SATI
RUBBER AND PVC PRODUCTS

SATIVERTICAL

SISTEMA DI TRASPORTO BORDI E TAZZE

SIDEWALL CONVEYING SYSTEM

www.satigroup.it

PRODUCTION DRIVEN BY PASSION

From more then 50 years we are a leading company in the production and distribution of rubber conveyor belts, industrial rubber and pvc hoses, rubber sheets and mats.

We have always pursued the aim of efficiently addressing our customers' requests and the continuous search for innovative products as the underlying factor for constant growth to our corporate values.

Driven by passion, knowledge and intuition, forming close ties with our customers and production partners, has enabled us to take a new challenge, introducing on the market a **high quality product made in the heart of Italy**.

All our conveyor belts for vertical or highly tilted transport follow a production process that focuses on complying with the quality standards required by the market: sidewalls and cleats are designed and produced at the warehouse of our Bologna headquarters and assembled to the belt by hot vulcanization.

Our technical staff are highly skilled and exclusively assigned to the project and are ready to support our clients in choosing the most suitable solution for their needs, assuring a high quality, customised product.

THE BELT UNIVERTICAL

SATI GROUP has been supported by specialists to develop the UNIVERTICAL belt.

Produced at the Sati Group headquarters of Castel Maggiore, the UNIVERTICAL belt stands out for its hot vulcanization process.

In case of specific request by the customer, the cold application may also be supplied.

The conveyor system sidewalls and cleats

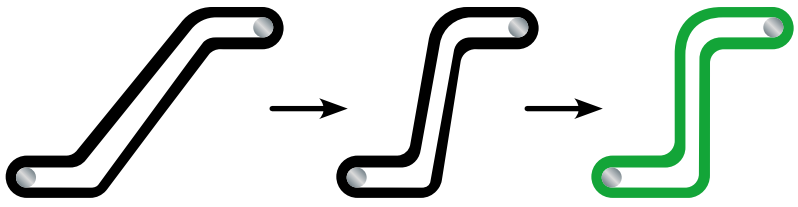
The conveyor system called Univertical is tested and effective. It is used to increase the capacity of the conveyor belt even up to four times more then a standard belt, overcome height differences inclination up to 90°, optimise vertical space, bend even by 180°, minimise material dispersal and decrease the number of conveyors used. Thanks to gravity, in its ideal work position at 90°, the energy required to move the belt is minimal, thus allowing it to be managed easily. As a matter of fact, a 90° set-up optimises the use of the conveyor system and decreases belt and mechanical components wear.

If proper maintenance is performed, this conveyor system is very effective and has very low costs.

APPLICATIONS

- POWER PLANTS
- FOUNDRIES
- MINES
- SHIP LOADING AND UNLOADING
- STEEL WORKS
- RECYCLING PLANTS
- MINE EXTRACTION SHAFTS
- STORAGE PLANTS

A 90° set-up optimises the use of the conveyor system and decreases wear of the belt and mechanical components.



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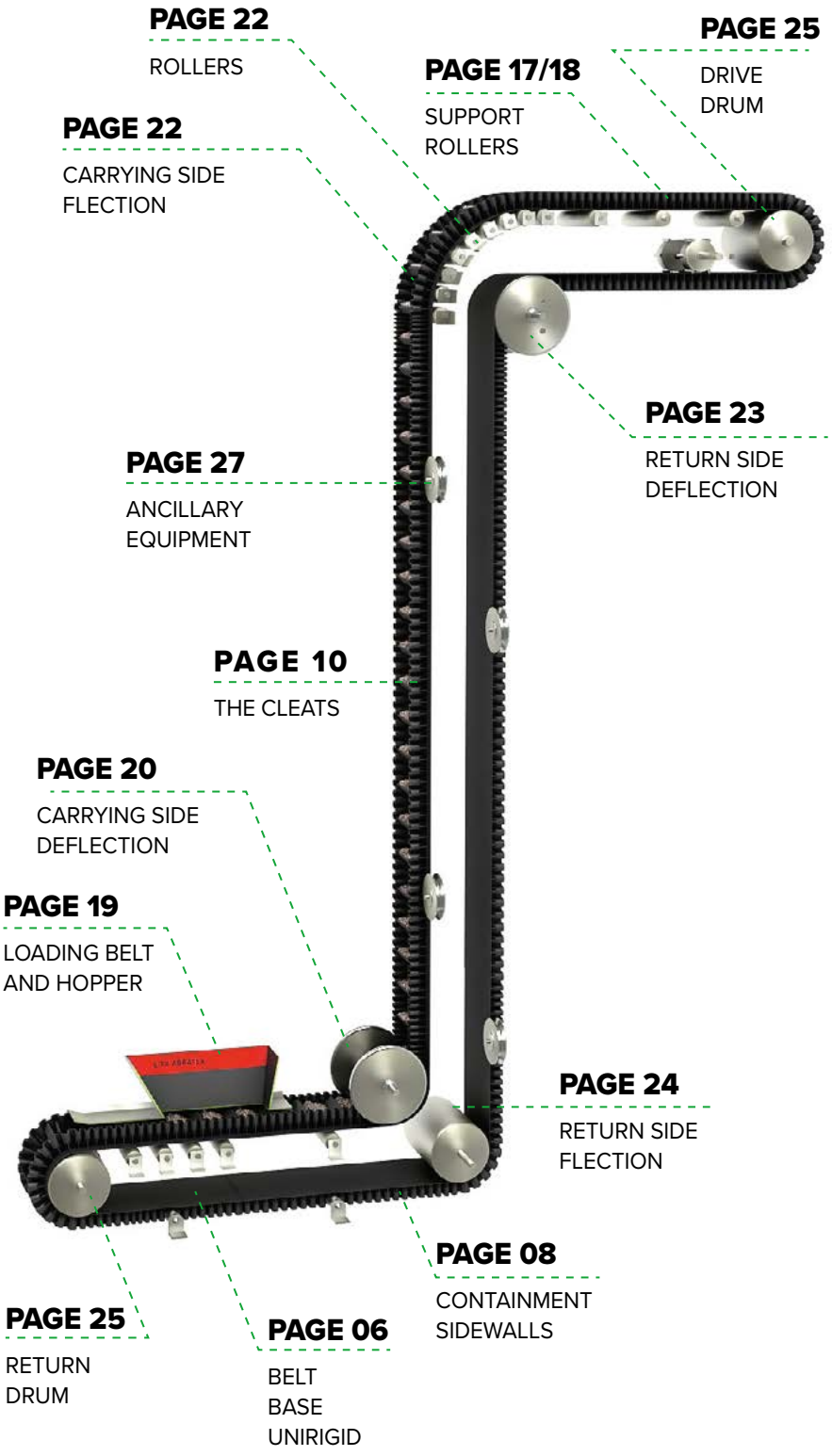


THE UNIRIGID BASE BELT

UNIRIGID is a special belt with a specifically designed carcass, which makes it stiff crosswise and flexible lengthwise.

This feature makes it ideal for application of sidewalls and cleats, assures stability in changes of tilt, eliminates possible damage to the belt in the return stage and does not waste motor force, thus assuring longer service life for your conveyor.

The stiffness of the belt is given by the combination of standard plies, special plies of various materials and correct layout of rubber inter-layers. The choice of base belt must be performed according to the needs of your conveyor:

EM The belt carcass consists of crosswise stiff plies only. It is ideal for low-medium intensity work.

XE The belt carcass consists of a combination of EP plies and 2 crosswise stiff nylon plies placed above and below the original EP core (the required rigidity, in fact, is only obtained with two plies since using one ply only is not enough). This gives high stiffness and good work load to the belt. Suitable for medium heavy-duty work.

XESC The belt carcass consists of a combination of EP plies and 2 crosswise stiff metal plies placed above and below the original EP core. This gives very high cross stiffness and good work load to the belt. Suitable for heavy-duty work with significant height.

XEST The belt carcass consists of a combination of metal frame and 2 crosswise stiff metal plies placed above and below the original metal core. This gives very high cross stiffness and high work load to the belt, and very low elongation. Suitable for heavy-duty work with very significant height.

NORMAL BELT

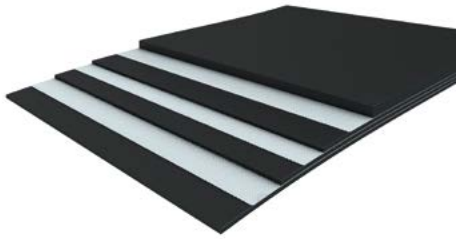
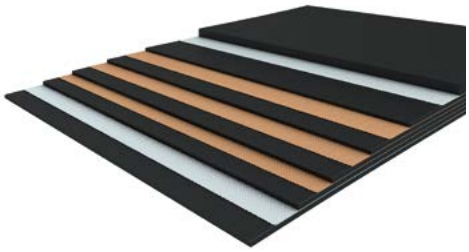
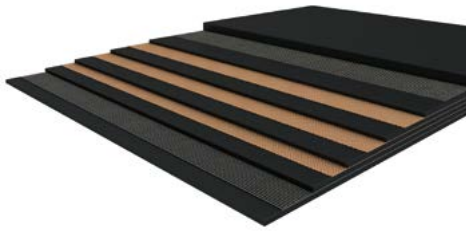
UNIRIGID BELT

After choosing the type of construction of the base belt, its type of compound of the covers must be selected. This decision must be taken based on the features of the material to be conveyed:

Y	HR	OIL	X	K	White
ABRASION RESISTANT	HIGH TEMPERATURE RESISTANT	RESISTANT TO OIL	RESISTANT TO ABRASION AND CUTTING	SELF-EXTINGUISHING	WHITE, SUITABLE FOR CONTACT WITH FOODSTUFF

*other types also available on request

TECHNICAL SPECIFICATIONS **UNIRIGID:**

CODE	CROSS SECTION:	BELT TYPE	COVERS	THEORETICAL WEIGHT kg/m²	Ø MIN.DRUMS mm
EM		EM 400/3	4+2	13, 20	315
		EM 500/3	4+2	13,8	400
XE		XE 400/3+2	4+2	13,2	315
		XE 500/4+2	4+2	13,8	400
		XE 630/4+2	4+2	14,5	500
		XE 800/5+2	4+2	18	630
		XE 1000/5+2	4+2	19	800
XESC		XESC 500/3+2	4+2	15,5	400
		XESC 630/4+2	4+2	16,2	500
		XESC 800/4+2	4+2	17,8	630
		XESC 1000/4+2	4+2	19	800
XEST		XEST 1600+2	4+2	On request	1250
		XEST 2000+2	4+2	On request	1250
		XEST 2500+2	4+2	On request	1400
		XEST 3150+2	4+2	On request	1400

CONTAINMENT SIDEWALLS

The choice of the sidewall depends on cleats choice.
The sidewall must always be higher than the cleat and, based on this parameter, the sidewall may have an inner EP textile reinforcement or not.
Our sidewalls are moulded using a high quality compound, resistant to ozone and weathering, with excellent elastic modulus, high breaking strength and high resistance to abrasion.

These technical and specifications combined with hot application to the base belt give great vertical stability to the whole as well as excellent lengthwise flexibility, also thanks to the sinusoidal geometry specifically designed in the higher part. This feature allows the sidewall to work excellently on the return part i.e. where the sidewall is strained by continuous friction on the return rollers, thus preventing breakdowns and bending. The sinusoidal geometry is such as to prevent the rollers from entering it.
The solid base makes the sidewall anchoring even safer and contributes to its longer service life. Furthermore, the base design allows the sidewall to be pressed down on both sides during application.

SIDEWALL WITHOUT PLIES

The sidewalls can also be sold loose.

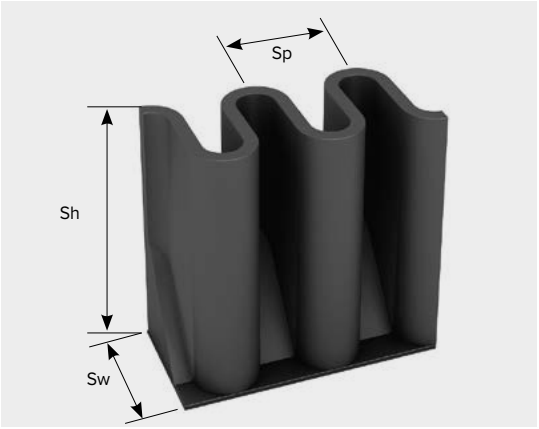
Available types:
- Standard anti-abrasive
- Moderate anti-oil
- HR1 heat resistant
- HR2 heat resistant
- Self-extinguishing

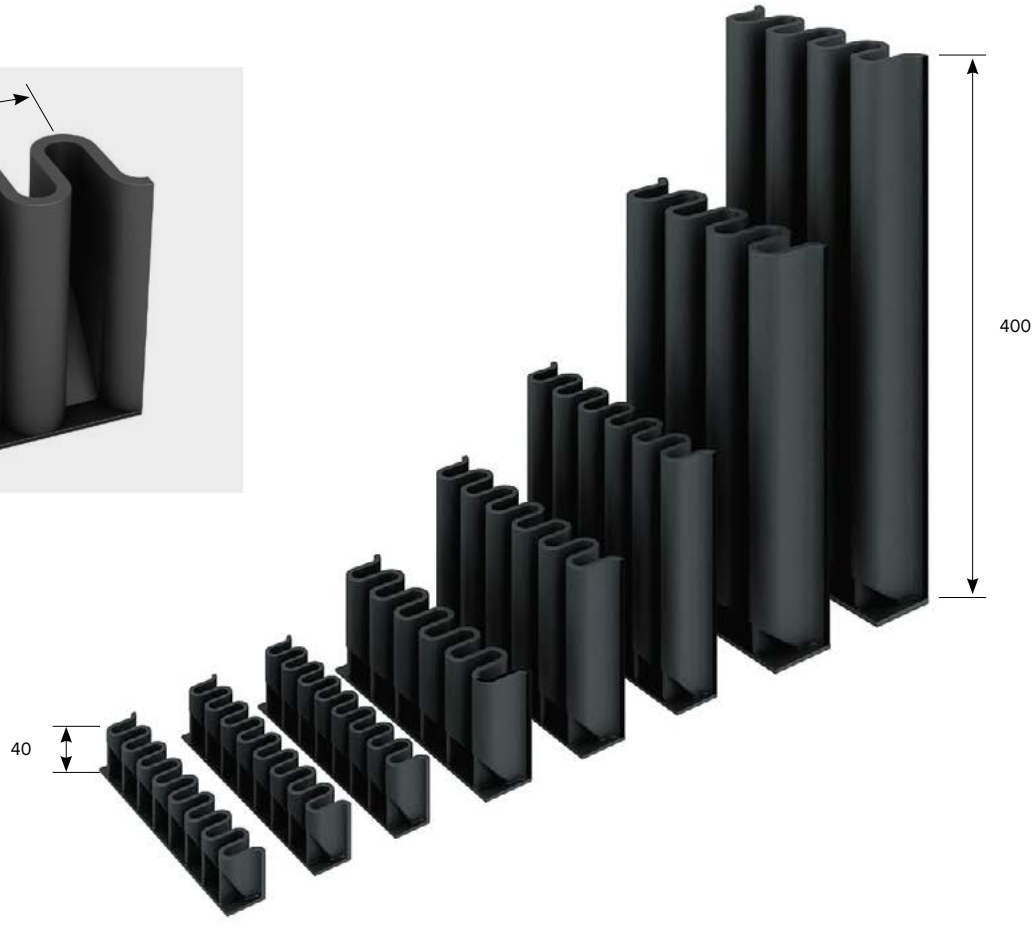
SIDEWALL WITH PLIES

TECHNICAL SPECIFICATIONS AND TYPES:

TYPE	HEIGHT mm	BASE mm	PITCH mm	WEIGHT kg/m²	Ø MIN. DRUMS mm
	Sh	Sw	Sp		
F40	40	50	51,5	0,60	120
F50	50	50	51,5	1,10	150
F60	60	50	51,5	1,30	180
F80	80	50	51,5	1,80	240
F100	100	50	51,5	2,00	300
FT100	100	50	51,5	2,00	300
F120	120	50	51,5	2,25	360
FT120	120	50	51,5	2,25	360
FT160	160	75	60,0	4,80	500
FT200	200	75	60,0	6,50	600
FT240	240	75	60,0	7,35	720
FT300	300	75	63,5	9,30	900
FT350	350	75	63,5	10,85	1000
FT400	400	75	63,5	12,40	1200

SIDEWALL SIZES





CARRYING CLEATS

Sati Group cleats are produced using a high quality blend, resistant to ozone and weathering, have high breaking strength and high resistance to abrasion. These technical features combined with hot application of the same to the base belt assure great vertical stability and capacity.

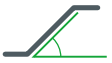
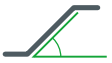
The choice of carrying cleats and their pitch must be made based on lump size, dimensions and features of the conveyed material.
Respect three basic rules:

1. The minimum pitch must be double the largest lump size;
2. The cleat width must be at least two and a half times the largest lump size;
3. You must know the conveyor's tilt angle and maximum dimensions of the lump size.

In case of very small sized material, capacity may be optimised by making the cleat pitch very narrow.
After finding out about that, the most suitable cleats may be chosen.

The cleats can also be sold loose.

Available types:
- Rubber
- Rubber with textile reinforcement
- Base in rubber and rubber bulkhead secured with screws
- Base in rubber and polyurethane bulkhead secured with screws

CLEAT SECTION	TYPE	HEIGHT mm	BASE mm	REINFORCEMENT PLY	WEIGHT kg/m²	ANGLE
	**T20**	20	40		0,52	 max 45°
	T35	35	50		0,90	
	T55	50	100	•	1,20	
	T75	75	90		1,50	
	T90	90	110		2,00	
	T110	110	100		2,50	
	**TK55**	55	100		1,40	 max 75°
	TK75	75	100		1,70	
	TK90	90	110		2,10	
	TK110	110	110		2,60	
	**TKS75**	75	100		1,55	 max 90°
	TKS90	90	100		2,20	
	TKS110	110	100	•	2,75	
	TKS140	140	150	•	6,50	
	TKS180	180	180	•	8,30	
	TKS220	220	160	•	9,75	
	TKS230	230	160		10,50	
	TKS280	280	170	•	13,90	
	**TG280**	280	230		17,50	 max 45°
	TG330	330	230		18,80	
	TG380	380	230		20,50	
	**TP280**	280	230	•	19,50	 max 45°
	TP330	330	230	•	21,00	
	TP380	380	230	•	23,50	
	**TKSI280**	280	230		17,50	 max 90°
	TKSI330	330	230	•	19,00	
	TKSI380	380	230		20,20	
	**TKSP280**	280	230	•	22,50	 max 90°
	TKSP330	330	230	•	24,00	
	TKSP380	380	230	•	27,20	

TG = Straight cleat / **TP** = Straight polyurethane cleat / **TKSI** = Polyurethane tilted cleat / **TKSP** = Tilted cleat

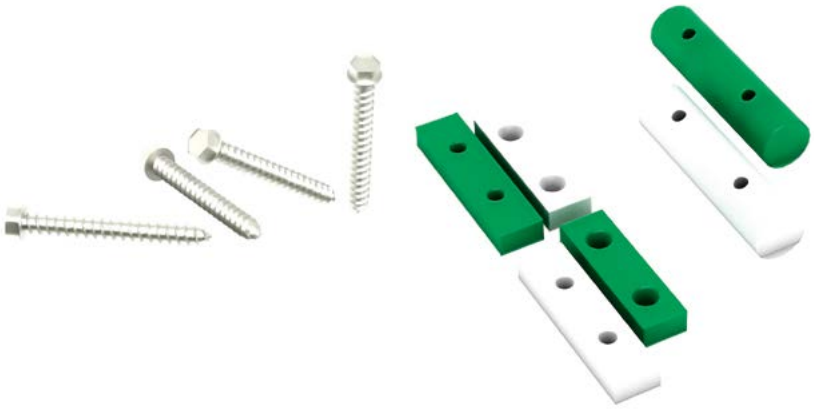
* OTHER FORMAT AVAILABLE ON REQUEST

ACCESSORIES

SCREWS AND PLATES

If higher than 110mm or upon the customer's express request, the cleat may be fixed to the sidewall by a set of two nylon plates and four zinc-coated screws.

PLATES DIMENSIONS	20x10x70mm

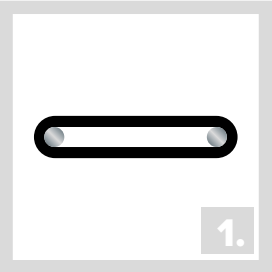


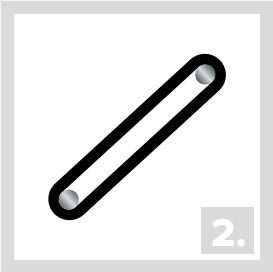
LATERAL PARTITIONS CONTAINING MATERIAL

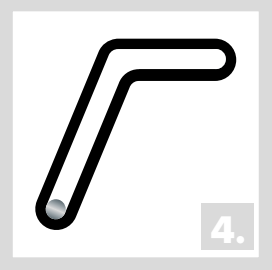
Side partitions may be fitted in case of conveying small-sized and/or dusty material. These prevent the material from getting into the gaps between the sidewall and the cleats.

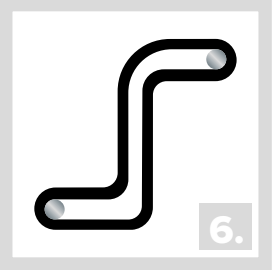
Questionnaire for sidewalls and cleats conveyor system

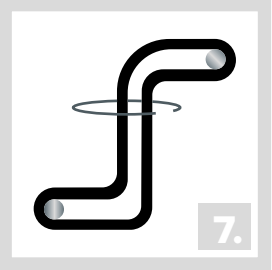
INDICATE CONVEYOR SET-UP











CONVEYOR DETAILS / COMPLETE AS MANY FIELDS AS POSSIBLE:					
	Drawing No.				
Supply length	m		Supply angle		°
Height	m		Tilt angle		°
Tilt length	m		Unloading angle		°
Unloading length	m		Comments		
Notes:					

MATERIAL DATA					
Description material				Lump size:	mm
Capacity:	t/h	Volume:	m^3/h	Temperature:	°
Density:	t/m^3	Rest angle*:	°	Presence of oil	Yes / No
Comments:					

* The angle formed by the material placed on a flat surface.

Questionnaire for sidewalls and cleats conveyor system

Date:

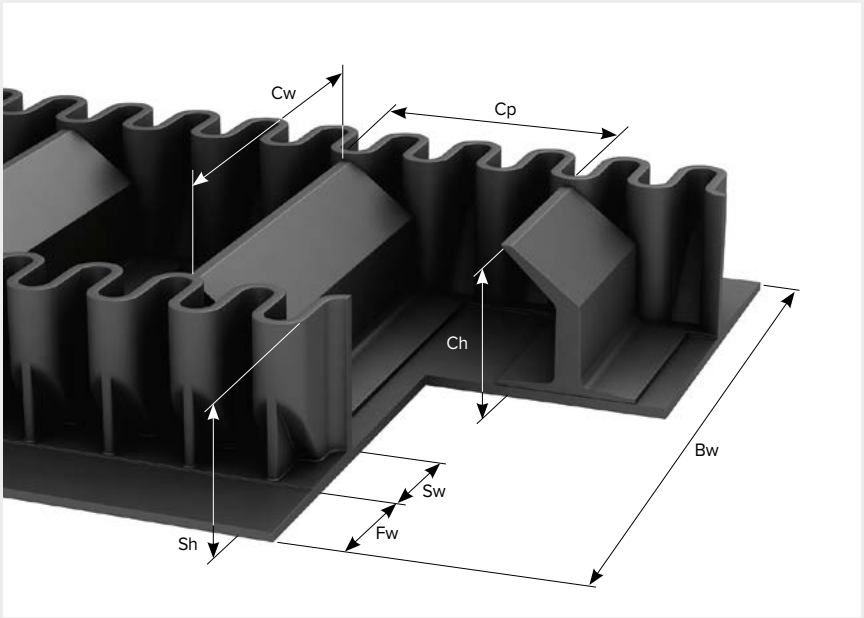
Company:

Contact:

Tel. Fax

Email:

BELT DIMENSIONS	
Belt length:	mm
Bw:	mm
Fw:	mm
Sw:	mm
Cw:	mm
Cp	mm
Sh:	mm
Ch:	mm
*Base belt	
*Quality:	
Open / Endless	



*Please read notes shown below

*CLEAT TYPE:

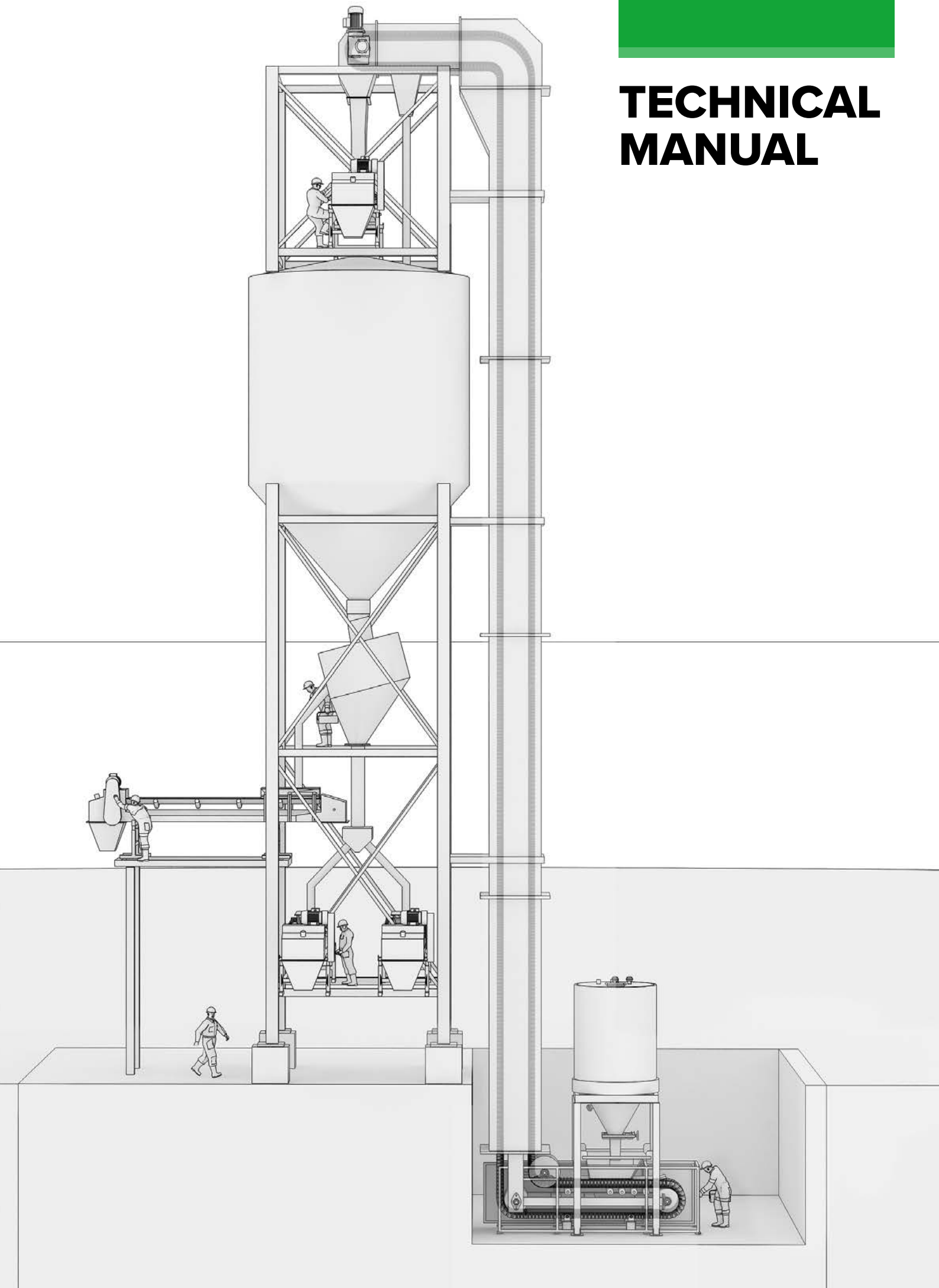
○ T ○ TK ○ TKS ○ TG ○ TP ○ TKSI ○ TKSP

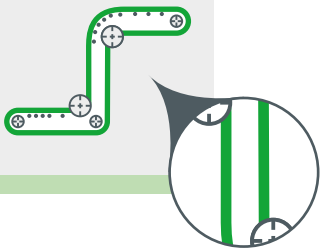
*Base belt. The belt must be selected based on conveying needs, we recommend using UNIRIGID belts. In some cases it is permissible to use standard belts.

COVER QUALITY BASED ON USE:	TYPE
Abrasion resistant	**Y**
Oil resistant	**OIL**
Heat resistant	**HR**
Self extinguishing	**K**

Note: In case of doubts or questions do not hesitate to contact our technical personnel.

TECHNICAL MANUAL



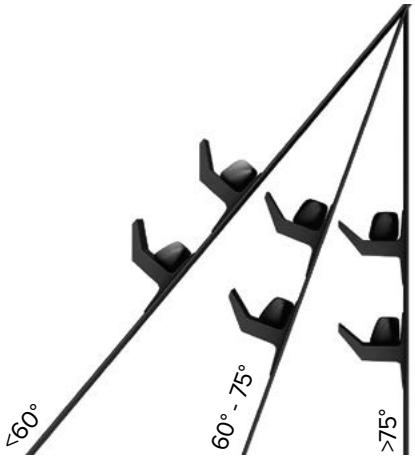


CHOICE OF THE CLEATS

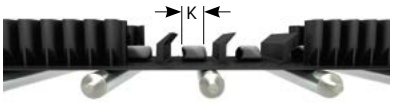
The decision concerning the type of cleats to be used is taken based on the type of material to be conveyed. Two basic information must be identified:
• TYPE OF MATERIAL
• MATERIAL LUMP SIZE

A LUMP SIZE MEDIUM LARGE

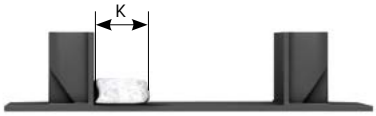
In case of conveying material of medium high particle size, there are three basic rules that need to be adhered to:



1 SPACE BETWEEN THE CLEATS
it must be at least twice the maximum lump size of the material (K)



2 WIDTH OF THE CLEATS
The cleats must be at least 2.5 times the maximum lump size of the material (K)



3 HEIGHT OF THE CLEAT
The following must be taken into account in selecting the cleat height
A) maximum lump size of the material (K)
B) Belt tilt angle

TILT ANGLE:	<60°	60°-75°	>75°
CLEAT HEIGHT:	0,75/1,0 x K	1,00/1,2 x K	1,50 x K

Cleats type TKS, TKSI and TKSP must always be used to convey material over 75°.

B LUMP SIZE SMALL

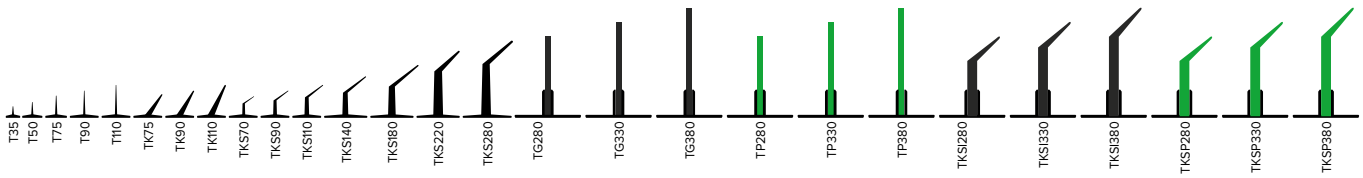
In general, the conveyed material never fully occupies the “drawer” to 100% of the possible volume.

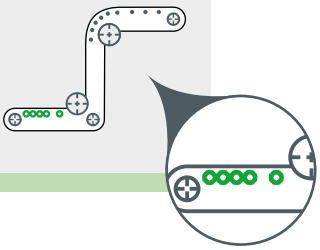
In calculating the volumetric capacity you must always consider 75% utilisation.
In order to make full use of the conveyor belt the pitch between the cleats must therefore be decreased.
However, everything depends on the type of cleats used, the pitch between them, tilt and rest angle of the conveyed material.

CHOICE OF SIDEWALLS

After selecting the cleat, the sidewall must be higher than the cleats in order to protect them:

Cleat height	< 110mm	> 110mm
Sidewall height	Cleat height + 5/10mm	Cleat height + 20mm



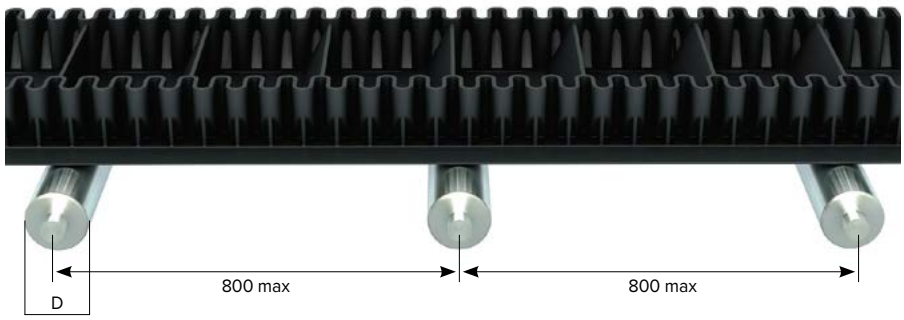


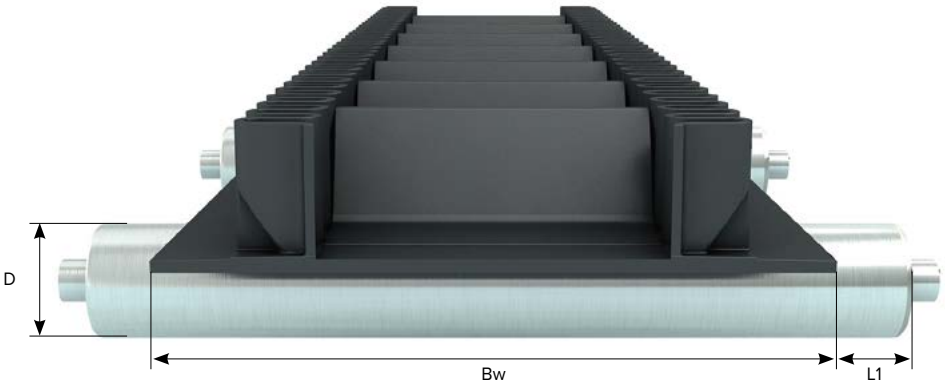
SUPPORT ROLLERS ON THE CARRYING PART

The pitch of the support rollers on the carrying part is normally 800mm.
However, it might be required to decrease it based on:
- material conveyed;
- belt speed;
- conveyor tilt;
- belt width.

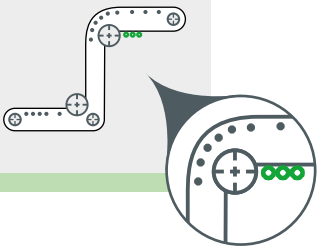
In the material loading part we suggest increasing the number of rollers, using rubber ones. In the event of falling heavy material, it is advisable to install Unimpact impact bars.

Theoretical roller sizing diagram (it is important to calculate the actual belt weight):

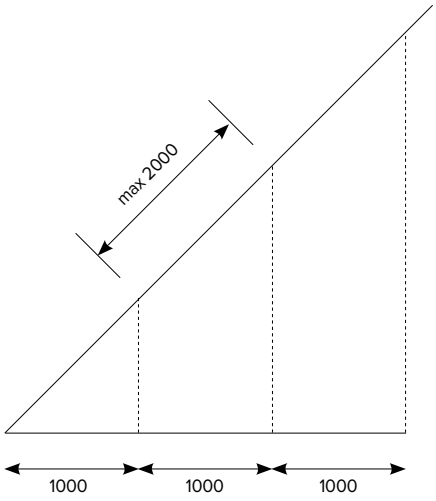




SIDEWALL TYPE	ROLLERS Ø mm	BELT WIDTH mm	ADD ROLLER WIDTH
	D	Bw	L1
without textile reinforcement	89-108	400-800	2 x 50
with textile reinforcement	108-133	800-1400	2 x 75

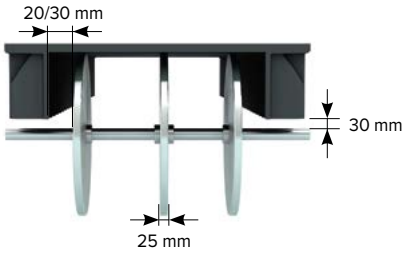


SUPPORT ROLLERS ON THE RETURN PART



Normally, the maximum permissible pitch on the horizontal section is 1000mm. This rule obviously is not applicable in the tilted section, explained from the diagram shown here.
This diagram also makes it possible to estimate the position of the rollers on any conveyor. The weight of the belt that bears down on the rollers is inversely proportional to tilt. The greater the tilt, the lower the weight. A belt that works at 90° has an ideal tilt.

There are three ways to support the conveyor belt on the return part and the choice depends on belt type as well as on available space:



A

CLASSIC ROLLER FULL WIDTH

The choice of roller diameter depends on two factors:

- Belt weight
- Type of containment sidewalls used.

If the roller diameter is too small, it might go into the sidewall sinusoid and cause breakdowns or premature abrasion. If however the belt's breaking load is too low, sagging may occur between the roller sets, causing issues or wear and energy consumption. The solution is to decrease the pitch between rollers or increase the breaking load of the conveyor belt.

B

SIDE SUPPORT ROLLERS

This system is used if there is no room on the return part or if the conveyor belt is very heavy. The side support roller is a special model since its rounded end makes it possible to prevent damage to the base belt and containment sidewall, as well as being adjustable to centre the belt more easily.

C

INTERNAL WHEELS

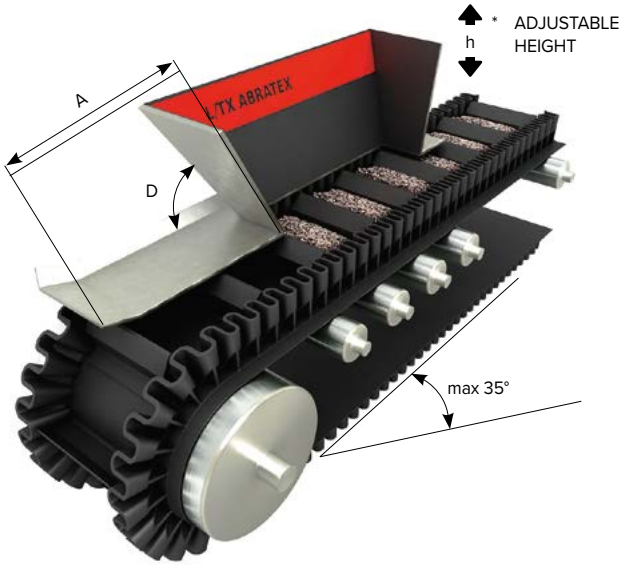
If the conveyor belt has no cleats but only the containment sidewalls, it is correct to use the internal wheels system. These must support the conveyor belt in a balanced manner. The wheels must be placed at about 25-35mm from the containment sidewall to support the heaviest section of the conveyor belt. The surface of the wheel in contact with the belt must be at least 25mm wide and have rounded edges in order not to damage the belt's surface. The diameter of the wheels must be such as to leave at least 30mm space between the axis of the wheels and the containment sidewall.

LOADING THE BELT AND HOPPER

The loading of the material onto the belt is the most crucial moment of the conveyance. Correctly loading preserves the belt and optimises its capacity. **Ideal loading of each conveyor belt takes place in the same direction and at the same speed as the conveyor belt.** This also applies to UNIVERTICAL belts.

BELT AND HOPPER POSITIONING AND SIZING

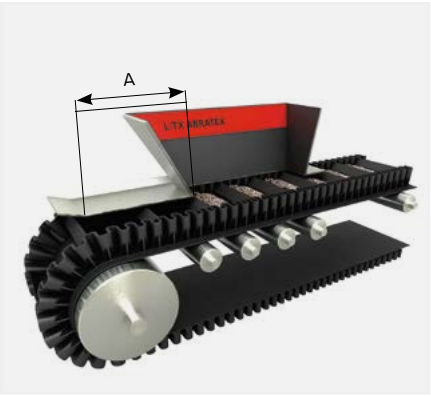
Calculation of UNIVERTICAL belts capacity assumes optimal filling. The hopper must be height adjustable* to be able to adapt it to the height of the sidewall and not disperse the material to the side. In the loading part under the belt it is required to increase the number of rollers in order to prevent any sagging from forming and excessive strain on the rollers that receive the material's weight. In case of heavy loads we recommend using rubber rollers or Unimpact impact bars.

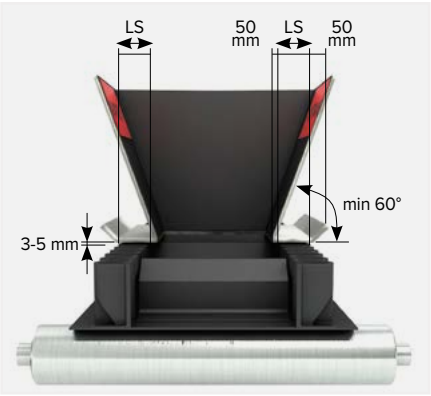


0°	If loading takes place in a horizontal section it is required to set distance A (the section from the centre of the return drum to the start of the hopper) equal to at least twice the bucket pitch: **A = 2 x cleat pitch**
≤ 35°	However, if loading takes place on a tilted section, distance A must be at least three times the cleat pitch: **A=3 x cleat pitch**
> 35°	If however, the belt exceeds 35° in the loading section, it must be fed by an additional horizontal belt. **Additional loading belt**

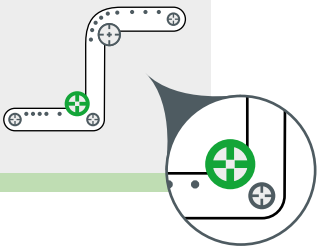
Hopper sizing depends on conveyor belt tilt in the loading area. In horizontal position the hopper must be placed from the centre of the return drum at a distance (A) equal to two cleats pitches.
If however the belt is tilted, this distance must be equal to three bucket pitches. Loading is possible up to a 35° tilt. Over this tilt an additional feeding belt must be used.

Hopper opening must be designed based on the dimensions and features of the material and in any case it must have an angle not lower than 65°.





The decision on how much to tilt the sides of the hopper must be taken based on the loaded material.
As a rule, tilt must not be less than 65°.



CHANGE OF TILT

A CARRYING SIDE DEFLECTION **WITH ROLLERS**

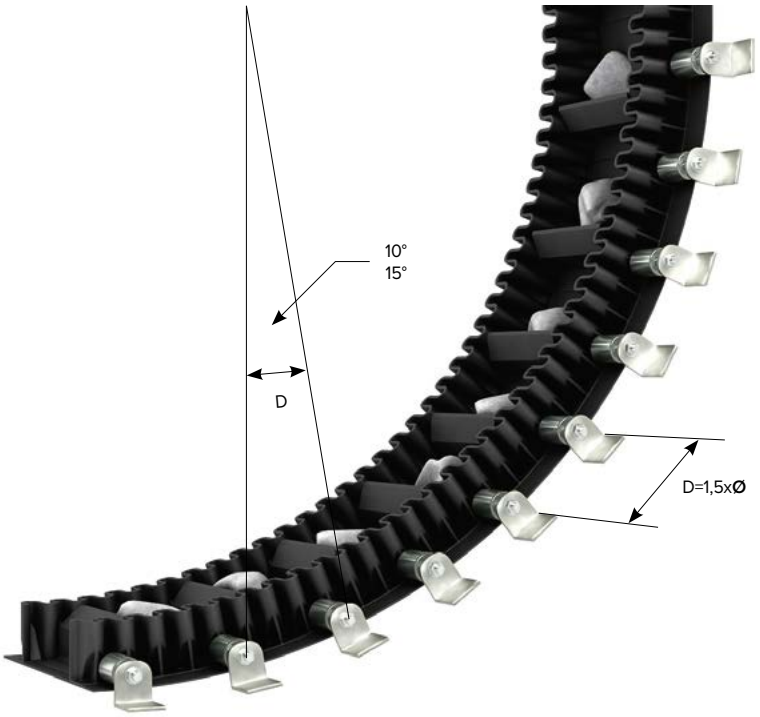
The curvature radius diameter is determined by:

- The rest angle
- Type of sidewall
- Pitch of the cleats

MINIMUM WHEEL DIAMETERS TABLE

Type	Diameter Ø mm
F40	76
F50	76
F60	76
F80	89
F120	108
FT120	108
FT160	108
FT200	108
FT240	133
FT300	133
FT350	133
FT400	133

The rollers must have bevelled heads and be placed at 20-30mm from the sidewall in order to prevent damaging it. The rollers must be placed exactly at 90° with respect to the belt to prevent irregular tension and skidding of the belt.



One should always consider that, when using a non reinforced F-type containment sidewall, the maximum angle is 15° whereas using a reinforced FT-type containment sidewall, the maximum angle is 10°.
The pitch (D) is the same and must be 1.5 x roller diameter.

Rollers must keep distance “S” from the containment sidewall.
S = 20% of x

CHANGE OF TILT

B CARRYING SIDE DEFLECTION **WITH WHEEL**

According to the simple formula the diameter of the wheels must be four times the height of the containment sidewall:

$$ØW = 4 \times Sh$$

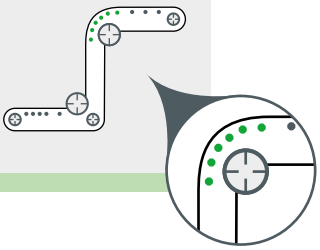
In addition to that, however, other factors must be taken into account to prevent problems with the belt:

- Conveyed material lump size
- Pitch of the cleats

In the change of tilt, the material might get crushed between the cleats, thus straining them or it might get jammed between the sidewall sinusoid and damage it.
The outer free zone (X) must assure support to the wheels and be correctly sized. Must be considered the actual load, length and width of the belt. The wheel must be placed 20-30mm from the containment sidewall (s) and the edges of the wheels must be rounded.

MINIMUM WHEEL DIAMETERS TABLE

Type	Diameter Ø mm
F40	160
F50	200
F60	240
F80	360
F120	500
FT120	500
FT160	640
FT200	800
FT240	960
FT300	1200
FT350	1400
FT400	1600



CHANGE OF TILT

CARRYING SIDE FLECTION

As shown above, the change of tilt even in flection may be obtained with two different systems, necessarily adjustable, to assure correct belt centring.

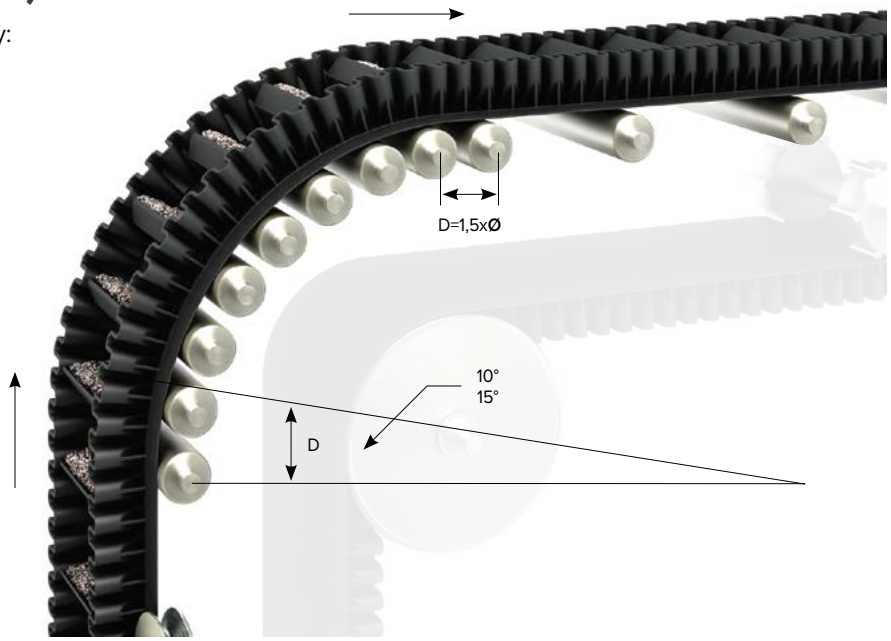
A WITH ROLLERS (recommended)

The curvature radius diameter is determined by:

- The rest angle
- Type of sidewall
- Pitch of the cleats

MINIMUM WHEEL DIAMETERS TABLE

Type	Diameter Ø mm
F40	76
F50	76
F60	76
F80	89
F120	108
FT120	108
FT160	108
FT200	108
FT240	133
FT300	133
FT350	133
FT400	133



Always consider that on the non reinforced F-type containment sidewall, the maximum angle is 15° and on the reinforced FT-type containment sidewall, the maximum angle is 10°, whereas the pitch is the same and must be 1.5 x roller diameter.

B WITH WHEEL

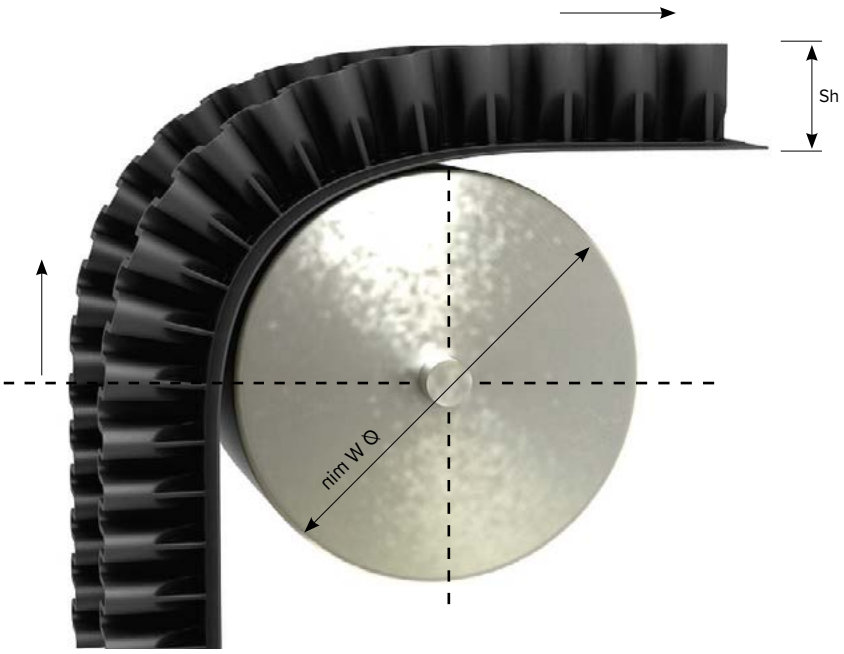
According to the simple formula the diameter of the wheels must be four times the height of the containment sidewall:

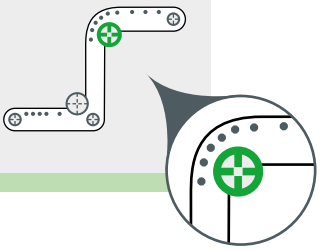
$$ØW = 4 \times Sh$$

In addition to that, however, other factors must be taken into account in order to prevent problems with the belt:

- Conveyed material lump size
- Pitch of the cleats

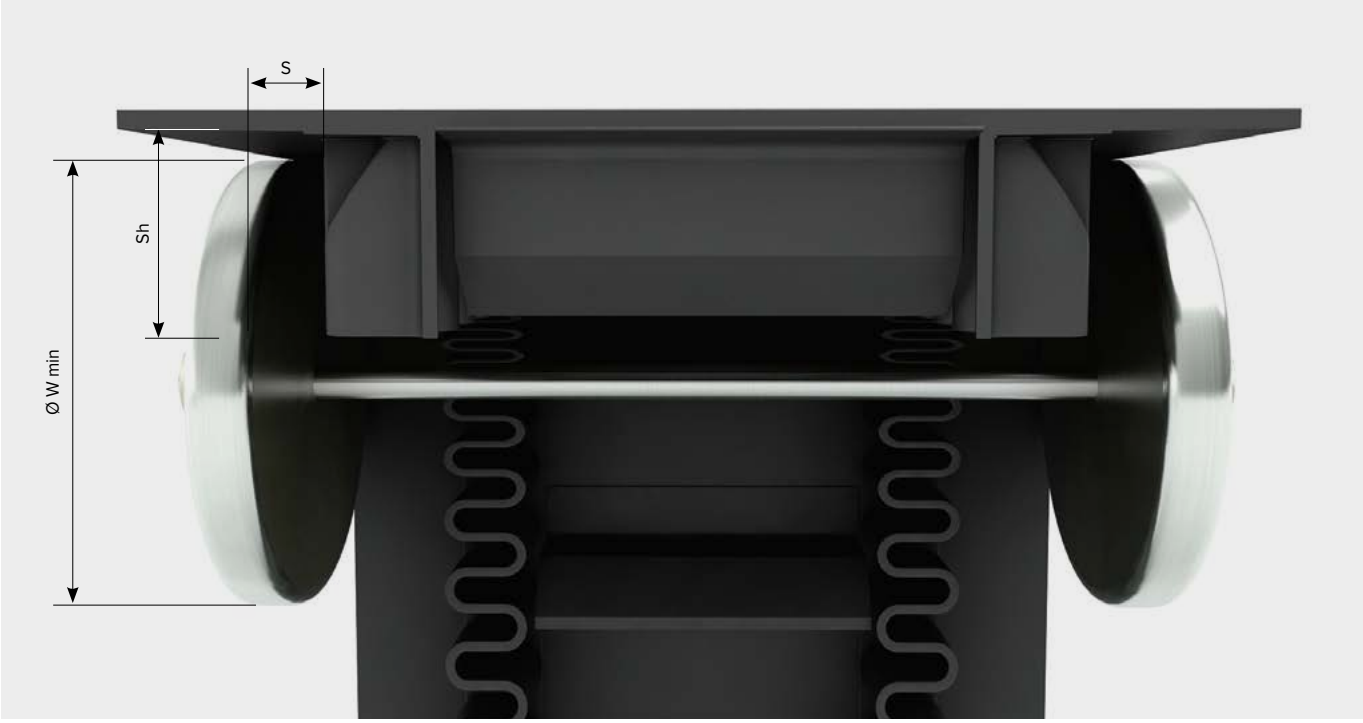
In this section, one must avoid excessively acute angles and high speeds that might cause loss of material. The radial load must be considered in choosing the wheel diameter.





CHANGE OF TILT

RETURN DEFLECTION **WITH WHEEL**



According to the simple formula the diameter of the wheels must be four times the height of the containment sidewall:

$$ØW = 4 \times Sh$$

The outer side space (X) must assure support to the wheels and be correctly sized. Consider the actual load, length and width of the belt. The wheel must be placed at 20-30mm (s) from the containment sidewall. The edges of the wheels must be rounded.

MINIMUM WHEEL DIAMETERS TABLE

Type	Diameter Ø mm
F40	160
F50	200
F60	240
F80	360
F120	500
FT120	500
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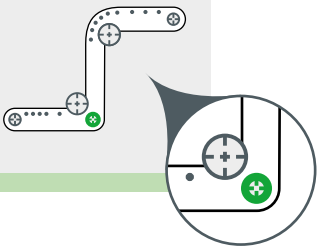
FT200	800
FT240	960
FT300	1200
FT350	1400
FT400	1600



CHANGE OF TILT

RETURN SIDE FLECTION

As shown above, the change of tilt even in flection may be obtained with two different systems.

A WITH ROLLERS

The curvature radius diameter is determined by:

- The rest angle
- Type of sidewall
- Pitch of the cleats

MINIMUM WHEEL DIAMETERS TABLE

Type	Diameter Ø mm
F40	76
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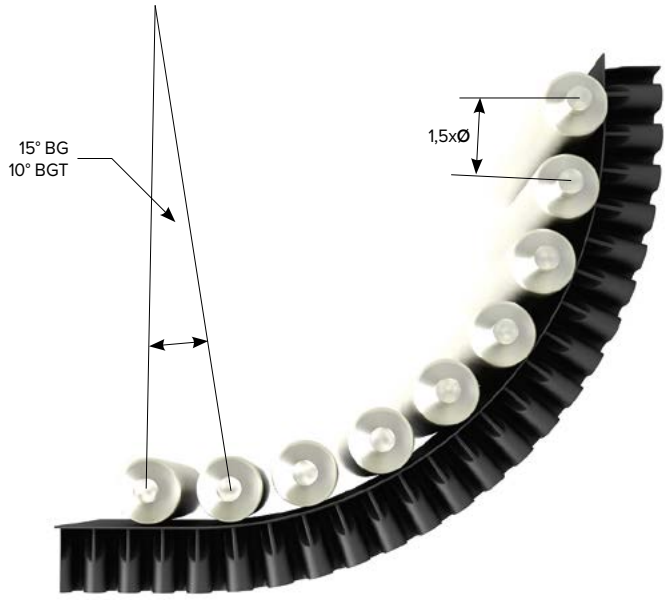
FT300	133
FT350	133
FT400	133



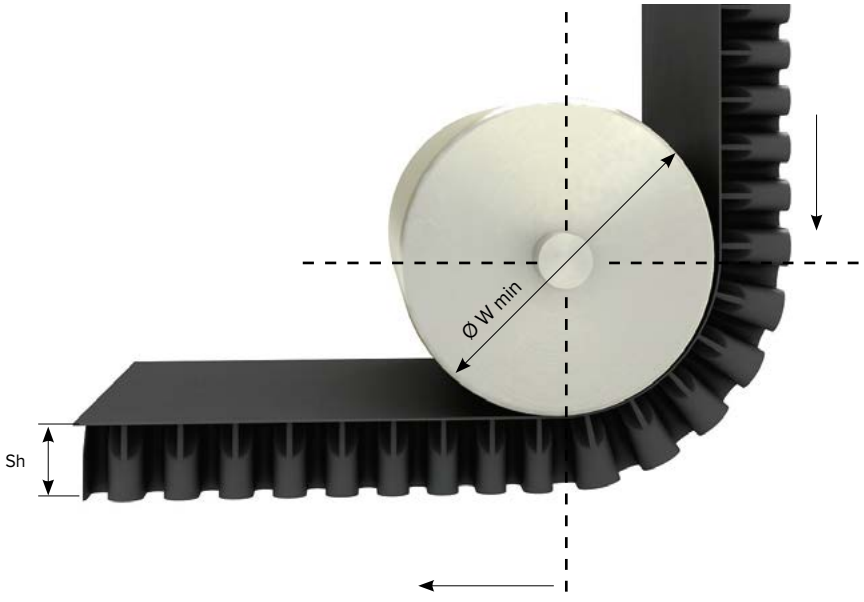
You must always consider that on the non reinforced F-type containment sidewall, the maximum angle is 15° and on the reinforced FT-type containment sidewall, the maximum angle is 10°, whereas the pitch is the same and must be 1.5 x roller diameter.

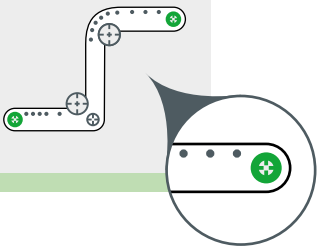
B WITH WHEEL

According to the simple formula the diameter of the wheels must be four times the height of the containment sidewall:

$$ØW = 4 \times Sh$$

All systems must be adjustable to help centring and tension of the belt





DRIVE DRUM AND RETURN DRUM

DIMENSIONS

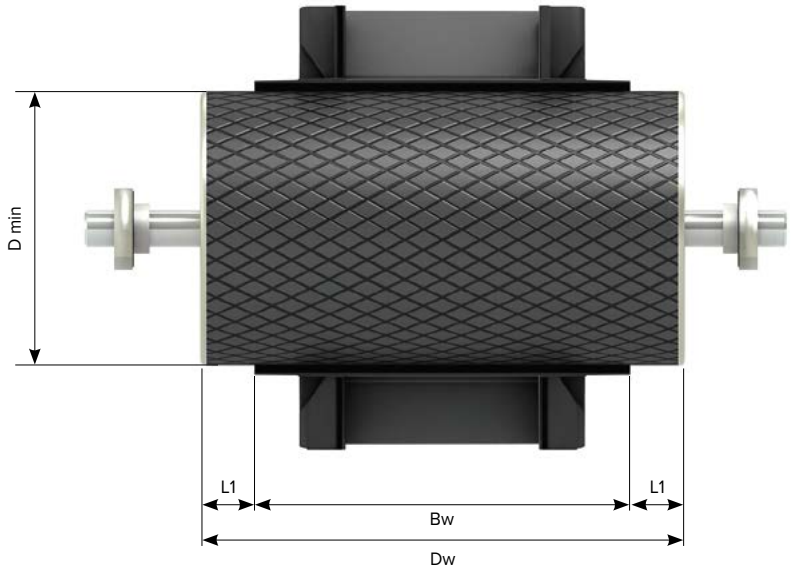
Both the drive drum and the return one have common dimensional rules in as that they especially depend on the type of sidewall and width of the belt:

MINIMUM DRUM DIAMETER TABLE

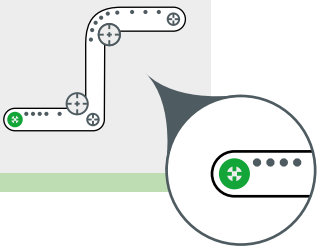
Type	Drive drum diameter Ø mm	Return drum diameter Ø mm
F40	150	120
F50	180	150
F60	240	180
F80	300	240
F120	400	360
FT120	400	360
FT160	600	500
FT200	720	600
FT240	800	720
FT300	1000	900
FT350	1200	1000
FT400	1400	1200

MINIMUM DRUM WIDTH TABLE

Belt width mm	Add	Drum width
Bw	2xL1	Dw
400 - 700	100	Bw + 100
700 - 1400	150	Bw + 150
1400 - 2000	200	Bw + 200



The drive drum is normally placed in the unloading area and is rubberised and rounded except when wide belts are used, as this type of drum might cause damage to the base belt itself.



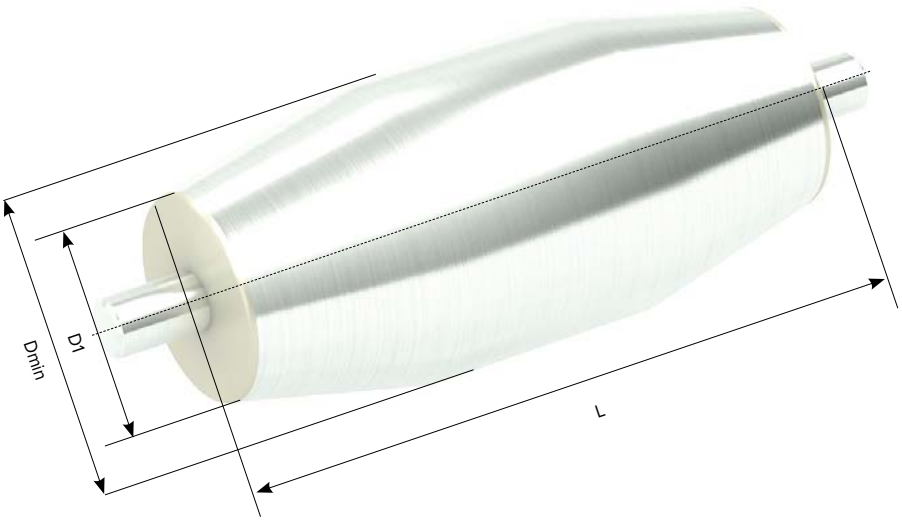
DRIVE DRUM

The drive drum, which should be rubberised, is placed in the unloading area. The drum must be rounded for easier centring the belt:

FORMULA FOR DETERMINING DRUM ROUNDING

$$D1=Dmin - (Lx0.005)$$

EXAMPLE:
D1 Drum diameter 1000 x 1200mm
D1= 1000 - (1200 x 0.005)
Dmin = 994mm
In case of using type ST conveyor belts or especially rigid crosswise, it is recommended to consult with the belt manufacturer. Excessive rounding may damage the belt.

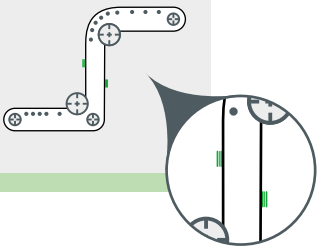


RETURN DRUM AND TENSIONING DEVICE

The return drum normally also acts as tensioning device and must be fitted on adjustable chassis to be able to adapt the tension. It is not required to rubberise it.

TENSIONING DEVICE SIZING TABLE

Type of conveyor belt	Formula
EP	Belt centre distance x 1.8% x 2 operating margin
ST	Belt centre distance x 1.2% x 2 operating margin

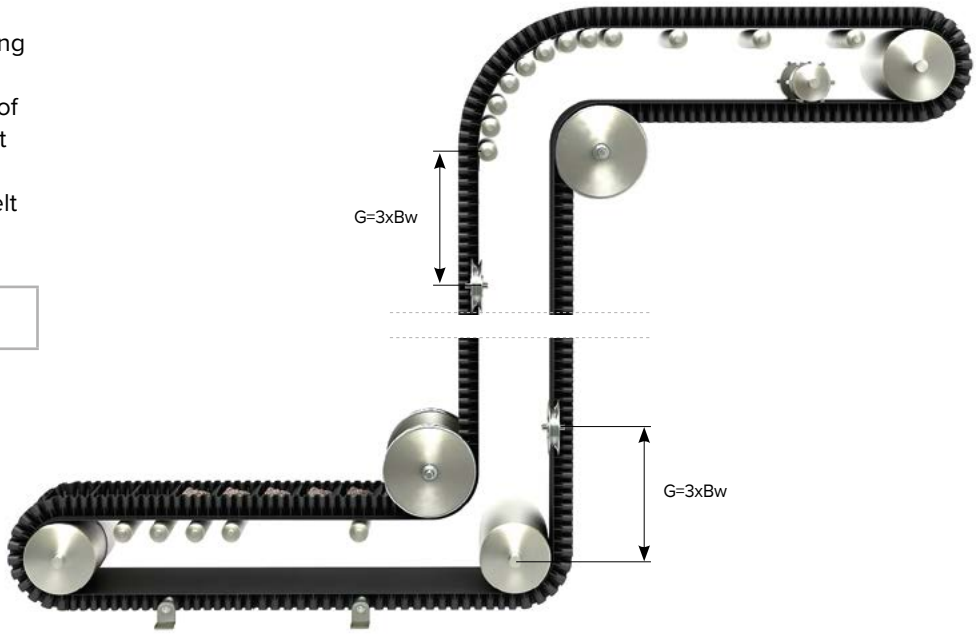


ANCILLARY EQUIPMENT

SIDE GUIDE ROLLERS

The side guide wheels are an effective and simple method to prevent damage to the conveyor belt, keeping it centred in case of heeling. They must be placed on the vertical part of conveyor belt travel out and back, at a distance from the inlet or outlet of the tilt change by three times the belt width:

G = 3 x Bw



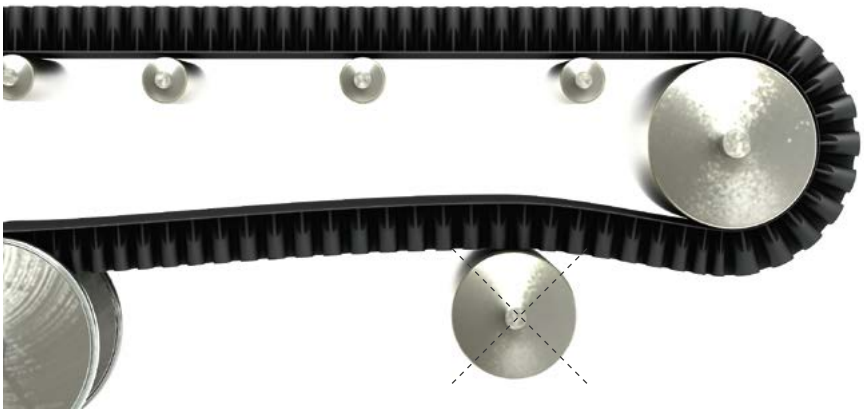
The side guide wheels must neither be in contact nor too far removed from the belt. It is ideal to maintain a distance of 10mm from the edge of the belt. The minimum diameter of the wheels must be 150mm.
In case of swaying we suggest acting on the adjustable parts to centre the belt.

ANCILLARY EQUIPMENT

SUPPORT ROLLERS ON THE RETURN SIDE

To hold the belt on the return part without the side roller system but a full belt width roller system, it is required to place them under the ideal horizontal direction line in order to prevent excessive compression of the sidewalls when passing over them and consequently causing their premature wear.

Avoid to constrain the belt to increase the winding angle using counter-drums. Increasing the winding angle would mean damaging sidewalls and cleats.



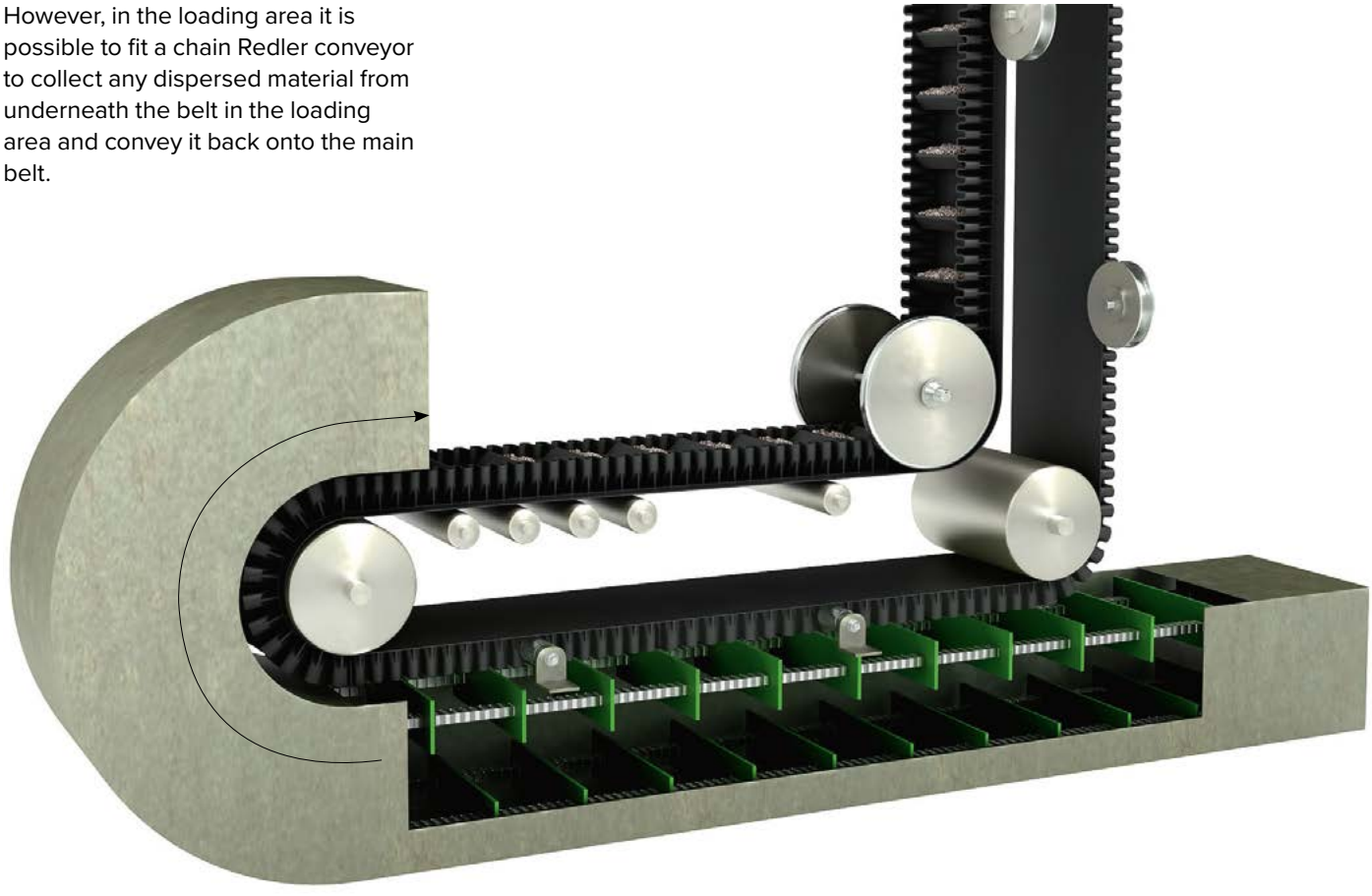
ANCILLARY EQUIPMENT

ADDITIONAL BELT - MATERIAL RECOVERY

To retrieve the material that remains on the belt or is dispersed in the working environment in the first part of the return, it is required to fit a smooth belt underneath this area in order to collect and unload residues into the hopper. The belt must be positioned near the main belt but not too close in order to prevent larger sized material from getting stuck between them.

REDLER - MATERIAL RECOVERY

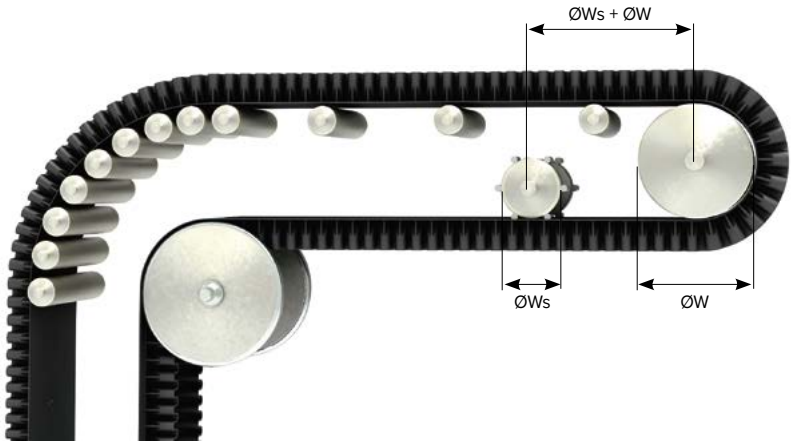
However, in the loading area it is possible to fit a chain Redler conveyor to collect any dispersed material from underneath the belt in the loading area and convey it back onto the main belt.



CLEANING SYSTEMS

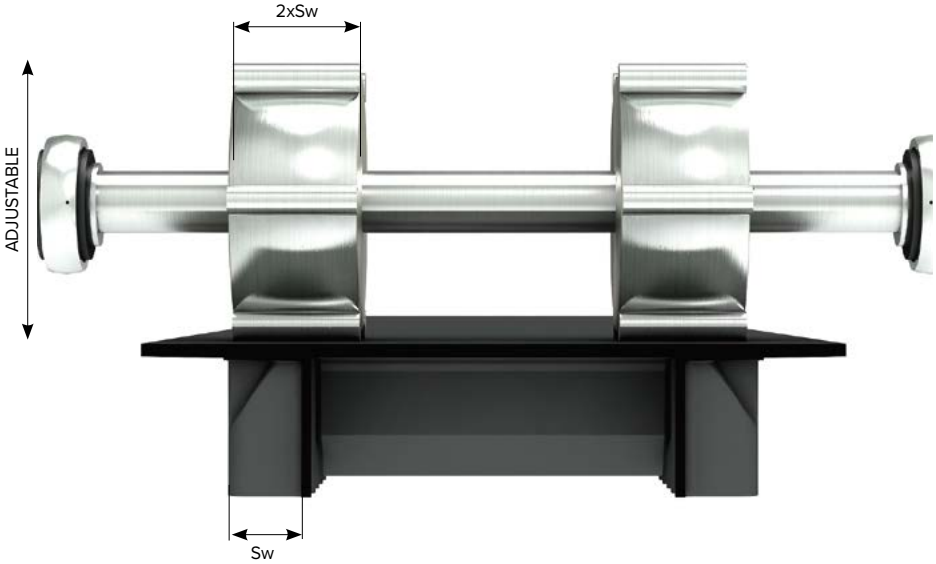
SHAKER ROLLER

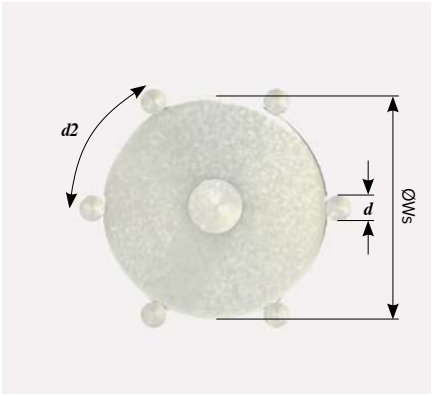
Sometimes, moist and packed material needs to be conveyed, which makes the belt cleaning difficult. In this case it is recommended to fit a shaker roller on the return part, immediately after the unloading area. This accessory helps keeping your belt clean. The shaker roller must be twice the width of the sidewall and must be vertically adjustable and placed at 90° on the belt.



WATER SPRINKLERS

In the event of highly packing conveyed material, water sprinklers may also be used.

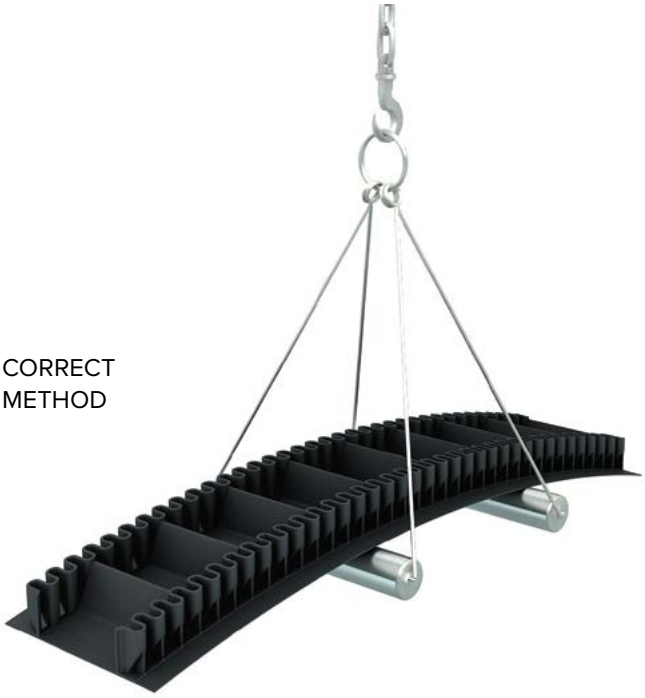




BELT PACKAGING AND HANDLING

The UNIVERTICAL belt is protected for transport by special packaging, so it remains in perfect conditions even if it remains packaged for a long time.
Simple rules must be followed to handle it without damaging it:

CORRECT METHOD

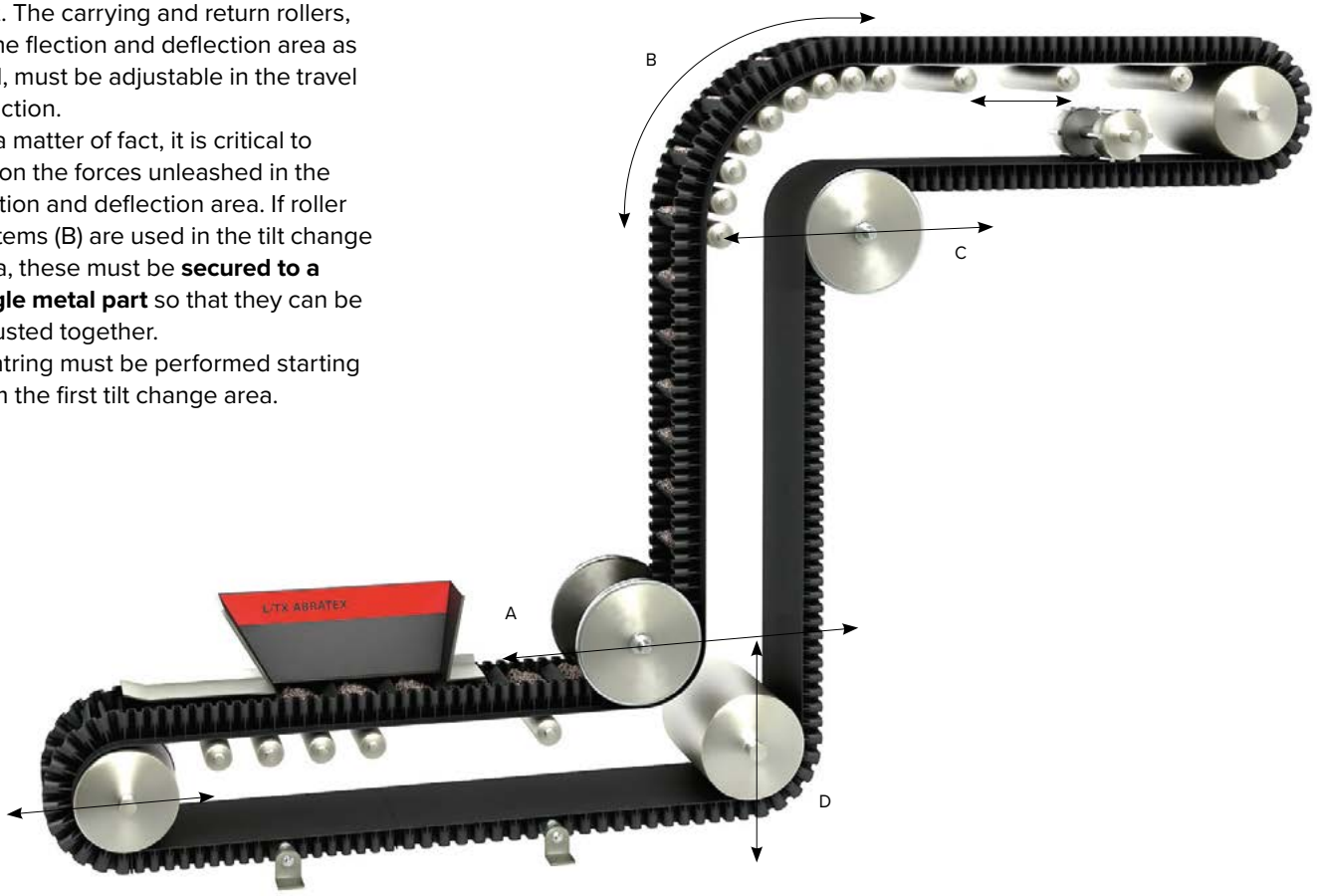


INCORRECT METHOD

CORRECT METHOD TO REMOVE THE BELT

CENTRING THE CONVEYOR BELT

When constructing the conveyor, ensure all rolling parts are adjustable as this helps centring your conveyor belt. The carrying and return rollers, in the flection and deflection area as well, must be adjustable in the travel direction.
As a matter of fact, it is critical to act on the forces unleashed in the flection and deflection area. If roller systems (B) are used in the tilt change area, these must be **secured to a single metal part** so that they can be adjusted together.
Centring must be performed starting from the first tilt change area.

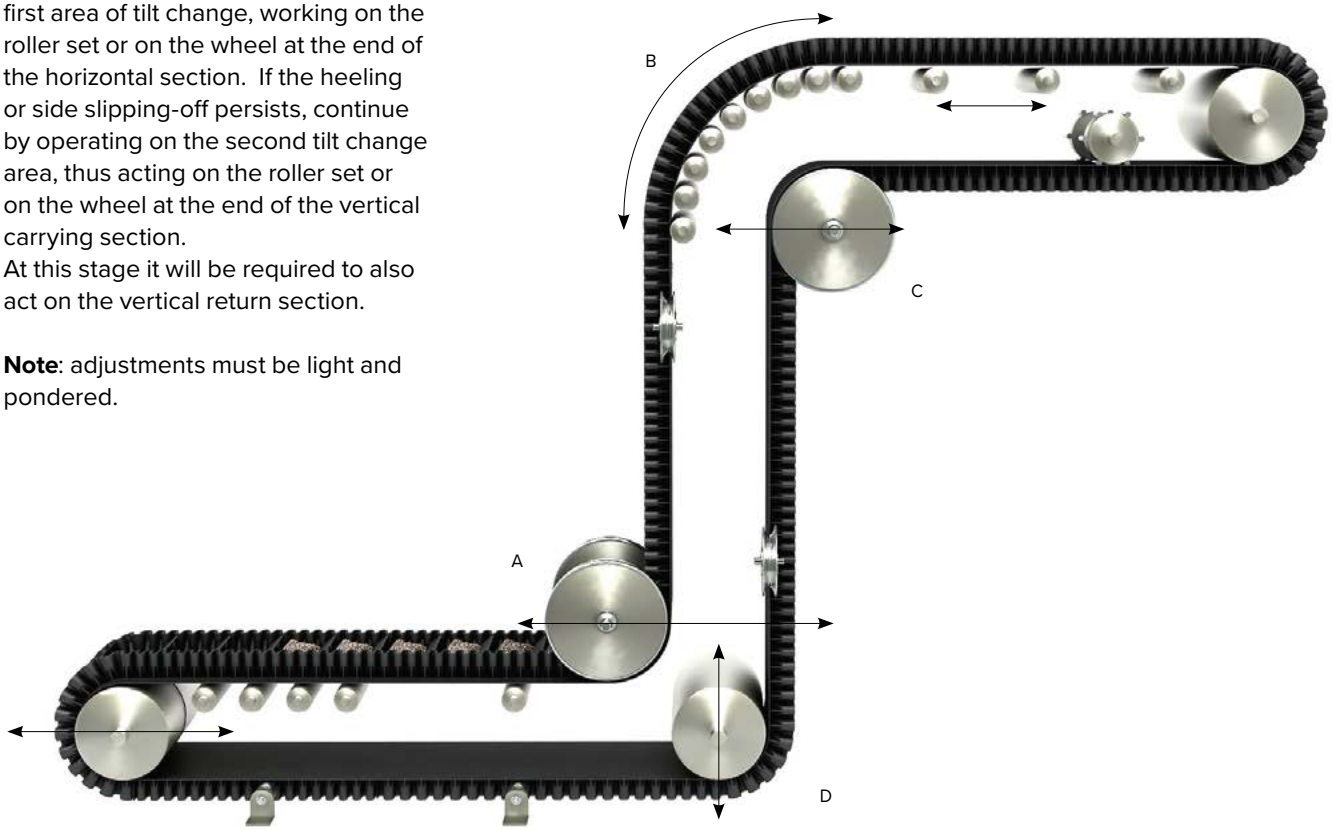


START-UP INSTRUCTIONS

1.	Ensure that the structure is perfectly square, check diagonals and tilts.
2.	The drive drum and the return one must be perfectly and equally centred and perfectly placed at 90° on the structure.
3.	The rollers must be perfectly and equally centred and perfectly placed at 90° on the structure. The right number of rollers with the right diameter must be used having the correct diameter in the tilt change areas.
4.	The joint area must be perfectly linear.
5.	The belt must be correctly tensioned to prevent sagging and skidding on the drive drum.
6.	Ensure tensioning is equal on both sides.
7.	When loaded, ensure that the material is equally distributed on the belt.

Belt centring must be performed by skilled personnel. In the event of heeling or side slipping-off of the belt, start adjusting the belt working on the first area of tilt change, working on the roller set or on the wheel at the end of the horizontal section. If the heeling or side slipping-off persists, continue by operating on the second tilt change area, thus acting on the roller set or on the wheel at the end of the vertical carrying section.
At this stage it will be required to also act on the vertical return section.

Note: adjustments must be light and pondered.



MAINTENANCE

Routine and regular maintenance and supervision are essential.
Scheduled checks can ensure a long service life of your UNIVERTICAL.
Maintenance is crucial to prevent damage due to mechanical accidents that often cause its prematurely replacement. The following checks must be performed regularly:

CENTRING THE BELT
If the belt sways damage might occur to the edge of the belt or other components such as sidewalls and cleats.

ACTION:
Find the cause, eliminate it and centre the belt again.

DISTANCE WHEELS-EDGE
Rubbing of the wheels on the edge causes it to wear prematurely.

ACTION:
Increase the distance between the wheels and belt edge.

ROLLERS
They must always be clean and freely rolling.

ACTION:
Replace those that are damaged or not rolling.

DRUMS
The drive drum must always have intact rubber lagging and have no packed up material.

ACTION:
Clean or rubberise the drum.

SIDEWALLS AND CLEATS
Check for wear and damaged areas.

ACTION:
Find the cause of the damage and eliminate it. If necessary, replace the damaged parts.

GENERAL CONVEYOR CLEANING:
Ensure there are no foreign bodies that might damage your belt, accumulated material that might divert its path.

ACTION:
Schedule periodic cleaning cycles.

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