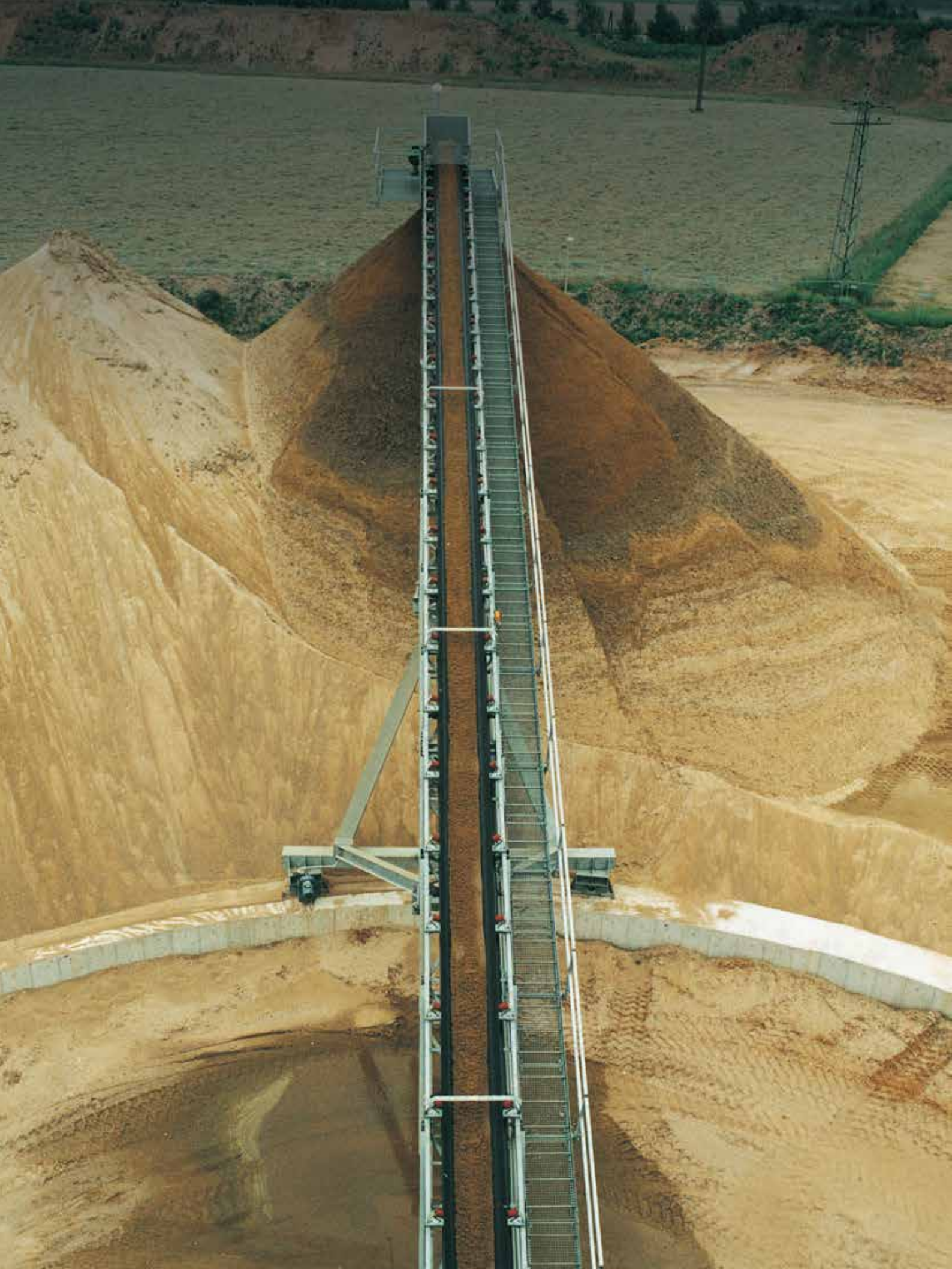


Conveyor Solutions
Trellex conveyor belts
with textile reinforcement







The single source for textile belts

Metso delivers a comprehensive range of conveyor belts. Based on more than 100 years of experience in development, manufacturing and applications know-how, Trellex conveyor belts and conveyor belt systems are designed to meet specific end-user requirements for high performance and cost efficiency.

The Trellex range includes textile-reinforced belts, Trellex steelcord belts, Trellex aramid belts and PVG belts, as well as a complete line of accessories for enhanced system performance. With subsidiaries in more than 50 countries and more than 80 service centers in all parts of the world, Metso participates in engineering, design, installation, and service to ensure users of maximum return on their investment.

Reinforcement

The reinforcement consists of a synthetic fabric called EP. The lengthwise or warp threads of this fabric are made of polyester (E), and the crosswise or weft threads are polyamide (P). This fabric ensures high tensile-strength to weight ratio, excellent flexibility and outstanding troughing characteristics, as well as low elongation and high resistance to impact and chemicals.

Additionally to that Metso can provide a range of market specific fabric types such as E (polyester in both warp and weft) and P (polyamid in both warp and weft) and also different weave types. These can be crow foot weave (CFW) or straight warp weave (EPP) which provide increased impact and slitting resistance.

In-house quality assurance

The textile-reinforced belts are manufactured with state-of-the-art technology to ensure optimal price performance ratios, and every belt we deliver meets the strict criteria of the Metso Quality Assurance system.

Skim coat

Layer of rubber scaled to:

- Provide appropriate adhesion with reinforcement.
- Transmit and distribute tension between plies of reinforcement.
- Absorb and distribute stress generated by impact.

Covers

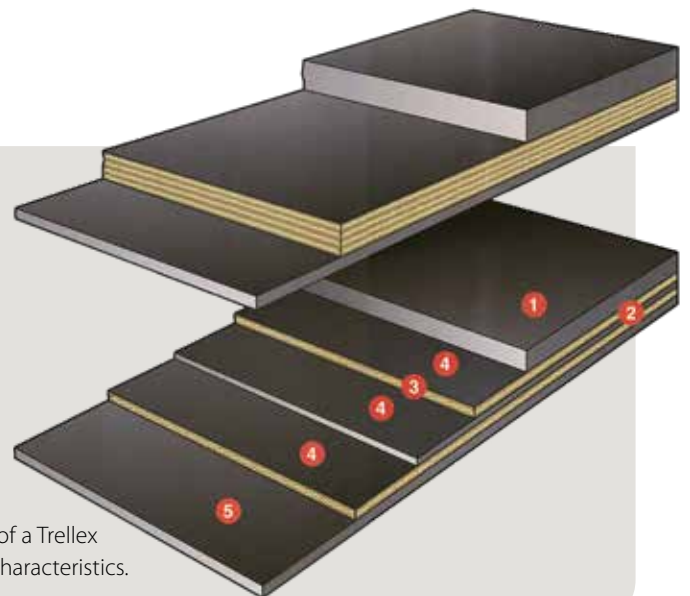
The polymer used for the cover varies with the properties required, e.g., styrene-butadiene or natural rubber are used for abrasion resistance, styrenebutadiene, butyl or ethylene/propylene rubber for heat resistance, chloroprene or styrene-butadiene rubber for flame resistance, chloroprene or nitrile rubber for oil resistance. Cleats or patterned surface are required for inclined belts.

Cover thickness depends on the characteristics of transported material and on loading conditions. The Trellex range of textile-reinforced belts covers a broad spectrum of applications.

Structure

1. Top cover
2. Carcass
3. Textile reinforcement
4. Rubber skim coat
5. Bottom cover

The illustration shows the construction of a Trellex textile-reinforced belt and its principal characteristics.



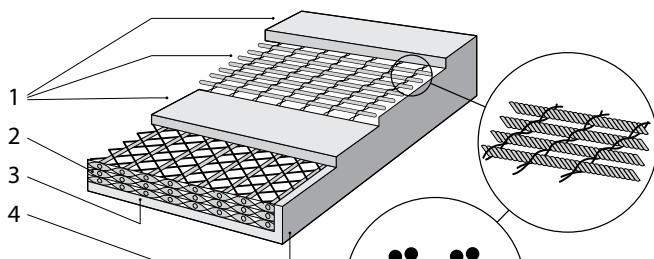


Wear resistant

Heavy-duty transport of abrasive material

Trellex conveyor belts are designed for transport of heavy abrasive material such as rock, ore and gravel. The covers of these belts are made of extra-tough rubber with extremely high resistance to abrasion, shearing and impact. The fabric reinforcement is specially treated to ensure low elongation. Trellex conveyor belts are anti-static, and have electrical surface resistance that complies by a wide margin with the maximum permissible limits of DIN EN ISO 284. Trellex belts also comply fully with DIN, BS, NF, ISO and AS. Trellex conveyor belts can be delivered in any configuration to meet specific user requirements, in strengths of up to 3600 N/mm and widths of up to 3000 mm.

Belts exposed to very high impact force can be supplied with a textile or steel breaker reinforcement.



1. Top cover incl. metal breaker
2. Carcass
3. Bottom cover
4. Solid rubber edge

Cross section of a textile belt with a metal breaker in the top cover.

European and Australian type belts

Carcass type	Belt strength	Plies	Carcass thickness	Carcass approx. weight (kg/m ²)
EP, PN	315	2	1,8	2,5
EP, PN	315	3	2,4	2,6
EP, PN	400	2	2,0	2,6
EP, PN	400	3	2,7	3,2
EP, PN	500	3	3,0	3,7
EP, PN	500	4	3,4	4,3
EP, PN	630	3	3,0	3,8
EP, PN	630	4	3,6	4,9
EP, PN	800	3	3,9	4,6
EP, PN	800	4	4,0	5,1
EP, PN	800	5	4,5	6,1
EP, PN	1000	4	4,8	6,1
EP, PN	1000	5	5,0	6,4
EP, PN	1250	4	5,2	7,0
EP, PN	1250	5	6,0	7,7
EP, PN	1600	4	7,6	9,8
EP, PN	1600	5	7,5	8,8
EP, PN	2000	4	8,8	11,4
EP, PN	2000	5	9,5	12,2
EP, PN	2500	5	11,0	14,2
EP, PN	3150	6	13,2	17,0

North American type belts

Carcass type	Belt strength	Plies	Carcass thickness	Carcass approx. weight (kg/m ²)
EE	220	2	2,5	3,0
EE	250	2	2,8	3,0
EE	330	3	3,7	5,1
EE	375	3	3,7	5,1
EE	440	4	4,9	6,3
EE	500	4	4,9	6,3
EE	600	3	5,5	7,5
EE	600	4	6,5	8,2



Cover grades

Grade	ISO	DIN	AS	CEMA	Characteristics (example)
X	H	X	M		Wear resistant, heavy duty cover for sharp and lumpy material, or extreme drop heights
Y		Y			Wear resistant cover for standard applications
W	D				Wear resistant cover, for fine and abrasive material
N			N		Standard grade cover according to AS
RMA-I				RMA-I	Premium grade cover according to RMA
RMA-II				RMA-II	Premium grade cover according to RMA
UAR					Ultra abrasion resistant cover
UAR25					Ultra abrasion resistant cover with max. 25 mm ³ abrasion
CGS					Cut & gouge resistant cover with excellent resistance against slitting
M+, MA-A					Extremely wear resistant, heavy duty covers for sharp and lumpy material, or extreme drop heights

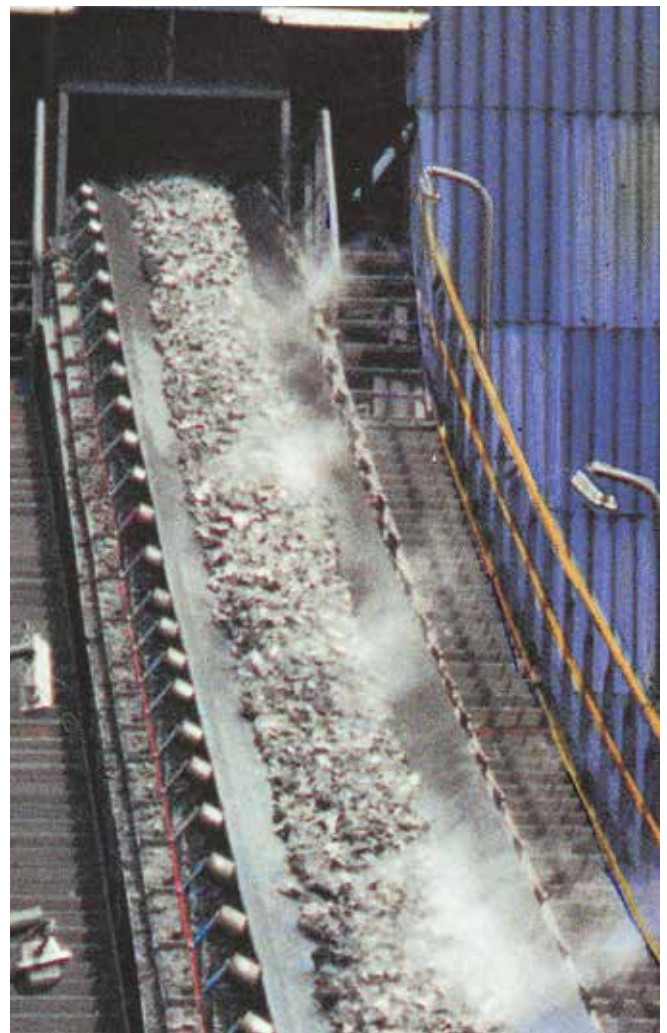


Heat resistant

High-temperature applications

For high-temperature applications different types of belting are available. These belts are designed for transport of materials such as clinker, coke, foundry sand and slag.

Trellex heat-resistant conveyor belts can be used for transport of material at continuous temperatures of up to 180 °C, with peaks of up to 230 °C. Selection of belting depends on several factors, including the cooling rate and density of the material as well as the thermal coefficient of the belt. Users can rely on expertise from Metso engineers in order to identify appropriate belting for specific applications.



Cover grades

Grade	Elastomer	Permanent material temperatures up to	Occasional peaks up to
T120	SBR	+120 °C	+140 °C
T200	EPM, EPDM	+180 °C	+230 °C



Flame resistant and self-extinguishing plied

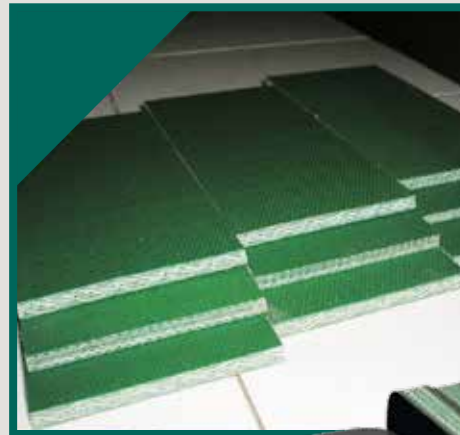
Plied belts

Flame resistant belts are not necessarily heat resistant. In case of a fire, flame resistant belts inhibit the spread of a fire over the complete belt.

The cover grades used, comply to a number of national and international standards.

Trellex® flame resistant and self-extinguishing belts

Grade	Characteristics and recommended applications	International standard
K	Flame-resistant covers	EN 12882
S	Flame-resistant covers and carcass	EN 12882
V	Self-extinguishing for underground coal mining	EN 14973
VT, VLS	Self-extinguishing for above ground coal mining	EN 14973



Solid woven belts

In underground mining and especially when it comes to coal mining, potential fire hazards are much more and thus the requirements for fire resistant belts are much higher. Solid woven belts have an interwoven carcass which means that the carcass yarns are interlocked to one thick and stable ply.

This carcass is impact resistant yet flexible enough for the use in underground mining conveyors. Using one single ply with a complex weave there is no risk of ply separation and excellent fastener retention rates can be achieved as well. The carcass is fully dipped into PVC which makes it impenetrable for moisture and dirt and ideally suitable for the highest fire-resistant properties.

The covers can either be made of PVC or of rubber and can comply to various national and international standards. The belts can be manufactured in widths up to 1600mm and in strengths up to 2500 N/mm. The cover thicknesses for both PVC and PVG covers can be supplied up to 3mm which is common industry practice.

Min. tensile strength in N/mm

Belt type	Warp direction	Weft direction	Min. pulley dia. (mm)
680	680	265	320
800	800	280	400
1000	1000	300	500
1250	1250	350	500
1400	1400	350	630
1600	1600	400	750
1800	1800	400	800
2000	2000	400	800
2240	2240	450	1000
2500	2500	450	1000



Inclined & vertical transport

Belts for inclined transport

Rubber conveyor belts with smooth surfaces are normally limited to applications with gradients of no more than 15-18°. Steeper angles call for belts with profiled or cleated surfaces that prevent bulk material or unit loads from sliding backward.

Elevator belts

Vertical transport of abrasive goods such as gravel or crushed rock requires elevator belts with covers of wear-resistant rubber. Trellex Elevator belts are also available in other cover grades.

Escort

Supplied in version v-cleats for all types of bulk material, such as rock, sand and gravel. Escort is also suitable for material in sacks or bags.

Escort belts are mainly used in the construction industry and thus made of wear-resistant rubber. Escort is also available in various profiles, widths and rubber grades to meet specific user requirements.



Market-driven technology

Trexlex conveyor belts are developed in close cooperation with major manufacturers of conveyor systems. Along with the applications expertise acquired in over 100 years of belt production, this helps to keep Metso close to the real world in which our customers operate. Our belts are made to deliver benefits to users in the form of efficiency, reliability and long service life.

These benefits are maximized by the global support provided by Metso engineers. We work with our customers around the world, from the planning stage, to installation and commissioning. We are on hand to deliver service and on-going consultancy for the lifetime of your conveyor belt system. The information below comprises recommendations for belt selection and conveyor design.

Tensile strengths

Trexlex conveyor belts are manufactured as standard in the following tensile strengths (N/mm): 160, 200, 250, 315, 400, 500, 630, 800, 1000, 1250, 1600, 2000, 2500, 3150 and 3600.

	50 m	800	EP	630/4	6/2	X
Belt length						
Belt width in mm						
Ply material						
Ultimate tensile strength of belt in N/mm						
Number of plies						
Cover thickness top/bottom in mm						
Grade of cover						

Belt widths

Trexlex conveyor belts are manufactured as standard in the following widths (mm) 300, 400, 500, 600, 650, 800, 1000, 1200, 1400, 1600, 1800, 2000, 2200, 2400, 2600, 2800 and 3000.

Technical design

Metso's extensive know-how is always available to help you with the design of your conveyor, whether in the choice of the correct belt or in the calculation of curve radii, transition lengths or belt turnovers.

On these pages you will find standard values for determining minimum curve radii and transition lengths.

Curve radii

The minimum required curve radii for a standard three-roll troughing idler can be taken from the table.

Standard values for curve radii

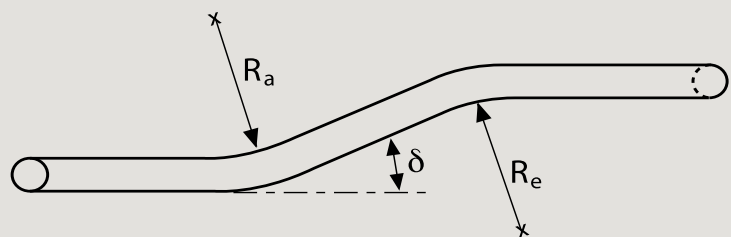
In the case of concave curves R_a , allowance also has to be made so that the belt is not lifted off the idlers when running empty. The minimum radius required can be determined as follows:

Standard values for minimum curve radii in mm

Troughing angle λ	Concave curve R_a	Convex curve R_e
20°	14 x B	20 x B
25°	17 x B	30 x B
30°	21 x B	40 x B
35°	24 x B	45 x B
40°	27 x B	50 x B
45°	30 x B	55 x B

$$R_a \leq \frac{1000 \cdot T_x}{m'_G \cdot g \cdot \cos \delta} \text{ in m}$$

R_a	m	Minimum radius, concave curve
R_e	m	Minimum radius, convex curve
B	mm	Belt width
λ	°	Troughing angle
T_x	kN	Local belt tension
m'_G	kg/m	Belt weight
g	m/s ²	Acceleration due to gravity (g=9,81 m/s ²)
δ	°	Angle of inclination in curve area



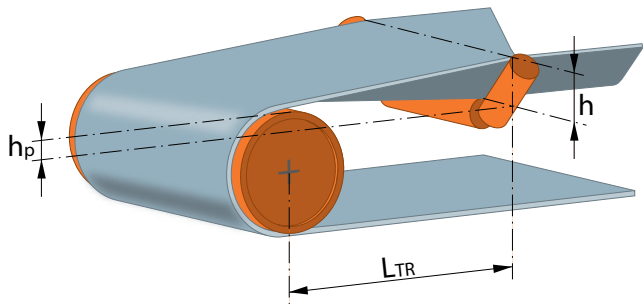
The larger radius (from the table or according to the formula) must be chosen.



Pulley diameters

Standard values for transition lengths

(minimum transition length, troughed to flat with standard three-roll troughing idlers).

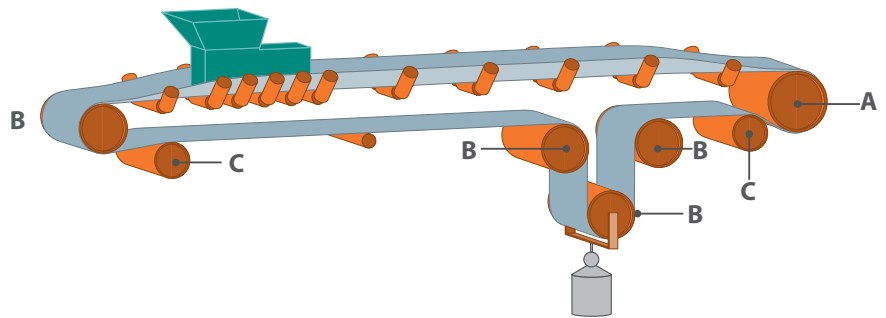


Standard values for minimum transition length in mm

Troughing angle λ	Without pulley elevation	With pulley elevation*
20°	0.9 x B	0.7 x B
25°	1.1 x B	0.8 x B
30°	1.3 x B	0.9 x B
35°	1.5 x B	1.0 x B
40°	1.7 x B	1.2 x B
45°	1.9 x B	1.3 x B

* Pulley elevated 1/3 of the trough height above the center idler roll ($h_p = h/3$)

- A** **Group A**
Drive and discharge pulleys and all other pulleys, where belt tension is relatively high.
- B** **Group B**
Pulleys, where belt tension is relatively low.
- C** **Group C**
Snub Pulleys, where belt wrap angle is $\leq 30^\circ$.



Belt type	Over 60% to 100% Pulley group			Over 30% to 60% Pulley group			Up to 30% Pulley group		
	A	B	C	A	B	C	A	B	C
EP160/2	250	200	160	200	160	125	160	160	125
EP 250/2	250	200	160	200	160	125	160	160	125
EP 315/2	250	200	160	200	160	125	160	160	125
EP 315/3	315	250	200	250	200	160	200	200	160
EP 400/2	315	250	200	250	200	160	200	200	160
EP 400/3	315	250	200	250	200	160	200	200	160
EP 500/3	400	315	250	315	250	200	250	250	200
EP 500/4	500	400	315	400	315	250	315	315	250
EP 630/3	500	400	315	400	315	250	315	315	250
EP 630/4	500	400	315	400	315	250	315	315	250
EP 800/4	630	500	400	500	400	315	400	400	315
EP 800/5	630	500	400	500	400	315	400	400	315
EP 1000/3	630	500	400	500	400	315	400	400	315
EP 1000/4	630	500	400	500	400	315	400	400	315
EP 1000/5	800	630	500	630	500	400	500	500	400
EP 1250/4	800	630	500	630	500	400	500	500	400
EP 1250/5	800	630	500	630	500	400	500	500	400
EP 1600/4	1000	800	630	800	630	500	630	630	500
EP 1600/5	1000	800	630	800	630	500	630	630	500
EP 2000/5	1250	1000	800	1000	800	630	800	800	630

Recommended minimum pulley diameters

Minimum diameters are given in the table above for three different groups of pulleys.



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