



Rexnord Food Industry

Engineering Manual

SAFETY

Product safety: Products designed and manufactured by Rexnord are capable of being used in a safe manner; but Rexnord cannot warrant their safety under all circumstances. **Purchaser must install and use the products in safe and lawful manner in compliance with applicable health and safety regulations and laws and general standards of reasonable care; and if purchaser fails to do so, purchaser shall indemnify rexord from any loss, cost or expense resulting directly or indirectly from such failure.**

Safety devices: Products are provided with only safety devices identified herein. **It is the responsibility of purchaser to furnish appropriate guards for machinery parts** in compliance with **MSHA** or **OSHA** Standards, as well as any other safety devices desired by Purchaser and/or required by law; and **if purchaser fails to do so, purchaser shall indemnify rexord from any loss, cost or expense resulting directly or indirectly from such failure.**

If any flame cutting, welding etc. is to occur in the conveyor vicinity, take adequate precautions to insure that no burning of any chain or other components occurs. If adequate protection cannot be provided, remove the chain and other plastic components from the conveyor and store in a safe location. Thermoplastic and similar materials can burn and give off toxic fumes. Acetal (POM) material burns invisible and are very difficult to distinguish with water. Do not install, operate or perform maintenance on these products until you read and understand the instruction contained in this manual

HANDLING AND TRANSPORT



Take special care when handling the boxes. The maximum box size is 19, 68 ft (6 m) with a total combined load of 2645.54 lbs (1200 kg).



Depending on the belt the total box length can be 21.32 ft (6,5 m) long, 3.28 ft (1 m) wide and 1.64 ft (0,5m) heigh and can reach a total weight of 2645.54 lbs (1200 kg).

Always wear safety shoes when handling or moving the boxes.

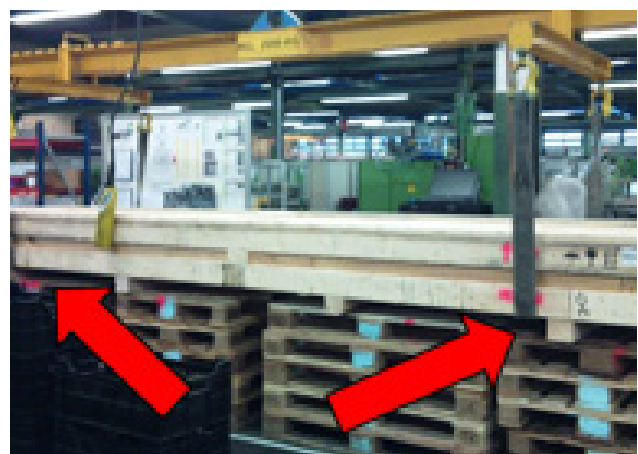
Forklift handling

- Only lift the box in the center with 1 forklift truck
- Put the individual forks spaced apart as much as possible
- Make sure the box is lifted horizontally
- Never stack the boxes higher than 5 units
- Always store the boxes closed, in a dry environment, out of sunlight and avoid considerable temperature differences at all time
- Always store the boxes on a flat, straight, horizontal surface



Hoist handling

- Always hoist with 2 persons
- Put the hoist bands on the inside of the outer supports
- The box should always be hoisted horizontally
- Never stack the boxes higher than 5 units



INSTALLATION AND HANDLING



Take special care when handling the individual sheets. The maximum sheet weight can reach 200 kg and thus should be handled with sufficient people



- Make sure that the sheet to handle is at the same height as the carry way
- Avoid the chance that the sheets can fall down or in between
- When handling the sheets the box has to be stable on a solid floor
- When handling belt sections, be careful to avoid injury to fingers and hands, such as pinching cutting or crushing of fingers or hands
- Be careful when handling MatTop® shipping crates and chain sections due to heavy weight.
Wide crates_chain section must be supported in the middle to prevent bending and/breakage

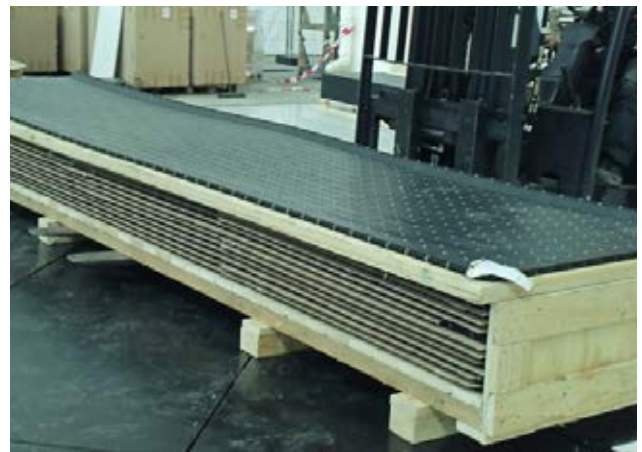


When removing or installing MatTop chain

- Always wear protective clothing: safety glasses, work gloves, steel toed safety shoes, ear protection and protective head gear
- Always lock out/tag out all power switches to equipment and adjacent conveyors and follow proper safety procedures before entering or working around equipment
- Secure and support the chain to prevent uncontrolled movement of chain and parts
- Tools should be in good condition and used properly

Do not attempt to connect or disconnect chain until you understand chain construction, including the correction direction for pin removal / insertion and proper chain direction of travel

For these and other installation and maintenance instruction, refer to Rexnord FlatTop Chain Engineering Manual and Installation/Maintenance manuals. Or contact the Application Engineering Department



TECHNICAL SUPPORT

1. APPLICATION EXPERTISE / SUPERIOR ENGINEERING SUPPORT

With over 120 years of experience, Rexnord is the industry's most knowledgeable team of conveying experts. Our chains are manufactured to perform better and last longer. Every chain stamped with the Rex® brand has undergone extensive research and quality testing, ensuring your conveying needs will be met with the most economical, efficient and reliable means possible.

Our qualified engineering staff is willing and able to assist you on all of your application needs. Rexnord will provide assistance with:

- Chain selection recommendations
- Chain pull calculations
- Product performance analysis
- Product handling tests
- Retrofit information
- New product development

2. APPLICATIONS THROUGHOUT THE INDUSTRY

Rexnord's broad selection of chain is used throughout a wide variety of applications; such as food processing, beverage, unit handling, car care, and industrial applications.

Whenever the industry has to move, transfer, or deliver the goods, chain from Rexnord is the preferred choice.

3. ONLINE – AT YOUR FINGERTIPS

Let's face it – your time is valuable. At Rexnord, we realize the success of your business depends on up-to-date product information, superior technical support and customer service. That's why we've created www.rexnord.com. It's loaded with product information, useful tools and technical support operations to help your business succeed. You can even search for a distributor in your area! Best of all, it's available 24 hours a day, seven days a week. So go ahead and log on today.

www.rexnord.com

The 2D and 3D models of most products used in automotive industry can be found at (this information is subject to a Registration at our site): **www.rexnord.com**

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Rexnord Sideflexing Chain

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Rexnord MatTop Chain

From standard low friction to specialized high-tech materials for very specific applications, the Rexnord plastic Table-Top range is capable of delivering a wide range of solutions for conveyor applications for virtually any industry.

Features

High strength materials

For dry running and lubricated beverage applications and also for abrasive applications in glass works, special materials are available, offering high PV resistance or very low friction.

Sliding properties

To ensure superior sliding properties, Rexnord uses a number of chain materials. In many cases these materials are especially defined for conveyor applications. All different materials have friction coefficients tailored to the intended application.

Flatness

The design of the mould and the control of the production process take care of flatness values meeting the highest standards. Together with the optimum sliding properties, this will prevent tipping of the products conveyed.

Standardization

In case handling a number of different chains are used. Standard chains (LF, HP) are used for general conveying of cases, trays or crates. High friction versions (Rubber Top, SuperGrip) are used for inclines and declines or on stopper belts. Version with rollers (LBP) are used in lines feeding palletizers in order to reduce the backline pressure and noise. The wide product range allows standardization of case handling conveyors, as a result of the same sprockets, track width, return rollers, return design, wearstrips and hinge width, also in co-operation with stainless steel (60 M 75 and 60 S 75). If plastic modular belts are used for straight running, sideflexing chainbelts are ideal for conveyors with 85 mm pitch; FGM 1040, FT 1040 and FTM 1060 match with 1000- and 8500-series with 1005- and 7700-series. These chains feature a maximum support area and excellent transfers, even in small radii. For demanding applications FGM/FTM Magnetflex versions are recommended, whilst the FT tab versions are intended for less critical circumstances.

84 mm wide chains

Rexnord offers a complete range of both plastic and steel chains with 84 mm width, intended for the global beverage standard 85 mm pitch between the lanes of multi-lane conveyors. In plastic chains the straight running SHP84 and the sideflexing RHMP84 are companions, running on the same sprockets. The gap between the different tracks/lanes is minimized compared to the traditional 3.25" chains as well as the gap between the links of the chains, to offer superior product handling and minimize the risks of products falling.

D-pins

SHP, RHMP, 1060, 1055, 879, 880 and 882 chains have D-style pins. Once assembled, the pin retention is done by means of geometrical fit instead of mechanical tension on the hinge eyes. This makes the chain less sensitive for attack by chemicals; it also allows (dis)assembly from both sides of the chains, reducing the chance of error.

Conveyor Design

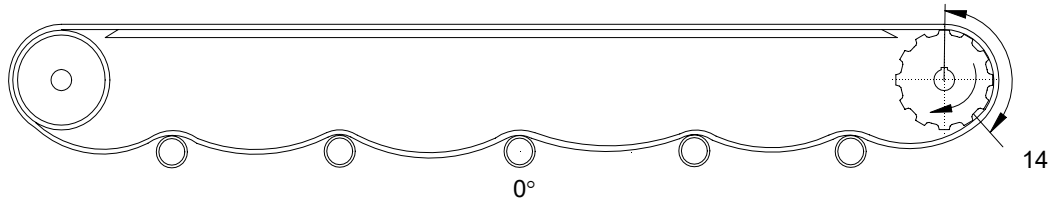
Introduction Straight running MatTop conveyors

In this chapter we supply engineering details for conveyors for straight running belts. The guidelines in this chapter are based upon many years of experience. If you got have any remarks or additions, please feel free to contact us.

Drive Construction

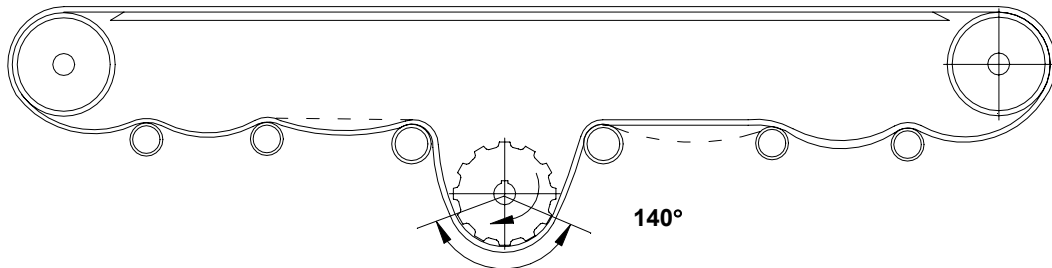
The drive unit of a conveyor can be placed in several positions and conveyors can be uni-or bi-directional.

END DRIVEN CONVEYOR



These conveyors have the drive construction on one end of the conveyor, which is the most common drive construction.

CENTRE DRIVEN CONVEYORS

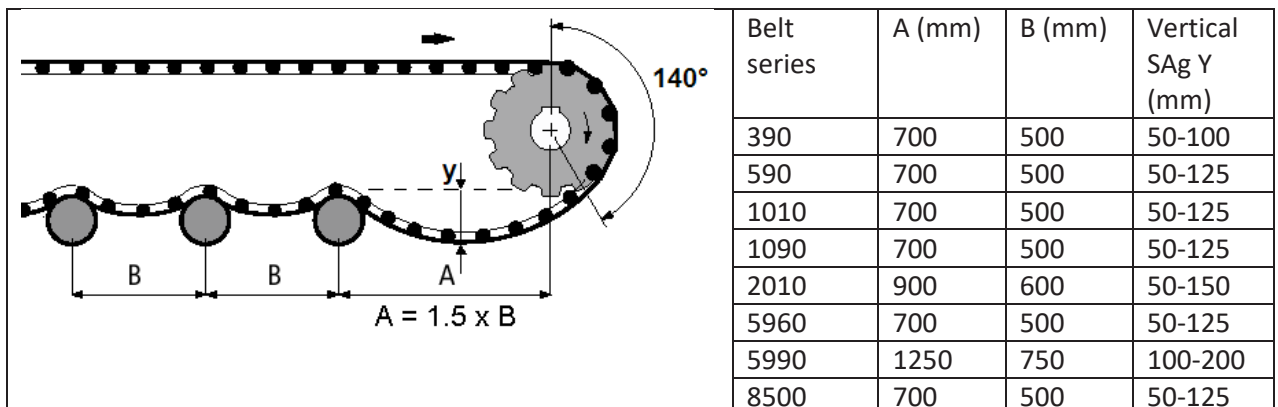


This construction is mainly used for bi-directional conveyors. Also centre-drive conveyors are used when space is not sufficient for the drive construction or the catenary sag at the end of the conveyor. Centre drive constructions are also being used to obtain small rollers transfers.

Note: most belts have a preferred running direction, which is shown on the underside.

Catenary sag

It is recommended to create a catenary sag just behind the sprocket which provides a complete discharge of the belt load.



The right vertical catenary sag can usually be obtained automatically by just pulling both ends together and mounting them together. The catenary sag will increase due to elevated temperatures. Furthermore, the chain or belt can elongate due to strain and wear of the pins and hinge eyes. Therefore it is important to check and adjust the catenary regularly.

Wrap Around Angle

Recommended wrap angle on sprockets is 140° +/- 10°.

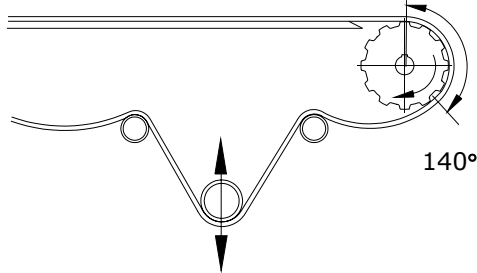
When the wrap angle is too small, the sprocket will not be able to transfer all the load to the belt, which causes the belt to jump on the sprockets. When the wrap angle is too big, the belt can stick to the sprocket and not release properly.

Conveyor Design

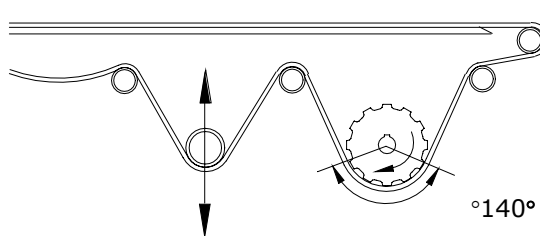
Tensioner Construction

If the catenary sag does not bring enough tension in the return part the belt will not be driven properly. Irregular belt movement can be an indication for too low tension. We prefer using a standard catenary sag in the return part of the conveyor to provide sufficient tension. However, installing a tensioner in the return part can introduce more tensioning in the return part, to ensure a proper engagement between the belt and the sprockets.

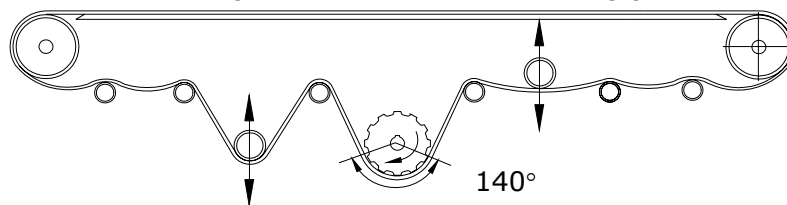
END DRIVE WITH TENSIONER



CENTER DRIVE WITH TENSIONER



BI DIRECTIONAL CENTRE DRIVE WITH TENSIONER

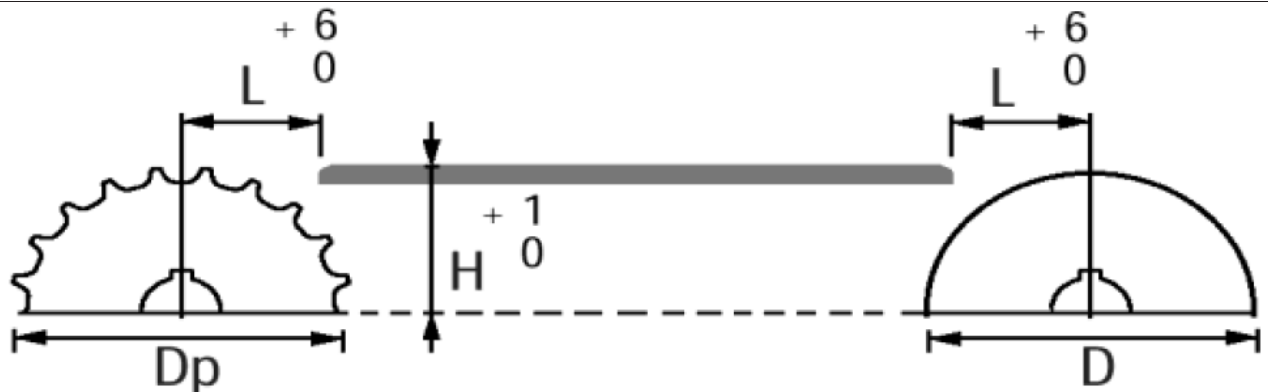


Weight indication for tensioner construction:

Pitch: 1 inch (25.4 mm) -> 5 Kg/m

Pitch: 2 inch (50.8 mm) -> 10 Kg/m

Note: for belts a roller can be used, which should be able to rotate freely and move up and down.



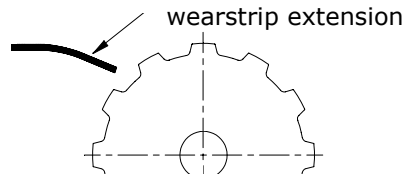
Belt series	Sprocket H (mm)
390	$D_p/2 - 3.0$
590	$D_p/2 - 3.0$
1010	$D_p/2 - 5.0$
1090	$D_p/2 - 3.0$
2010	$D_p/2 - 8.0$
5960	$D_p/2 - 6.35$
5990	$D_p/2 - 9.15$
8500	$D_p/2 - 4.35$

Idler Drum H (mm)	L (mm)
$D/2$	8.0
$D/2$	12.7
$D/2$	25.4
$D/2$	25.4
$D/2$	50.8
$D/2$	38.1
$D/2$	57.2
$D/2$	19.1

Conveyor Design

Chamfering of Wearstrips

At the idler position we recommend to chamfer or bent down the wearstrips. At this side of the conveyor this is very important in order to assure a trouble free infeed of the belt into the upperpart.



Conveyor Design

Shafts & Bearings

In all situations stainless steel is recommended for shaft material. Metaloxides that come from a carbon steel are extremely abrasive and would therefore reduce the wearlife of the conveyor components and affect the cleanability of the conveyor. It is also important to use shafts with a sufficient hardness and a smooth surface. The recommended shaft diameter depends on the conveyor load and its width. We recommend to use a shaft with a hardness of > 25 HRC.

In the food processing environment mostly square shafts being used. Square shafts are being considered to be more hygienic because of the absence of keys and keyways.

Note: Maximum deflection of the shaft must not exceed 2 mm. Depending on the load and shaftlength, it can be necessary to use an extra bearing in the middle of the shaft to reduce the shaft deflection.

Square shafts

- More rigid than round shafts of the same size.
- No keyway preparation is required.
- Larger drive surface results in a better load transfer.
- More hygienic.

Round shafts

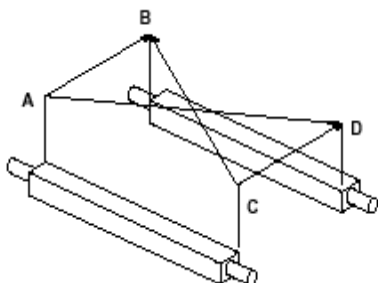
- More readily available.
- Usually straighter than square shafts.
- Easier to install.
- Shafts are ready to accommodate bearings.

Shaft Tolerances

It is important that the tolerance of the shaft meets the specifications of the sprocket, so the sprocket can slide over the shaft at all times. The following shaft specifications are required, depending on the shaft diameter.

Shaft type	Dimension (mm)	Shaft tolerance (mm)	Idler shaft surface finish (µm)
Square	40 x 40	+ 0 / - 0.16	0.8
	90 x 90	+ 0 / - 0.5	1.6
	120 x 120	+ 0 / - 0.5	1.6
Round	< Ø 90	h 9 (ISO)	0.8
	> Ø 90	h 11 (ISO)	1.2

Parallelism



Idler and drive shaft must be (perfectly) parallel to ensure correct belt movement. Badly aligned shafts can cause overloading on one side of the belt, pins coming off and failure after a few weeks of operation.

The picture shows a practical method to check if shafts are parallel.

WITH BOTH SHAFTS HORIZONTAL:

IF AB = CD AND BC = AD

THAN SHAFTS ARE PARALLEL

Conveyor Design

Bearings

Drive shafts always require bearings. However, idler drums/sprockets can also rotate freely on a static round idler shaft at speeds up to 30 m/min. At higher speeds the use of a shaft with bearings is recommended.

Before selecting bearings, check which chemicals will be present. Also check if dust and/or water are present. Sealed bearings have a better protection against water and other environmental conditions.

Also use bearings with high mechanical and heat resistance for a longer wearlife of the construction. In our product programme we can offer a large number of bearings. See our catalogue MB BEARINGS for more details.

Note: Make sure the edges of the shaft are rounded off to ease assembly and to avoid damage to the rubber parts of the bearing sealing units.

Conveyor Design

Belt Support

Upper Part

In our product programme we offer a large number of belt support parts. Like different wearstrip in different materials and executions.

Parallel Wearstrips

This is the most common used construction in the industry. We recommend this construction due to the easy and cost effective installation and good cleanability.

The maximum parallel wearstrip spacing is recommended in table below

Belt Series	Upper part (kg/m2)			Return Part
	< 50	50 – 100	> 100	
390	250 mm	170 mm	85 mm	600 mm
590	250 mm	170 mm	85 mm	600 mm
1010	250 mm	170 mm	85 mm	600 mm
1090	250 mm	170 mm	85 mm	600 mm
2010	300 mm	200 mm	85 mm	600 mm
5960	300 mm	200 mm	85 mm	600 mm
5990	300 mm	200 mm	85 mm	600 mm
8500	250 mm	170 mm	85 mm	600 mm

Note: The mentioned dimensions in the table above are based on equally divided loads. In combination with concentrated loads (point) the minimum spacing (85 mm) is always recommended.

Full Bed Support

We recommend this kind of belt support only in applications where products cause a high impact on the belt. The full bed construction is needed to prevent the belt from being damaged. The construction is only used in the position where the impact is applied to the belt, in the other part of the conveyor the standard construction has to be used.

Wearstrip Material

The best suitable wearstrip material depends on the application and the production environment where it is being used.

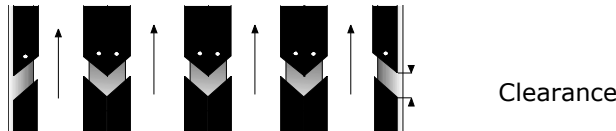
The most common wearstrip material is **UHMWPE**. This material has an extreme low friction, good dimensional stability and excellent resistance against many chemicals. It reduces noise and avoids blackening of the belt.

The second possible material is **stainless steel**. We recommend this material in abrasive environments and/or high temperature. Direct contact of stainless steel with white plastic belts can leave grey marks (blackening). We recommend to use a cold rolled quality with a hardness > 25 Rc and a surface finish of minimum 1.6 µm.

Conveyor Design

Wearstrips Sections

On straight sections, with a length of more than 3 metres or for high (40° - 70°C) application temperatures, we recommend to divide the wearstrip into several sections because of the thermal expansion of the strips. The size of the clearance depends on the expected elongation due to thermal expansion, see drawing.



For UHMWPE material the expansion coefficient is 0.2 mm/m/°C.

A temperature increase of 40°C would elongate a 2 meter wearstrip with:

$$40^{\circ}\text{C} \times 2\text{mtr} \times 0.2 = 16 \text{ mm}$$

In this case, the gap between the wearstrips should be larger than 16 mm, e.g. 17 – 20 mm.

Note: *It is recommended to cut the wearstrips at double 45° angles to provide smooth chain/ belt transfers. Make sure only the infeed side of the wearstrip is fixed to the conveyor frame to avoid bulging of the wearstrips.*

Chamfering of Wearstrips

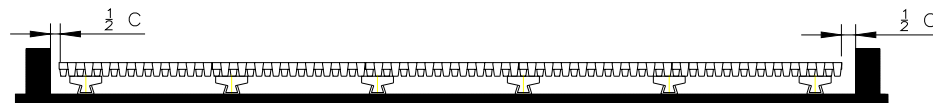
Wearstrips should always be chamfered at the beginning of the strip where they are fixed. Chamfering reduces the risk of chain-obstruction resulting in a smooth operation. The wearstrips should be chamfered at the sides and at the top.

Belt Guidance

The minimum clearance (C) between the sides of the belt and guides at **maximum operation or cleaning temperature!**

Belt Guidance

The minimum clearance (C) between the sides of the belt and guides at **maximum operation or cleaning temperature!**



belt width (mm)	C (mm)
< 500	1
500 - 1500	2
1500 - 3000	3
> 3000	5

Note: *If lugs or bevels guide flex belts, belt guidance at the side of the belt is not necessary.*

Conveyor Design

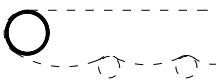
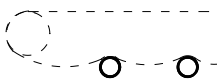
Belt Support Return Part

For the return part we recommend to use drums / rollers.

- The drum / roller construction reduces wear on the belt.
- It is a simple construction and has a good accessibility for maintenance and cleaning.

Note: it is important that the drums / rollers are able to rotate freely at all times

Roller diameter

Type	Idler Rollers	Return Rollers	Backflex Rollers
			
390-series	>6	30 - 100	>30
590-series	>19	30 - 100	>30
1010-Series	>50	50 - 100	>80
1090-Series	>50	45 - 100	>60
2010-series	>100	50 - 120	>100
5960-series	>100	50 - 100	>80
5990-series	>100	60 - 120	>100
8500-series	>36	45 - 100	>50

The recommended roller diameters in the table above are an indication. The width of the conveyor is not taken into account. The diameter of the shaft should be large enough to avoid deflection of the roller. At the same time it is recommended not to exceed the maximum diameter, because the roller friction may be too high to be set in motion by the belt.

In combination with wide conveyors and elevated temperatures (pasteurizers, blanchers, etc.), metal rollers are recommended. In applications with products, which tend to adhere (e.g. sugar, dirt), frequent checking of the condition of the rollers is advised.

Wearstrip Return

Besides a return support with rollers, also wearstrips can be used in the return part. This provides a smooth operation of the belt. Wearstrips are used in the return part mainly in combination with flighted belts.

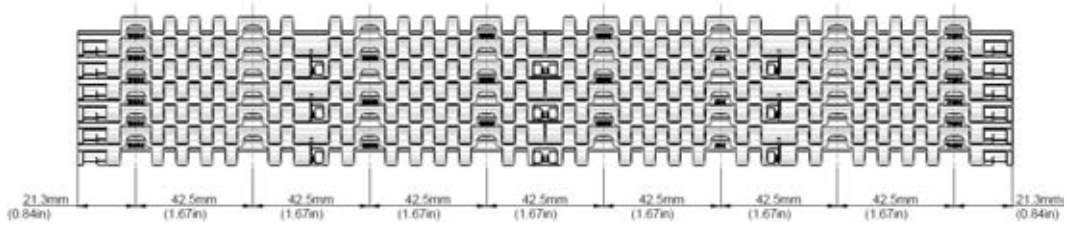
Using wearstrips in the return part there must be a sufficient distance in between the sprockets and the infeed of the wearstrip return part to allow for a proper catenary. In case of a big variation in the size of the catenary, the use of a roller directly after the drive sprocket is recommended to ensure the 140-degree wrap around the sprocket.

Conveyor Design

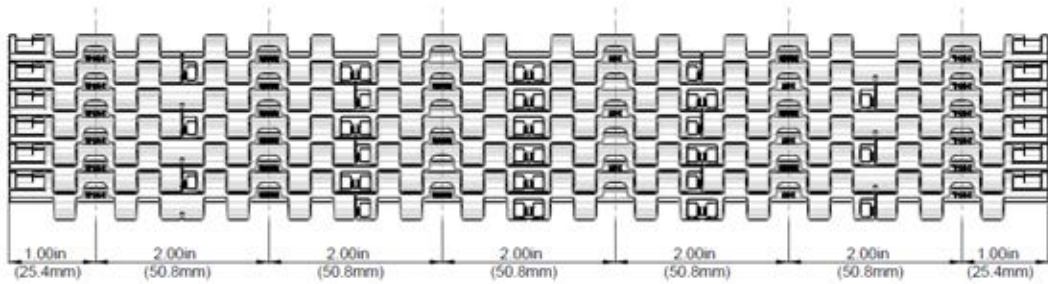
Sprocket Positions

390 Chain Series (395)

Assembled to Width

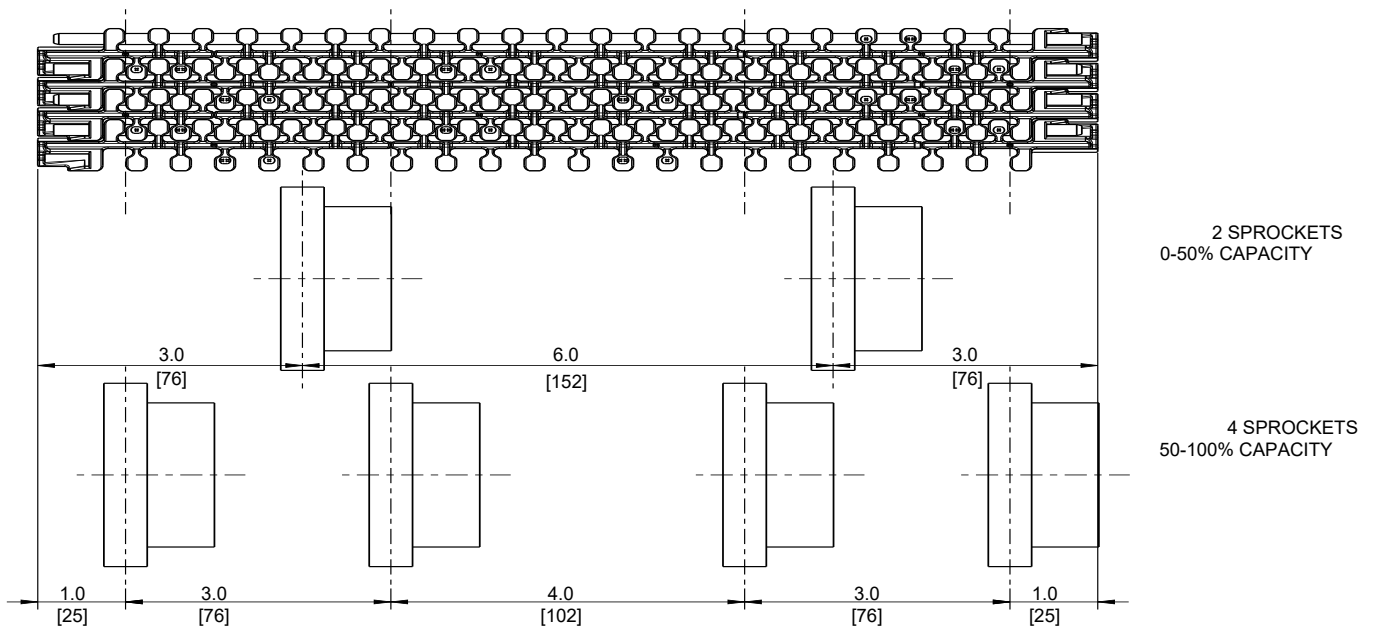
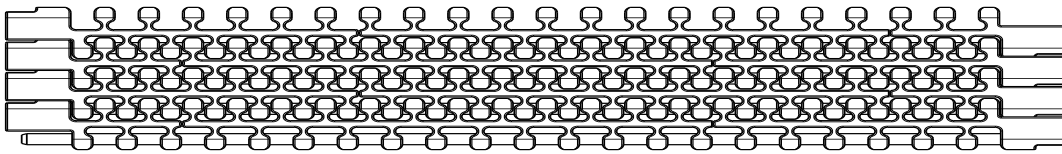


390-Series Imperial



590 Chain Series (595/596)

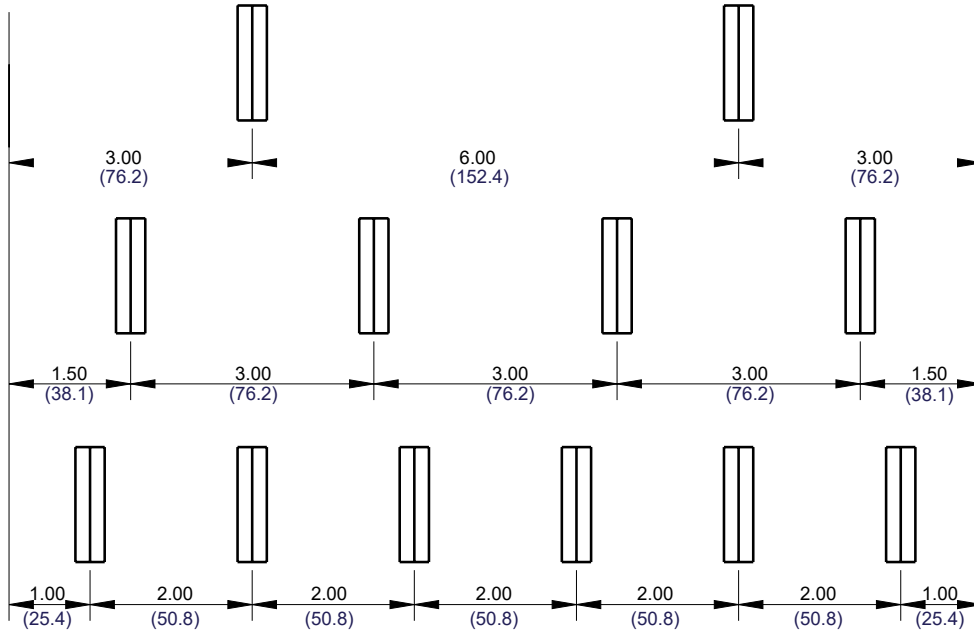
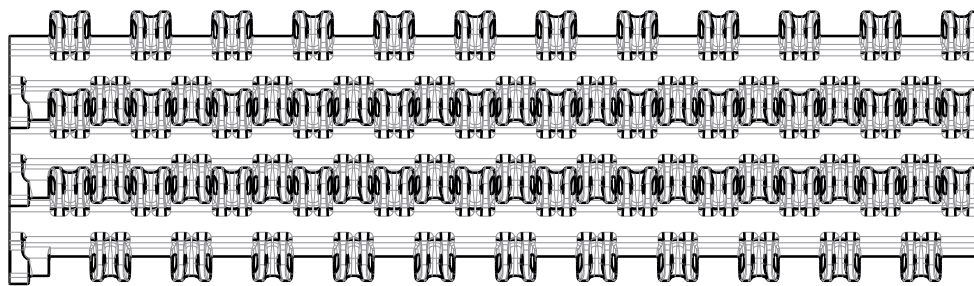
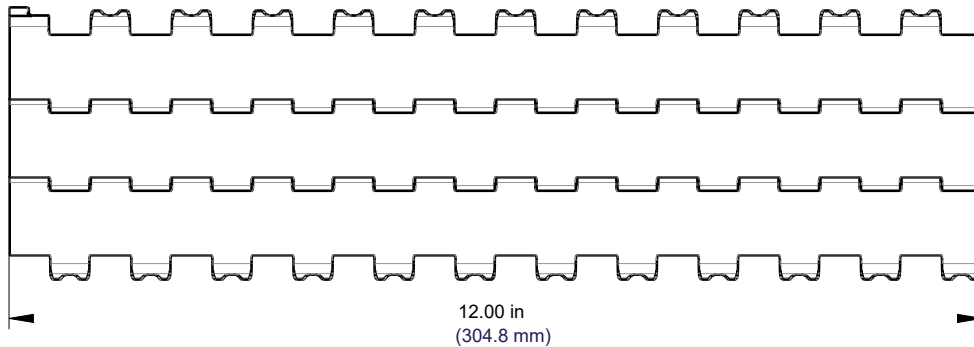
Assembled to Width



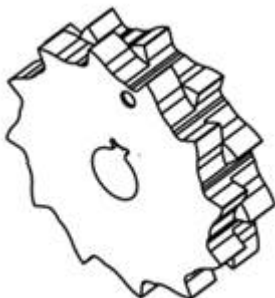
Conveyor Design

1010 Chain Series (1011/1015/1016/1018)

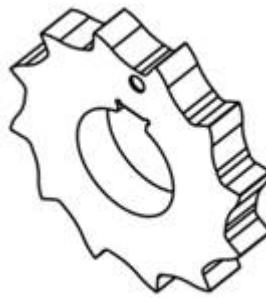
Assembled to Width



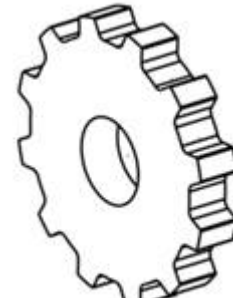
1015 — 12.00 in



Standard version (bi-directional)



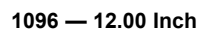
STR (Single Teeth Row)
Only for mono-directional
conveyors



Idler STR (Single Teeth Row)

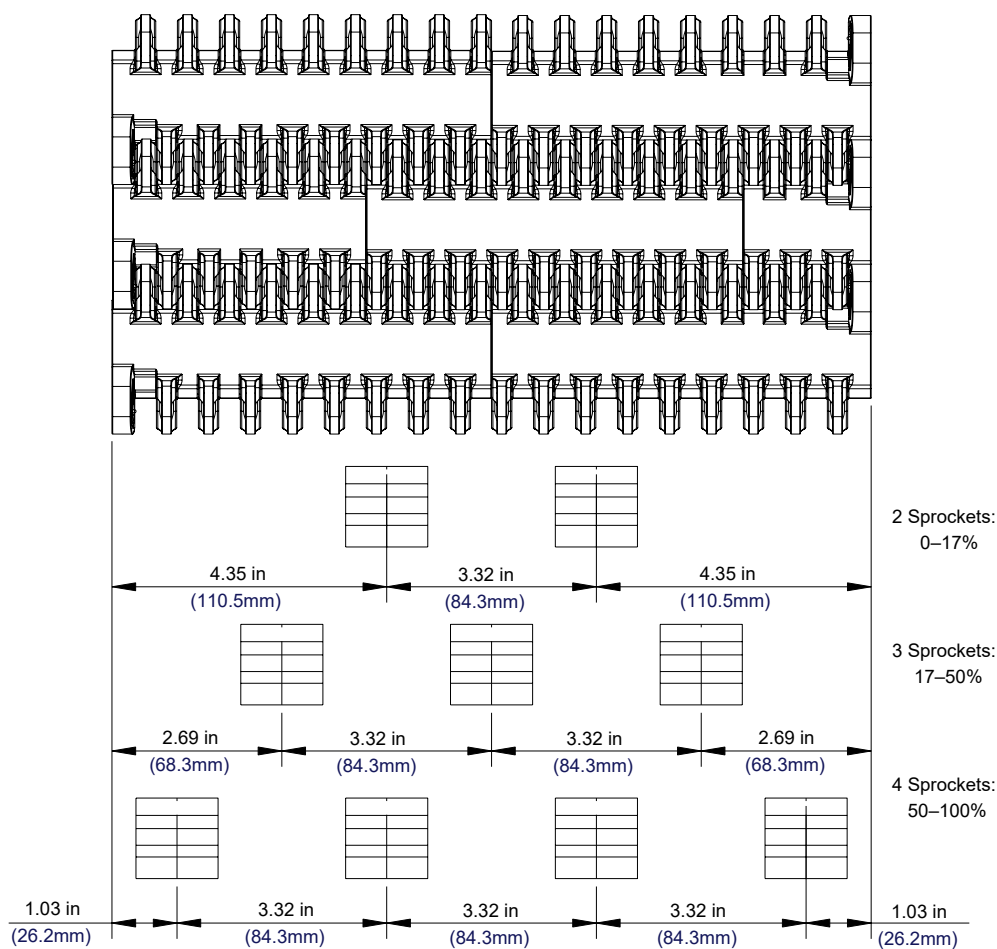
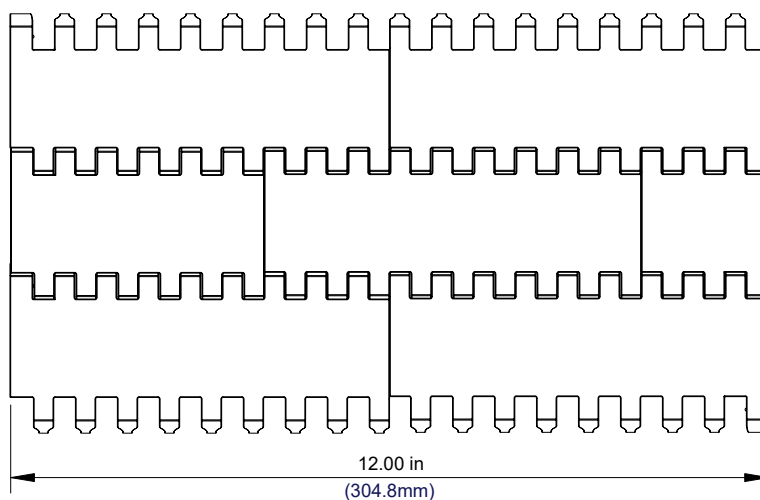
Rexnord MatTop Chain

Assembled to Width



Conveyor Design

2010 Chain Series (2011/2015/2016) Assembled to Width — 2011/2015/2016



2015 — 12.00 in — Assembled to Width

Conveyor Design

Introduction Inclined & Declined conveyors

Belts can be used on inclined and declined conveyors. These conveyors are basically constructed in the same way as level (horizontal) conveyors. In order to keep products from sliding down either SuperGrip belts or belts with flights (and sideguards) can be used. For both belt types the construction guidelines are similar and therefore they will be described only once.

There are several ways to build an inclined or declined conveyor. Main differences, besides the orientation (going up or down) are the presence or absence of horizontal infeed and / or outfeed sections.

Below the different situations for inclined and declined conveyors are described. Wearstrip dimensions and spacing, as well as recommended roller diameters can be found in the "straight running conveyors" section.

Inclined Conveyors

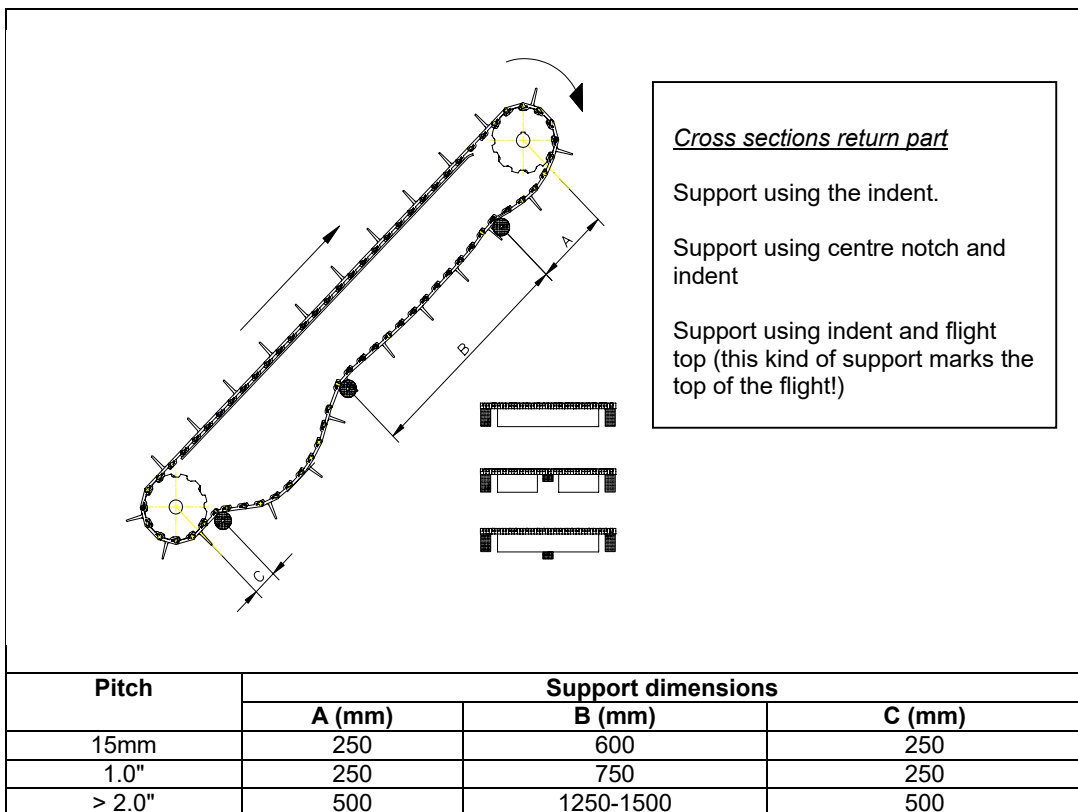
Position of the drive

We strongly recommend the drive on the top-end of the conveyor for inclined conveyors. This automatically results in a correct wrap-angle around the sprocket and a proper catenary sag. It must be avoided "pushing" the belt up the incline.

Classic Inclined Conveyors

The most simple conveyor construction is the set-up without horizontal in- or outfeed. This conveyor is build like a horizontal conveyor. In the return part the belt is guided at the side indents besides the flights or SuperGrip pattern.

In case of flat wearstrips at the side of the belt or steep conveyors (> 20-degrees), the catenary sag will tend to develop at the position of the idler sprocket. Therefore the position of the last support position before the idler sprocket requires extra attention. The general set-up of this type of conveyors can be found in the drawing below.



Conveyor Design

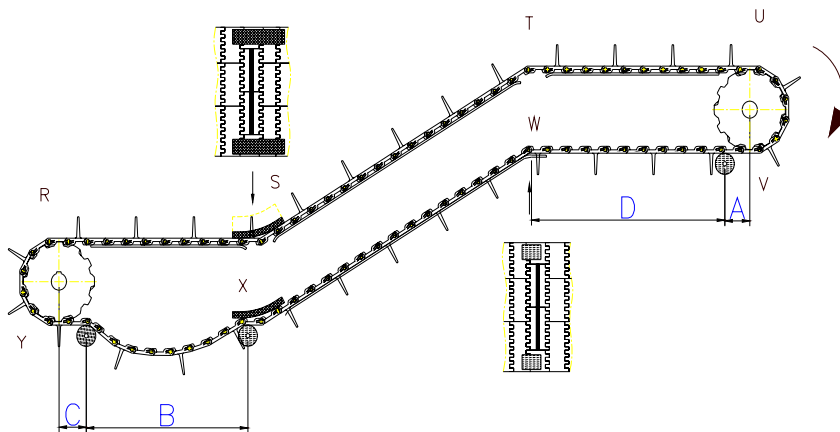
Inclined Conveyors with Horizontal In- and Outfeed

In the **upper part** the belt is supported by wearstrips as in a horizontal conveyor. There is no need to apply a radius in the wearstrips in position "S" (see drawing [II]), a radius does need to be applied in either the hold down shoe or the roller on top of the belt, keeping the belt down in this position. In position "T" a radius is recommended in the support wearstrips as well. If the conveyor is being built with static guides, in case of a flighted belt, these can be used as hold down profiles.

In the **return part** either rollers or a combination of rollers and wearstrips can be used. In section V-W, rollers are recommended. Section W-X can be equipped with sliding wearstrips, this makes the operation of the belt smoother. In position "X" an internal shoe or roller must be used to prevent the belt from moving upwards. In section X-Y rollers are required as well, because in this position the catenary tends to develop, especially in combination with long or steep inclines.

Tightening the belt by hand normally results in a proper catenary. However, with long conveyors an adjustable idler shaft can help in getting the catenary sag right. To help the catenary develop in a single position, distance D should be chosen smaller than B.

Drawing II (inclined conveyor with horizontal in- and outfeed)

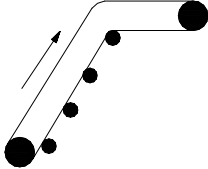
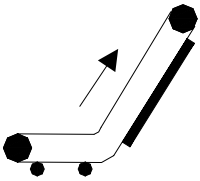


Support dimensions							
Pitch	A [mm]	B [mm]	C [mm]	D ^{*1)} [mm]	Radius S ^{*2)} [mm]	Radius T [mm]	Radius X [mm]
15mm	250	600	250	<600	35	40	30
1.0"	250	750	250	<750	55	75	50
>2.0"	500	1250	500	<1250	115	140	115

^{*1)} **Note:** It is recommended to choose distance D < distance B to force the catenary sag in position B.

^{*2)} **Note:** Using a larger radius or diameter will extend the lifetime of the belt surface and optimise the belt performance.

Conveyor Design

	Outfeed / No infeed In case the conveyor has got a horizontal outfeed but no horizontal infeed we strongly recommend using roller supports in section W-X.
	Infeed / no outfeed In case there is a horizontal infeed but no horizontal outfeed, guidelines are the same as for conveyors with horizontal in- and outfeed.

Vertical Inclined Conveyors

Conveyors with an incline steeper than 60-degrees, are being referred to as "vertical". These conveyors often require belts with bent or scooped flights. The conveyor set-up is similar as described above. If it is a classic conveyor set-up, without horizontal in- or outfeed, the idler shaft needs to be adjustable to provide the right tension in the return part. The tension of the belt at the position of the idler shaft must be checked regularly.

Conveyor Design

Declined Conveyors

Also in combination with declined conveyors several executions are found. The return support system is very similar to incline conveyors, however the drive construction can require extra attention.

Position of the Drive

In this type of conveyor the drive can be at the lower or at the upper side of the conveyor. The best position can be determined by calculating the "critical angle" and comparing it with the decline angle of your conveyor. The "critical angle" depends on the friction between the belt and wearstrips in the upper part:

$\tan(\angle_{\text{critical}}) = \text{Static friction between belts and wearstrips}$

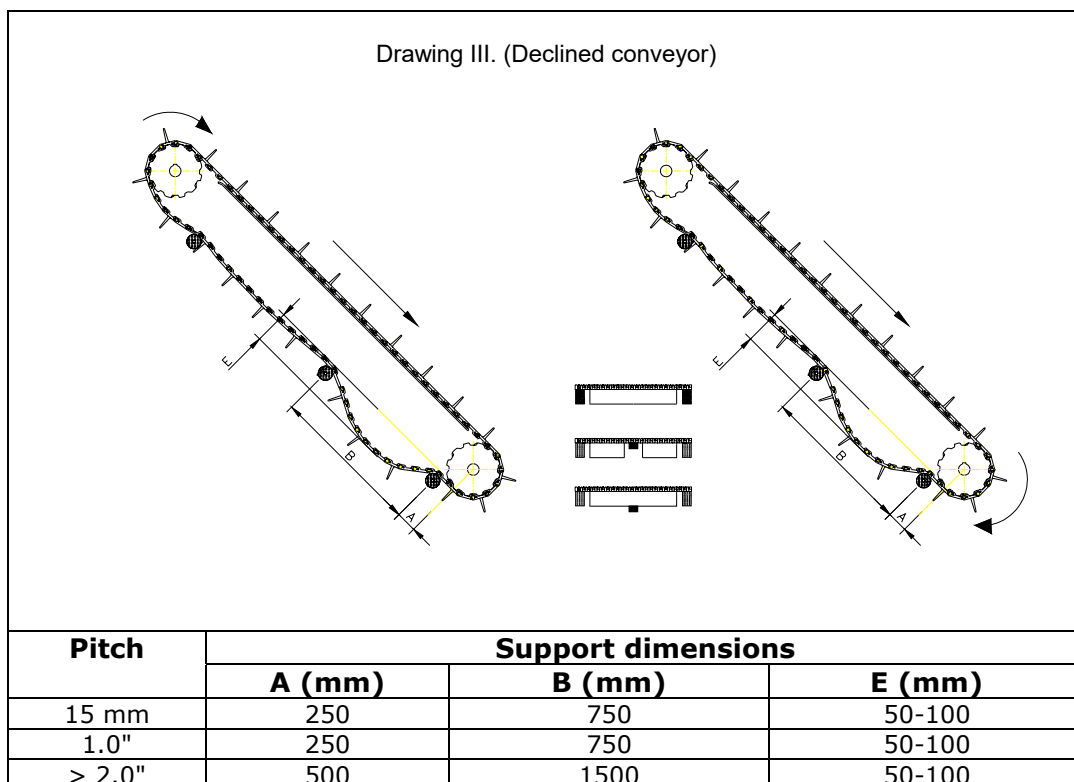
Typical belt material and wearstrip combinations are found below:

Belt material	Dry		Wet	
	Wearstrip PE	Wearstrip SS	Wearstrip PE	Wearstrip SS
WSM / SMB	0.18	0.20	0.13	0.15
WHT / BHT	0.23	0.30	0.15	0.25
WLT / BLT	0.23	0.28	0.20	0.22

If your angle is steeper than the calculated "critical angle", theoretically the belt will slide down by itself when loaded with product and the drive can best be positioned at the top-end of the conveyor.

Classic Decline Conveyor

The set up of this conveyor is similar to the inclined classic conveyor. To create a proper catenary the position of the first and the second roller after the shaft at the lower end are very important. It is recommended to choose distance B at least 3 times as large as distance A. The "vertical" position of the first roller should be higher compared to the position of the second and other rollers. In this type of declined conveyor the use of flat sliding wearstrips in the return part is not recommended! In this conveyor set-up the idler shaft does not need to be adjustable.



Conveyor Design

When it is necessary to position the drive at the lower end of the conveyor in combination with a steep decline (>20 degrees) the use of a tensioner (gravity roller) is recommended. The gravity take-up ensures sufficient tension in the return part to ensure a proper engagement between the belt and the sprockets.

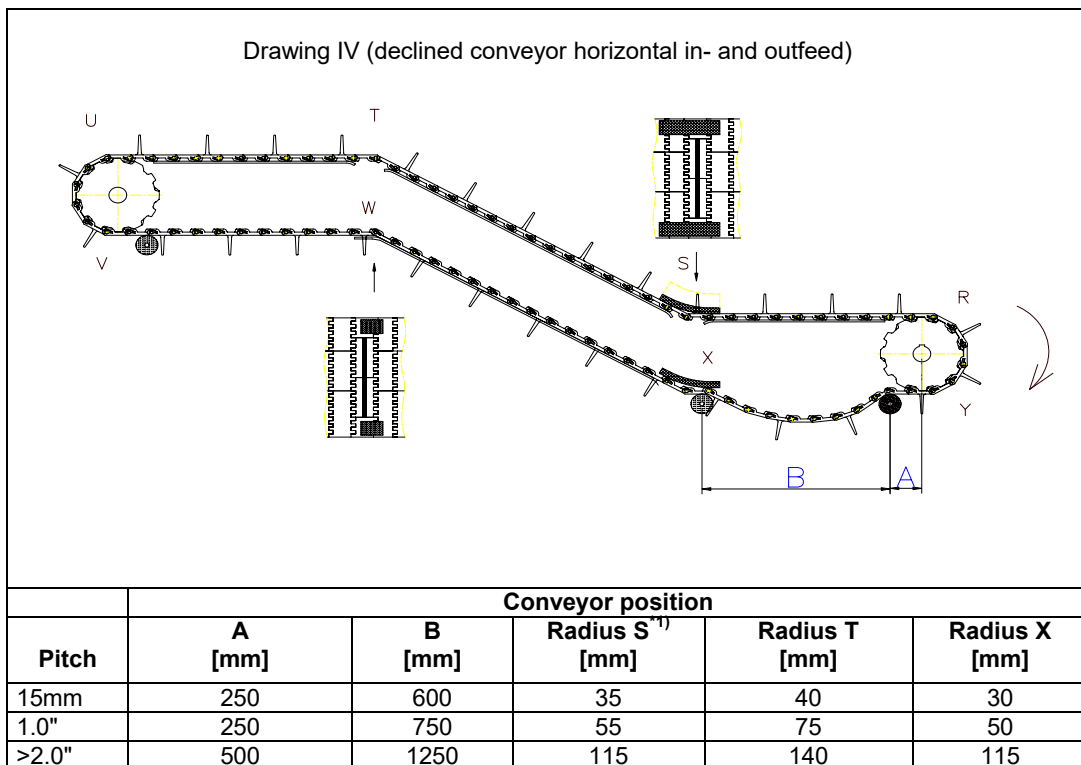
Declined Conveyors with Horizontal In –and Outfeed

In this conveyor set-up the **drive** can always be positioned at the lower-end of the conveyor. Important is that the horizontal outfeed section is long enough (min. A+B) to accommodate the catenary sag in the return part. If not gravity takes up must be used to provide the correct return part tension.

In the **upper part** at position "S" the belt needs to be held down by means of a radius shoe or roller. If static guides are being used besides the flights these can be used to hold down the belt. The wearstrips support in this position does not require a radius. In position "T" it is recommended to use support wearstrips with a radius.

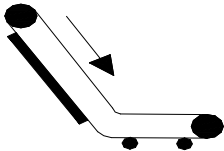
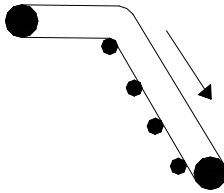
In the **return part** either rollers or a combination of rollers and sliding wearstrips can be used. In section Y-X rollers should be used to accommodate the catenary sag (see remarks above). In section X-W flat sliding wearstrips can be used, they provide a smoother belt operation compared to rollers in this section. In section W-V, either rollers or flat sliding wearstrips or rollers can be used. When W-V is a long section (>2000mm), rollers are preferred.

In this conveyor set-up the idler shaft does not need to be adjustable. Tightening the belt by hand will provide a sufficient tension in the return part.



^{*)} **Note:** Using a larger radius or diameter will extend the lifetime of the belt surface and optimise the belt performance.

Conveyor Design

	<u>Outfeed / no infeed</u> In case the conveyor has got a horizontal outfeed but no horizontal infeed guidelines are the same as for conveyors with horizontal in- and outfeed
	<u>Infeed / no outfeed</u> In case there is a horizontal infeed but no horizontal outfeed, we strongly recommend use a roller support in the return part of section X-W. The guidelines for the set-up of the drive remain the same.

Vertical Declined Conveyors

Conveyors with a decline steeper than 60-degrees, are being referred to as "vertical". These conveyors often require belts with bent flights. The recommended position for the drive is the top end of the conveyor. The conveyor set-up of a conveyor like is similar as the conveyors described above. If it is a classic conveyor set-up, without horizontal in- or outfeeds, the idler shaft needs to be adjustable to provide the right tension in the return part. The tension of the belt at the position of the idler shaft must be checked regularly.

Other Incline and Decline Combinations

In case of combinations of inclined and declined sections, or in case of extreme long horizontal in- or outfeeds, please consult our Technical Support department for recommendations for your specific conveyor set-up.



Rexnord Sideflexing Chain

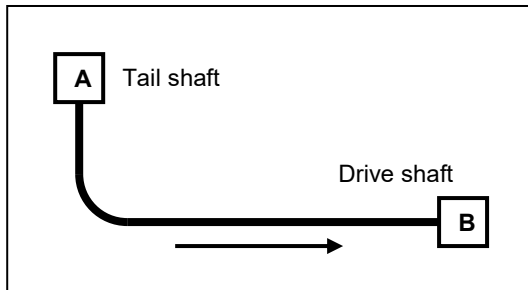
Sideflexing Belts

Basic design considerations

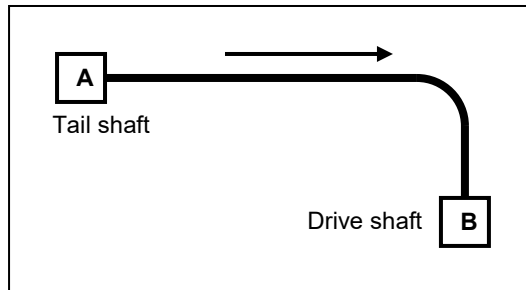
Side flexing configuration

When planning the side-flexing conveyor layout, the designer must consider the following factors that affect chain life:

- Minimize the number of corners in each conveyor whenever possible
- When conveying from point A to point B, design the conveyors so that the last curve is positioned furthest from the last drive (see drawing), resulting in lower chain tension and maximizing chain life



Preferred

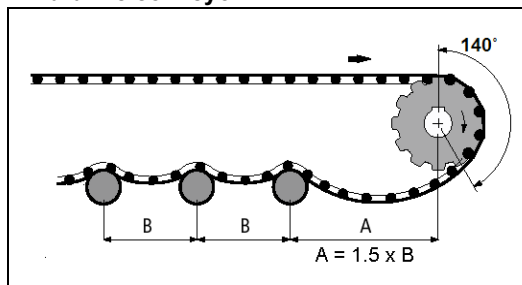


Avoid

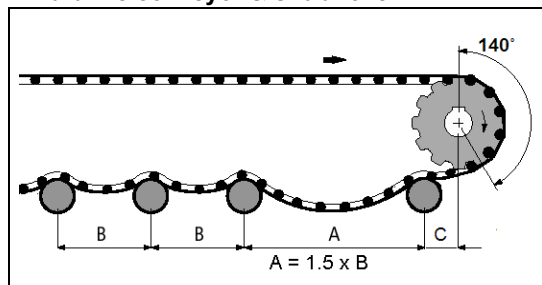
End drive construction

These conveyors have the drive-motor and sprocket at the end of the conveyor.

End-drive conveyor

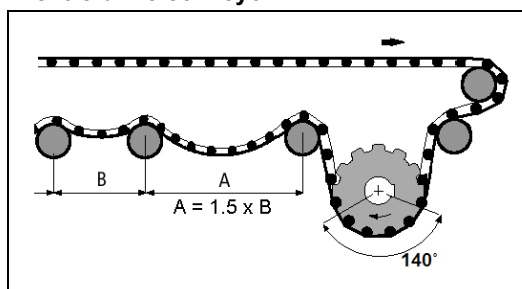


End-drive conveyor & snub roller



C should be 150-250mm

Centre-drive conveyor



Wrap around angle

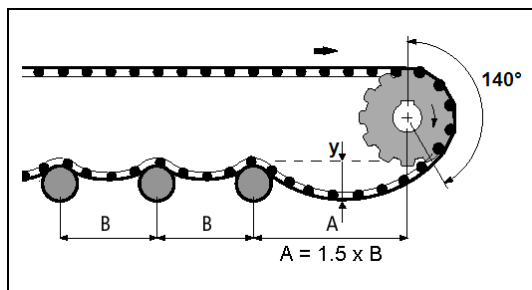
Recommended wrap angle on sprockets is: $140^\circ \pm 10^\circ$.

When the wrap angle is too small, the sprocket will not be able to transfer the load to the chain anymore causing the chain/belt to jump on the sprockets. When the wrap angle is too big, the chain/belt can stick to the sprocket.

Sideflexing Belts

Catenary sag

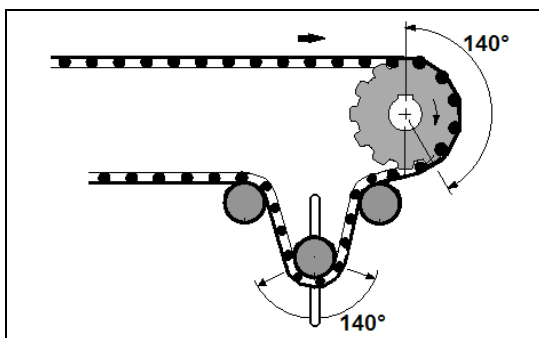
It is recommended to create a catenary sag which provides a complete discharge of the load on the belt.



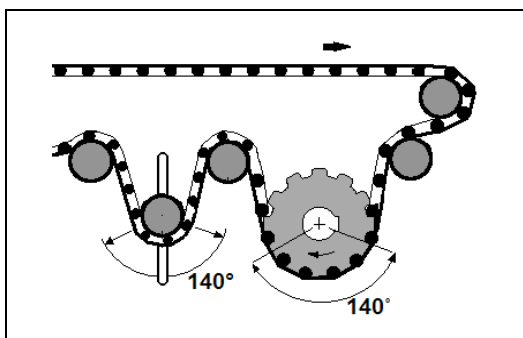
type	A (mm)	B (mm)	Vertical sag Y(mm)
505-series	700	500	50-125
1255-series	600	500	50-125
1275-series	600	500	50-125

The right vertical catenary sag can usually be obtained automatically by just pulling both ends of the belt together and connecting them. The catenary sag will increase due to elevated temperatures. Furthermore, the belt can elongate due to strain and wear of the pins and hinge eyes. Therefore it is important to check and adjust the catenary regularly.

End drive with tensioner



Centre drive with tensioner



A tensioner construction is only necessary if the conveyor design does not allow a proper catenary sag due to lack of space. A tensioner can also be used with declined conveyors, but in all other cases it is not recommend to tension the chain/belt.

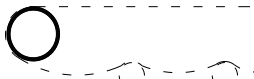
NOTE: The tensioner roller/sprocket can be fixed on an arm or move up and down in slots in the conveyor sideplates.

Maximum speed sideflexing belts

The maximum speed of a sideflexing belt depends on the PV-value of the curve. This PV-value represents a combination of pressure and velocity with a specific limit. Please contact application engineering if you require support in determining the PV-limit and maximum speed of an application. A maximum speed of 40 m/min is recommended. For higher speeds please contact application engineering.

Sideflexing Belts

Roller diameter for sideflexing belts

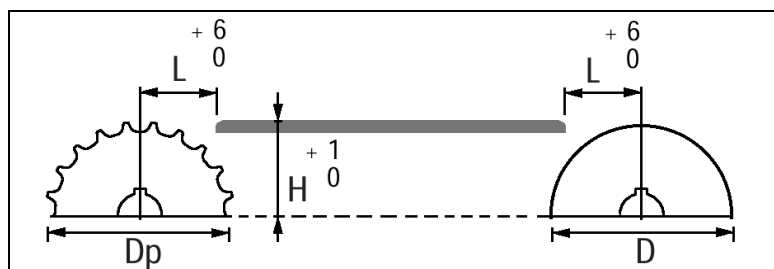
Beltype	505-series	1255-series	1275-series
	All dimensions in mm		
Idler rollers 	>30	>60 ¹	>60 ¹
Return rollers 	60-100	60-100	60-100
Backflex rollers 	> 30	> 80	> 80

¹ For long conveyors with high load we recommend to use a roller with a diameter of 80mm.

The recommended roller diameters in the table are an indication. The width of the conveyor is not taken into account. The diameter of the shaft should be large enough to avoid excessive deflection of the roller. At the same time it is recommended not to exceed the maximum diameter, because the roller friction may be too heavy to be set in motion by the belt.

Position sprocket - wearstrips

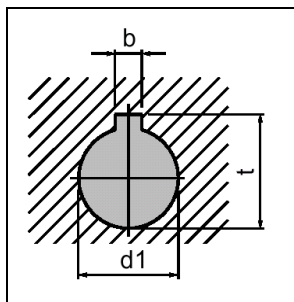
When the belts enter the sprocket, it tends to rise and fall slightly (chordal action). For this reason the sprockets should be mounted in such a way that their highest point is no higher than the top of the wearstrips. The front edges of the wearstrips should be chamfered to allow smooth and free running of the chain. The distance from the end of the wearstrip to the sprocket shaft centerline should equal dimension L, otherwise the wearstrip will interfere with the free articulation of the chain as it enters the sprockets.



Belt type	Drive sprocket H (mm)	L mm	Idler roller H (mm)	L mm
505-series	$\frac{Dp}{2} - 6.35$	12.7	$\frac{D}{2}$	12.7
1255-series	$\frac{Dp}{2} - 6.35$	32.0	$\frac{D}{2}$	32.0
1275-series	$\frac{Dp}{2} - 6.35$	32.0	$\frac{D}{2}$	32.0

Sideflexing Belts

Keyway dimensions of Rexnord sprockets



d1 (mm)	b (mm)	t (mm)
25mm	8	28.3
30mm	8	33.3
35mm	10	38.3
40mm	12	43.3
45mm	14	48.8
50mm	14	53.8
60mm	18	64.4

d1 (inch)	b (inch)	t (inch)
1"	1/4	1 1/8
1 1/4"	1/4	1 3/8
1 1/2"	3/8	1 9/16
1 3/4"	3/8	1 15/16
2"	1/2	2 1/4

Wearstrip materials

Stainless steel wearstrips

Can be used in most situations using plastic belts and are strongly recommended in abrasive environments.

- Recommended for abrasive conditions due to avoiding of dirt embedding in the wearstrips;
- Recommended for plastic chains/belts in dry environments with speeds > 60m/min;
- Cold rolled stainless steel with a hardness of at least 25 Rc and a surface finish of maximum 1.6 µm is recommended;
- Best results can be achieved by using stainless steel AISI 431 (Werkstoff-Nr. 1.4057 material; hot rolled AISI 304 (Werkstoff-Nr. 1.4301) is not recommended as wearstrip material.

UHMWPE / ULF wearstrips

Friction is low compared to steel wearstrips. Two types of plastic are suitable to be used as a wearstrip material.

- Most common used wearstrip material with extreme low friction;
- Excellent resistance against many chemicals;
- Virtually no moisture absorption, therefore very suitable for lubricated lines;
- Good dimension stability;
- Reduces some of the noise conveyors produce;
- Suitable for dry running conveyors with speeds up to 40 m/min (UHMWPE) or up to 60 m/min (ULF);
- Extruded quality 1000 grade UHMWPE is recommended.

Recommended wearstrip materials

Wearstrip material	Plastic modular belts	
	Dry	Lubr.
UHMWPE / ULF	+	+
Polyamide	+/-	-
Stainless steel	+	+
+ Recommended +/- Satisfactory - Not recommended 1) Up to 60 m/min in non abrasive conditions 2) Only in non abrasive conditions		

Belt return

For sideflexing belts we recommend to use rotating rollers for the returnpart to reduce wear.

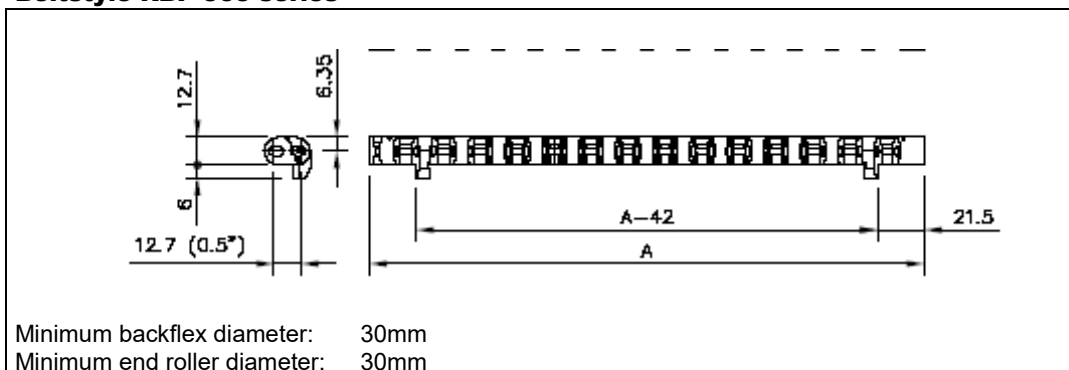


- + Simple construction.
- + Good accessibility
- Only point contact between chain/ belt and roller.
- Small rollers may cause a rattling sound.

Rollers should rotate freely therefore, rollers with rubber cover are recommended.

RBP 505-Series

Beltstyle RBP 505-series

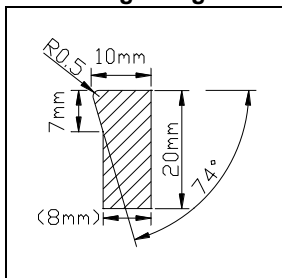


Lay-out Guidelines

	A	Minimum straight section drive side* For belt width <500mm: minimal 500mm. For belt width >500mm: minimal belt width.
	B	Minimum straight in between 2 curves (S-bend) 1.5 x belt width
	C	Minimum straight section idler side 500mm
	D	Minimum inside radius 2 x belt width

* For centre-drive add 200mm.

Rexnord guiding Profile RBP 505-series



The MCC guiding profile should be used to guide the belt through the curve. Material of the guiding strip is special polyamide, which offers low friction and high wear resistance.

Standard:

Codenr. **10144189** (length of 3m, MCC 3500)

FDA-approved:

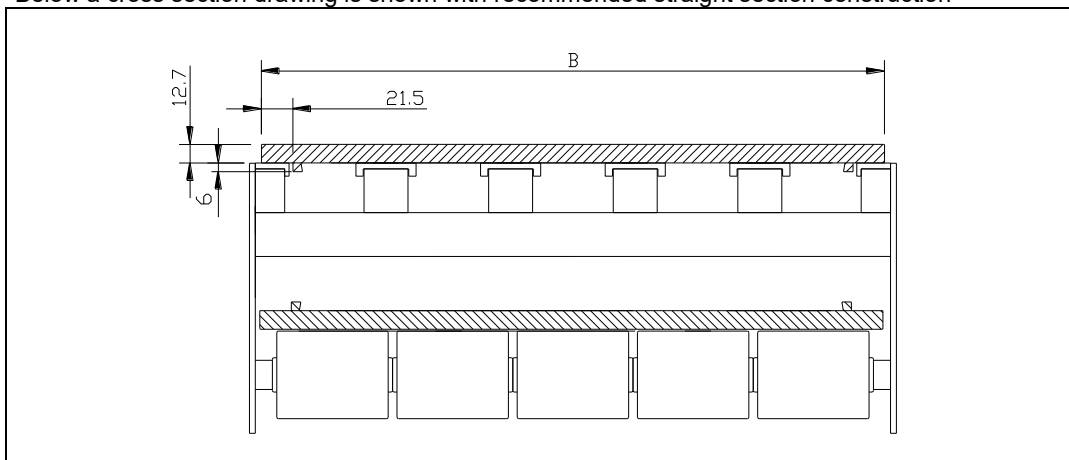
Codenr. **10318501** (length of 2m, MCC 3600)

ULF:

Codenr. **10383606** (length of 3m, MCC 4000)

Straight section RBP 505-series

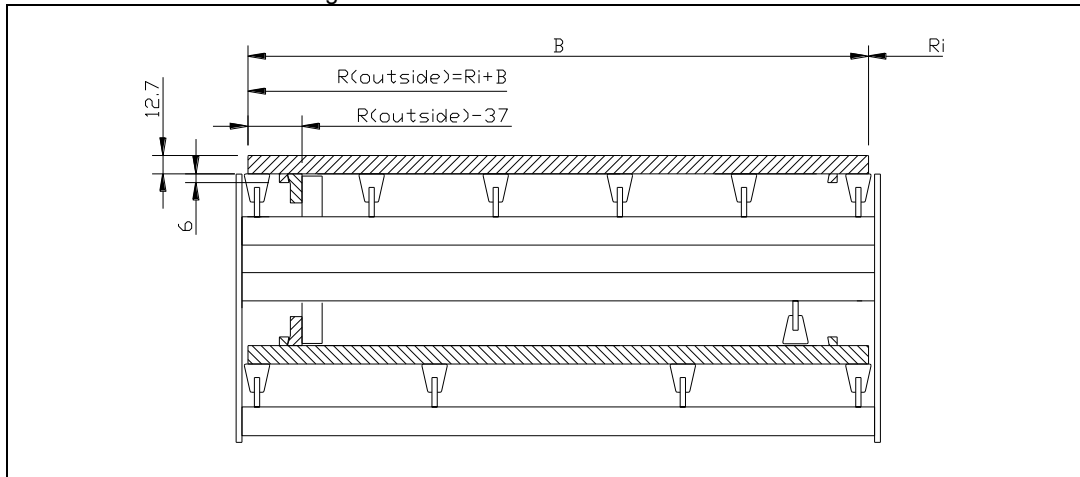
Below a cross section drawing is shown with recommended straight section construction



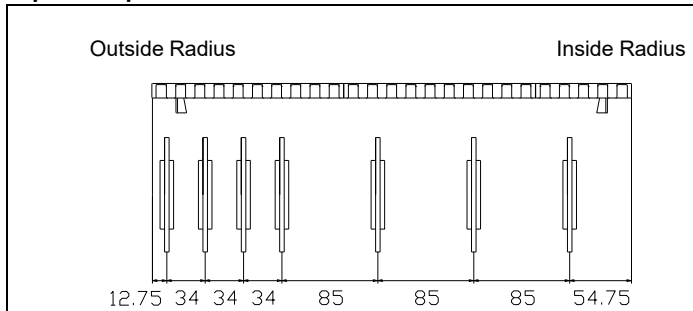
Please make sure there is enough space between belt and conveyor / surrounding area. Sideguides can prevent the belt from touching the conveyor sheet, especially after the curves.

Rexnord Sideflexing Chain

Below a cross section drawing is shown with recommended curve construction

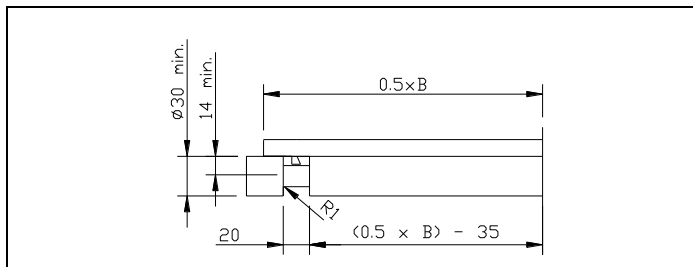


Sprocket positions RBP 505-series



Belt width	Nr. of sprockets	
	Drive	Idler
170 mm	4	2
255 mm	5	3
340 mm	6	4
425 mm	7	5
510 mm	8	6
595 mm	9	7
680 mm	10	8

Roller dimension RBP 505-series



Rollers should rotate freely at all times; therefore we strongly recommend to equip the rollers with bearings.

*) For high loads (>500 N) or wide belts (>510 mm) use bigger shaft diameter and/ or support the shaft in the centre

Additional Notes

- Complete machined UHMPWE curves including curve profiles are available in any angle and for any belt width.
- Please note that the catenary sag can increase under load. Make sure the belt cannot catch against the sideframe in the retourpart taking increased catenary into account.

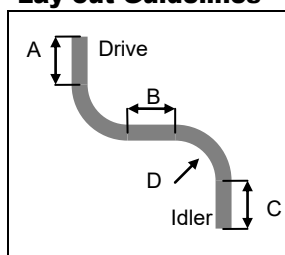
RB 1255-Series

Beltstyle RB 1255-series



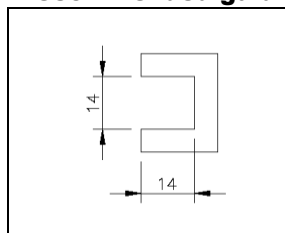
Minimum backflex diameter: 60mm
Minimum end roller diameter: 60mm

Lay-out Guidelines



A	Minimum straight section drive side 750mm with normal drive, 500mm width gravity tensioner.
B	Minimum straight in between 2 curves (S-bend) 1.5*belt width
C	Minimum straight section idler side 500mm
D	Minimum inside radius 2 * belt width

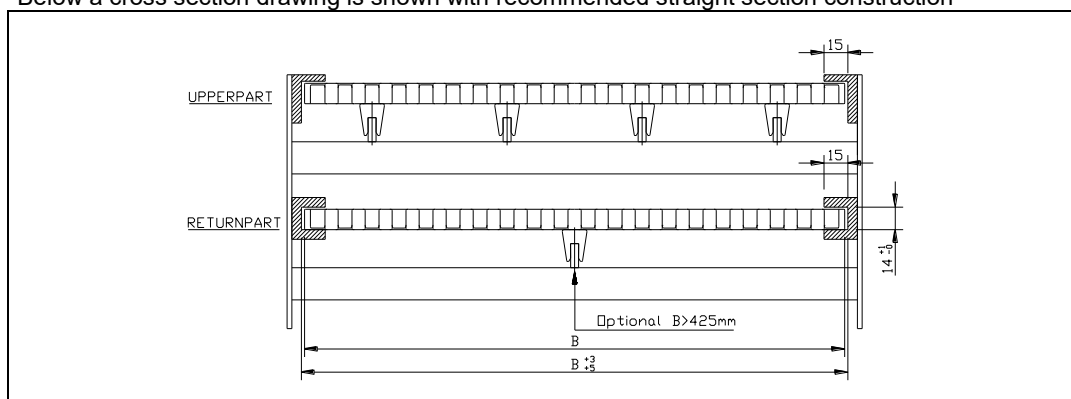
Recommended guiding Profile dimensions for RB 1255-series



The guiding profile should be used to guide the belt through the curve. We recommend to use a c-profile according to the drawings dimension. Recommended material of the guiding strip is Nylatron which offers low friction and high wear resistance. UHMWPE can also be used.

Straight section RB 1255-series

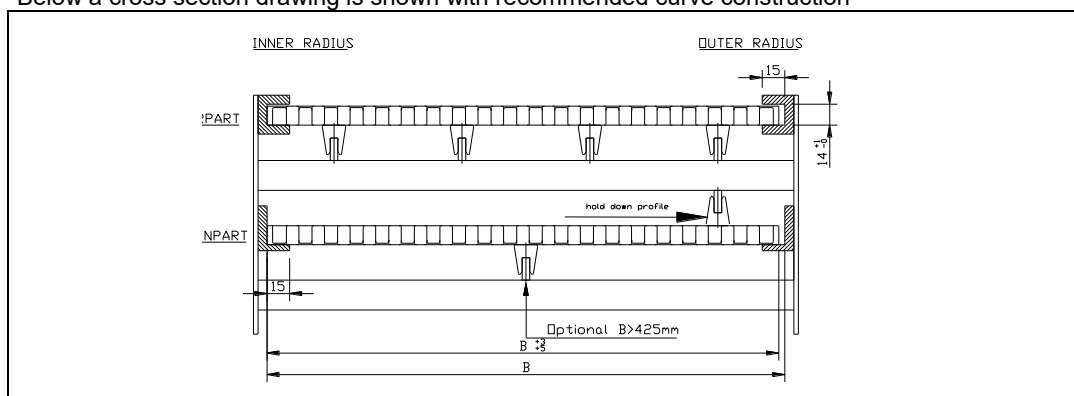
Below a cross section drawing is shown with recommended straight section construction



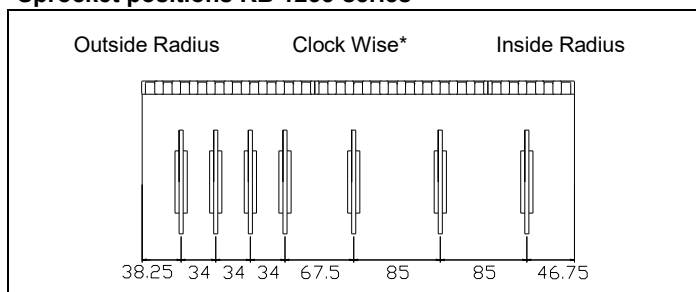
RB 1255-Series

Curve section RB 1255-series

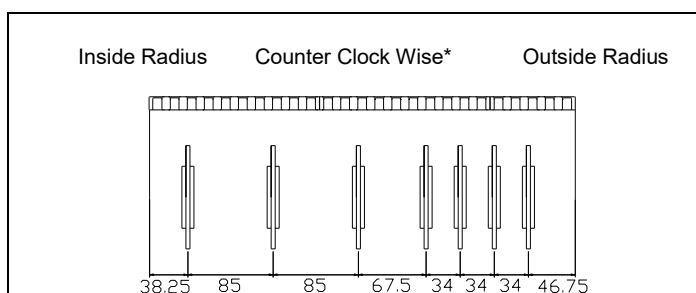
Below a cross section drawing is shown with recommended curve construction



Sprocket positions RB 1255-series

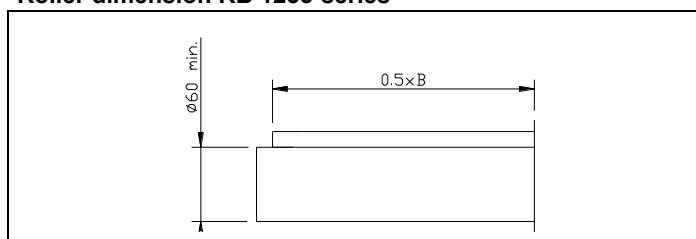


Belt width	Nr. of sprockets	
	Drive	Idler
170 mm	3	2
255 mm	5	3
340 mm	6	4
425 mm	7	5
510 mm	8	6
595 mm	9	7
680 mm	10	8



*Seen in running direction

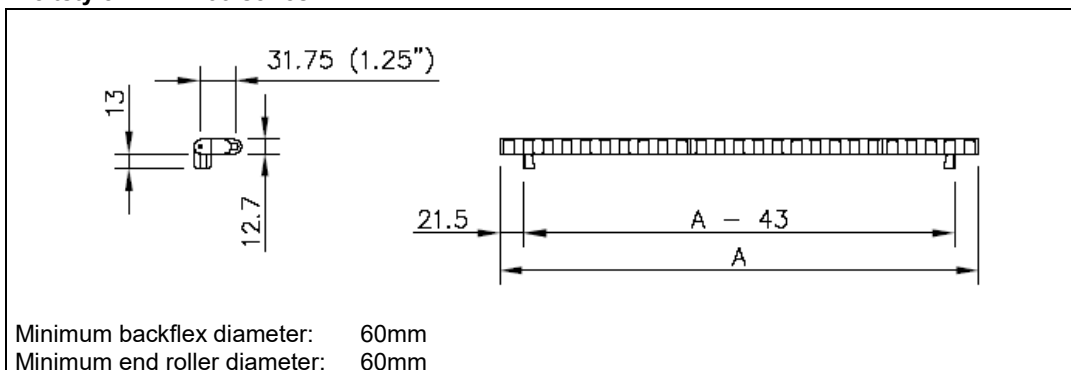
Roller dimension RB 1255-series



Rollers should rotate freely at all times; therefore we strongly recommend to equip the rollers with bearings.

RBP 1255-Series

Beltstyle RBP 1255-series



Lay-out Guidelines

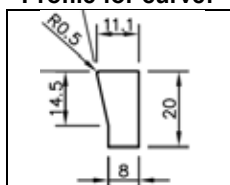
	A	Minimum straight section drive side 750mm with normal drive, 500mm width gravity tensioner.
	B	Minimum straight section in between 2 curves (S-bend) 1.5 * beltwidth
	C	Minimum straight section idler side 500mm
	D	Minimum inside radius 2 * beltwidth

Rexnord guiding Profile RBP 1255-series

The MCC guiding profile should be used to guide the belt through the curve and along the frame.
There are 2 materials available:

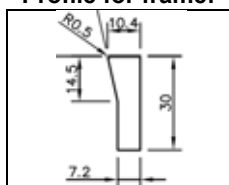
- MCC3500: Special polyamide
- MCC4000: Ultra Low Friction UHMWPE

Profile for curve:



Standard:
Codennr. 10341541
(length of 3m, MCC3500)
ULF:
Codennr. 10383604
(length of 3m, MCC4000)

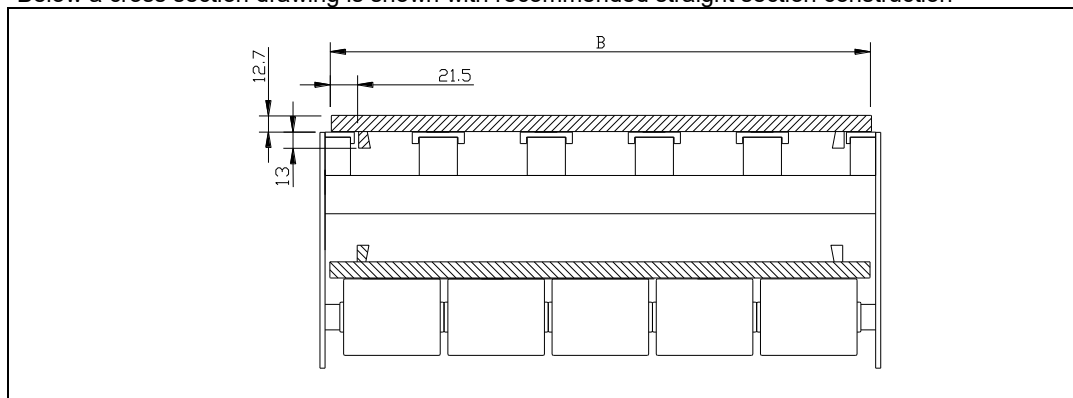
Profile for frame:



Standard:
Codennr. 10361334
(length of 1.8m, MCC3500)
ULF:
Codennr. 103836610
(length of 3m, MCC4000)

Straight section RBP 1255-series

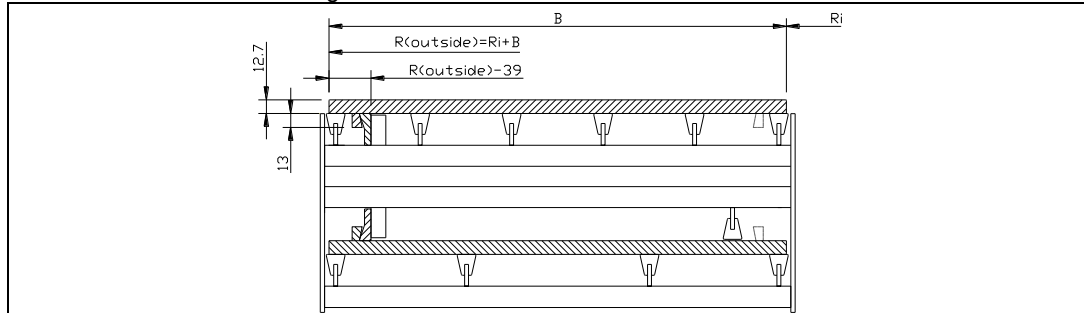
Below a cross section drawing is shown with recommended straight section construction



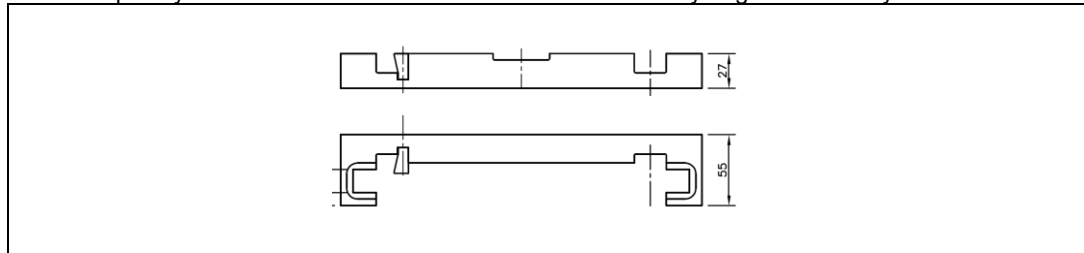
RBP 1255-Series

Curve section RBP 1255-series

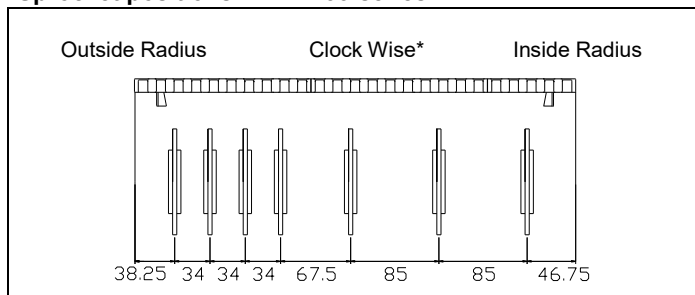
Below a cross section drawing is shown with recommended curve construction



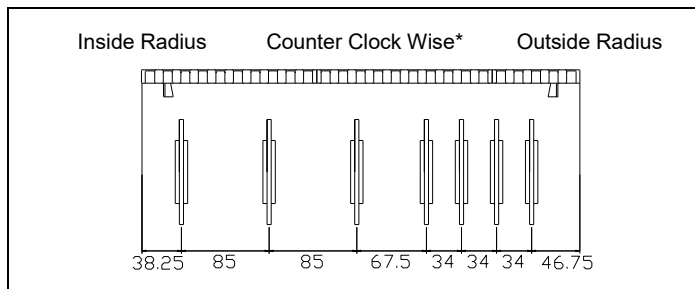
Also completely machined UHMWPE curves are available in any angle and for any belt width.



Sprocket positions RBP 1255-series

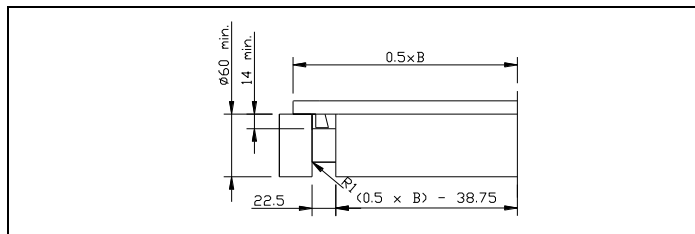


Belt width	Nr. of sprockets	
	Drive	Idler
170 mm	3	2
255 mm	5	3
340 mm	6	4
425 mm	7	5
510 mm	8	6
595 mm	9	7
680 mm	10	8



*Seen in running direction

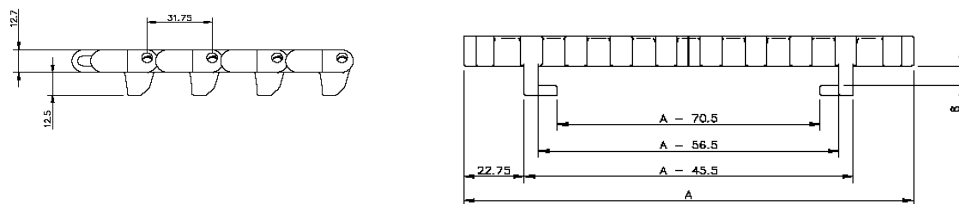
Roller dimension RBP 1255-series



Rollers should rotate freely at all times; therefore we strongly recommend to equip the rollers with bearings.

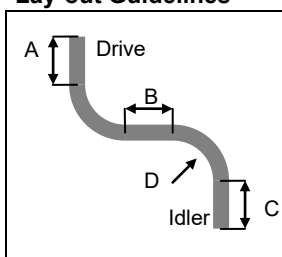
RBT 1255-Series

Beltstyle RBT 1255-series



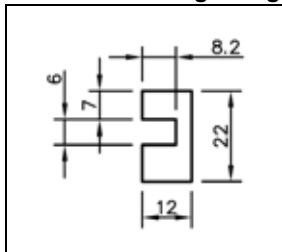
Minimum backflex diameter: 60mm
Minimum end roller diameter: 60mm

Lay-out Guidelines



A	Minimum straight section drive side 750mm with normal drive, 500mm with gravity tensioner.
B	Minimum straight in between 2 curves (S-bend) 1.5*belt width
C	Minimum straight section idler side 500mm
D	Minimum inside radius 2 * belt width

Recommended guiding Profile dimensions for RBT 1255-series



The MCC guiding profile should be used to guide the belt through the curve and along the frame. There are 2 materials available:

- MCC3500: Special polyamide
- MCC4000: Ultra Low Friction UHMWPE

Standard:

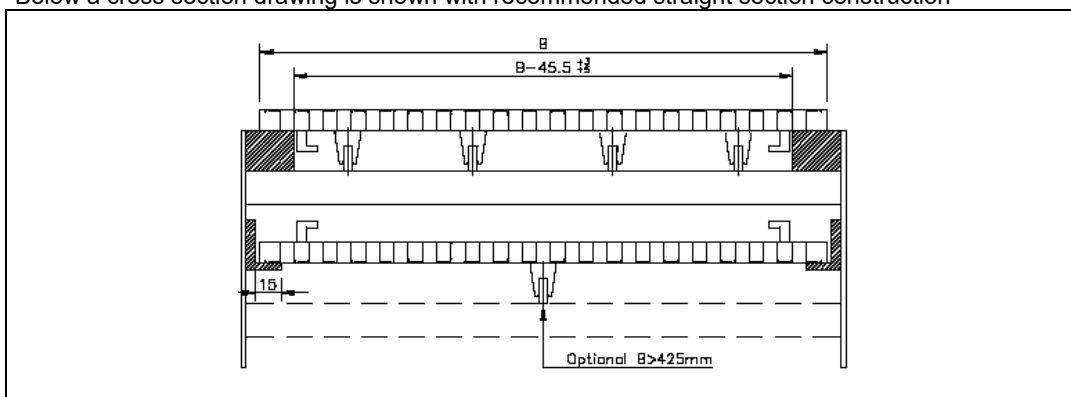
Codenr. 10341543 (length of 3m)

ULF:

Codenr. 10383613 (length of 3m)

Straight section RBT 1255-series

Below a cross section drawing is shown with recommended straight section construction

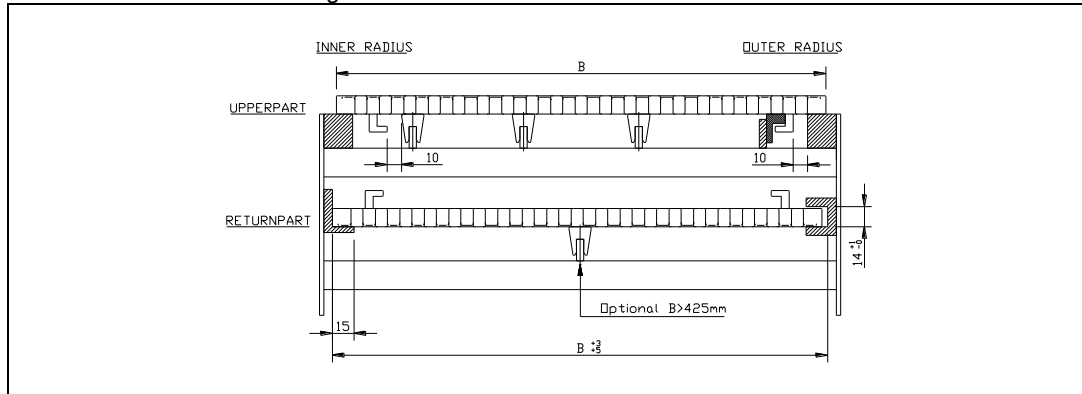


*) For the returnpart, also rotating rollers can be used.

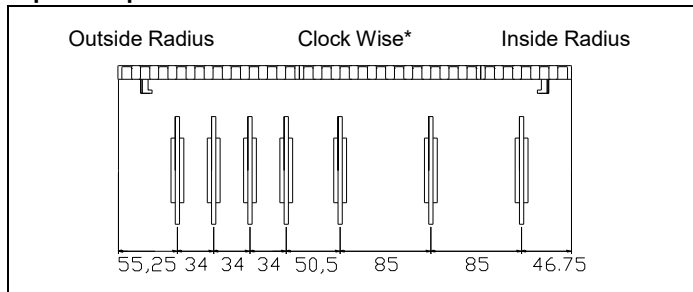
RBT 1255-Series

Curve section RBT 1255-series

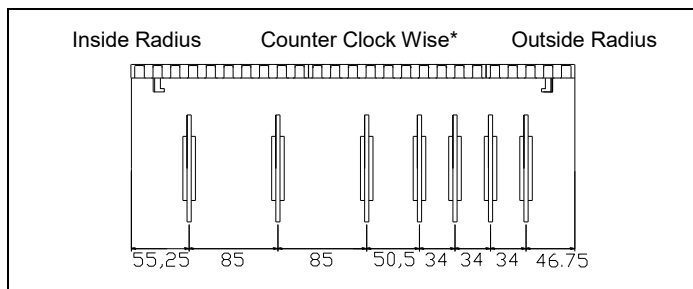
Below a cross section drawing is shown with recommended curve construction



Sprocket position RBT 1255-series

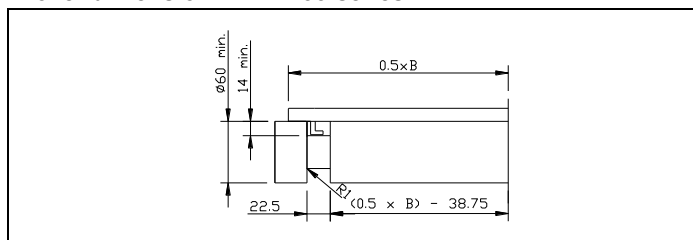


Belt width	Nr. of sprockets	
	Drive	Idler
170 mm	3	2
255 mm	5	3
340 mm	6	4
425 mm	7	5
510 mm	8	6
595 mm	9	7
680 mm	10	8



*Seen in running direction

Roller dimension RBT 1255-series



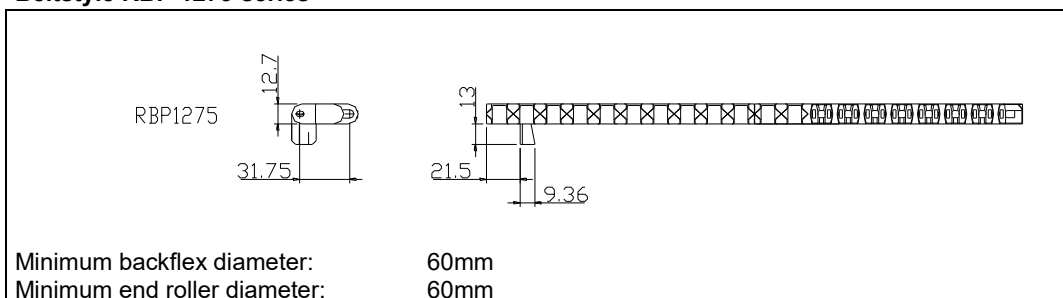
Rollers should rotate freely at all times; therefore we strongly recommend to equip the rollers with bearings.

Additional Notes

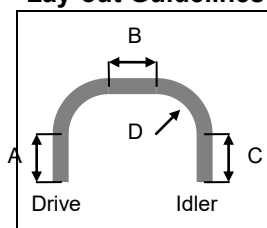
- Complete machined UHMWPE curves including curve profiles are available in any angle and for any belt width

RBP 1275-Series

Beltstyle RBP 1275-series



Lay-out Guidelines



A	Minimum straight section drive side 750mm with normal drive, 500mm with gravity tensioner.			
B	Minimum straight in between 2 curves (No S-bend!) No minimum straight needed			
C	Minimum straight section idler side 500mm			
D	Minimum inside radius (min R)			
	Belt width	Min. radius	Belt width	Min. radius
	255	300	680	860
	340	400	765	1020
	425	500	850	1200
	510	600	935	1350
	595	720	1020	1500

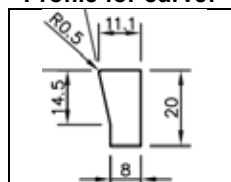
Rexnord guiding Profile RBP 1275-series

The MCC guiding profile should be used to guide the belt through the curve and along the frame.

There are 2 materials available:

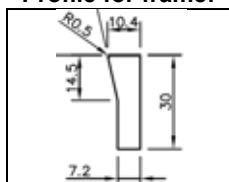
- MCC3500: Special polyamide
- MCC4000: Ultra Low Friction UHMWPE

Profile for curve:



Standard:
Codennr. 10341541
(length of 3m, MCC3500)
ULF:
Codennr. 10383604
(length of 3m, MCC4000)

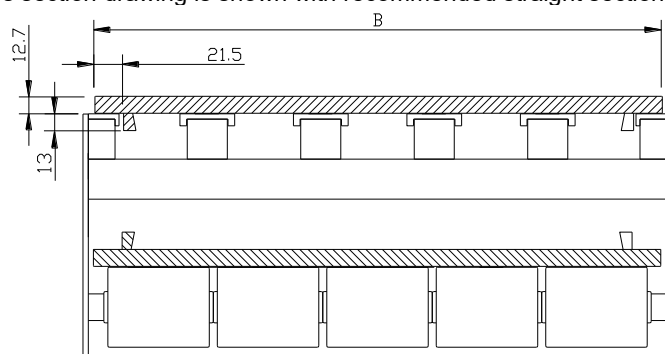
Profile for frame:



Standard:
Codennr. 10361334
(length of 1.8m, MCC3500)
ULF:
Codennr. 103836610
(length of 3m, MCC4000)

Straight section RBP 1275-series

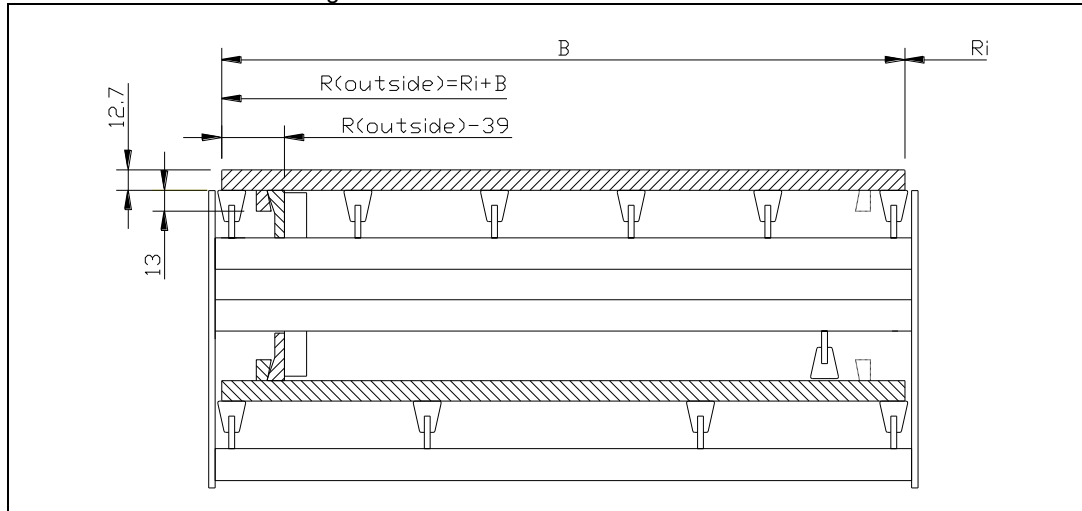
Below a cross section drawing is shown with recommended straight section construction



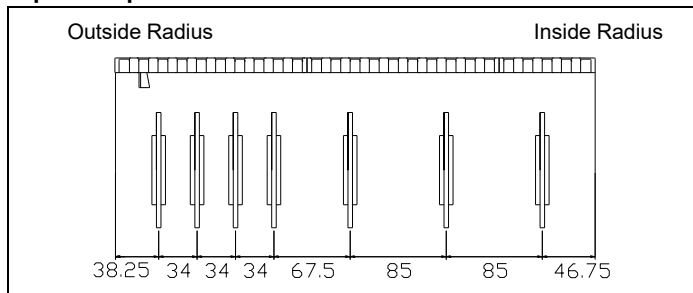
RBP 1275-Series

Curve section RBP 1275-series

Below a cross section drawing is shown with recommended curve construction

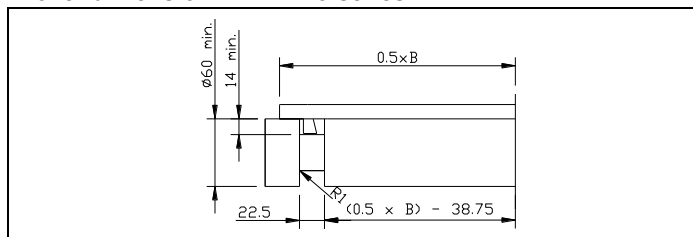


Sprocket positions RBP 1275-series



Belt width	Nr. of sprockets	
	Drive	Idler
255 mm	5	3
340 mm	6	4
425 mm	7	5
510 mm	8	6
595 mm	9	7
680 mm	10	8
765 mm	11	9

Roller dimension RBP 1275-series



Rollers should rotate freely at all times; therefore we strongly recommend to equip the rollers with bearings.

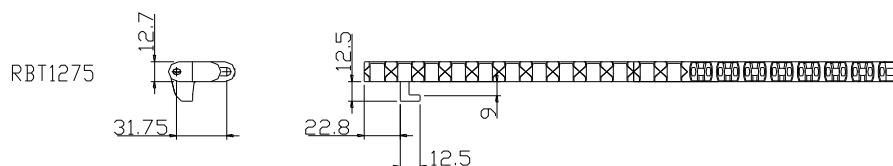
*) For high loads (>500 N) or wide belts (>510 mm) use bigger shaft diameter and/ or support the shaft in the centre

Additional Notes

We recommend to use the Rexnord machined corner tracks, which allow a simple design and a trouble-free operation.

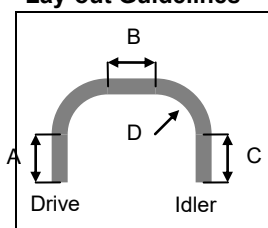
RBT 1275-Series

Beltstyle RBT 1275-series



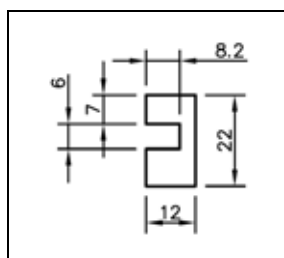
Minimum backflex diameter: 60mm
Minimum end roller diameter: 60mm

Lay-out Guidelines



A	Minimum straight section drive side 750mm with normal drive, 500mm with gravity tensioner.			
B	Minimum straight in between 2 curves (No S-bend!) No minimum straight needed			
C	Minimum straight section idler side 500mm			
D	Minimum inside radius (min R)			
	Belt width	Min. radius	Belt width	Min. radius
	255	300	680	860
	340	400	765	1020
	425	500	850	1200
	510	600	935	1350
	595	720	1020	1500

Rexnord guiding Profile RBT 1275-series



The Rexnord guiding profile should be used to guide the belt through the curve and along the frame. There are 2 materials available:

- MCC3500: Special polyamide
- MCC4000: Ultra Low Friction UHMWPE

Standard:

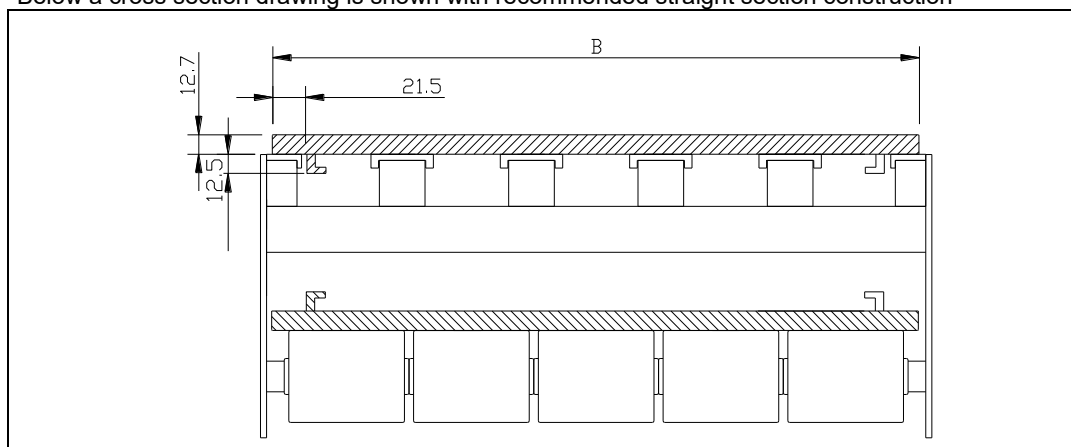
Codenr. 10341543 (length of 3m)

ULF:

Codenr. 10383613 (length of 3m)

Straight section RBT 1275-series

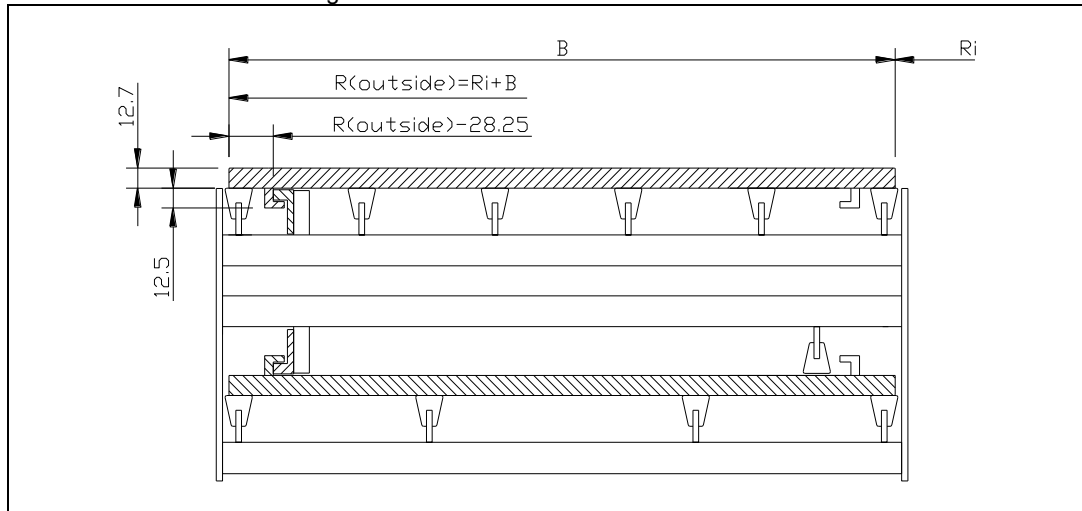
Below a cross section drawing is shown with recommended straight section construction



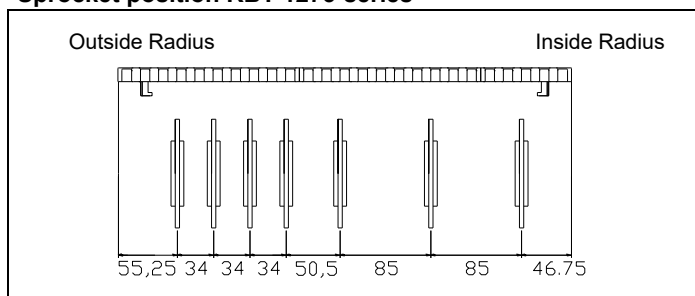
RBT 1275-Series

Curve section RBT 1275-series

Below a cross section drawing is shown with recommended curve construction

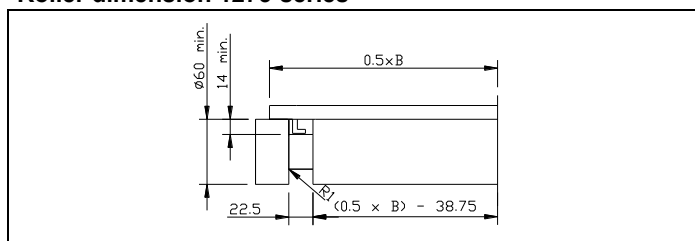


Sprocket position RBT 1275-series



Belt width	Nr. of sprockets	
	Drive	Idler
255 mm	5	3
340 mm	6	4
425 mm	7	5
510 mm	8	6
595 mm	9	7
680 mm	10	8
765 mm	11	9

Roller dimension 1275-series

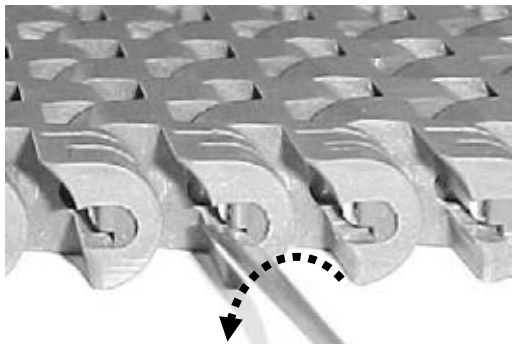


Rollers should rotate freely at all times; therefore we strongly recommend to equip the rollers with bearings.

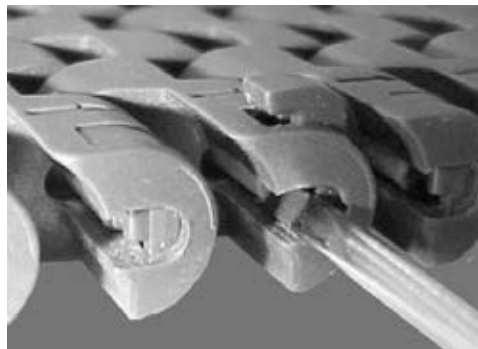
*) For high loads (>500 N) or wide belts (>510 mm) use bigger shaft diameter and/ or support the shaft in the centre

Installation instructions

505-series



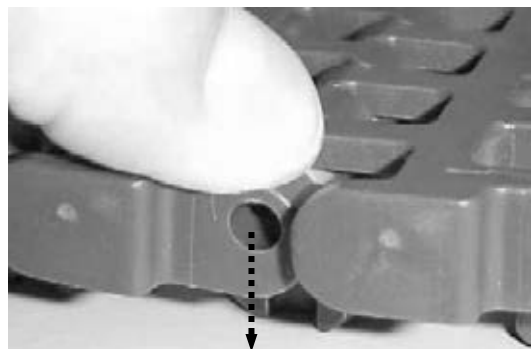
Turn screwdriver counter clockwise to remove clip.



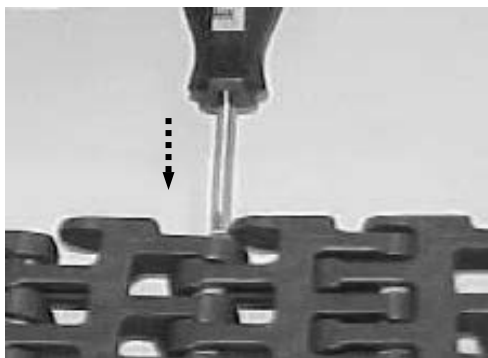
Place screwdriver between clip and belt end.

Please note that 505-series belts have a specific running direction, indicated by the arrow at the bottom.

1255-series belt

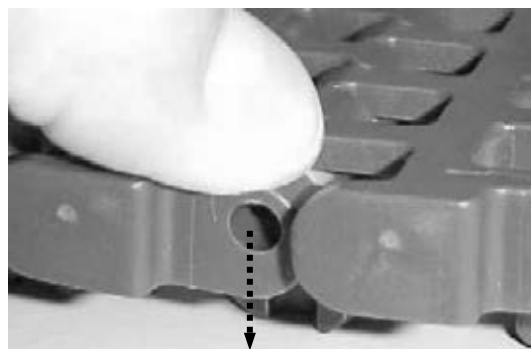


Lift belt out of tracks and position belt on the lugs. Now, push one belt module downwards.

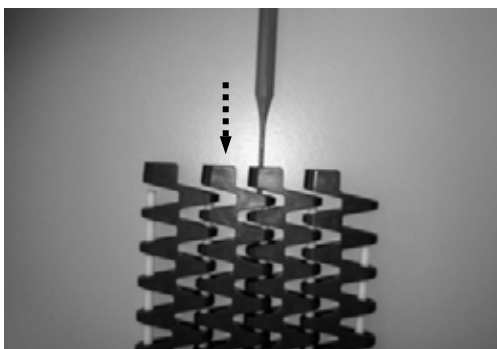


Place screwdriver in opposite end hole and push pin out.

1275-series belt



Lift belt out of tracks and position belt on the lugs. Now, push one belt module downwards.



Place screwdriver in opposite end hole and push pin out.

Rexnord TableTop Chain

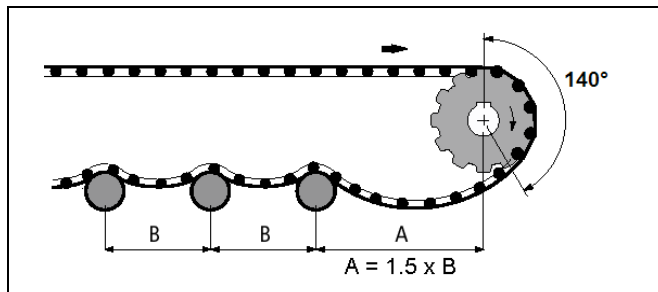
Rexnord® TableTop® chains are engineered to satisfy a wide range of conveyor applications for virtually any industry. A large selection of straight running and side-flexing chains are designed to convey flawlessly in even the most demanding environments. Chains formed from metal or molded from thermoplastic are perfect for

high strength and high speed applications. Narrow widths are ideal for multiple strand and variable speed conveyors. Chains with low backline pressure rollers minimize product damage. Several chain series couple traditional top plates with roller base chains for increased strength and precision.

Conveyor Design

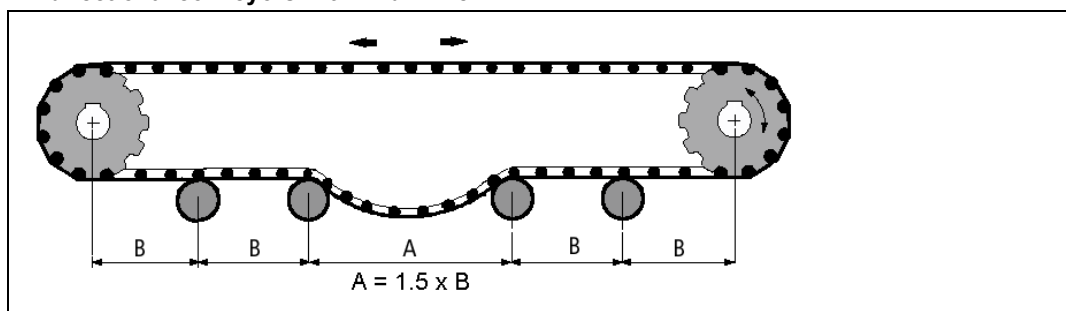
Drive construction

Uni-directional end driven conveyors



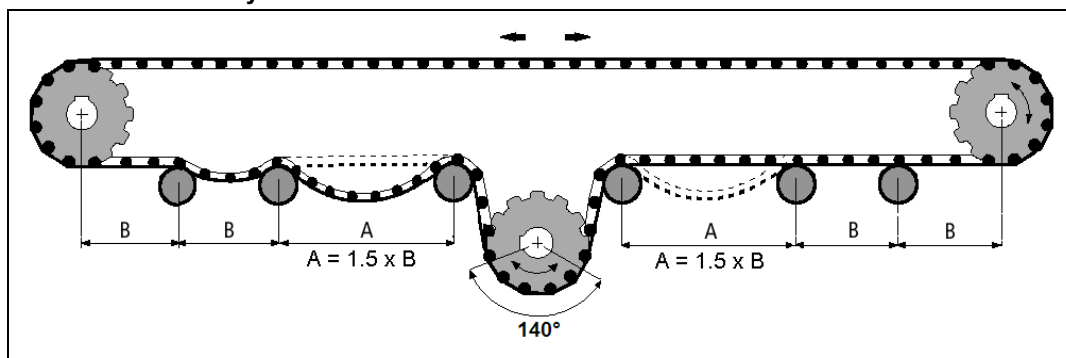
These conveyors have the drivemotor and sprocket at the end of the conveyor

Bi-directional conveyors with End Drive



These conveyors have the drivemotor and sprocket at the end of the conveyor

Bi-directional conveyors with Centre Drive



These conveyor can have a small end roller to reduce the transfer area

Most Rexnord chains have a preferred running direction, which is shown on the underside.

Wrap around angle

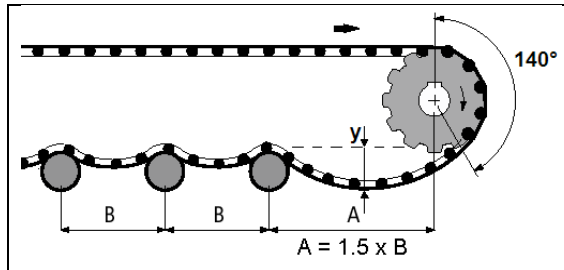
Recommended wrap angle on sprockets is: **140° +/- 10°.**

When the wrap angle is too small, the sprocket will not be able to transfer the load to the chain anymore causing the chain/belt to jump on the sprockets. When the wrap angle is too big, the chain/belt can stick to the sprocket.

Conveyor Design

Catenary sag

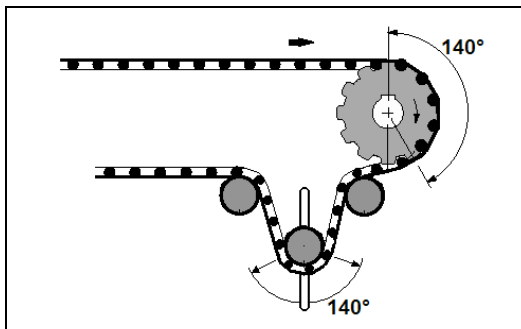
It is recommended to create a catenary sag just behind the sprocket which provides a complete discharge of the chainload and ensures proper running.



type	A (mm)	B (mm)	Vertical sag Y(mm)
Slatband	700	500	50-125
Crate chains	700	N/A ¹⁾	100-300
LBP-chains	700	400 ²⁾	50-100
¹⁾ Use flat returnpart for CC-series chains			
²⁾ Use guide shoes/flat return for LBP chains			

The right vertical catenary sag can usually be obtained automatically by just pulling both ends together and mounting them together. Note the chain can elongate due to strain and wear of the pins and hinge eyes. Therefore it is important to check and adjust the catenary regularly.

Tensioner construction



A tensioner construction is only necessary if the conveyor design does not allow for a proper catenary sag. A tensioner can also be used with declined conveyors, but in all other cases it is not recommended to tension the chain/belt.

The tensioner roller/sprocket can be fixed on an arm or move up and down in slots in the conveyor sideplates. This will bring constant tension, independent of length differences in the chain.

Roller diameter for slatband chains

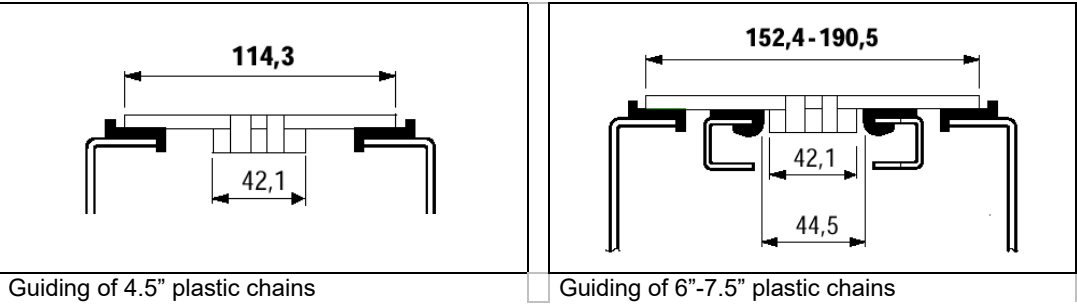
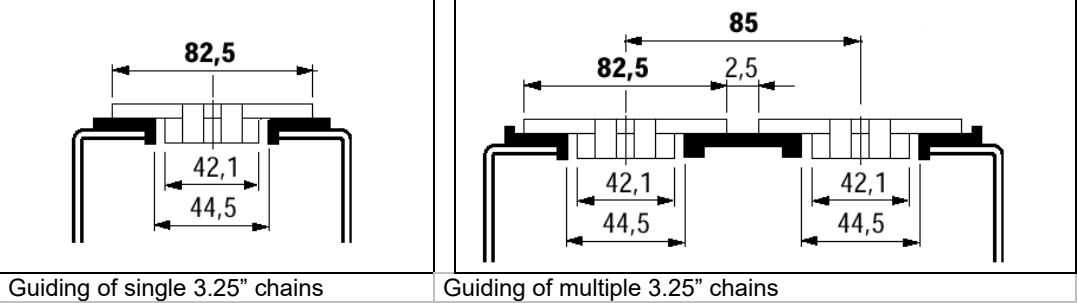
Chaintype	Slatband chains	LBP chains	1040 / 1050 1060
Idler rollers 	> 100mm	>100mm	>100mm
Return rollers 	60-100mm	Guideshoes are recommended	>100mm
Backflex rollers 	300mm	Not recommended	260mm

The recommended roller diameters in the table are an indication. The width of the conveyor is not taken into account. The diameter of the shaft should be large enough to avoid deflection of the roller. At the same time it is recommended not to exceed the maximum diameter, because the roller friction may be too high to be set in motion by the belt.

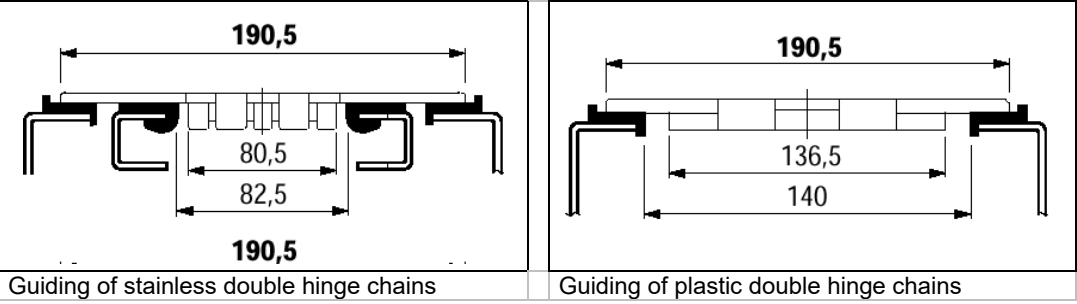
Conveyor Design

Chain support

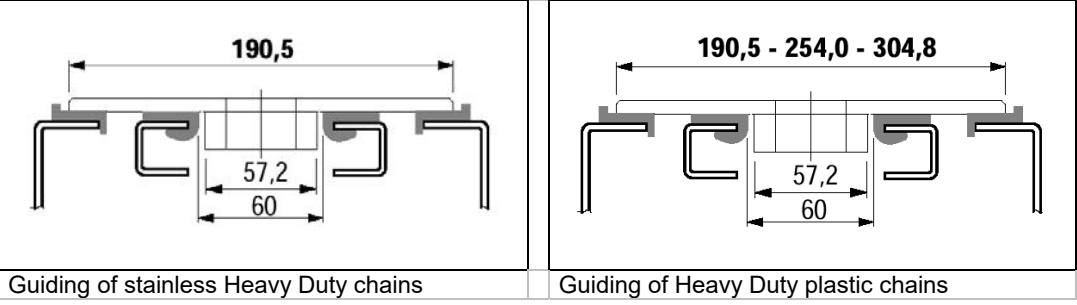
Guiding of slatband chains



Guiding of Double Hinge slatband chains



Guiding of Heavy Duty slatband chains



Conveyor Design

Wearstrips

Wearstrip Materials

Metal wearstrips

Metal wearstrips can be used in most situations using plastic chains and are strongly recommended in abrasive environments.

● **Stainless steel** is recommended for corrosive,

abrasive or high temperature applications

- Abrasive particles are less likely to imbed in metal wearstrips in comparison to plastic
- A cold rolled austenitic grade with a hardness of at least 25Rc is recommended which offers the best corrosion resistant properties
- Hardness is more critical than grade for better wear resistance
- Hot rolled AISI 304 (Werkstoff-Nr. 1.4301) is **not** recommended as wearstrip material.

Plastic wearstrips

Friction is low compared to steel wearstrips. Two types of plastic are suitable to be used as a wearstrip material.

UHMWPE / ULF:

- Most common used wearstrip material with extreme low friction;
- Excellent resistance against many chemicals;
- Virtually no moisture absorption, therefore very suitable for lubricated lines;
- Good dimension stability;
- Reduces some of the noise conveyors produce;
- Suitable for dry running conveyors with speeds up to 100 m/min (ULF) or up to 60 mtr/min (UHMWPE);
- Recommendation: RAM-Extruded UHMWPE (see page EM-TT-08) or Rexnord ULF.

Polyamide:

- Only suitable for dry applications
- Relatively high moisture absorption which makes the material expand;
- Polyamide is also used with additives to reduce the coefficient of friction;
- Suitable for dry running high speed conveyors.

Recommended wearstrip materials

Wearstrip material	Steel chains		Plastic chains	
	Dry	Lubr.	Dry	Lubr.
UHMWPE / ULF	+	+	+ ¹⁾	+ ²⁾
Polyamide	+/-	-	+/-	-
Stainless steel	-	-	+	+
+ Recommended +/- Satisfactory - Not recommended 1) Up to 60 m/min in non abrasive conditions 2) Only in non abrasive conditions				

It is not recommended to use the same material for the wearstrip and chain.

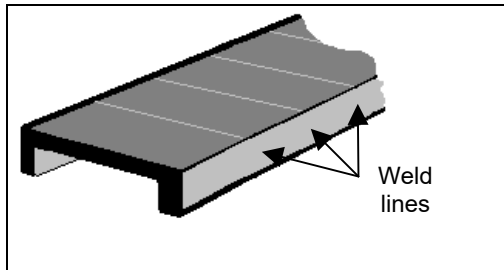
Conveyor Design

UHMWPE Wearstrip Installation

RAM-extruded wearstrips

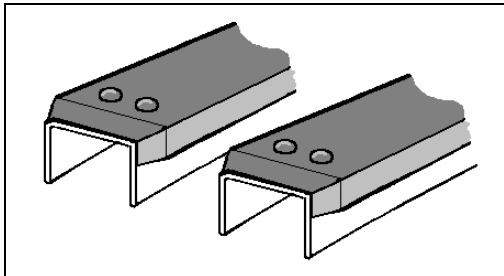
We recommend to use RAM-extruded wearstrips. Main benefits of RAM-extruded UHMWPE wearstrips is that less debris will embed in the material in comparison to worm extruded or machined UHMWPE. This will result in less chain/beltwear.

Ram-extruded wearstrips can be recognized by weld lines which occur with each ram stroke, see drawing.



Chamfering of wearstrips

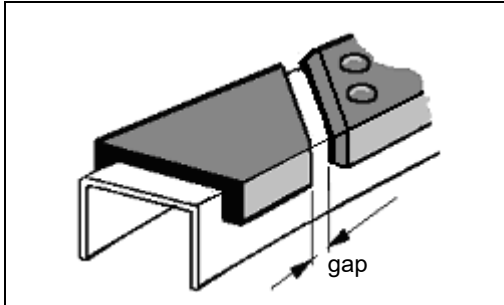
Wearstrips should always be chamfered at the beginning of the strip where they are fixed. Chamfering reduces the risk of chain-obstruction resulting in a smooth operation. The wearstrips should be chamfered at the sides and at the top.



Splitting the wearstrips

On straight sections with a length of more than 3 metres, or for high (40° - 70°C) application temperatures, we recommend to divide the wearstrip into several sections, because of the thermal expansion of the strips.

It is recommended to cut the wearstrips at 45° angles to provide smooth chain/ belt transfers. Make sure only the infeed side of the wearstrip is fixed to the conveyor frame to avoid bulging of the wearstrips.



The gap depends on the expected elongation due to e.g. thermal expansion, see drawing.

■ Calculation example

For MCC1000 UHMWPE material the expansion coefficient is 0.2 mm/m/°C. A temperature increase of 20°C would elongate a 3 meter wearstrip with:

$$20^{\circ}\text{C} * 3\text{mtr} * 0.2 = 12 \text{ mm}$$

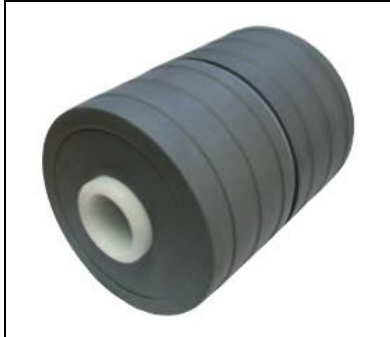
In this case, the gap between the wearstrips should be a bit larger than 12 mm.

We recommend a maximum wearstrip length of 6mtr. with UHMWPE wearstrips.

Conveyor Design

Chain return construction

Rubberized rollers



- + Reduced wear
- + Simple construction.
- + Good accessibility
- + Noise reduction
- + Higher friction between chain and roller ensures free rotation of the rollers
- Only point contact between chain and roller.

Rotating rollers



- + Reduced wear
- + Simple construction.
- + Good accessibility
- + Ejection of debris in the returnpart by the movement of the chain.
- Only point contact between chain and roller.
- Small rollers may cause a rattling sound.

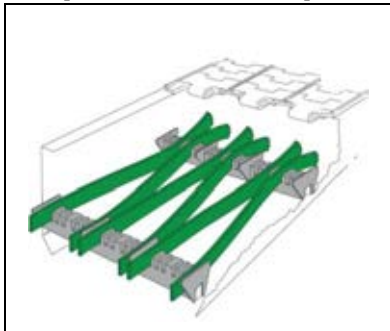
Fixed guide shoes



- + Good accessibility
- + Simple construction.
- + Ejection of debris in the returnpart by the movement of the chain.
- + Required for LBP chains/belts.
- Risk of uneven wear chain surface
- Only point contact between chain and guide shoe.
- High friction.

Minimum guide shoe radius is 200 mm.

Serpentine wearstrips



- + Full support of the chain over the length of the conveyor.
- + Reduced noise in returnpart.
- + Recommended in high speed lines with slatband chains
- Less favorable accessibility for maintenance.
- Less possibility to absorb elongation.
- Uneven wear of the chain/belt when not supported over entire width.
- Higher friction.

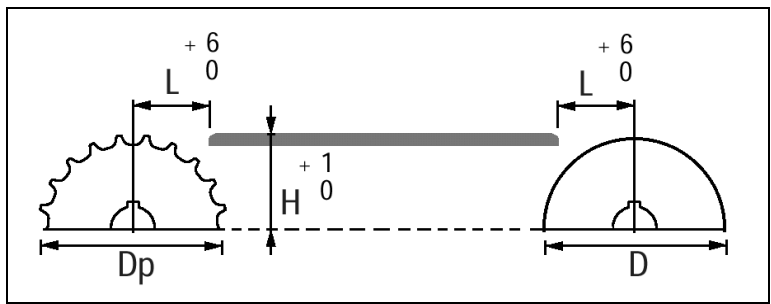
Material used for wearstrips should be UHMWPE. A roller can be used for the infeed onto the serpentine wearstrips

Conveyor Design

Shafts & Bearings

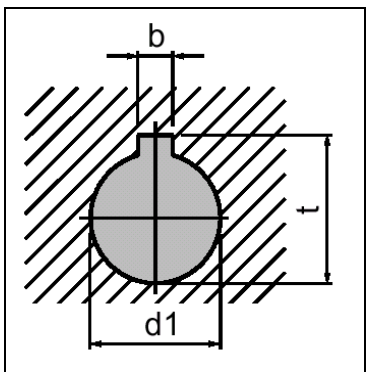
Position sprocket - wearstrips

When the chain enters the sprocket, it tends to raise and fall slightly (chordal action). For this reason the sprockets should be mounted in such a way that its highest point is no higher than the top of the wearstrips. The frond edges of the wearstrips should bevel to allow smooth and free running of the chain. The distance from the end of the wearstrip to the sprocket shaft centerline should equal dimension L, otherwise the wearstrip will interfere with the free articulation of the chain as it enters the sprockets.



Chain type	Drive sprocket H (mm)	L mm	Idler Drum H (mm)	L mm
Steel chains 1.5" pitch SH, SWH, 820, 821	$\frac{Dp}{2} + 3.2$	38.1	$\frac{Dp}{2}$	38.1
Steel chains 661	$\frac{Dp}{2} + 2.0$	25.4	$\frac{Dp}{2}$	25.4
SHD, 831	$\frac{Dp}{2} + 2.4$	38.1	$\frac{Dp}{2}$	38.1
SHP, SRH, RH(D), 880, RHM, RHMP,	$\frac{Dp}{2} + 3.5$	38.1	$\frac{Dp}{2}$	38.1
RHMD, RHMDP, 879,	$\frac{Dp}{2} + 2.8$	38.1	$\frac{Dp}{2}$	38.1
HDS, HDF, HDFM, 882, 883	$\frac{Dp}{2} + 4.7$	38.1	$\frac{Dp}{2}$	38.1
1757	$\frac{Dp}{2} + 13.5$	38.1	$\frac{Dp}{2}$	38.1
1775 ZeroGap	$\frac{Dp}{2} + 14.3$	25.4	$\frac{Dp}{2}$	25.4
1785 ZeroGap	$\frac{Dp}{2} + 11.0$	48.0	$\frac{Dp}{2}$	48.0

Keyway dimensions of Rexnord sprockets



d1 (mm)	b (mm)	t (mm)
25mm	8	28.3
30mm	8	33.3
35mm	10	38.3
40mm	12	43.3
45mm	14	48.8
50mm	14	53.8
60mm	18	64.4

d1 (inch)	b (inch)	t (inch)
1"	1/4	1 1/8
1 1/4"	1/4	1 3/8
1 1/2"	3/8	1 9/16
1 3/4"	3/8	1 15/16
2"	1/2	2 1/4

Conveyor Design

Shafts

In all situations stainless steel is recommended for shaft material. Metalloxydes that come from a rusty shaft are extremely abrasive and would therefore reduce the wearlife of the conveyor components. It is also important to use shafts with a sufficient hardness and a smooth surface. The shaft diameter depends on the conveyor load and its width. For slatband chain sprockets round shafts are used.

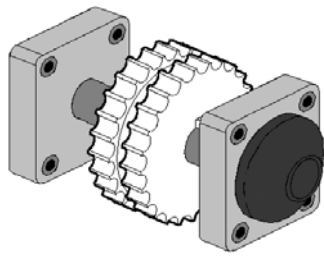
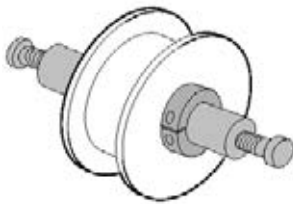
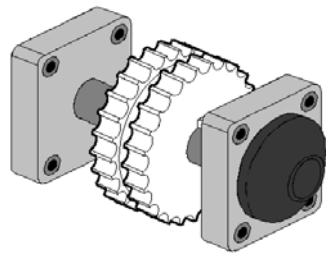
Maximum deflection of the shaft must not exceed 2 mm. Depending on the load and shaftlength, it can be necessary to use a larger diameter shaft or an extra bearing in the middle of the shaft to reduce the shaft deflection.

Shaft tolerances

It is important that the tolerance of the shaft meets the specifications of the sprocket, so the sprocket can slide over the shaft at all times. In combination with all MCC sprockets the following shaft specifications are required, depending on the shaft diameter.

Dimension (mm)	Shaft tolerance (mm)	Idler shaft surface finish (µm)
Round shaft		
< Ø 90	max h 9 (ISO)	0.8
> Ø 90	Max h 11 (ISO)	1.2

Bearings

Drive sprocket	Idler	
	drum	sprocket
		
Shaft with keyway equipped with bearings	Fixed idler shaft without keyway. The idler drum rotates freely on the shaft. Suitable for lower speed < 30mtr/min dry run < 60mtr/min well lubricated	Idler shaft with keyway equipped with bearings for higher conveyor speed > 30mtr/min dry run > 60mtr/min well lubricated In poluted area's an idler shaft with bearings is recommended.

Before selecting bearings, check which chemicals will be present. Also check if dust and water are present. Sealed bearings have a better protection against dust. Also use bearings with high mechanical and heat resistance for a longer wearlife of the construction.

Make sure the edges of the shaft are rounded off to ease assembly and to avoid damage to the rubber parts of the bearing sealing units.

Fix sprockets with lowest speed

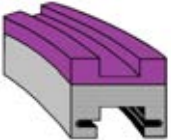
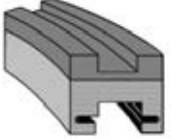
When the speed of the idler sprockets on the same shaft is different, we recommend fixing the sprocket with the lowest speed to the shaft. This way the relative speed difference which occurs between the shaft and the other idler sprockets is as low as possible and the fixed idlers will not drive the slower moving idlers. This case all other idler sprockets must be able to rotate independently.

Conveyor Design

Curves

Magnetflex® curve materials

Magnetflex® curves are available in several materials, each for specific applications, see below.

Curve	Color	Properties & Applications	Notes
Combi A MCC 1200		High grade UHMWPE for good wear and abrasion resistance. Suitable for most applications with steel and plastic chains.	Lubricated or dry running
Combi G MCC 2000		Special UHMWPE with ceramic additives for superior abrasion resistance For abrasive conditions with stainless steel chains	Lubricated or dry running
Combi S MCC 3500		Special polyamide for high PV limits and optimum wear resistance. Suitable for dry running high speed conveyors equipped with plastic chains. Also suitable for abrasive conditions.	Dry running only
Combi X MCC 5000		New hybrid construction with high performance ULF-material ensures high wear resistance and very low friction. For dry and lubricated applications with plastic and stainless steel chains.	Lubricated or dry running
Return part material is MCC 1001 UHMWPE, return guide shoe material is MCC 1000 UHMWPE			

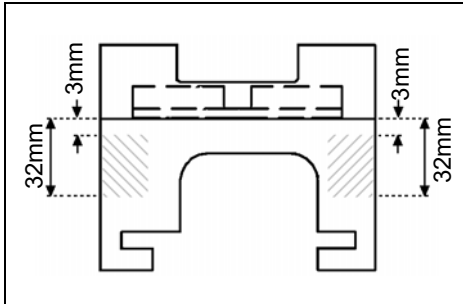
APPLICATION							
CURVE MATERIAL	Lubricated, clean, stainless steel chains, plastic chains	Lubricated, abrasive, stainless steel chains	Lubricated, abrasive, plastic chains	Dry running, low speed, abrasive, steel chains	Dry running, low speed, clean, plastic chains	Dry running, high speed, clean, plastic chains	Dry running, high speed, abrasive, plastic chains
Combi-A							
Combi-G							
Combi-S							
Combi-X							

Conveyor Design

Curve installation

For Magnetflex® curves, the following installation recommendations should be taken into account.

Installing Magnetflex® curves

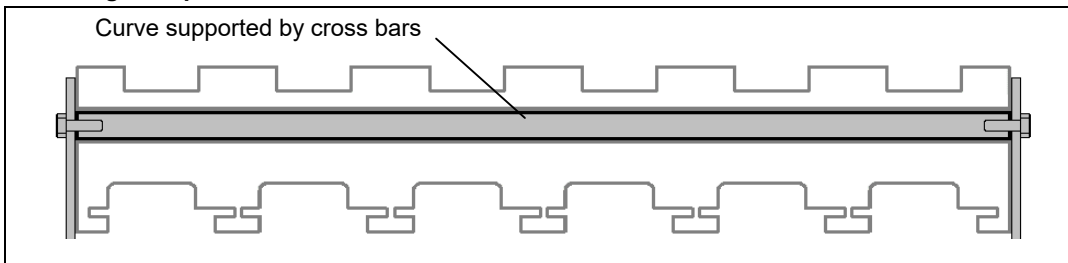


Magnetflex® curves are mounted to the conveyor frame using inserts in the curve returnpart. The upperpart is fixed to the returnpart with screws.

It is important to take care of the position of the inserts. Magnetflex® curves should only be drilled in the underpart, taking the dimensions into account shown in the drawing.

Note: Always check returnpart for protruding bolts, which could obstruct the chain.

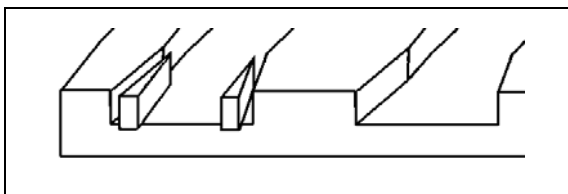
Installing multiple track curves



For multiple track curves (>500mm) we recommend to support the curve upperpart and the curve returnpart with cross bars.

Note: make sure the curve is mounted level, and the conveyor frame is positioned level

Chamfering the curve infeed

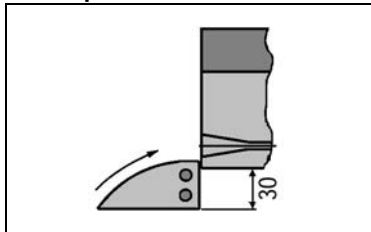


All upperpart infeed sides should be chamfered to ensure a smooth running of the chains. Make sure the chamfered parts stay vertical. The chamfering of the curves has to be done only at the infeed sides.

Magnetflex® guide shoe installation

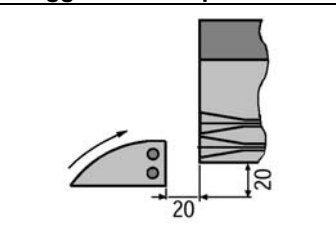
The MCC return guideshoes helps the chain run into the returnpart. The return guideshoe has to be mounted at the infeed side of the return part of the curve.

Returnpart at same level



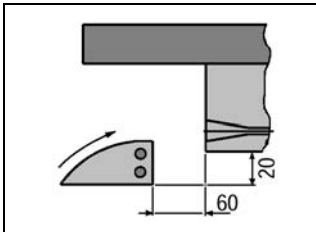
Returnpart guideshoe should be mounted against infeed of underpart, with underside of the guideshoe 30 mm lower than the curve underside.

Staggered returnpart



Curves with a track pitch of less than 89 mm, feature a staggered returnpart. Returnpart should be mounted 20 mm off the curve infeed.

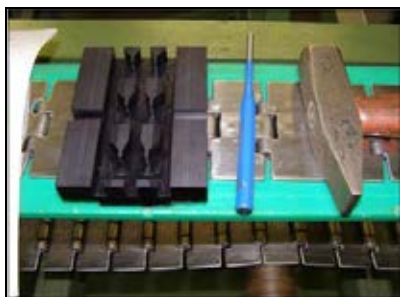
1050/1055 chainbelts



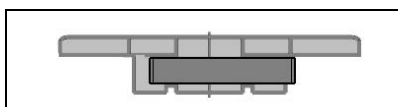
The infeed shoe should be positioned 20 mm below the curve infeed, at distance of 60 mm.

Installation of TableTop chains

- Chains can be installed using **Rexnord chain tool**, hammer and a punch.



Pins should be positioned exactly in the middle of the hinge eyes.



Wrong assembly. If pins stick out the chain can jam.

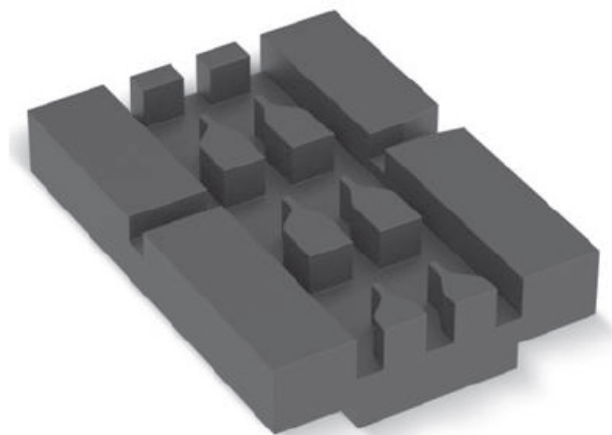
- Pins in plastic chains should have the knurl on the same side, and this knurled side should be put in the chain last. D-style pins have no direction preference.
- Check running direction, since the chain should always be driven at the fixed hinge eyes. Running direction is shown at the underside of the chain.
- Do not tension the chain when installing. Tensioning will result in a higher chainload and more wear of components. During installation the proper tension is manually achieved.
- It is recommended to install chains made from DKA material with the use of our machined assembly tools.

Chain Tools

Rexnord have for most chains an assembly tool available for installing or removing the pin of the chain.

Chain tools for the following chains are available:

- | | |
|---|------------------|
| • Plastic & Metal Table Top Chain with 1.5" Pitch | (Code: 10143737) |
| • Metal Heavy Duty Table Top Chain | (Code: 10360631) |
| • Metal Table Top Chain 661 Series | (Code: 10361105) |
| • Metal Table Top Chain Heavy Duty Double Hinge | (Code: 10360579) |



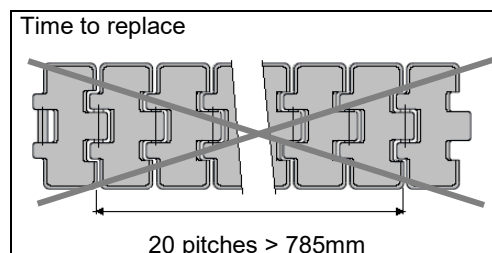
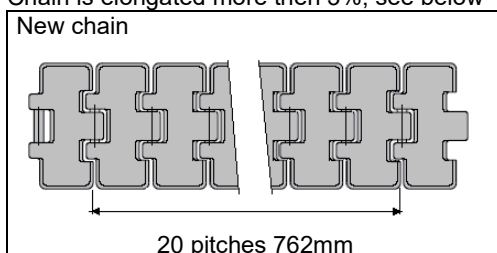
Chain inspection & maintenance

- Check the condition of the chain regularly, and replace links which are damaged. Important in this matter is to try to find the cause of the damaged links. Wear patterns or damage on a chain can often lead you to a problem area elsewhere in the conveyor.
- Check the amount of catenary sag and remove links or modules when the catenary of the chains exceeds prescriptions. Remember catenary grows during full load.
- Check if the rollers turn freely, repair or replace (with rubberized rollers) if not.
- In case of lubrication check if the lubrication system operates properly.
- Check carryways and wear strips for excessive wear or peculiar wear patterns.
- Check positions of transfer plates and check the fingerplates for broken/ worn parts and repair or replace if necessary.

Chain replacement

We recommend replacement of slatband chains, if the following is the case:

- Chain is elongated more then 3%, see below



- The thickness of the toplate of the slatband chain is reduced to 2.0 mm
- The surface becomes unflat or very rough due to (uneven) wear, especially in applications where product handling is critical. Also replace if the side of the hinge of sideflexing chains wears away and exposes the pin.
- The chain jumps on the sprocket
- It is also important to look at the position of the chain in the production line. Chains that run on a no-pressure inliner have to be replaced all at once. If only one chain is replaced there will be a chance of unacceptable height differences, which could result in products topping over.



Appendix

Cleaning Instructions

Introduction

For each application in each industry cleaning is important to achieve good hygiene and prevent or reduce:

- Contamination;
- Decrease of product safety;
- Decrease of product shelf life;
- Build up of Biofilm.

Nevertheless daily cleaning increases belt life and performance and prevents:

- Additional load on the belt and motor;
- Accelerated wear on the sprocket teeth;
- Jerky running of the conveyor and additional wear;
- Increased wear on the modules and in the belt hinge;
- Rapid wear of the wear strips.

Also a clean work environment motivates a higher personal hygiene and results in a higher productivity and quality. The company objective reflects more in case of a clean work environment.

All *Rexnord* Kleantop belts are designed for good cleanability. In general no closed or hidden pockets but large open areas and smooth surfaces; rod retention area have no rims or hidden areas but are open and accessible and a general good accessibility for cleaning.

Note: *The main objective is to clean the belt carrying surface and underside of the belt as well as the wearstrips, rollers, sprockets and all other belt contact areas.*

Note: Rexnord MCC sideflexing belts are provided with positracks guiding lugs. This allows the belt to be easily lifted from the curve (and other conveyor sections) for cleaning purposes.

Note: *Inspect conveyors often. Remove spillage or other not wanted residues as soon as they are detected. Use cleaning solutions to clean excessive spillage.*

General guidelines for cleaning solutions

1. Acceptable PH 4-10. Recommended PH 7.
2. Avoid chorine (bleach), ammonia and Iodine in all cases.
3. With plastic belts, avoid phosphoric acid (found in many stainless steel cleaners).
4. Refer to the enclosed corrosion resistance guide to determine compatibility or check with your supplier of cleaning agents.

HOW TO CLEAN

Below are typical phases in a food surface-cleaning programme. Each industry must determine which cleaning programme will result in the best hygiene and most economic cleaning operation in their specific situation.

Rexnord MCC does not specify cleaning instructions. Based on experience, *Rexnord MCC* points out general guidelines. Use these as a supplement for your own cleaning programme.

1. PRE-CLEAN

Remove excess food, dirt or other residues. If large quantities of foreign materials and/or spilled products have accumulated, the conveyor should be cleaned. Minimise the risk of trapped micro organism into the belt surface, therefore do not damage the belt surface by sweeping, wiping with sharp tools. Cleaning tools as soft sweeping-brush and warm water generally used for this purpose.

Recommended water temperature: 55 – 60 Degrees Celsius.

Most common water pressure: 70 - 80 bar.

Recommended pre-clean procedure: (running conveyor)

1. Conveyor Rinse every sprocket and belt contact area separately. (**)
2. Upper part Start rinsing opposite to the running direction of the belt. (*)
3. Return part Rinse opposite to the running direction of the belt. (*)
4. *Make sure that all food, dirt and other residues are removed.*

2. MAIN CLEAN

Removes more firmly adhering food residue, grease or dirt. Usually detergents (foam or gel) are used to emulsify food particles and reduce surface tension. Detergents or other chemical cleaners may be used if they not damage or discolour the belt material. Carefully follow the instructions provided by the detergent supplier to determine proper concentration of solutions, necessary time, and proper, safe use and disposal. In case of doubt, please contact your cleaning agent supplier for recommendations.

Recommended main clean procedure: (stationary or running conveyor)

1. Upper part Apply the detergent opposite to the running direction of the belt. (*)
2. Conveyor Apply the detergent every sprocket and belt contact area separately. (**)

Cleaning Instructions

3. Return part Apply the detergent opposite to the running direction of the belt. (*)
4. Make sure the detergent is covering the belt and each contact area completely.

3. RINSE

Removes detergents and emulsified / dissolved dirt and grease. High-pressure hot water should prove satisfactory.

Recommended water temperature: 55 – 60 Degrees Celsius.
Most common water pressure: 70 - 80 bar.

Recommended rinse procedure: (stationary or running conveyor)

1. Conveyor Rinse every sprocket and belt contact area separately. (**)
2. Upper part Start rinsing opposite to the running direction of the belt. (*)
3. Return part Rinse opposite to the running direction of the belt. (*)
4. *Make sure that all detergent and emulsified / dissolved dirt and grease is removed.*

4. DESINFECT

Further reduction in the number of micro-organisms. To minimise the risk of cross contamination a disinfectant or sanitation agent is used to increase product life and shelf life. Carefully follow the instructions provided by the manufacturer to determine proper concentration of solutions, necessary time, and proper, safe use and disposal. In case of doubt, please contact your supplier for recommendations.

Recommended disinfecting procedure: (running or stationary conveyor)

1. Upper part Start disinfecting opposite to the running direction of the belt. (*)
2. Conveyor Disinfect every sprocket and belt contact area separately. (**)
3. Return part Disinfect opposite to the running direction of the belt. (*)
4. *Make sure that the disinfectant covering the belt and contact area completely.*

5. FINAL RINSE

Removed traces of disinfectant. Tap water should prove satisfactory.

Recommended water temperature: ambient temperature.
Most common water pressure: tap water pressure

Recommended rinse procedure: (running or stationary conveyor).

1. Conveyor Rinse every sprocket and belt contact area separately. (**)
2. Upper part Start rinsing opposite to the running direction of the belt. (*)
3. Return part Rinse opposite to the running direction of the belt. (*)
4. *Make sure that all disinfectant residues are removed completely.*

6. DRY

Dry the conveyor belt. Dry conveyor belts and surfaces reduce the possibility for micro-organisms to develop on the clean surface. Use disposable materials to minimise recontamination or use the open air.

7. TEST

Frequently swap or contact plate tests must be performed done to make sure the applied cleaning procedures achieve a good hygiene-level.

- *) Be aware that the belt must run minimum one cycle.
- *) The best possible position for cleaning the hinge eyes is at the idler side of the belt.
- **) *Sprockets must be cleaned separately in each possible direction with a running conveyor.*
- **) *Other belt contact area (wearstrips, support, frame, etc.) must be also cleaned separately in each possible direction.*

Note: *Belts equipped with Microban must be cleaned normally as belts without. Microban is no substitute for detergents-, disinfectants-, sanitation agents and cleaning.*

Note: *Be aware that temperature changes can influence the mechanical properties and thermal expansion.*

Note: *Be aware that the used cleaning agents are compatible with all materials used in the conveyor. In case of doubt please, contact your supplier for recommendations.*

Note: *Keep water, steam and chemicals away from electrical disconnects motors, photo cells etc.*

Note: *If conveyors are going to sit idle for a long time before start-up, they must be covered with plastic or drop cloth to minimise dirt and debris than can settle into the belt and tracks.*

Note: *Before start-up, remove any tools, fasteners, or other items that may have been left behind. Thoroughly clean belt, wear strip and tracks (carry and return) with air hose or high pressure water spray.*

Fire-, Cleaning- and Safety Hazards

FIRE HAZARD

PLEASE ALWAYS REMEMBER THAT PLASTIC MATERIALS ARE GENERALLY GOING TO BURN WHEN IN CONTACT WITH FLAME.

SPECIFICALLY ACETAL MATERIALS WILL BURN ALSO WHEN IN CONTACT WITH VERY HIGH TEMPERATURE PARTICLES, LIKE HOT WELDING DRIPS OR METAL DEBRIS.

IF ANY FLAME CUTTING, WELDING, ETC. IS DONE NEAR CONVEYORS, PROTECT THE CHAIN. AND OTHER COMPONENTS OR REMOVE THEM AND STORE THEM IN A SAFE LOCATION.

NEVER WELD OR CUT METAL WITH HIGH SPEED TOOLS IN PROXIMITY OF CONVEYORS WHEN ACETAL BELTS ARE ALREADY IN PLACE!

THERMOPLASTICS BURN AND GIVE OFF TOXIC FUMES.

CLEANING HAZARD

ALL CLEANING AGENTS AND LUBRICANTS MUST BE COMPATIBLE WITH THE BELT, WEARSTRIPS AND SPROCKET MATERIALS.

IN CASE OF DOUBT, PLEASE CONTACT YOUR CLEANING- / LUBRICANT MANUFACTURER FOR ASSISTANCE.

IT IS RECOMMENDED THAT STEAM NOT BE HELD ON THE BELT FOR PROLONGED PERIODS.

THE BELT MAY DEFORM OR BECOME PERMANENTLY DAMAGED.

STRONG CAUSTIC AGENTS SHOULD NOT BE USED WITH PLASTIC BELTS.

ALWAYS THOROUGHLY RINSE ALL CLEANING AGENTS COMPLETELY OFF THE BELT AND CONVEYOR FRAME. THIS APPLIES ALSO FOR THE UNDERSIDE OF THE BELT.

SAFETY HAZARD

NEVER WALK ON CONVEYORS. IF IT IS ABSOLUTELY NECESSARY FIRST COVER THE BELT AND TRACKS WITH CLEAN CARDBOARD AND THEN CLEAN-UP AFTERWARDS.

BEFORE WORKING INSIDE CONVEYOR FRAMES OR COMING IN CONTACT WITH CONVEYOR COMPONENTS, ALWAYS MAKE SURE ALL DRIVES ARE LOCKED OUT AND TAGGED.

TO AVOID PERSONAL INJURY, ALL MACHINERY MUST BE TURNED OFF AND LOCKED OUT, PRIOR TO BELT INSTALLATION, INSPECTION, MAINTENANCE AND REMOVAL.

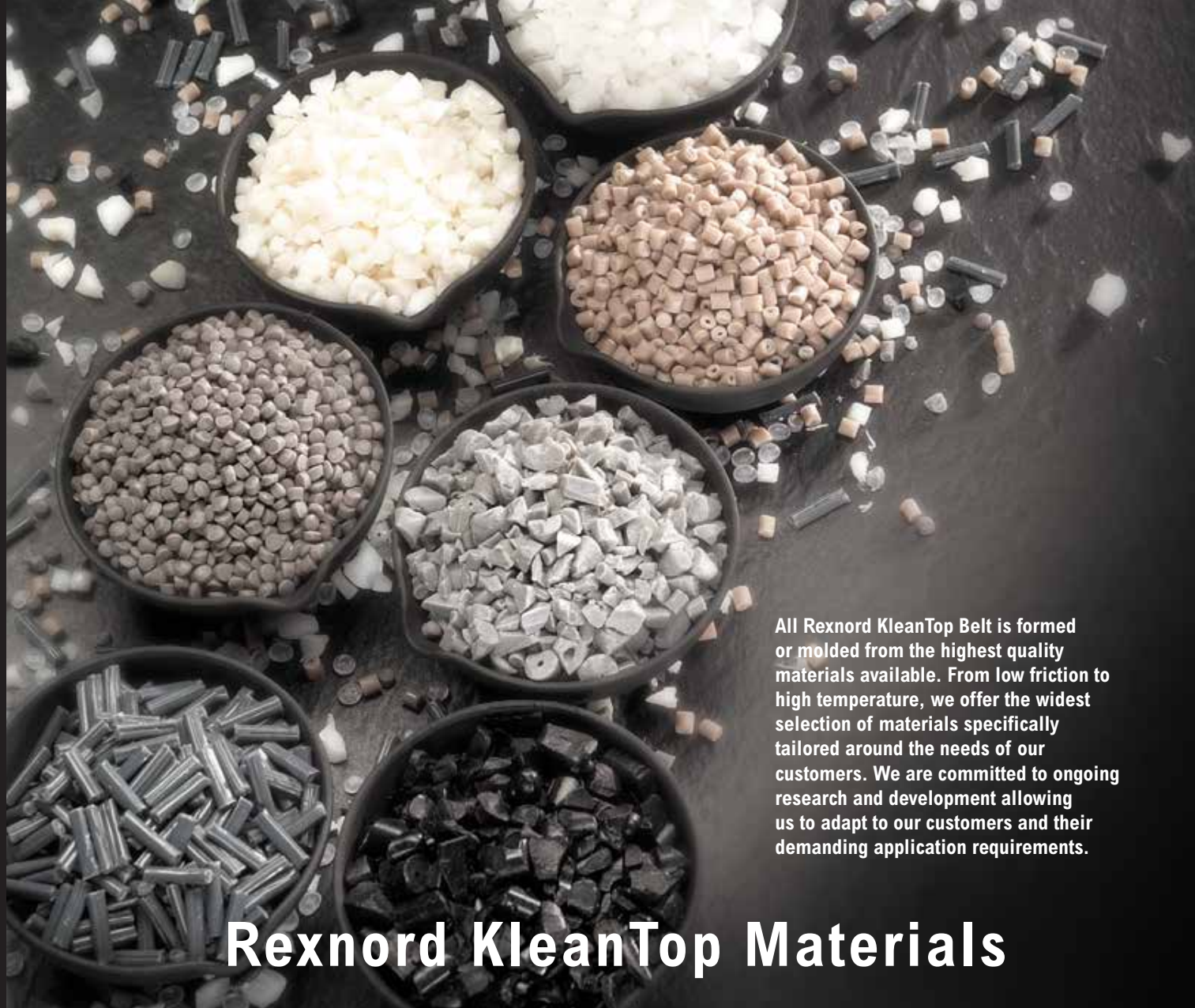
ALLWAYS WEAR SAFETY GLASSES.

DO NOT ATTEMPT TO CONNECT OR DISCONNECT THE BELT UNLESS THE BELT CONSTRUCTION IS CLEARLY KNOWN AND UNDERSTOOD.

Responsibility

INFORMATION IN THIS MANUAL IS GIVEN AS HELP AND SERVICE FOR OUR CUSTOMERS. REXNORD DOES NOT GUARANTEE PRECISION, UPDATING AND SPECIFIC APPLICABILITY OF THE INFORMATION AND REJECTS ANY RESPONSIBILITY ON DAMAGES TO PROPERTY OR INJURIES TO PERSON(S) DIRECTLY COMING FROM WRONG CONVEYOR DESIGN, INSTALLATION OR IMPROPER USE OF OUR PRODUCTS MADE WITH OR WITHOUT REFERENCE TO THE INFORMATION HEREWITH REPORTED.

IT IS RESPONSIBILITY OF THE PURCHASER TO PROVIDE PROPER GUARDS, SAFETY DEVICES AND PROCEDURES AS RECOMMENDED BY SAFETY CODES AND SAFETY STANDARDS. REXNORD DOES NOT GUARENTEE THAT DESIGN AND FUNCTION OF MACHINES EQUIPPED WITH OUR PRODUCTS ARE COMPLIANT WITH APPLICABLE LOCAL, EUROPEAN OR USA FEDERAL LAWS OR REGULATIONS.



All Rexnord KleanTop Belt is formed or molded from the highest quality materials available. From low friction to high temperature, we offer the widest selection of materials specifically tailored around the needs of our customers. We are committed to ongoing research and development allowing us to adapt to our customers and their demanding application requirements.

Rexnord KleanTop Materials

MATERIAL INDEX

Material Prefix	Description	Page	Primary Components	FDA Approved
BHT	Blue High Temperature	55	Polypropylene (PP)	Yes
BLT	Blue Low Temperature	57	Polyethylene (HDPE)	Yes
FTR	Fryer Temperature Resistant	56	Fryer Temperature Resistant Nylon (PA).	Yes
SMB	Blue Cut Resistant	58	Cut and abrasive wear resistant acetal (POM)	Yes
WHT	White High Temperature	55	Polypropylene (PP)	Yes
WLT	White Low Temperature	57	Polyethylene (HDPE)	Yes
WSM	White Cut Resistant	58	Cut and abrasive wear resistant acetal (POM)	Yes

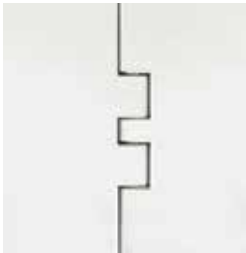
BHT



Brief Description

Formulated to be used in both high temperature and general applications in both dry and wet conditions. A good general purpose conveyor chain material and in addition has excellent resistance to chemicals including salts, alcohol, bases and many acids.

WHT



Primary Components

Polypropylene (PP)

General Information

Prefix	Material	Temperature						FDA Approval
		Fahrenheit			Celsius			
		min	max		min	max		
			dry	wet		dry	wet	
WHT	White High Temperature	40	220	212	4	104	100	Yes
BHT	Blue High Temperature	40	220	212	4	104	100	Yes

Friction Factors Between Material and Product

Operating Condition	Product Material						
	Aluminum	Returnable Glass Bottles**	Non-Returnable Glass Bottles	Paper	Plastic (crates, shrink wrap, etc)	PET	Steel
Dry	0.29	0.29	0.24	0.35	0.32	0.28	0.31
Water	0.19	0.21	0.18	NR	0.24	0.20	0.25
Soap and Water	0.15	0.14	0.10	NR	0.19	0.15	0.17
Oil	---	---	---	NR	---	---	0.10

Friction Factors Between Material and Wearstrips

Operating Condition	Wearstrip Material			
	Carbon and Stainless Steel	UHMWPE	Nylatron ⁺	ULF
Dry	0.35	0.30	0.30	0.26
Water	0.30	0.25	0.25	0.22
Soap and Water	0.25	0.20	0.20	0.19
Oil	0.10	0.10	0.10	0.10

1. Buoyant in water.

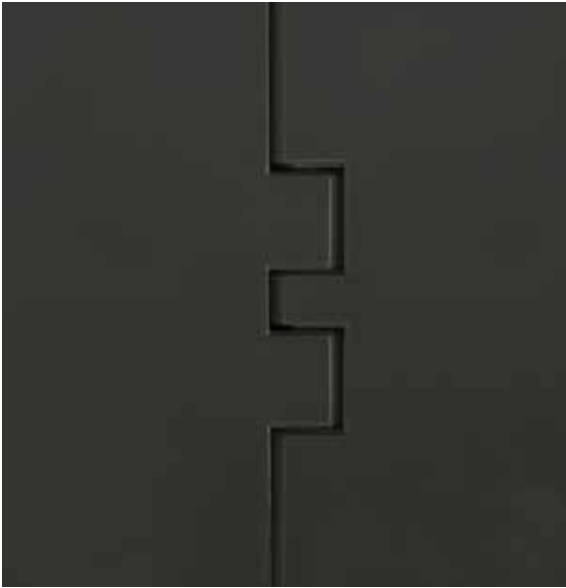
Regulatory Information

The Food and Drug Administration (FDA) accepts certain materials for direct food contact. FDA approved material is compliant to FDA 21 CFR § 177.

⁺Nylatron[®] is a registered trademark of Quadrant Engineering Plastics Products. All rights reserved.

**Friction of returnable bottles will vary depending on the quality of the glass, the amount of roughed-up surface, etc.
NR denotes "not recommended", Dash denotes "combination not tested"

FTR



Brief Description

Formulated to be used in oven / fryer discharge conveyor applications where the chain is exposed to high temperatures. Can resist contact temperatures up to 350°F (177°C). Used to convey high temperature products such as chips.

Primary Components

Fryer temperature resistant nylon (PA)

General Information

Prefix	Material	Temperature						FDA Approval
		Fahrenheit			Celsius			
		min	max		min	max		
			dry	wet		dry	wet	
FTR	Fryer Temperature Resistant (Black)	-80	220	NR	-62	104	NR	Yes

Friction Factors Between Material and Product

Operating Condition	Product Material						
	Aluminum	Returnable Glass Bottles**	Non-Returnable Glass Bottles	Paper	Plastic (crates, shrink wrap, etc)	PET	Steel
Dry	0.25	0.27	0.20	0.33	0.25	0.25	0.30
Water	NR	NR	NR	NR	NR	NR	NR
Soap and Water	NR	NR	NR	NR	NR	NR	NR
Oil	NR	NR	NR	NR	NR	NR	NR

Friction Factors Between Material and Wearstrips

Operating Condition	Wearstrip Material			
	Carbon and Stainless Steel	UHMWPE	Nylatron [‡]	ULF
Dry	0.30	0.28	0.28	0.25
Water	NR	NR	NR	NR
Soap and Water	NR	NR	NR	NR
Oil	0.10	0.10	0.10	0.10

Regulatory Information

The Food and Drug Administration (FDA) accepts certain materials for direct food contact. FDA approved material is compliant to FDA 21 CFR § 177.

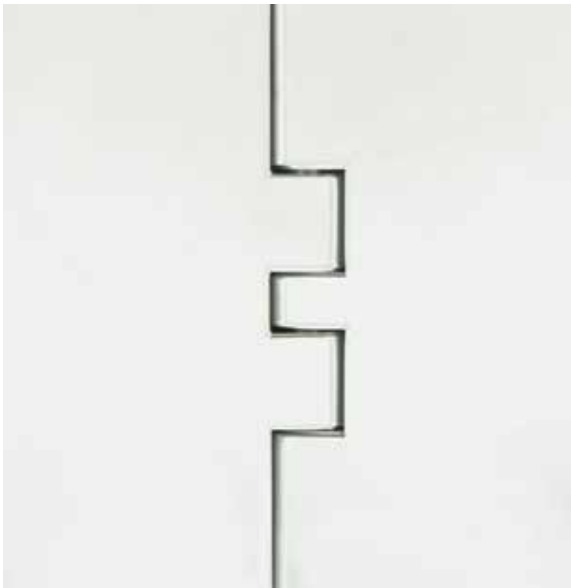
[‡]Nylatron[®] is a registered trademark of Quadrant Engineering Plastics Products.

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**Friction of returnable bottles will vary depending on the quality of the glass, the amount of roughed-up surface, etc.

NR denotes "not recommended", Dash denotes "combination not tested"

WLT



BLT



Brief Description

Formulated to retain toughness, impact strength and ductility in both dry and wet conditions. Retains its properties in temperatures as low as -100 °F (-73 °C). Has excellent impact resistance, and because of its inherent ductility, is excellent in applications where other materials may chip or fracture. Is also chemical resistant to most bleaches, bases, acids and hydrocarbons.

Primary Components

Polyethylene (HDPE)

General Information

Prefix	Material	Temperature						FDA Approval
		Fahrenheit			Celsius			
		min	max		min	max		
			dry	wet		dry	wet	
WLT	White Low Temperature	-100	80	80	-73	27	27	Yes
BLT	Blue Low Temperature	-100	80	80	-73	27	27	Yes

Friction Factors Between Material and Product

Operating Condition	Product Material						
	Aluminum	Returnable Glass Bottles**	Non-Returnable Glass Bottles	Paper	Plastic (crates, shrink wrap, etc)	PET	Steel
Dry	0.22	0.24	0.18	0.30	0.22	0.22	0.28
Water	0.17	0.17	0.14	NR	0.18	0.18	0.22
Soap and Water	0.12	0.14	0.10	NR	0.15	0.15	0.15
Oil	---	---	---	NR	---	---	0.10

Friction Factors Between Material and Wearstrips

Operating Condition	Wearstrip Material			ULF
	Carbon and Stainless Steel	UHMWPE	Nylatron [‡]	
Dry	0.28	0.23	0.23	0.21
Water	0.22	0.20	0.20	0.19
Soap and Water	0.15	0.15	0.15	0.14
Oil	0.10	0.10	0.10	0.10

1. Buoyant in water.

Regulatory Information

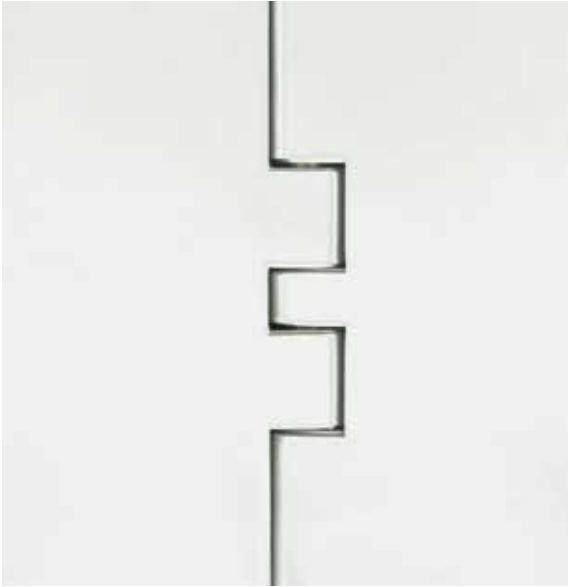
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**Friction of returnable bottles will vary depending on the quality of the glass, the amount of roughed-up surface, etc.

NR denotes "not recommended", Dash denotes "combination not tested"

WSM



SMB



Brief Description

Formulated to be used in applications when superior wear and cut resistance is required. Can be used in both dry and wet conditions and in applications where abrasive wear due to products or environment is a concern. Cut resistant materials are commonly used in the meat processing industry on cutting, boning and trimming lines. Has good impact resistance and is as strong as standard acetal materials.

Primary Components

Cut and abrasive wear resistant acetal (POM)

General Information

Prefix	Material	Temperature						FDA Approval
		Fahrenheit			Celsius			
		min	max		min	max		
			dry	wet		dry	wet	
WSM	White Cut Resistant	-40	180	150	-40	82	66	Yes
SMB	Blue Cut Resistant	-40	180	150	-40	82	66	Yes

Friction Factors Between Material and Product

Operating Condition	Product Material						
	Aluminum	Returnable Glass Bottles**	Non-Returnable Glass Bottles	Paper	Plastic (crates, shrink wrap, etc)	PET	Steel
Dry	0.25	0.27	0.20	0.33	0.25	0.25	0.30
Water	0.17	0.18	0.15	NR	0.20	0.20	0.22
Soap and Water	0.12	0.14	0.10	NR	0.15	0.15	0.15
Oil	---	---	---	NR	---	---	0.10

Friction Factors Between Material and Wearstrips

Operating Condition	Wearstrip Material			
	Carbon and Stainless Steel	UHMWPE	Nylatron [†]	ULF
Dry	0.30	0.25	0.25	0.20
Water	0.23	0.21	0.21	0.18
Soap and Water	0.15	0.15	0.15	0.15
Oil	0.10	0.10	0.10	0.10

Regulatory Information

The Food and Drug Administration (FDA) accepts certain materials for direct food contact. FDA approved material is compliant to FDA 21 CFR § 177.

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**Friction of returnable bottles will vary depending on the quality of the glass, the amount of roughed-up surface, etc.

NR denotes "not recommended", Dash denotes "combination not tested"

Chemical Table



Resistance against chemical agents	POLYAMIDE PA		POLYPROPYLENE PP		POLYETHYLENE PE		ACETAL POM		AISI 303 AISI 304		AISI 316		NICKEL PLATED BRASS		NBR RUBBER		VITON RUBBER	
CHEMICAL AGENT	Conc.% 23°C		Conc.% 23°C		Conc.% 23°C		Conc.% 23°C		Conc.% 23°C		Conc.% 23°C		Conc.% 23°C		Conc.% 23°C		Conc.% 23°C	
ACETIC ACID	10	–	40	+	10	+	5	-	20	+	50	+		/		–	20	–
ACETONE	100	+		+		+		/	50	+	25	+		+		–		–
ALUMINIUM CHLORIDE	10	+								–	/				+	Sat.	+	
AMMONIA	10	+	30	+		+	Sol.	+	50	+	100	+		–		/		/
AMMONIA CONC.		+		+		+		-								–		
AMMONIUM CHLORIDE	10	+							10	/		/				+	Sat.	+
AMYL ALCOHOL	100	+		+						+		+						+
ANILINE		/	100	+	3	+	3	+	3	+						–		
BEER		+		+		+		+		+				+		+		+
BENZENE		+		+		/		+	70	/						–		
BENZOIC ACID	Sat.	/	Sat.	+					100	/	100	+				+		+
BENZOL	100	+		/		/		+		+		+		+		–		/
BORIC ACID	10	+	Sat.	+	Sat.	+		+	100	/	Sat.	+				+	Sat.	+
BRINE		/	Sat.	+		+		/								+		
BUTTER		+		+		+		+		+				+		+		+
BUTYL ALCOHOL	100	+		+						+		+				/		+
BUTYRIC ACID		–	100	+		+		-	5	+						–		
CALCIUM CHLORIDE	10	+	50	+	Sat.	+		/	10	–		/		+		+	Sat.	+
CARBON SULPHIDE	100	+		+		+		+		+		+				–		+
CARBON		+		–		/		+	10	–		+		+		–		+
CAUSTIC SODA	10	+	52	+	25	+	25	-		+						/	45	+
CHEESE		–		+		+		+								+		
CHLORINATED WATER		+		–		-		-		–						–		
CHLOROFORM	100	–		/		-		-	100	+		+		+		–		+
CHOCOLATE		–				+		+								+		
CITRIC ACID	10	/	10	+		+		/	5	+	25	+		–		+	Sat.	+
CUPRIC SULPHATE	10	+	Sat.	+		+		+	5	+	100	+				+	Sat.	+
DISTILLED WATER		+		+		+		+		+						+		
ETHYL ACETATE	100	+		+					100	/						–		–
ETHYL ALCOHOL	96	+	96	+		+		+	10	+		+		+		/		+
ETHYL CHLORIDE	100	+		–		/		+		+		/		/		–		
ETHYL ETHER	100	+		+		+		+								–		–
FERRIC CHLORIDE	10	+		+					20	–		/				+	Sat.	+
FOOD FATS		+		+		+		+		+						+		+
FOOD OILS		+		+		+		+		+						+		+
FORMALDEHYDE	30	+	40	+		/		+	100	+				+		–	40	+
FORMIC ACID	10	–	100	+	10	+	10	-	5	/				+		–		
FREON 12		+								+						+		/
FRESH WATER		+		+		+		+		+				+		+		
FRUIT JUICES		+		+		+		+		+						+		
GASOLINE		+		/		/		+		+		+		/		/		+
GLYCERINE		+		+		+		+		+		+		+		+		+
HYDROCHLORIC ACID	10	–	30	+	37	+	37	-		–	1	+		/		10	/	37
HYDROCHLORIC ACID	2	–	2	+	2	+	2	/								2	/	
HYDROFLUORIC ACID	40	–	40	+	70	+		-		–						65	–	48
HYDROGEN PEROXIDE	3	–	30	+		+		-	30	+		+		/		80	–	90
IODINE		–		+		+		+								/		
LACTIC ACID	10	+	20	+		+		+	5	+	10	+		–		+		+
LINSEED OIL		+		+					100	+		+				+		+
MAGNESIUM CHLORIDE	10	+	Sat.	+					5	+		/				+	Sat.	+
MERCURY		+	100	+		+		+	100	/		+		/		+		+
METHYL ALCOHOL	100	+		+		+		+	100	/		+		+		/		/
METHYLENE CHLORIDE	100	+		/		/		-		/		/				–		/
MILK		+		+		+		+		+				+		+		+
MINERAL OILS		+		+		+		+		+		+				+		+
MUSTARD		–		+		+		+								+		
NITRIC ACID	10	–		+	5	/	5	-	10	+	65	+				10	–	70
OLEIC ACID	100	+		+		/		-	100	/				+		/		/
PARAFFIN		+	100	/		+		+		+						+		
PETROLEUM		+	100	/		-		+		+				+		+		+
PETROLEUM ETHER		+		+		+		+		+		+		+		–		

Chemical Table

Resistance against chemical agents	POLYAMIDE PA		POLYPROPYLENE PP		POLYETHYLENE PE		ACETAL POM		AISI 303 AISI 304		AISI 316		NICKEL PLATED BRASS		NBR RUBBER		VITON RUBBER	
CHEMICAL AGENT	Conc.% 23°C		Conc.% 23°C		Conc.% 23°C		Conc.% 23°C		Conc.% 23°C		Conc.% 23°C		Conc.% 23°C		Conc.% 23°C		Conc.% 23°C	
PHENOL		–		+					10	+		+				–		+
PHOSFORIC ACID	10	–	85	+	95	+	10	–	10	–	50	/		–	20	/	85	+
POTASSIUM	10	+							50	+	50	+				/		+
SEA WATER		+		+		+		/		+		+		+		+		+
SILICONE OIL		+		+												+		+
SILVER NITRATE		+	20	+					60	/						/		+
SOAP AND WATER		+		+		+		+		+						+		
SODIUM CARBONATE	10	+	Sat.	+		+		+	5	+	100	+				+		+
SODIUM CHLORIDE	10	+	Sat.	+		+		+	5	+		/		+		+	Sat.	+
SODIUM HYDROXIDE	10	+	30	+		+	10	+		–				+		/		+
SODIUM		+	20	+		+		–		–						–	5	+
SODIUM SILICATE		+							100	+	100	+				+		
SODIUM SULPHATE	10	+	Sat.	+		+		+	5	+	100	+				+		+
SOFT DRINKS		+		+		+		+		+				+		+		
SUDS		+		+												+		+
SULPHURIC ACID	10	–	98	+	40	/	40	–	10	–	100	+		+		–	95	+
TARTARIC ACID		+	10	+		+	30	/	10	+	50	+		–		+		+
TETRALINE		+		–												–		+
TINCTURE OF IODINE		–		+		+		+						–		/		
TRANSFORMER OIL		+		/												+		+
TRICHLORETHYLENE		/		/		+		–		+				+		–		+
TURPENTINE		/		–		–		–		+						–		
VASELINE		+		+		/		+								+		+
VEGETABLE JUICES		+		+		+		+		+						+		
VEGETABLE OILS		+		+		+		+		+						+		
VINEGAR		+		+		+		+		+				+		/		–
WHISKY		+		+		+		+		+				+		+		+
WINE		+		+		+		+		+				+		+		+
XIOL		+		–		/		+		+				/		–		+
ZINC CHLORIDE	10	/	20	+					10	–		/				+	Sat.	+

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