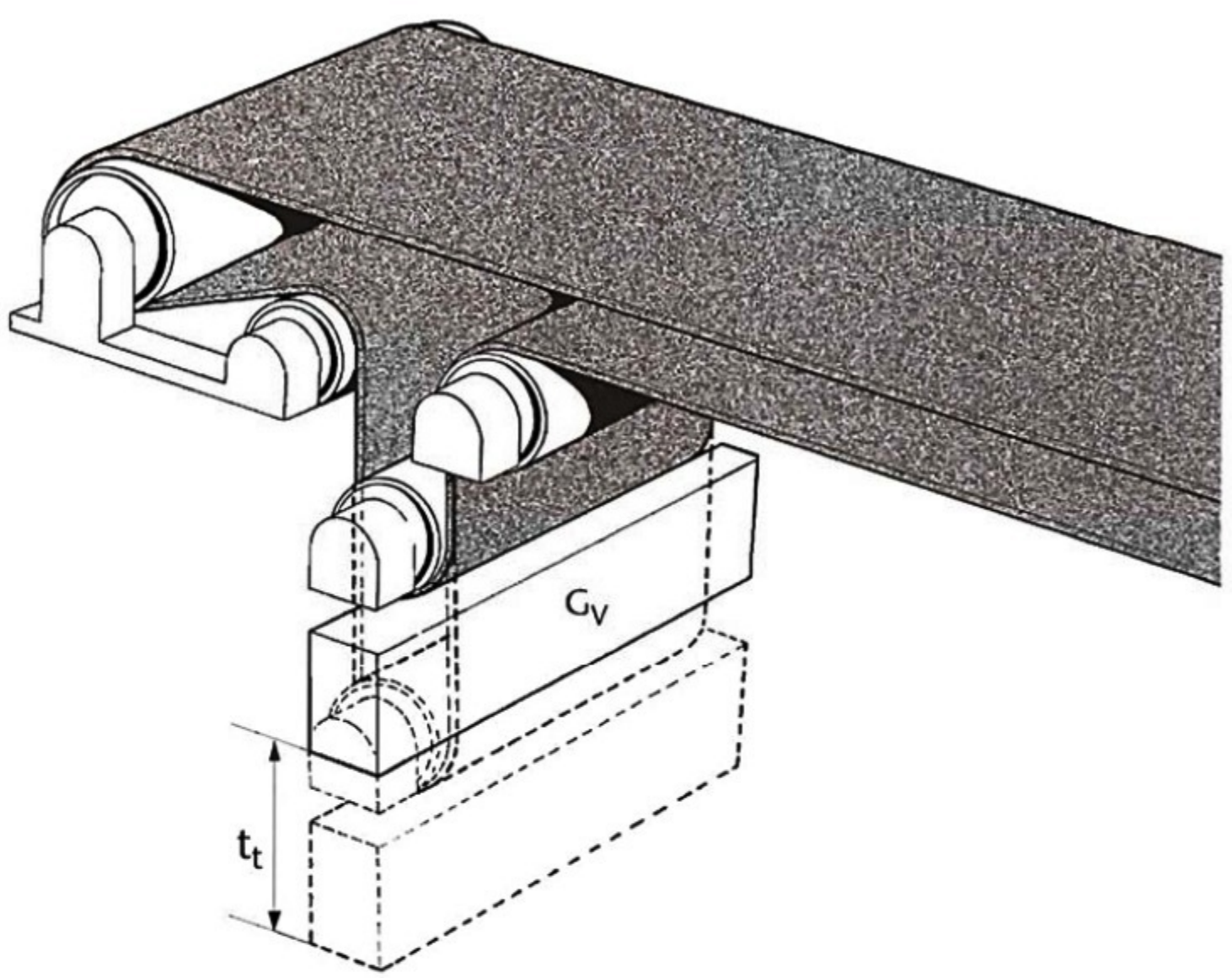
t_t = Take - up Travel
L_c = Center distance
L_s = Splice Length
n = Number of additional splices required.



Size of the Counterweight:

$$Gv = \frac{2 \cdot T_2}{g}\ (kg)$$

G_v = Counterweight (Kg)
T_2 = Slack - side tension (N)
g_v = Acceleration due to gravity (m/sn2)

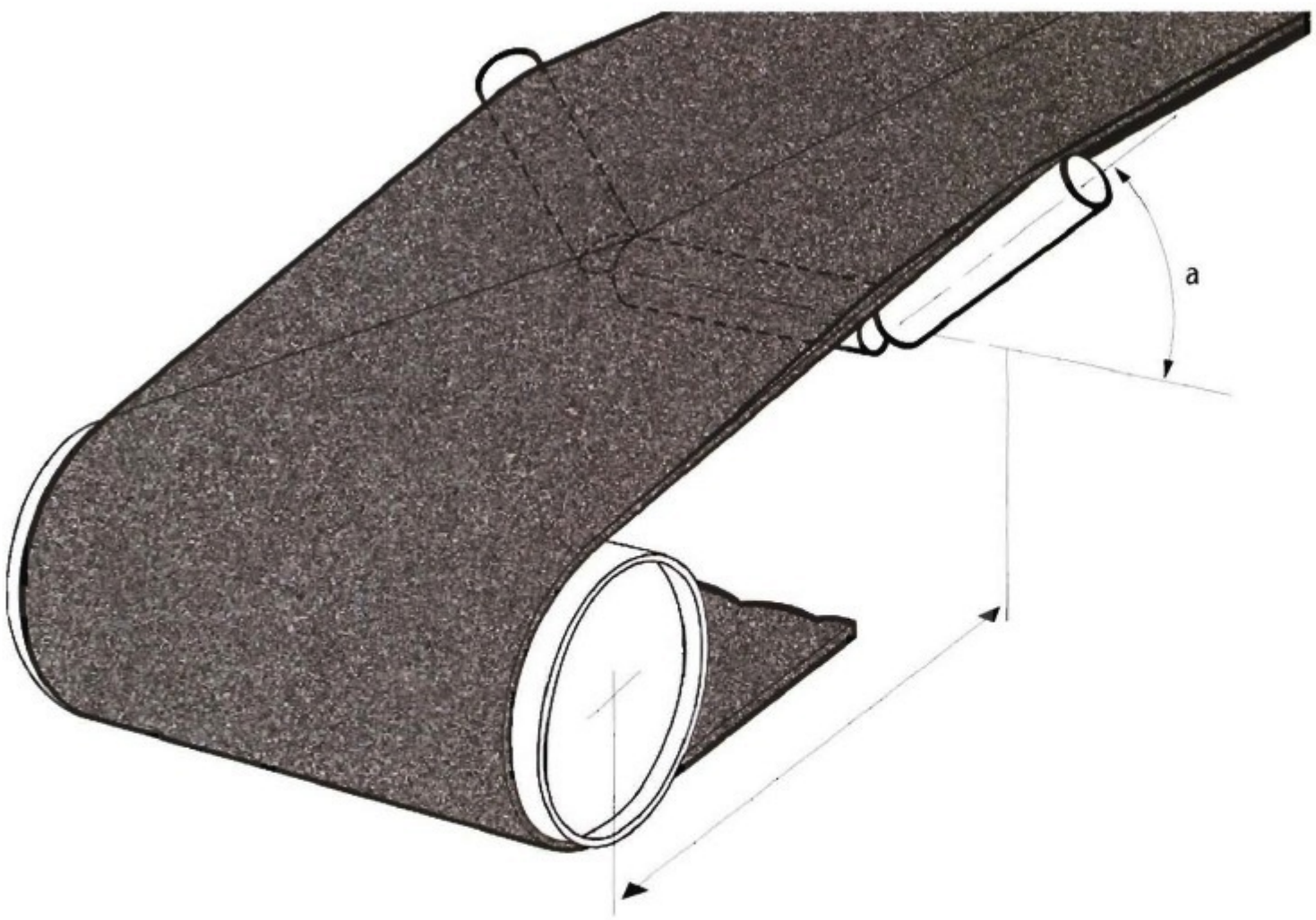


TRANSITION LENGTHS FOR TEXTILE AND STEEL CORD FABRIC BELTS

A = Minimum Transition Lengths

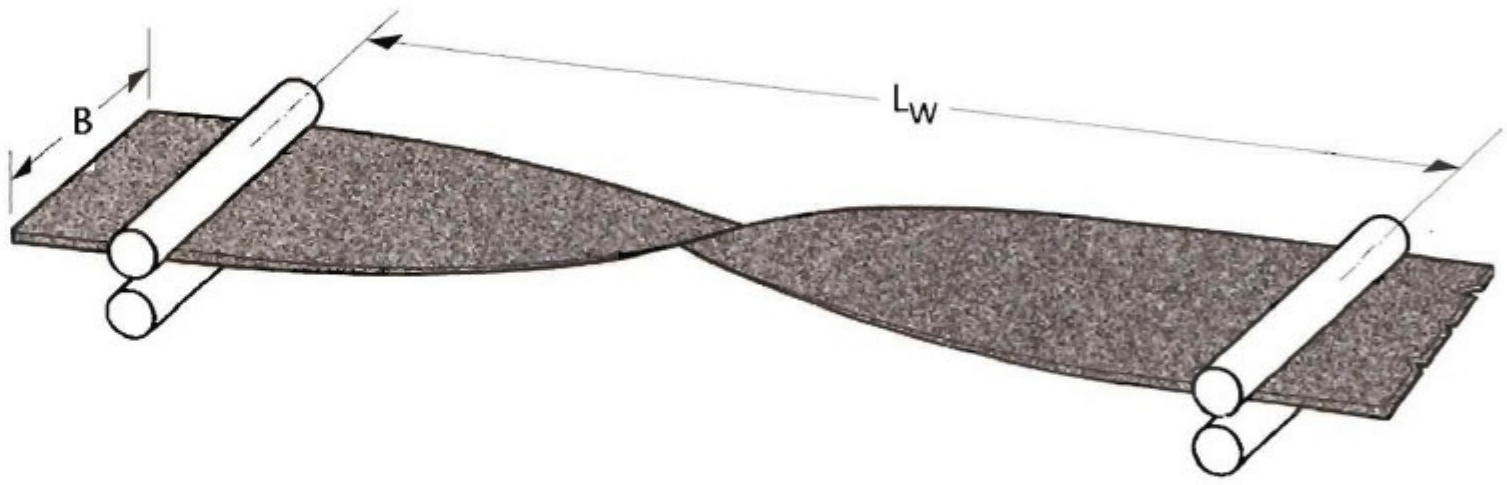
Belt width (mm)	TEXTILE BELTS			STEEL CORD FABRIC BELTS					
				FULL TROUGH DEPTH			1/3 TROUGH DEPTH		
	a = 20	a = 30	a = 45	a = 20	a = 30	a = 45	a = 20	a = 30	a = 45
500	0,41	0,43	–	1,04	1,52	2,15	0,69	1,01	1,42
650	0,55	0,56	0,82	1,35	1,98	2,80	0,90	1,32	1,86
800	0,66	0,69	1,01	1,66	2,43	3,44	1,11	1,62	2,29
1000	0,85	0,87	1,28	2,08	3,04	4,30	1,39	2,03	2,87
1200	1,01	1,04	1,53	2,50	3,65	5,16	1,66	2,43	3,44
1400	1,19	1,22	1,79	2,91	4,26	6,02	1,94	2,84	4,02
1600	1,19	1,41	2,07	3,33	4,87	6,88	2,22	3,24	4,59
1800	1,37	1,58	2,40	3,75	5,48	7,74	2,50	3,65	5,16
2000	1,55	1,76	2,58	4,16	6,08	8,59	2,77	4,05	5,73
2200	1,92	2,13	3,15	5,00	7,30	10,32	3,32	4,87	6,88
2400	1,92	2,13	3,15	5,00	7,30	10,32	3,32	4,87	6,88
2600	2,11	2,32	3,30	5,40	7,90	11,18	3,59	5,27	7,42

Minimum transition Length during loading : 0.8 x A
Minimum transition Length during unloading : A

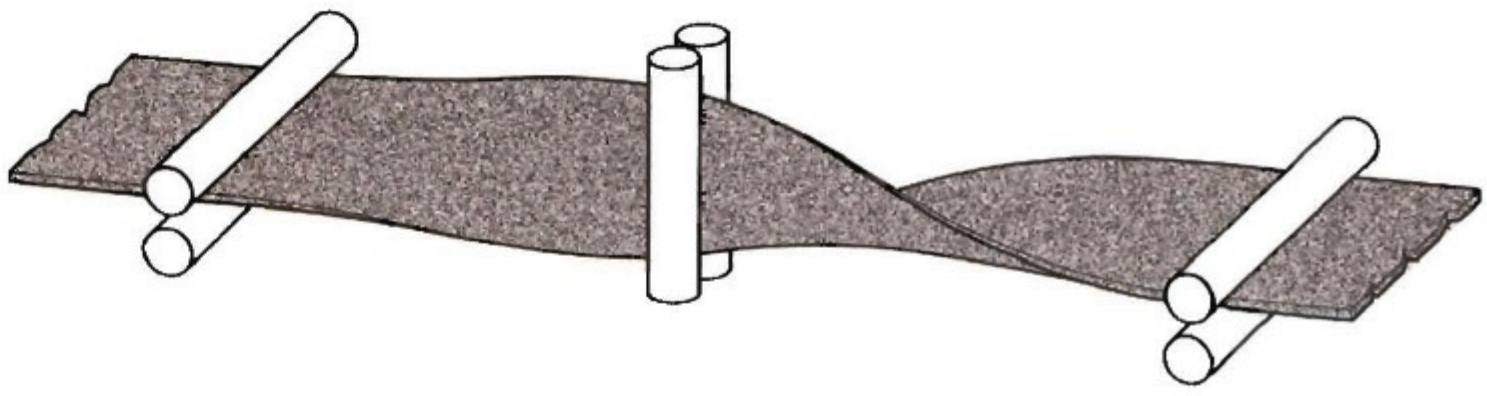


BELT TURNOVER

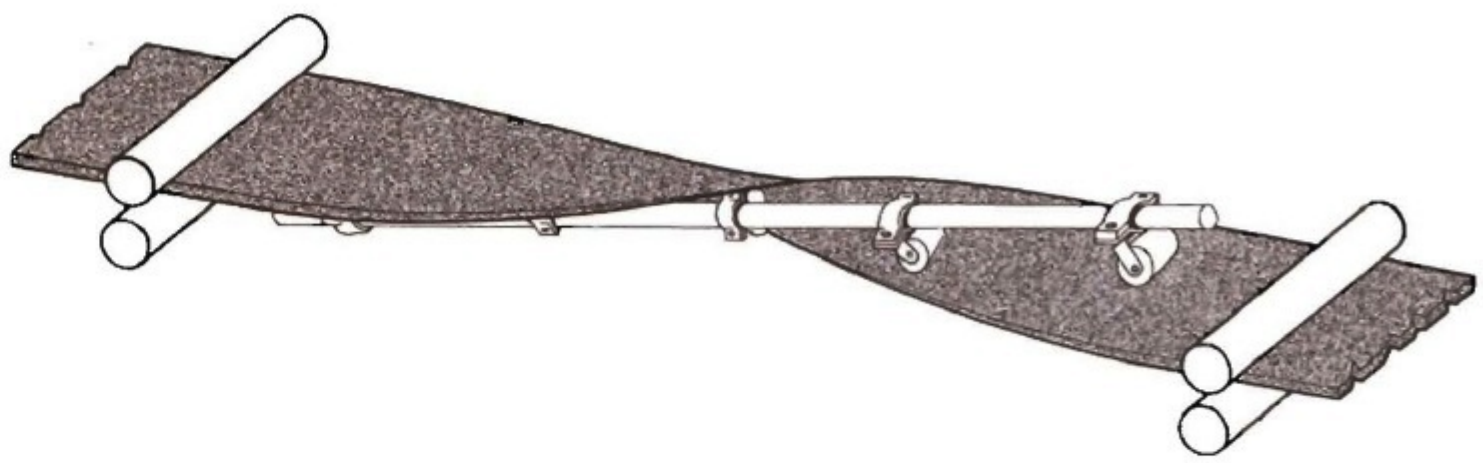
Unguided Turnover



Guided Turnover



Supported Turnover



The belt sag can be calculated from the following formula:

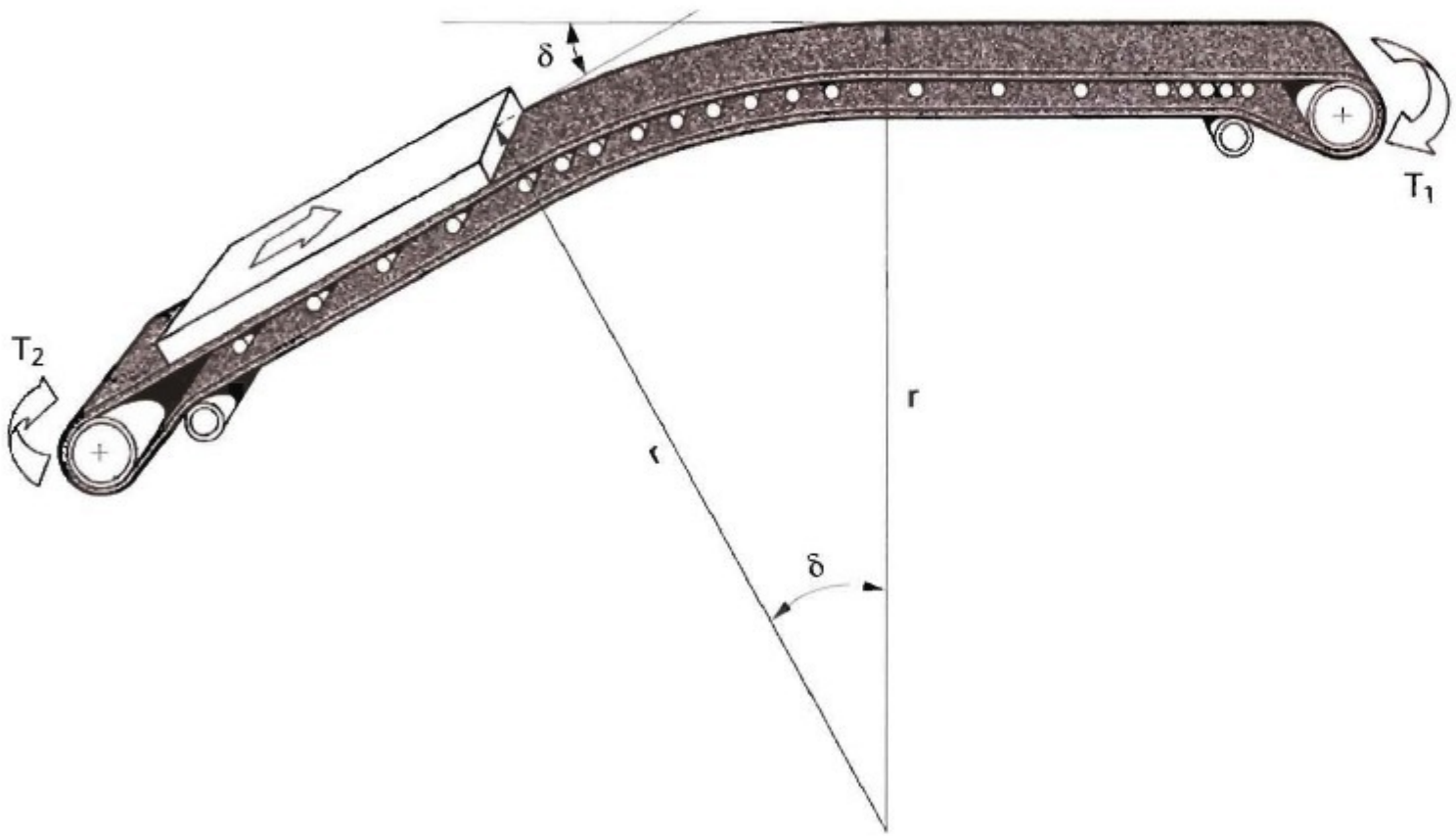
$$t = \frac{q_B \times L_w^2 \cdot g}{8 \times T \times 1000}$$

t = the sag in mm.
q_B = the weight of the belt in Kg/m
L_w = the turning length in (mm)
T = the belt tension in (N)
g = acceleration due to gravity (m/sec^2)

Attension: The distance between pulley and start of turnover should never be less than 1/2 the length of turnover.

Type of Turnover	Belt Width B in mm.	Belt Speed in m/sec.	MIN. Turnover Lw For	
			EP Belts	Steel Cord Belt
Unguided	≤ 1200	1.6	10 x B	–
Guided	≤ 1600	3.4	12.5 X B	22 X B
Supported	≤ 2400	6.0	10 X B	15 X B

CONVEX CURVE CALCULATIONS



❶ Minimum radius to avoid buckling on the belt center (for empty belt).

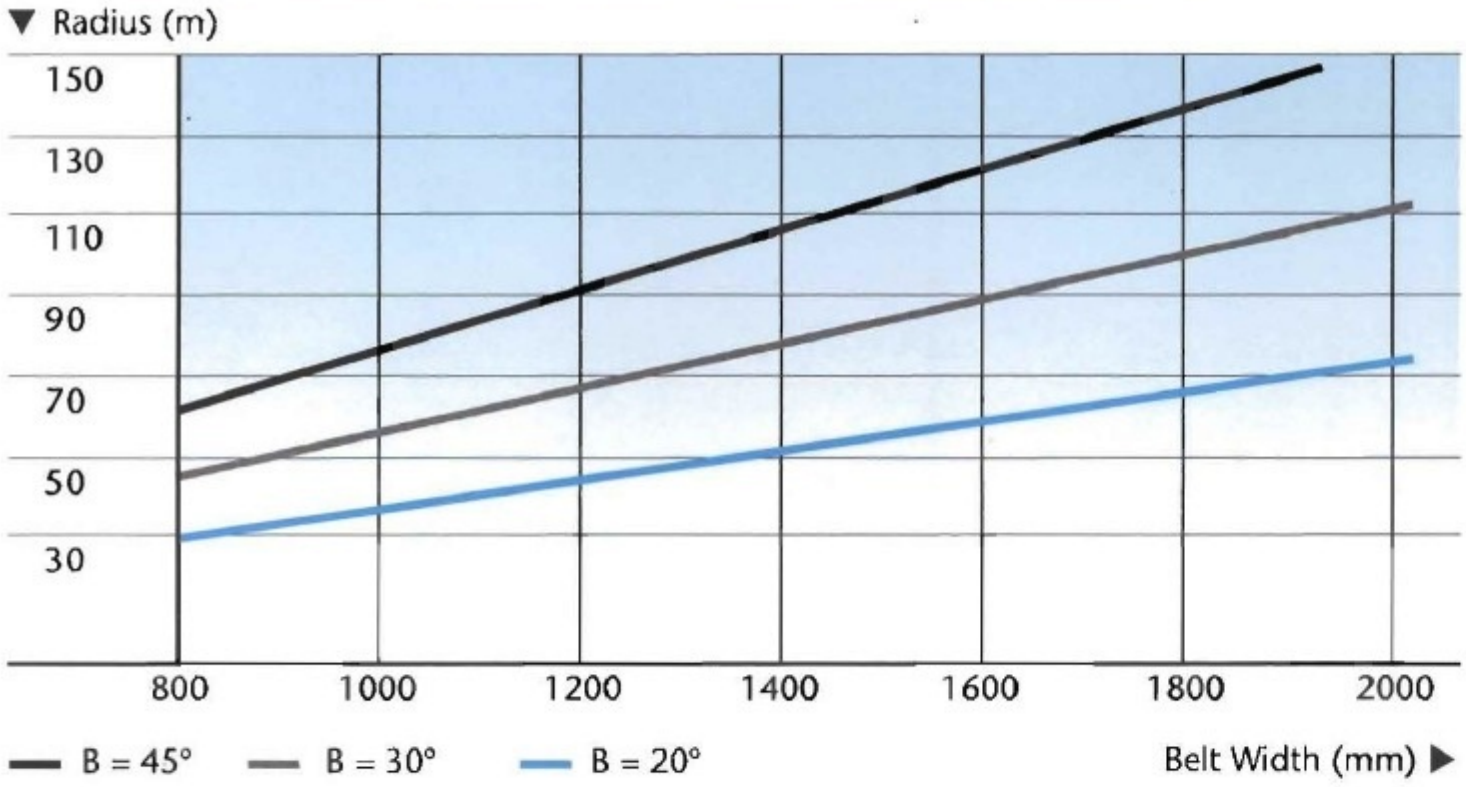
Assumption: compression deformation on belt center. Ec ≤ 0.5 %

$$Ec = \frac{(1/3)\,(W/3)\,\sin B}{r} = \frac{W \sin B}{9\,r}$$

$$\frac{W \sin B}{9\,r} \leq 0{,}005$$

$$r \geq 22\ W \sin B$$

For Steel Cord Fabric Belts



❷ Minimum radius to prevent overstress in the belt edges.

Assumption:
tension in belt edges Te ≤ R/8

$$Te = TB + Ee \,.\, M$$

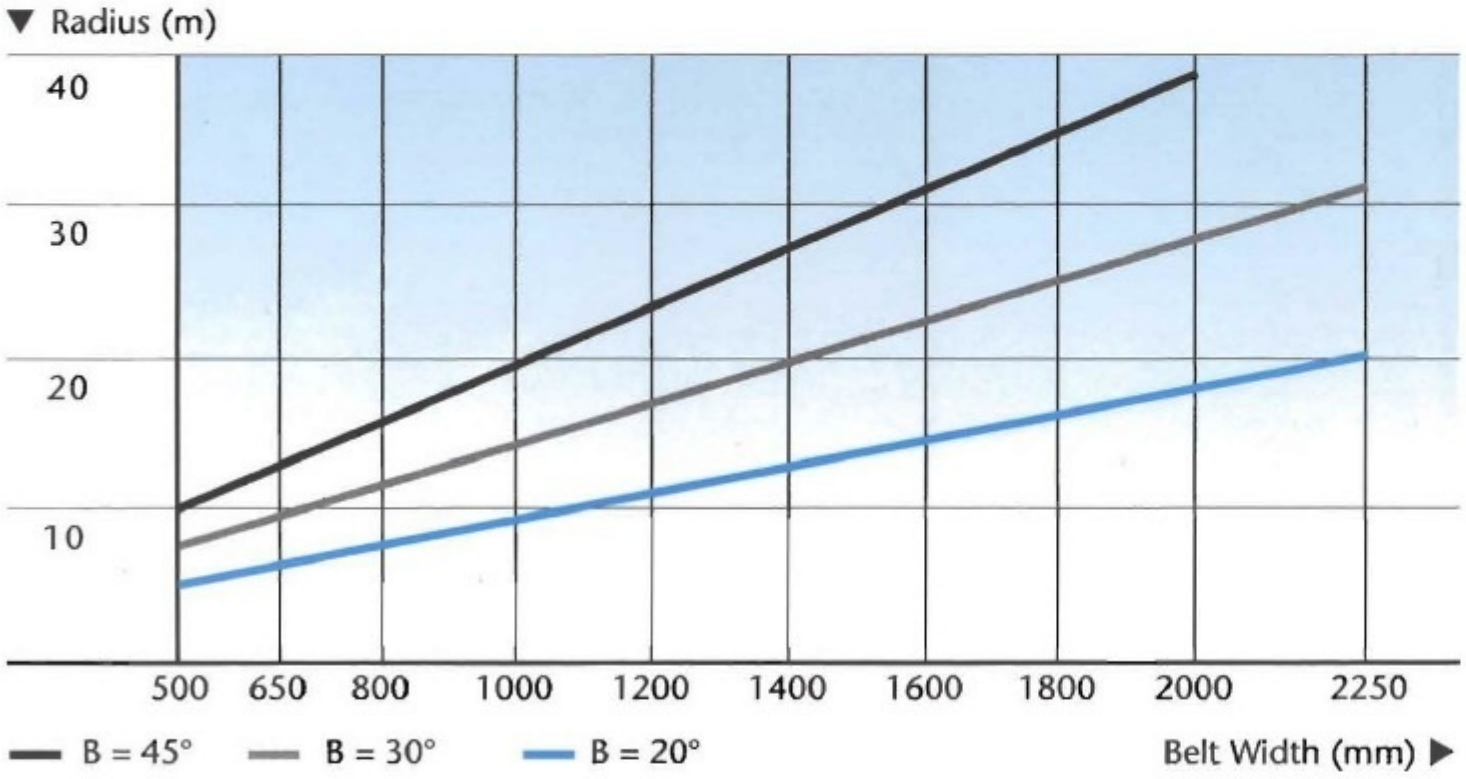
$$Ee = \frac{(2/3) \times (W/3)\,\sin B}{r} = \frac{2W \sin B}{9r}$$

with M = 25 R

$$Te = TB + \frac{2W \sin B}{9r} \cdot 25\,R \leq R/8$$

$$r \geq \frac{25\ R\ W \sin B}{4{,}5\,(R/8 - T_B)}$$

For Textile Belts

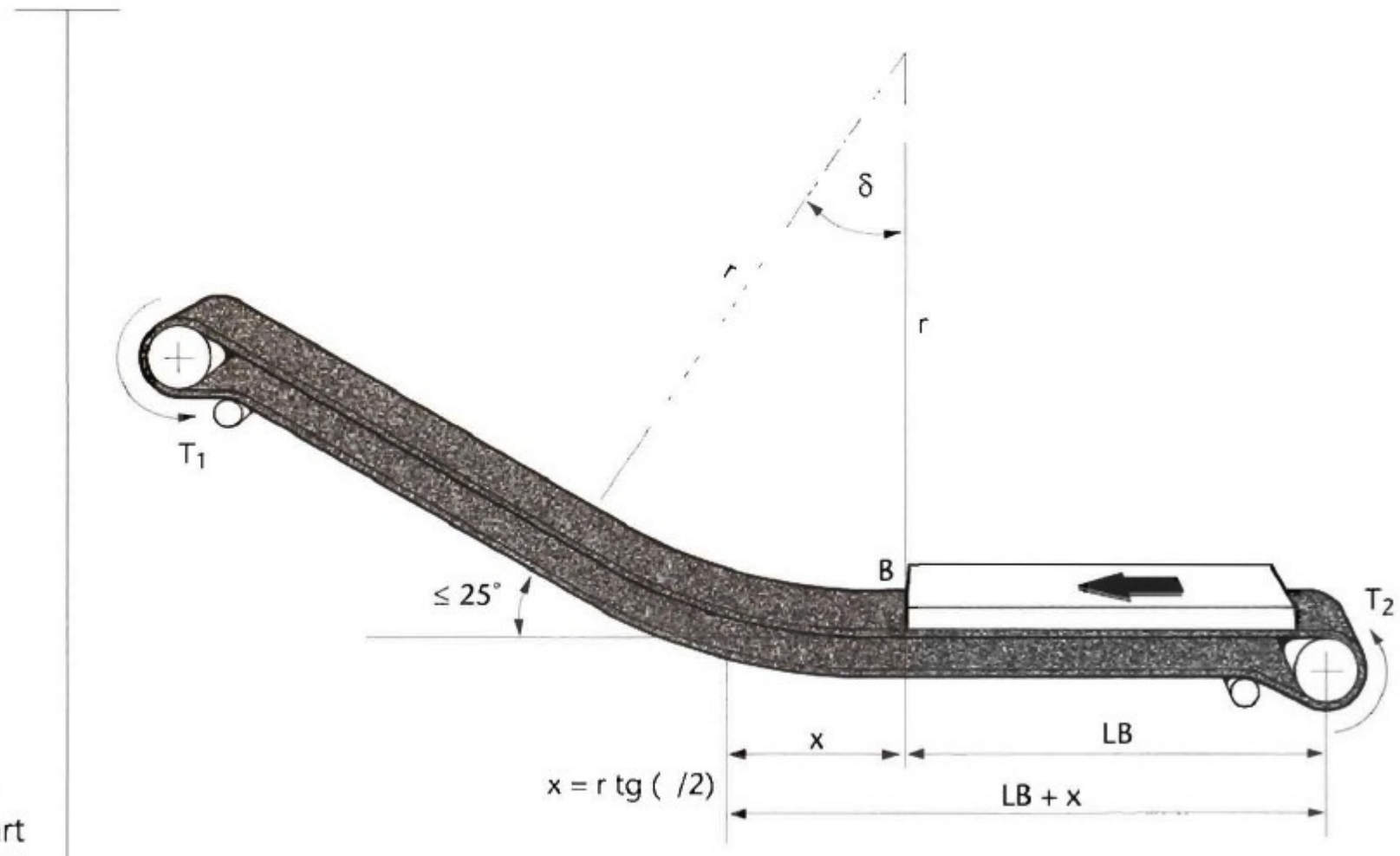


CONCAVE CURVE CALCULATIONS

The Symbols Used

r = minimum radius in m
B = troughing angle
T_B = belt tension in point B in N/mm
W = belt width in m
R = belt rating in N/mm
G_b = belt weight in kg/m
G_m = material weight in kg/m
M = belt modulus

For EP Belts	M = 15R
For TW, IW, SW Belts	M = 25R
For IWR Belts	M = 50R



❶ minimum radius to ensure contact with troughing idlers when part from feed point to tangent point (B) is loaded:

$$r \geq \frac{1{,}11 \cdot T_B}{G_b} \text{ m.}$$

❷ Special circumstances if space limitations:
- empty belt allowed to lift from idlers
- partially loaded belt may not lift during acceleration

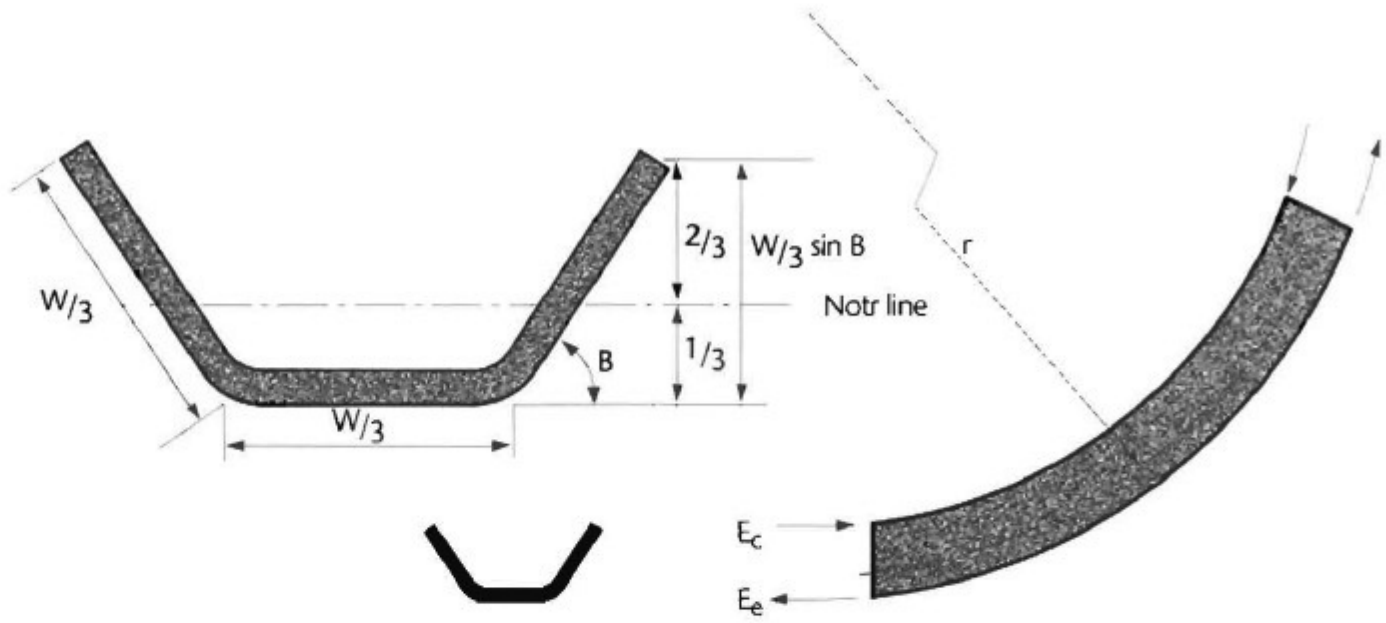
$$r \geq \frac{1{,}11 \cdot 2T_B}{(G_b + 0{,}3\ G_m)} \text{ m.}$$

❸ Minimum radius r to avoid edge buckling.

Assumption:
compression deformation Ec in edges at zero load: Ec ≤ %0,5

$$Ec = \frac{(2/3)\ (W/3)\ \sin B}{r} = \frac{2W\ \sin B}{9r} \leq 0{,}005$$

$$r \geq 45\ W \sin B \text{ m.}$$



❹ Minimum radius r to prevent overstrees in the center of the belt.

Assumption:
tension in belt center Tc ≤ R/8

$$Tc = T_B + E_e \cdot M$$

$$Ee = \frac{(1/3)\ (W/3)\ \sin B}{r} = \frac{W\ \sin B}{9r}$$

M = 25 R (TW, IW, SW, Bantlar için)

$$Tc = T_B + \frac{W\ \sin B}{9r}\ 25R \leq \frac{R}{8}$$

$$r \geq \frac{25R\ W\ \sin B}{9\ (R/8 - T_B)} \text{ m.}$$

COMPLAINT : The belt runs crooked to one side at a particular part of the conveyor frame.

Causes:

❶ Conveyor frame or structure crooked.

❷ One or more rollers immediately preceeding the troubled part, not square to the longitudinal axis of the belt.

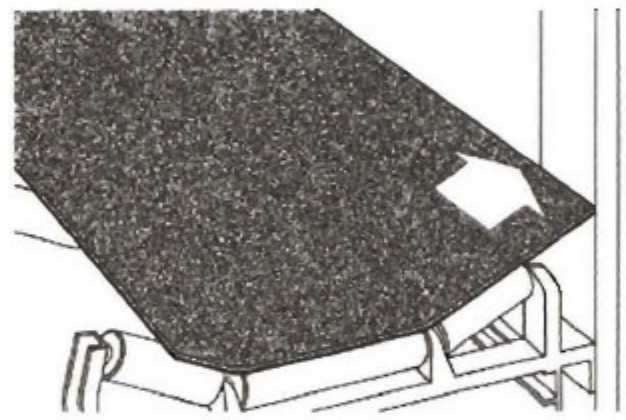
❸ Roller stuck with cake accumulation.

Solutions:

❶ Strech a string over the belt to determine the extent of crookedness, for adjusting the allignment and leveling.

❷ Advance forward the reel group in the point the belt leaned out in the direction of belt movement.

❸ Improve maintenance and install scraper or other cleaner.



COMPLAINT : A particular part of conveyor belt runs crooked to one side of all parts on the conveyor frame.

Causes:

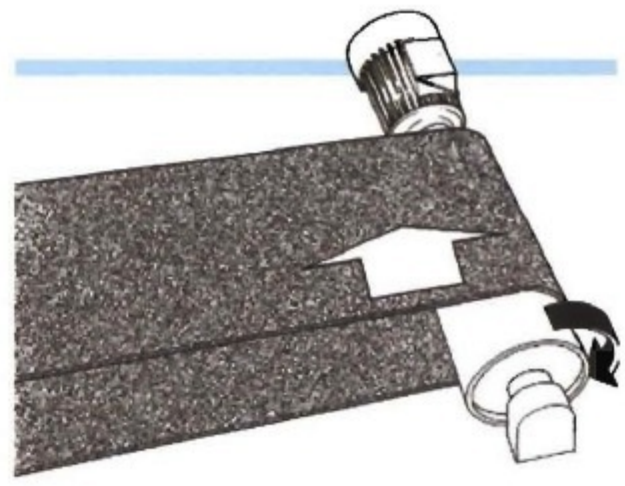
❶ Belt not spliced squarely.

❷ Belt might have stored in wrong winded condition.

Solutions:

❶ Newly splice the belt squarely.

❷ a) If belt is new it will correct it self. Otherwise leaned part is removed.
b) Use guide roller groups.



COMPLAINT : Belt leans out from the edge of drive pulley

Cause:

❶ Main pulley or roller groups just behind it are unadjusted.

Solution:

❶ Pulley and roller groups axes are adjusted perpendicular to belt axis.

COMPLAINT : Belt leans out aside at a specific part of conveyor.

Cause:

❶ Loading of the belt is wrong.

Solution:

❶ Take required measures in the loading location.

COMPLAINT : Belt leans out from the edge of tail pulley.

Causes:

❶ Return roller stuck with cake accumulation

❷ Return rollers are not adjusted.

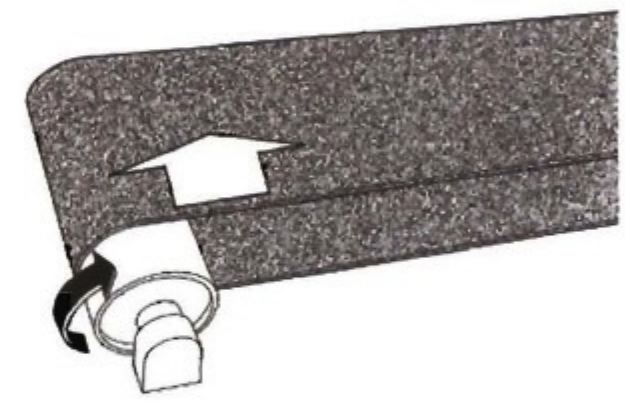
❸ Loading of the Belt is wrong.

Solutions:

❶ Clean the rollers.

❷ adjust return roller axes perpendicular to belt axis.

❸ Take required measures in the loading location.



COMPLAINT : Abnormal abrasion of bottom rubber.

Causes:

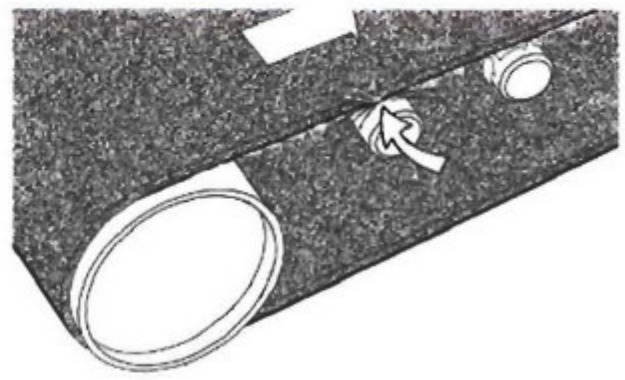
❶ Slipping of the belt on driving pulley.

❷ Carrier rollers jam

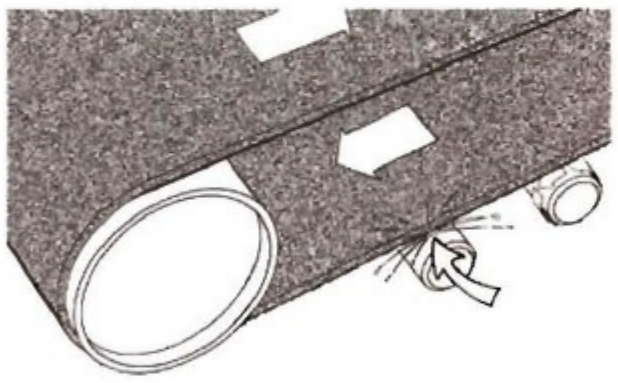
Solutions :

❶ a) Increase tension power.
b) Cover drive pulley with rubber or replace abroded cover.
c) Increase belt winding angle.

❷ Replace or repair carrier rollers.



ERROS IN BELT USAGE



COMPLAINT : Abnormal abrasion of top rubber

Causes:

❶ Return rollers jam.

❷ Material change its position while passing on the rollers due to excessive dip o the belt.

❸ Skirt boards wears the belt.

❹ Cover quality is low.

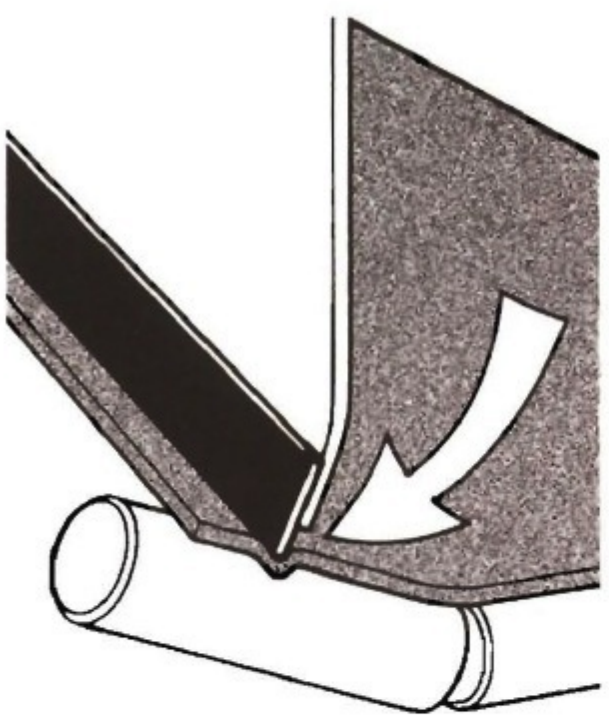
Solutions :

❶ a) Clean return rollers.
b) Use return rollers with support disc.
c) Install scrapers on head and tail pulleys.

❷ a) Increase tension power.
b) Decrease carrier roller spaces.

❸ Elevate skirt boards and use rubber without fabric.

❹ Use a belt which has better rubber quality or has more top cover thickness.



COMPLAINT : Top cover is partly carved or stripped

Causes:

❶ Feed chute wipers are too tough and presses on belt tightly.

❷ Space between belt and wiper is too much.

❸ Sides of feed chute are too close to belt. Opening is fixed.

❹ Curving of the belt in the feeding location due to impact thus causes material jamming between belt and wiper.

❺ Material jams in the groove.

Solutions:

❶ Use soft wiper. Do not use old belts as wipers.

❷ Decrease wiper space minimum.

❸ Leave at least 25 mm opening space between belt and metal. This space should be increased in the direction of belt movement. Thus prevent the material jamming.

❹ Use impact rollers.

❺ Enlarge groove in the direction of belt movement.

COMPLAINT : Belt and carcass is torn of in the juncture places of rollers

Causes:

❶ Distance between pulley and feeding location is not sufficient or belt transition is not satisfactory.

❷ Convex curve radius is not suficient.

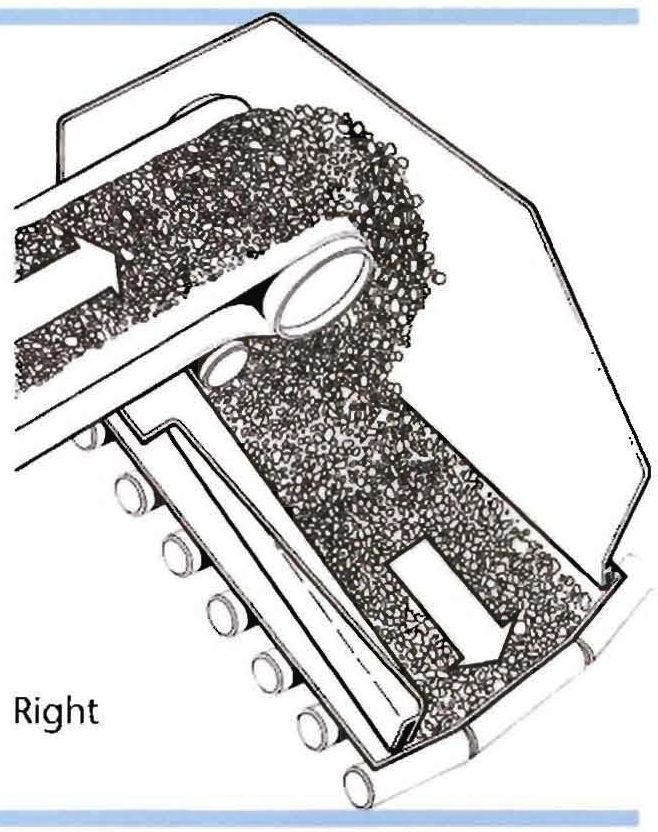
Solutions :

❶ a) Adjust rollers away from pulley.
b) Use transition rollers.
c) adjust tail pulley.

❷ a) Decrease roller space in curved part
b) Use transition rollers.
c) Increase curve radius.
d) Lower the elevated rollers in curved part.

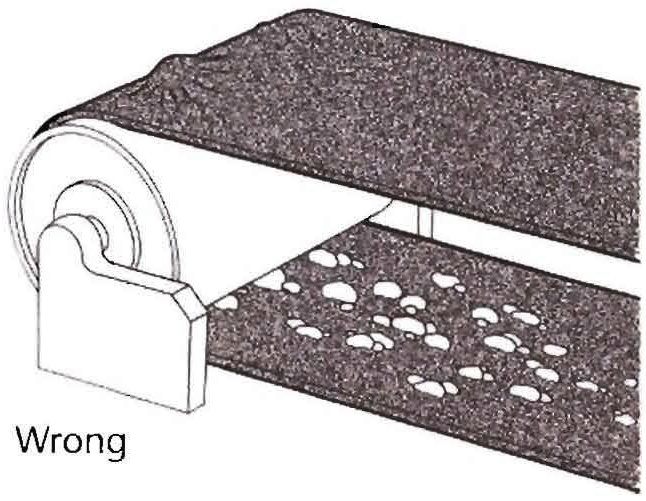
ERROS IN BELT USAGE

Wrong

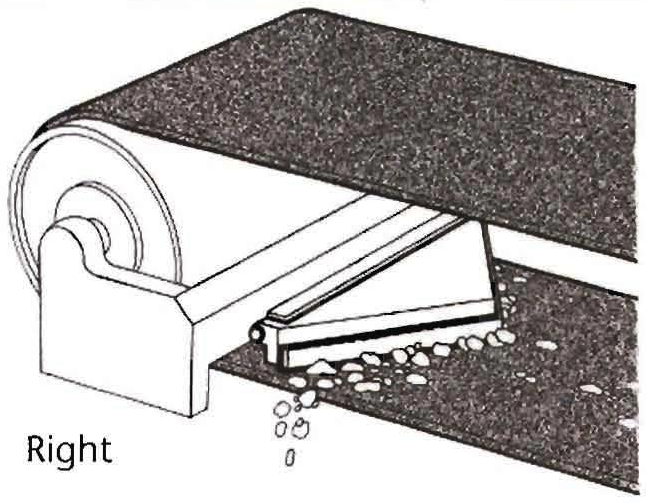


Right

At the loading location exactly use to impact rollers.

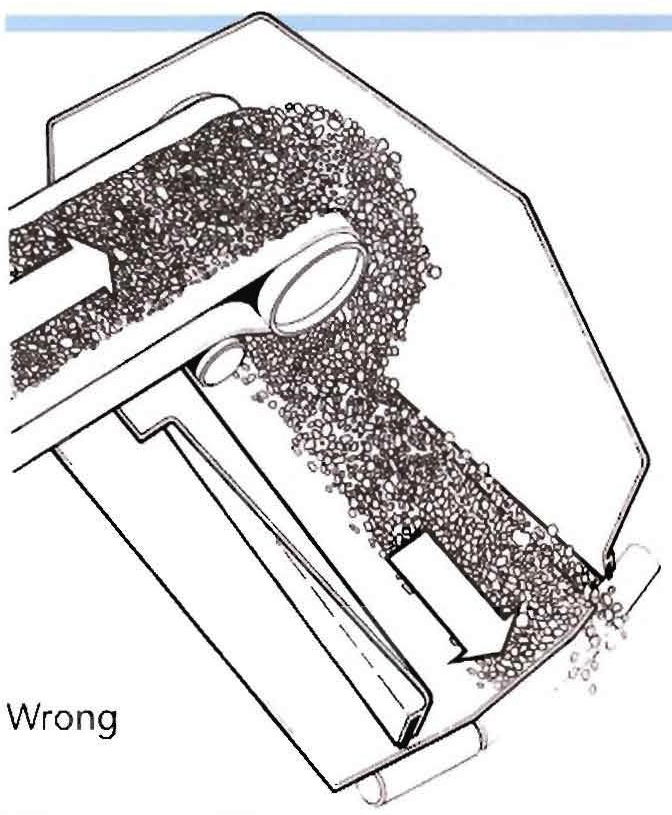


Wrong

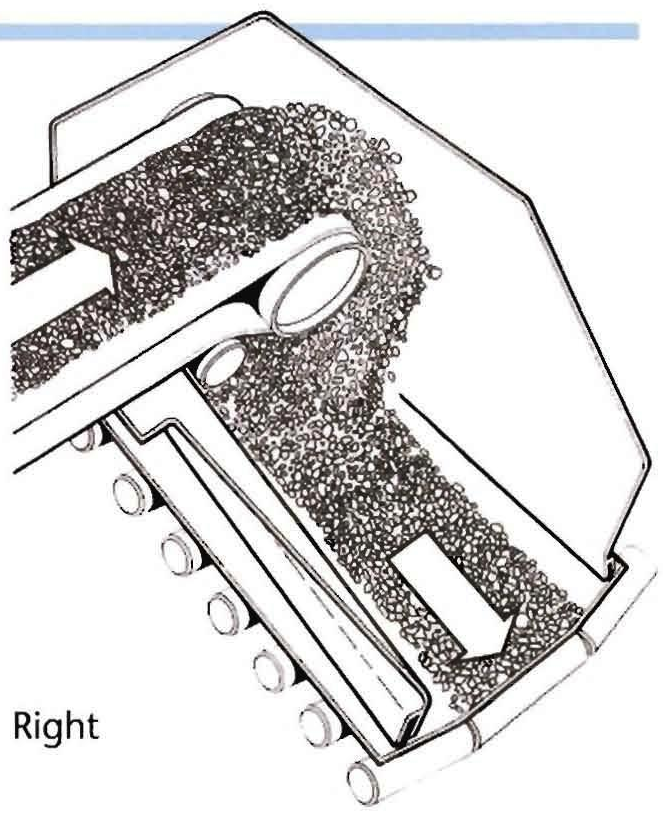


Right

Do not neglect to use scrapper before the tail pulley.

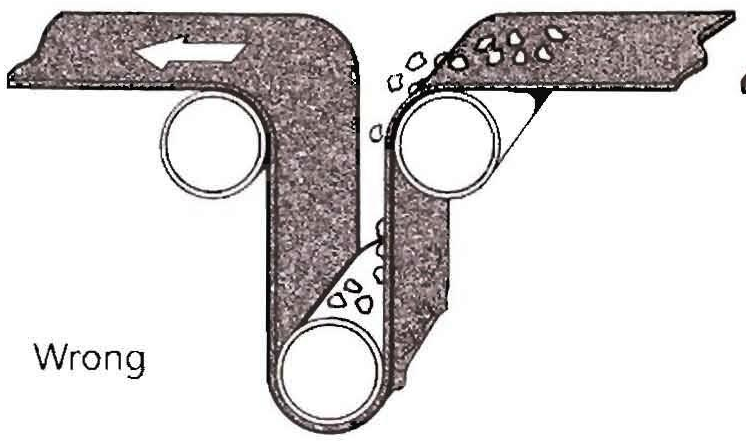


Wrong

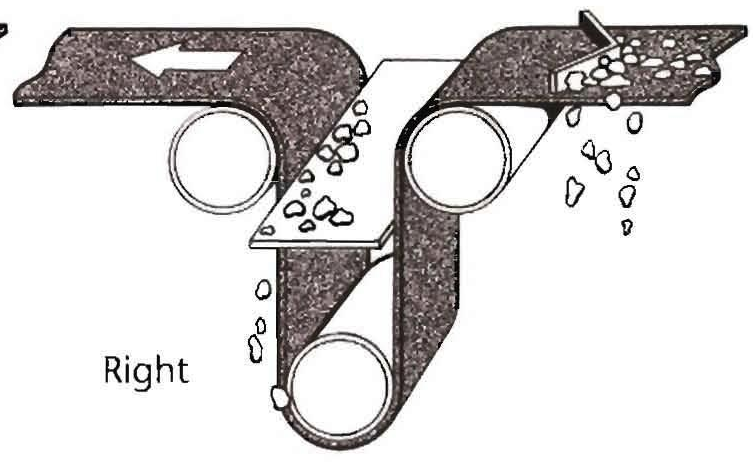


Right

Take attention for loading become centered and smooth.



Wrong



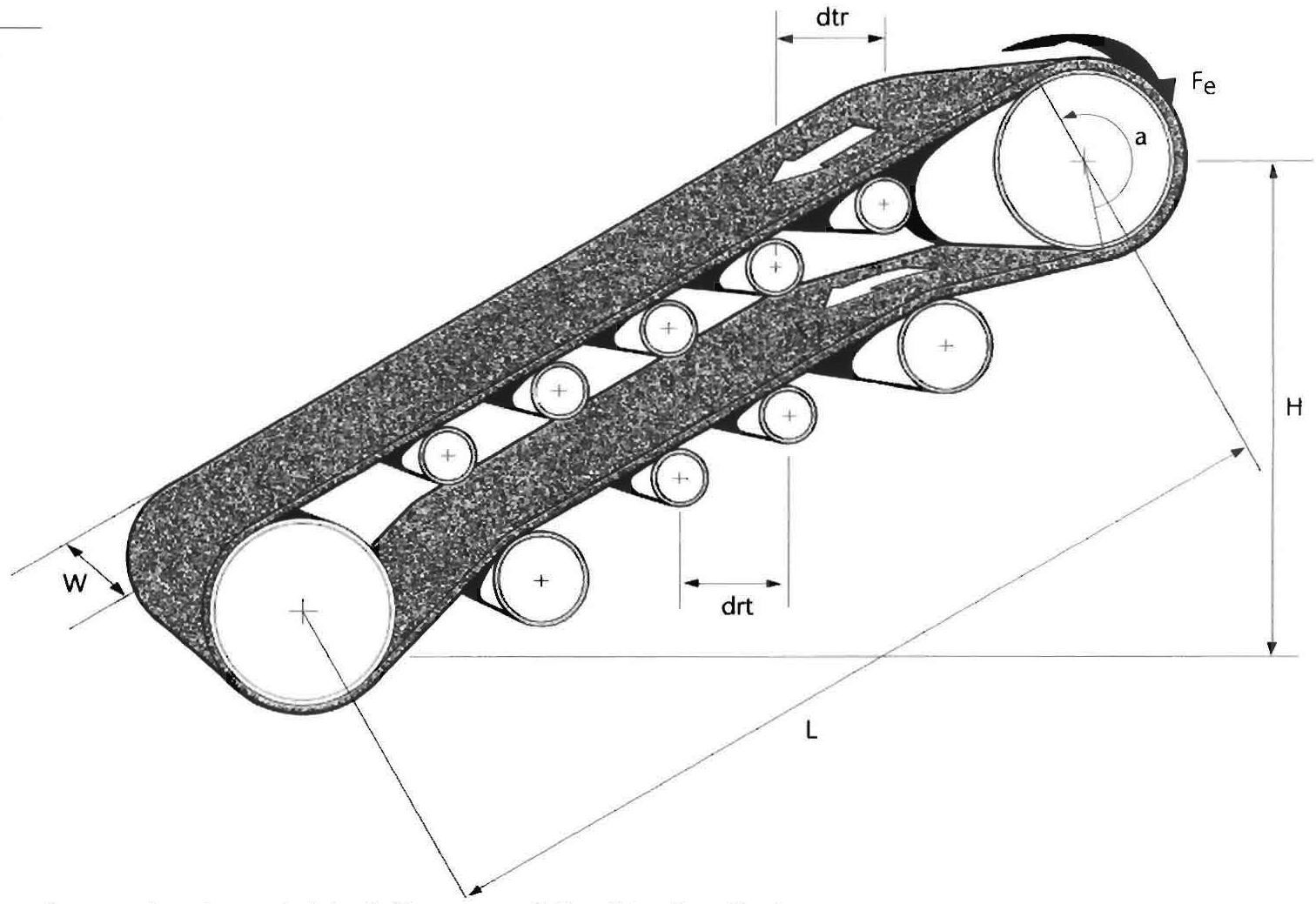
Right

If you use take - up pulley in the system, absolutely use rubber wiper before enter the take - up pulley and protect take - up pulley.

BELT CALCULATIONS

The Symbols used:

L = Center Length (m)
H = Lift of fall (m)
W = Belt width (mm)
V = Belt speed (m/sn.)
B = Troughing angle (°)
S = Safety factor (often10)
Im = Capacity (T/h)
a = Belt wrap on drive pulley (°)
u = Belt friction on drive pulley
Cd = Efficiency factor drive system (0,85 - 0,95)



gtr = Troughing idler weight (kg)
dtr = Troughing idler distance (m)
Gtr = Troughing idler weight/m. (gtr/dtr) (kg/m)
grt = Return idler weight (kg)
drt = Return idler distance (m)
Grt = Return idler weight/m (grt/drt) (kg/m)

◆ Troughing idler distance (dtr) generally 1, 1, 2 or 1,4 m.
◆ Return idler distance (drt) 2 x or 3 x dtr.

f = Idler friction factor

0,017 Conveyor with light running idlers and material with low internal friction

0,02 Standard value for normal conveyors and normal material

0,023 – 0,027 Unfavorable working conditions, bad maintanence, dust conditions, material with high internal friction, overloading conditions.

Approximate weight of Conveyor Idler Moving Parts:

Belt width (mm)	Outside diameter (mm)															
	51		70		89		108		133		159		191		216	
	Flat	Troughed	Flat	Troughed	Flat	Troughed	Flat	Troughed	Flat	Troughed	Flat	Troughed	Flat	Troughed	Flat	Troughed
300	1,6	2,4	2,7	4,1												
400	1,9	2,7	3,2	4,6												
500	2,2	3,0	3,7	5,1												
650			4,4	5,8	6,5	9,1										
800			5,4	6,8	7,8	10,4	11,4	16,0								
1000					7,8	11,7	13,3	17,9	17,5	23,5						
1200							15,7	20,3	20,7	26,7	28,3	36,9				
1400									23,2	29,2	31,7	40,3				
1600									25,8	31,8	35,2	43,8				
1800											38,7	47,2	55,5	70,5		
2000											42,2	50,8	60,3	75,3		
2200													65,1	80,1	84,7	104,7
2400													69,9	84,9	90,9	110,9
2600													74,8	89,8	97,1	117,1

f is function of belt speed.

Belt speed V (m/sn)	3	4	5	6
Correction factor for f	–%15	–%10	0	+%10

f is function of temperatur.

t°C	+ 20°	+ 10°	0°	–10°	–20°	–25°	–30°
Ct	1,0	1,1	1,4	2,0	2,7	3,2	3,8

$$ft = f\left(\frac{1}{6}Ct + \frac{5}{6}\right)$$

BELT CALCULATIONS

Slack Side Factor (k_2) dependent upon (u) and (a)

Pulley Friction Lagging			Friction Value	Single Pulley Drive Belt Wrap (a)	Two Pulley Belt Wrap (a)
Steel	Rubber	Ceramics	**u**	180° 200° 220° 240°	340° 360° 380° 400° 420° 440°
very wet, dirty	—	—	0,10	2,71 2,39 2,14 1,92	1,23 1,14 1,06 0,99 0,92 0,87
wet, dirty	—	—	0,15	1,66 1,45 1,18 1,14	0,70 0,64 0,59 0,54 0,50 0,46
wet	—	—	0,20	1,14 0,99 0,87 0,76	0,44 0,40 0,36 0,33 0,20 0,27
moist	very, wet dirty	—	0,25	0,84 0,72 0,62 0,54	0,29 0,26 0,24 0,21 0,19 0,17
dirty	wet, dirty	very, wet dirty	0,30	0,64 0,54 0,46 0,40	0,20 0,18 0,16 0,14 0,12 0,11
dry	wet	wet, dirty	0,35	0,50 0,42 0,35 0,30	0,14 0,13 0,11 0,10
clean	dirty	moist - wet	0,40	0,40 0,33 0,27 0,23	0,10 0,09 0,08
	dry	dirty	0,45	0,32 0,26 0,22 0,18	0,07
	clean	dry	0,50	0,26 0,21 0,17 0,14	
		clean	0,55	0,22 0,17 0,14 0,11	

k = Friction factor

According to Eytelwein - Euler

$$\frac{F_1}{F_2} = e^{u}$$

$$F_1 = F_2 \times e^{ua}$$

$$Fe = F_1 - F_2$$

$$Fe = F_2 \times e^{ua} - F_2$$

$$Fe = F_2 (e^{ua} - 1)$$

$$F_2 = Fe \,.\, k_2 \quad (k_2 = \frac{1}{e^{ua} - 1})$$

$$F_2 = Fe \,.\, k_2 \quad (k_2 = \frac{1}{e^{ua} - 1})$$

$$F_1 = Fe + F_2$$

$$F_1 = Fe + Fe \,.\, k_2$$

$$F_1 = Fe\,(1 + k_2)$$

$$F_1 = Fe \,.\, k_1 \quad (k_1 = 1 + k_2)$$

If $L \leq 75$ $\quad C = 2$

If $L < 75$ $\quad C = \frac{L + 75}{L}$

C = Correction factor

$$\cos H = \cos\,(\sin^{-1}\frac{H}{L})$$

cos H = Slope factor

$$Gm = \frac{Im}{3,6 \,.\, V}$$

Gm = Given material weight (Kg/m)

$$Pa = Pa_1 + Pa_2$$

Pa = Additional Power Requirements

$$Pa_1 = \frac{1,5 \,.\, W \,.\, V}{1000}$$

Pa_1 = Belt Cleaners

$$Pa_2 = 0,07 \,.\, V \,.\, I$$

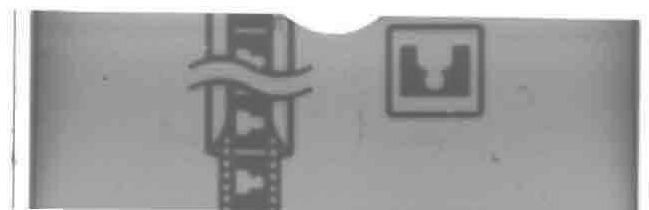
Pa_2 = Skirt Boards

I = Skirt board length (m)

$$Gb = A \,.\, W \,.\, 1,2$$

Gb = Belt weight (kg/m)

A = Belt Thickness (mm)

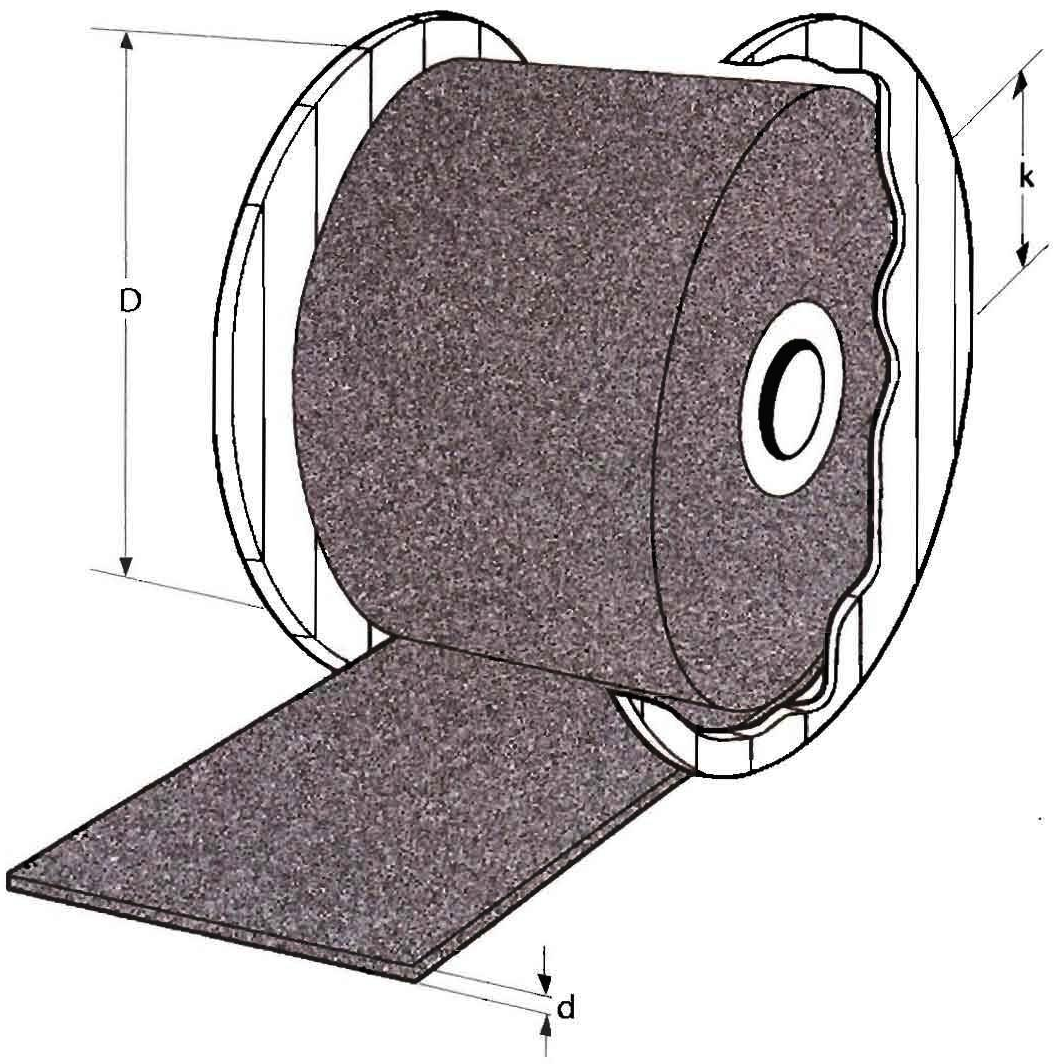


BELT CALCULATIONS

Ftr = Force troughing idlers	$Ftr = 9,81\ c\ .\ f.\ L\ [\ Gtr + (\ Gb + Gm)\ CosH\ ]$ Newton
Frt = Force return idlers	$Frt = 9,81\ c.f.L\ (Grt + Gb\ \cos H)$ Newton
Fa = Additional Force (skirts, clean)	$Fa = \frac{Pa\ .\ 1000}{V}$ Newton
Fm = Material Force	$Fm = Gm\ .\ H\ .9,81$ Newton
Fe = Effective Belt Force	$Fe = Ftr + Frt + Fa + Fm$ Newton
F_1 = Total Force	$F_1 = Fe\ .\ k_1$ Newton
F_2 = Return Force	$F_2 = Fe\ .\ k_2$ Newton
F_b = Return Belt weight Force	$F_b = 9.81\ .\ G_b\ .\ H$ Newton
F_P = Belt Pretension	$Fp = F_2 - F_b$ Newton
T_1 = Belt working Tension	$T_1 = \frac{F_1}{W}$ N/mm
R = Belt Range	$R = T_1\ .\ S$ N/mm
Pr = Required Power	$Pr = \frac{V\ .\ Fe}{100\ .\ Cd}$ kw
Based on installed Power (Pi)	$Fe = Pi\ .\ Cd\ .\ 1000$ Newton

WINDING DIAMETER

Belt Length	Drum core Ø k = 0.2 m Belt thickness d = mm					Drum core Ø k = 0.5 m Belt thickness d = mm								
	4	6	8	10	12	14	16	18	20	22	24	26	28	30
10	0,30	0,34	0,38	0,41	0,44	0,65	0,67	0,69	0,71	0,73	0,75	0,76	0,78	0,80
20	0,38	0,44	0,49	0,54	0,59	0,78	0,81	0,84	0,87	0,90	0,93	0,96	0,98	1,01
40	0,49	0,59	0,67	0,74	0,81	0,98	1,03	1,08	1,13	1,17	1,21	1,25	1,29	1,33
60	0,59	0,71	0,81	0,90	0,98	1,15	1,21	1,27	1,33	1,39	1,44	1,49	1,54	1,59
80	0,67	0,81	0,93	1,03	1,12	1,29	1,37	1,44	1,51	1,58	1,64	1,70	1,76	1,82
100	0,74	0,90	1,03	1,15	1,25	1,42	1,51	1,59	1,67	1,75	1,81	1,89	1,95	2,02
120	0,81	0,98	1,12	1,25	1,37	1,55	1,64	1,73	1,82	1,90	1,98	2,06	2,13	2,20
140	0,87	1,05	1,21	1,35	1,48	1,66	1,76	1,86	1,95	2,04	2,13	2,21	2,29	2,37
160	0,92	1,12	1,28	1,43	1,57	1,75	1,87	1,97	2,07	2,17	2,26	2,35	2,44	2,53
180	0,98	1,19	1,37	1,53	1,67	1,86	1,98	2,09	2,20	2,30	2,40	2,49	2,58	2,67
200	1,03	1,25	1,44	1,61	1,76	1,96	2,08	2,20	2,31	2,42	2,52	2,62	2,72	2,81
220	1,08	1,31	1,51	1,69	1,84	2,04	2,18	2,30	2,42	2,53	2,64	2,74	2,84	2,94
240	1,12	1,37	1,58	1,76	1,93	2,13	2,26	2,40	2,52	2,64	2,76	2,87	2,97	3,07
260	1,17	1,42	1,64	1,83	2,00	2,21	2,35	2,49	2,62	2,75	2,86	2,98	3,09	3,20
280	1,21	1,47	1,70	1,90	2,08	2,29	2,44	2,58	2,72	2,84	2,97	3,08	3,19	3,30
300	1,25	1,53	1,76	1,97	2,15	2,37	2,52	2,67	2,81	2,94	3,07	3,19	3,31	3,42
320	1,29	1,58	1,81	2,03	2,22	2,44	2,60	2,75	2,90	3,04	3,16	3,30	3,41	3,53
340	1,33	1,62	1,87	2,09	2,29	2,51	2,68	2,84	2,99	3,12	3,26	3,39	3,52	3,64
360	1,37	1,67	1,93	2,15	2,36	2,58	2,75	2,92	3,07	3,21	3,36	3,49	3,62	3,74
380	1,41	1,72	1,98	2,21	2,42	2,65	2,83	3,00	3,15	3,30	3,45	3,58	3,72	3,84
400	1,44	1,76	2,03	2,27	2,48	2,72	2,90	3,07	3,23	3,37	3,53	3,69	3,81	3,94



Winding Diameter of Conveyor Belts

D = Winding diameter
d = Belt thickness
L = Belt length
k = Diameter of drum core

$$D = \sqrt{\frac{4}{\pi} . d . L + k^2} = (m)$$

BELT STORAGE CONDITIONS

Belt Strorage Conditions

– ideal storage room should be cool and dark, free from light and moisture

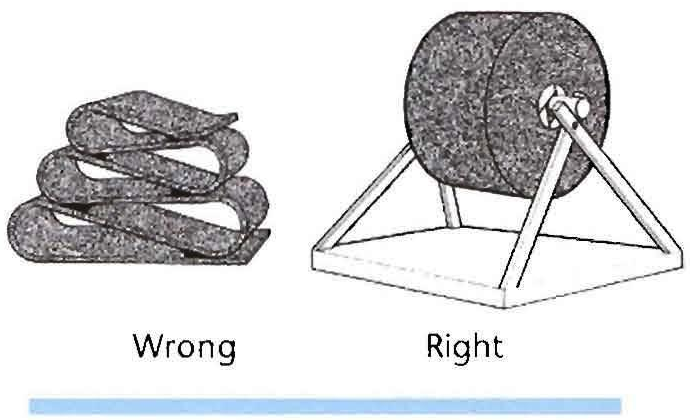
– Belts should be kept in reels as shown below.

– Belt pulleys should be rotated around a reel axis to form an angle of 45° once in fifteen days

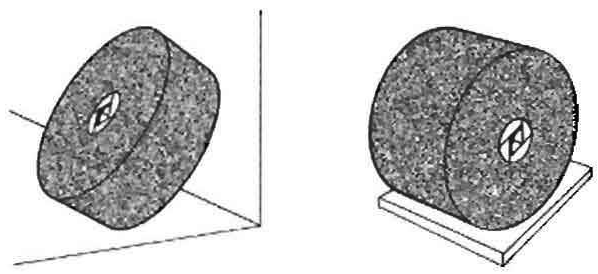
– Pulleys should be unloaded once in a month and talk powder should be apllied in rewinding.

– Long storage period decreases belts performance. Consider the chart below in storage preiods ofspare belts.

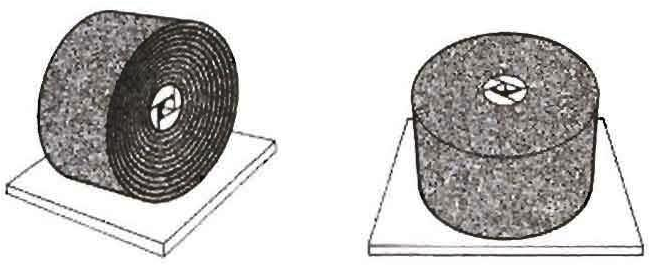
		Storage Room	Other than storage room	
			Direct sun light	Without direct sun light
Storage Preiod	Maximum	1,5 years	1 week	3 months
	Standard	0,5 year	3 days	1 month



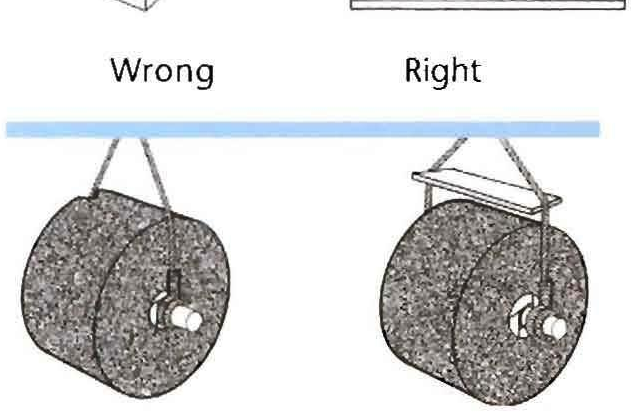
Wrong Right



Wrong Right



Wrong Right



Wrong Right

AFŞİN/ ELBİSTAN LIGNITE ESTABLISHMENTS

NewkoBalkan® L.L.C.

▼ Coal Conveying Belt / ST - 2500 / 1800 mm

▲ Ash Conveying Belt / ST - 2000 / 1600 mm

▲ Clay Conveying Belt / ST - 2500 / 1800 mm

AFŞİN/ ELBİSTAN POWER PLANT

NewkoBalkan® L.L.C.

▼ Coal Belt / EP - 1800 / 2200 mm

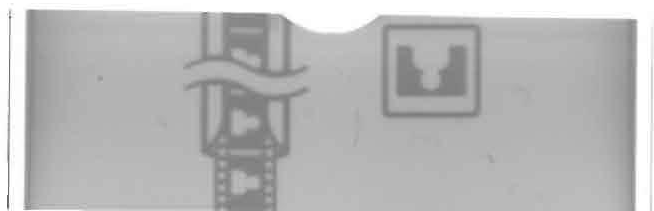
▲ Coal Stock Area's Belt / ST - 2000 / 1600 mm

SEYİTÖMER POWER PLANT

NewkoBalkan® L.L.C.

▼ Coal Belt / ST - 1000 / 1200 mm

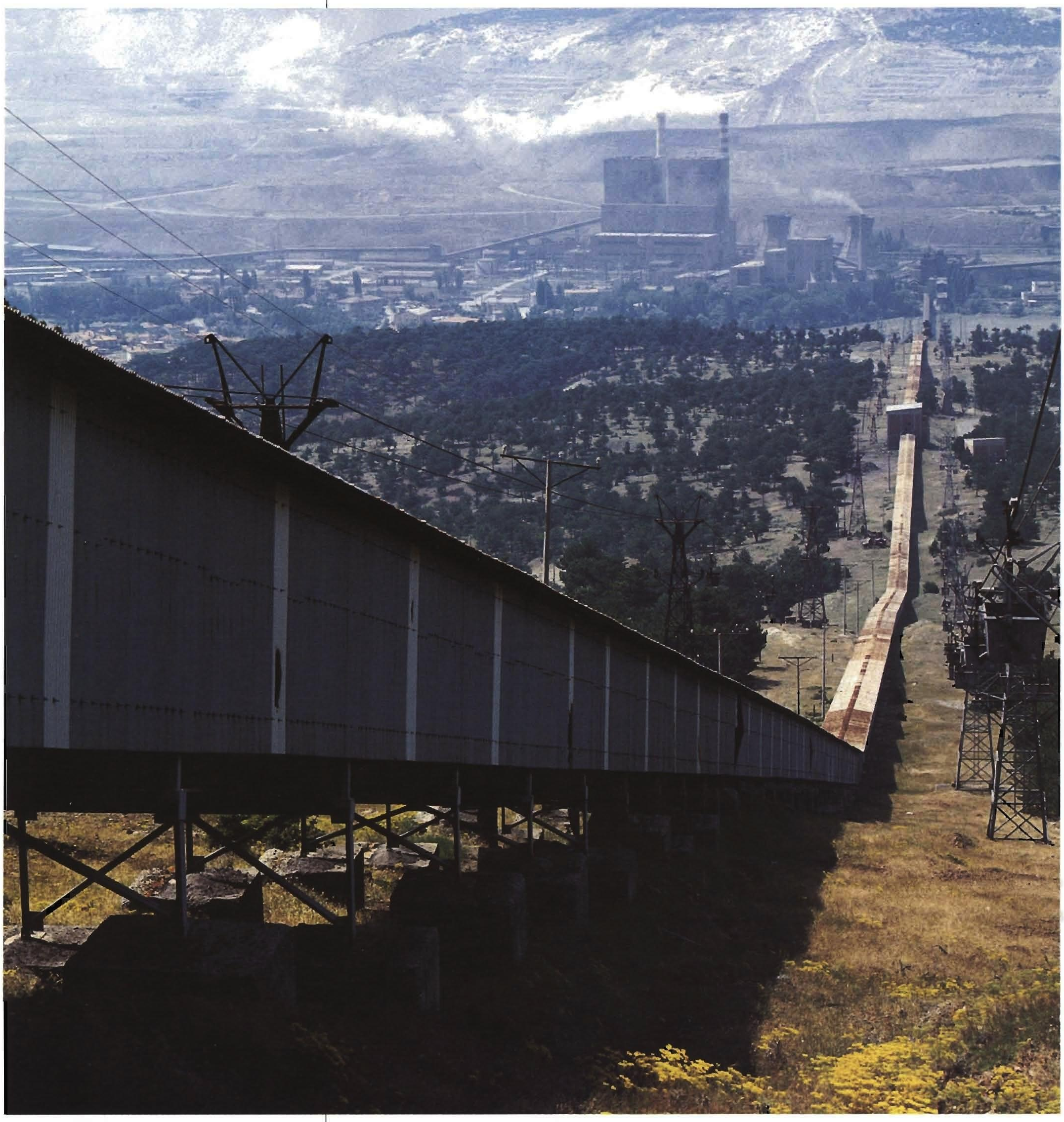
▲ Ash Conveying Belt / ST - 1800 / 1000 mm



TUNÇBİLEK POWER PLANT

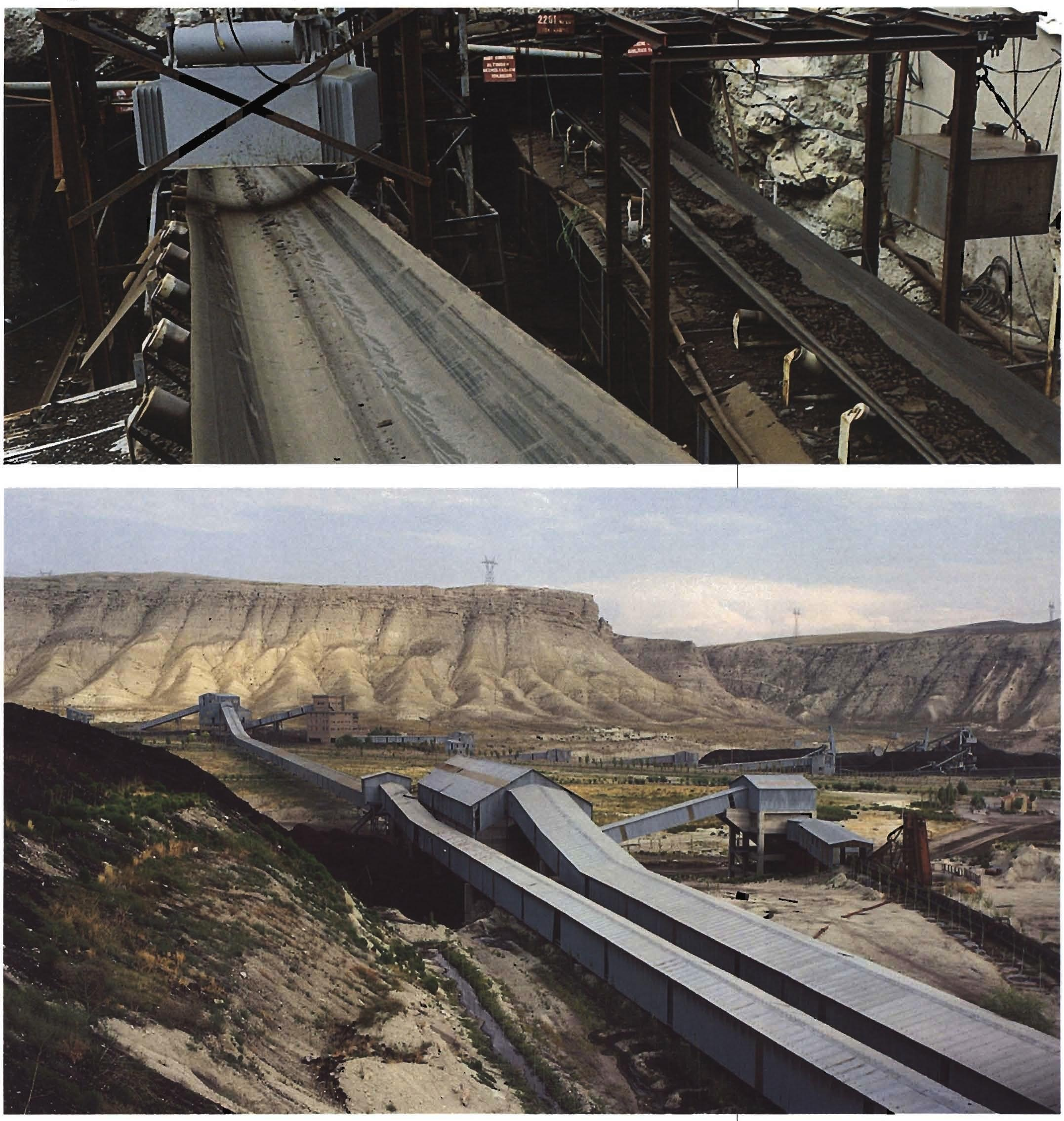
NewkoBalkan® L.L.C.

▼ Ash Conveying Belt / ST - 1600 / 1000 mm



NewkoBalkan® L.L.C.

▼ Underground Coal Belt / ST - 1000 / 1200 mm



▲ Stock Area Belt / ST - 1000 / 1200 mm

İSKENDERUN IRON AND STEEL MILL

NewkoBalkan® L.L.C.

▼ Port Belt / ST - 1600 / 1400 mm

▲ Hot Coke Belt / EP - 1250 / 1400 mm

▲ Stock Area Belt / EP - 1250 / 1400 mm

Certificate

NEWKO BALKAN L.L.C

RRUGA E DESHMOREVE NO:105 / SUHAREKE - KOSOVA

Has been assessed and found to Comply with the Requirements of:
Denetlenmiş ve aşağıdaki standartın gerekliliklerine uygunluğu görülmüştür:

OHSAS 18001:2007

The Occupational health and safety Management System is applicable to
İş Sağlığı Ve Güvenliği Yönetim Sistemi:

PRODUCTION AND SALE OF TEXTILE AND STEEL CARCASS CONVEYOR BELTS, INDUSTRIAL TIRE CORD, V-BELT

TEKSTİL VE ÇELİK KARKASLI KONVEYÖR BANTLAR, ENDÜSTRİYEL KORD BEZİ, V KAYIŞI ÜRETİMİ VE SATIŞI

Certificate No: OHS/17750
Sertifika Numarası: OHS/17750

Date of Certification Audit:26.07.2018
Denetim Tarihi: 26.07.2018

Date of Issue: 02.08.2018
Yayınlanma Tarihi: 02.08.2018

Date of Expiry: 01.08.2019
Son Geçerlilik Tarihi: 01.08.2019

1st Surveillance Audit : August 2019
1. Gözetim Denetim Tarihi : Ağustos 2019
2nd Surveillance Audit : August 2020
2. Gözetim Denetim Tarihi : Ağustos 2020

CERTIFICATE

This is to Certify that the
Quality Management System
of

NEWKO BALKAN L.L.C

RRUGA E DESHMOREVE NO: 105 / SUHAREKE - KOSOVA

has been independently assessed and is compliant
with the requirements of

ISO 9001:2015

This Certificate is applicable to the following product or service ranges:

PROCUDTION AND SALE OF TEXTILE AND STEEL CARCASS CONVEYOR BELTS, INDUSTRIAL
TIRE CORD, V-BELT

: Certificate No : XK81226A :

Date of initial registration	:	09 November 2017
Surveillance audit on or before	:	09 November 2017
Certificate expiry	:	08 November 2018
Recertification Due	:	08 November 2020

This Certificate is property of LMS Certifications and remains valid subject to satisfactory surveillance audits.

Director

Accreditation

LMS Certifications Private Limited
e-mail :- info@lmsassessments.com,
Visit :- www.lmsassessments.com.

CERTIFICATE OF REGISTRATION

This Certificate has been awarded to

NEWKO BALKAN L.L.C

RRUGA E DESHMOREVE NO:105 / SUHAREKE - KOSOVA

In recognition of the organization's Management System
which complies with

ISO 14001:2015 (EMS)

The scope of activities covered by this certificate is defined below

PRODUCTION AND SALE OF TEXTILEANDSTEELCARCASS CONVEYORBELTS, INDUSTRIALTIRE CORD, V-BELT

TEKSTİL VE ÇELİK KARKASLI KONVEYÖR BANTLAR, ENDÜSTRİYEL KORD BEZİ, V KAYIŞI ÜRETİMİ VE SATIŞI

Certificate Number: **SISEGYE082018111**
Date of Issue of Original Certificate: **02.08.2018**
Date of Issue of latest certificate: **02.08.2018** Issue No.: **02**
Expiry Date: **01.08.2019**
Re-certification Due on: **02.07.2021**

The Organization's documentation and Implementation has been reviewed and found to comply with the relevant standard rules. This certificate of Registration is based on the evaluation of the mentioned scope given above. Organization is responsible for maintaining the responsibilities of the relevant standard rules. Any significant changes in the scope of the certification or standard referred above render this certificate invalid.

Managing Director

This is an accredited certificate issued by SIS Certifications Pvt. Ltd. Sanctioned for issue by IAS (International Accreditation Services Inc.) Http://www.iasonline.org in accordance with the requirements if ISO/IEC 17021:2015. The validity of this certificate can be verified by checking the directory maintained with SIS certifications Pvt. Ltd. On the website "http://www.siscertifications.co.in".

If there is any doubt regarding the certificate,

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Email us :- info@siscertifications.co.in. , support@siscertifications.com, Call us:- +91-0124-4060495
Web:- http://www.siscertifications.co.in.

TÜRK STANDARDLARI ENSTİTÜSÜ
TURKISH STANDARDS INSTITUTION

DENEY HİZMETİ ALINABİLECEK LABORATUVAR ONAYI
SUBCONTRACTOR LABORATORY APPROVAL

TÜRK STANDARDLARI ENSTİTÜSÜ bu belge ile
TURKISH STANDARDS INSTITUTION approves that

ANKARA YOLU 2. KM AFYONKARAHİSAR

adresinde faaliyet gösteren
located at the address given above

ÖZER KONVEYÖR BAND TURİZM SAN. VE TİC. A.Ş

laboratuvarının TSE Deney Hizmeti Alınabilecek Laboratuvar Kriterlerine ve diğer ilgili TSE Mevzuatına göre, kapsamda belirtilen deneyleri yapmaya yeterli bulunduğunu onaylar.
found competent according to TSE Subcontractor Laboratory Criterion and the other relevant TSE regulations, refeted with tests stated in the scope.

Numarası / *Number* : 06/37
Veriliş Tarihi / *Date of Issue* : 15.12.2004
Geçerlilik Tarihi / *Valid Until* : 15.12.2016

15.11.2015
Buğra ÇAKIR
ANKARA HİZMET YERİ BELGELENDİRME MÜDÜRÜ

Sayfa / *Page*: 1 / 1

Bu doküman laboratuvarın TS EN ISO/IEC 17025'e göre belgelendirildiği/akredite edildiği anlamını taşımaz ve bu amaçla kullanılamaz.
This document does not mean that the laboratory is certified / accredited according to TS EN ISO/IEC 17025 and cannot be used for this purpose

NewkoBalkan® L.L.C

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