Conveyor Solutions

Trellex Flexopipe®

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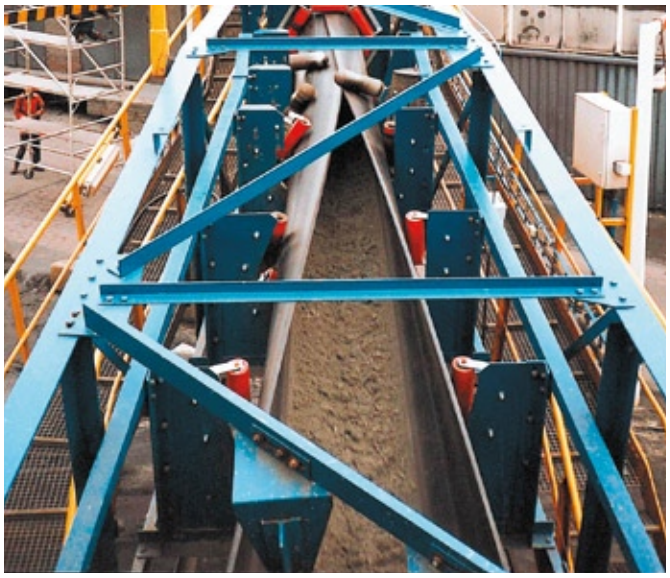
Trellex Flexopipe® – flexible, unique, ecological!

Conveyor belt systems of enclosed material transport are an excellent solution to various conveying problems. Metso is Europe's leading and most experienced manufacturer of belts for enclosed conveyor systems. Worldwide the belts are known under the trademark Trellex Flexopipe®.

Enclosed material transport

Remarkable advantages of enclosed material transport compared to conventional troughed belt conveyors :

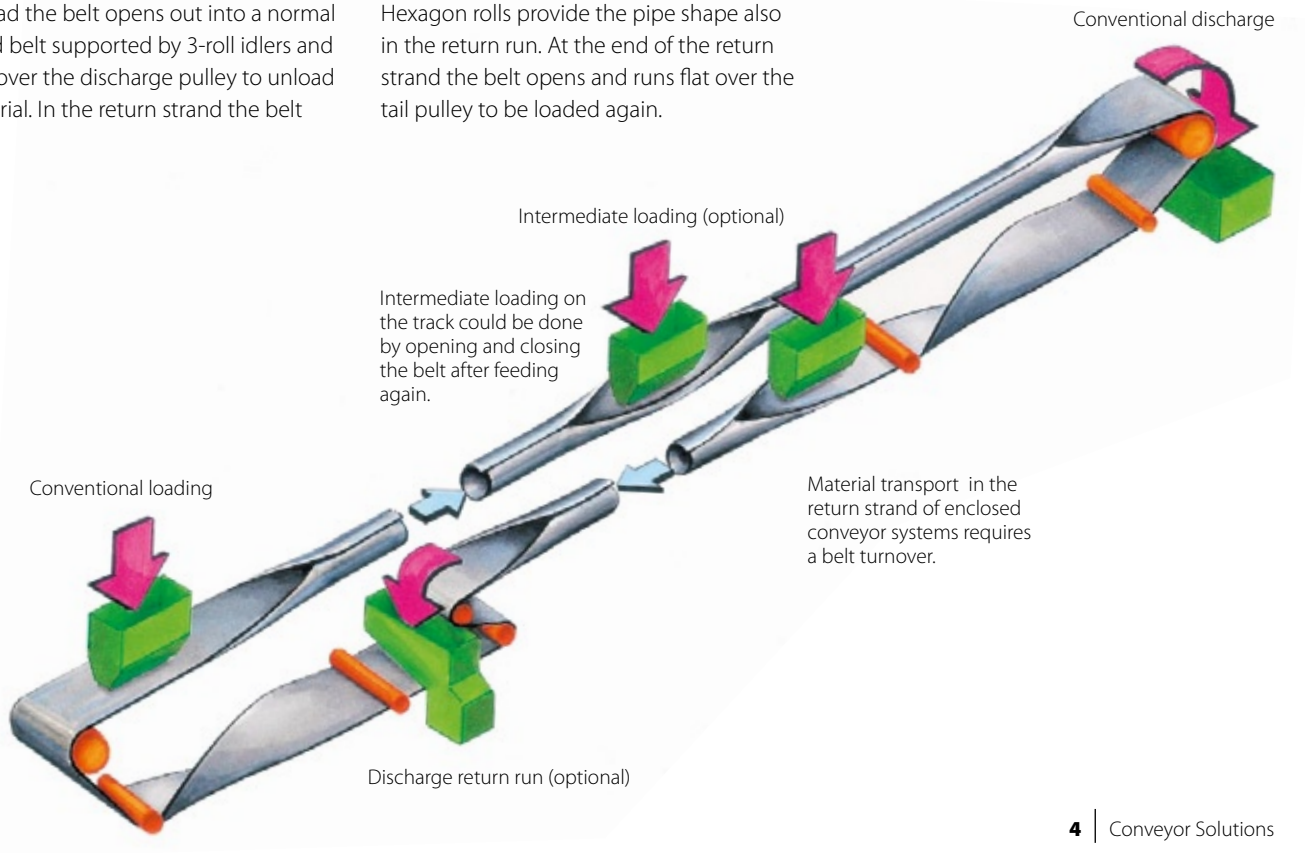
- Horizontal and vertical curves enable the routing over difficult terrain conditions.
- Fewer transfer points lead to smooth treatment of the material to be conveyed and reduces installation – as well as operating costs.
- The narrow width of the installations needs less space requirements on the track.
- Larger contact between material and belt allows increased angles of inclination (depending on the kind of material being conveyed).
- Material is completely enclosed, external environmental conditions such as rain, wind, temperature and dust have no negative influences.
- Clean and spillage free material transport protects the environment and keeps main-tenance costs on a low level.



The principle

In the loading area the Trellex Flexopipe® belt is troughed like conventional belts. After loading special idlers form the belt into a pipe shape with overlapped belt edges. The material being conveyed is completely enclosed by the belt.

Hexagonally arranged idler rolls keep the belt closed over the track. Close to the conveyor head the belt opens out into a normal troughed belt supported by 3-roll idlers and runs flat over the discharge pulley to unload the material. In the return strand the belt closes again into a pipe where its overlapped edges in general are on the bottom. Hexagon rolls provide the pipe shape also in the return run. At the end of the return strand the belt opens and runs flat over the tail pulley to be loaded again.



The Trellex Flexopipe® Belt

Conveyor systems for closed material transport are demanding applications with high requirements for the conveyor belt. Trellex Flexopipe® conveyor belts are specially developed for these systems.

Belt conveyors where only the return strand has a pipe shape, is already a solution to eliminate contamination below the conveyor.

Characteristic of the system	Requirement for the belt	Flexopipe® solution
Flexible and adaptive conveyor configuration	• Individual belt design for every application • Wide selection of reinforcement types	• Tailor-made belt construction with specially developed reinforcements and rubber compounds • Belt types: Steelcord-, Aramid, EP, P
Closed belt	• Sufficient troughability to fit into hexagon • Tight overlapping	• Unique carcass design with adjusted rigidity, more flexible at belt edges to ensure tight overlapping
Horizontal and vertical curves	• Sufficient elasticity of the reinforcement • Stable pipe shape	• Reinforcement with higher lengthwise elasticity for installation with narrow curves • Sufficient crossrigidity to maintain pipe cross-section
High dynamic stress	• Fatigue resistance of the belt	• Rubber compounds with excellent dynamic properties and improved ozone/UV resistance
Suitable for all bulk materials	• Broad selection of cover grades	• Complete range of cover grades: anti-abrasive, heat-, oil- and grease-, flameresistant, food (FDA), etc.

Trellex Flexopipe® Steelcord Belts

Trellex Flexopipe® Steelcord belts incorporate additional reinforcements in crosswise direction. Their unique design (patented in EU, US and other countries) is proven in industry and mining. Please contact Metso for more information.

Trellex Flexopipe® Textile Belts

Depending on the required elasticity, belt strength and rigidity, Trellex Flexopipe® belts can be produced with three different textile reinforcements. In short installations with narrow curves an elastic Polyamide (P) fabric is recommended, while with increasing center distances a Polyester (EP) or Aramid (D or DP) fabric should be used. The nominal pipe diameters as well as belt widths may vary from the values in the table, depending on the OEM's standard.

Nominal pipe diameter mm	Belt width mm	Carcass type	Belt strength			Minimum cover thickness D, DP, EP and P-belts	
			St-belts N/mm	EP- / P-belts N/mm	D- / DP-belts N/mm	top mm	bottom mm
120	500	EP, P	-	250-315	-	3	2
150	600	EP, P	-	250-400	-	3	2
200	780	EP, P	-	250-500	-	3	2
250	1000	D, DP, EP, P, St	630-1600	250-630	630-1600	4	2
300	1100	D, DP, EP, P, St	1000-2800	400-1000	630-2000	4	2
350	1300	D, DP, EP, P, St	1000-4000	630-1250	630-2500	5	2
400	1600	D, DP, EP, P, St	1000-4000	1000-2500	630-3150	5	2
500	1900	D, DP, EP, P, St	1000-4500	1000-3150	630-3150	5	3
530	2000	D, DP, EP, P, St	1000-4500	1000-3150	630-3150	5	3

Cover Grades

Trellex Flexopipe® conveyor belts offer a complete range of rubber covers allowing the useage in the whole field of mining or industrial applications. Enclosed transport of hot material does not allow heat exchange to the atmosphere, therefore material temperatures must be lower than in conventional installations. The table shows a selection of cover grades. Further cover grades available on request.

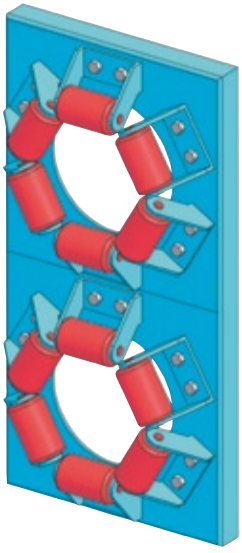
Grade			Characteristics	Applications (example)	Elastomer	Temperature (material) °C		
	ISO	DIN				min.	max.	peaks
XP	H	X	Wear resistant, heavy duty cover for sharp and lumpy material, or extreme drop heights	Ore, rock, limestone	NR / BR	-40	50	
YP	L	Y	Wear resistant cover for standard aplication	Coal, gravel, sand fertiliser, limestone	SBR	-30	50	
Y-30	D	Y, W	Extremely wear resistant cover, for fine and abrasive material	Cement, gypsum, abrasive sands	NR / BR	-30	50	
TXT	L	T, Y	Wear and heat resistant cover for coarse material	Cast iron, coke	SBR	-15	100	130
RET		T, C	Wear resistant cover with excellent heat resistance	Cement, klinker, ash	EPM	-30	150	170
GPP		G	Oil- and grease resistant cover	Wood chips, grain	NBR / SBR	-25	50	
SP100		S, Y	Flame resistant acc. to ISO 340 anti-abrasive	Coal, coke, fertilizer	SBR	-25	50	
GAK		G,A,K	White, grease and flame resistant cover, for food (FDA)	Sugar, paper, grain, flour, malt	NBR	-15	60	

All covers are antistatic

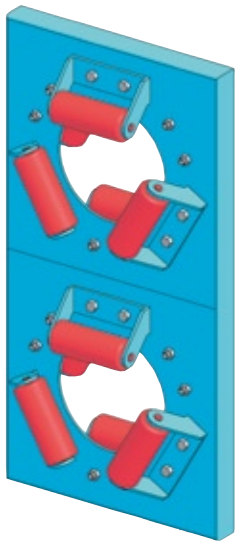
Conveyor Parameters

Key parameters to select the appropriate pipe diameters are the conveying capacity and lump size. Roll diameters and lengths are for standard (inline) design of the hexagon. Nominal pipe diameters and belt widths may vary from those values in the table depending on the OEM.

The design of the Pipe conveyor should consider the characteristics of the installed conveyor belt. The range of Trellex Flexopipe® belts comprises reinforcements with different elastic moduli. A more elastic belt allows narrower curves and shorter transition lengths (distance between pulley and first regular hexagon panel), but requires more take-up length. The table can be used as guideline for conveyor parameters depending on carcass type and pipe diameter. Please contact Metso for more information.



Conventional idler panel of a pipe conveyor with rolls arranged inline. Rolls are mounted with small gaps to avoid the belt edge to be trapped between two rolls.



Offset arrangement of idler rolls. This design allows larger rolls and brackets.

Nominal pipe diameter mm	Belt width mm	Capacity* m^3/h	Maximum lumpsize** mm	Recommended hexagon design			
				Roll distance mm	Roll diameter mm	Roll length - Inline mm	Roll length - Offset mm
120	500	30	40	140	63,5	80	130
150	600	45	50	165	63.5	96	150
200	780	80	70	217	63.5	126	175
250	1000	140	90	285	89	165	230
300	1100	160	100	311	89	180	250
350	1300	220	120	364	89	210	280
400	1600	350	140	457	108	265	340
500	1900	460	180	527	108	305	390
530	2000	530	190	562	108	325	400

*) Filling rate 75 %, speed 1 m/s **) filling rate 75 %, reduced filling rate allows larger lumps

Carcass type	Nominal pipe diameter (D) mm	Deflection of the curve and corresponding minimum curve radii (the maximum deflection per panel is 0,4°)				Transition length	Take-up length % of conveyor length
		≤ 25°	25°-50°	50°-75°	75°-100°		
P	120 - 300 350 - 530	300 * D 400 * D	400 * D 500 * D	500 * D 600 * D	600 * D 700 * D	25 * D	3 - 4
EP	120 - 300 350 - 530	400 * D 500 * D	500 * D 600 * D	600 * D 700 * D	700 * D 800 * D	30 * D	2 - 3
D, DP	250 - 300 350 - 530	500 * D 600 * D	600 * D 700 * D	700 * D 800 * D	800 * D 900 * D	35 * D	0.6 - 1.0
ST	250 - 300 350 - 530	700 * D 800 * D	800 * D 900 * D	900 * D 1000 * D	1000 * D 1100 * D	45 * D	0.3 - 0.6

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