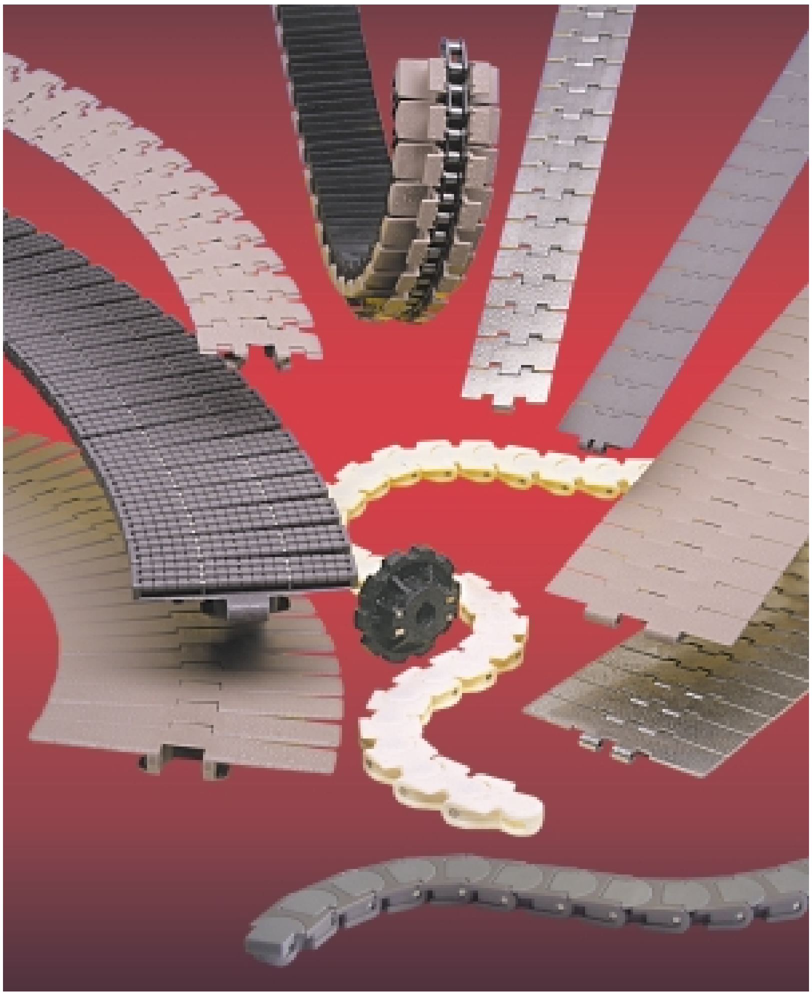
Rex®

TableTop®

Engineering Manual



English

Rexnord

invensys
Automation Systems

Conveyor Design

Straight Running and Sideflexing Chains

Wear Strips

Wear strips are used for one or several of the following reasons:
- protection of the chain carrying way and chain from excessive wear;
- reduction of friction thus reduction in drive power;
- reduction in plate wear.

There are many materials which are suitable for use as wear strips. However, none of these are equally suitable for all types of chains. In determining the effectiveness of the wear strips, i.e., whether the surroundings are dusty or clean, corrosive or hot, or whether lubrication takes place or not, the operating conditions are also important. Wear strips must be specially selected for each individual application, and all relevant factors taken into account.

Plastic wear strips vary widely in their efficiency. Due to their differing characteristics, the intended application should de carefully considered.

Plastic wear strips should be secured at short length and only at one and. This allows them to expand when subjected to the effects of heat or moisture.

Selection of correct wear strip material

Once the correct chain has been selected for a particular application, it will wear out before it breaks in fatigue. With straight running conveyors, wear normally occurs on the upper and lower sides and in the hinges.

The chain is normally regarded as being worn when the plate tops have been reduced to approximately half of their original thickness, or when the smooth transportation of the products is impaired. It is also regarded as being worn when its elongation amounts to more than 3% what makes the chain jump the sprocket.

The correct combination of chain and wear strip ensures maximum service life.

Thus, friction and wear resistance are the two most important factors in selecting the material for the wear strip.

1) The lower the coefficient of friction between chain and wear strip, the longer the service life of the chain.

2) The higher the resistance to wear in chain and wear strip, the longer the service life of both.

In the long term, the factor of chain tension, peak load, lubrication conditions, abrasion and transport speed determine the actual degree of wear in any given combination of chain and wear strip. High speeds and dry running conditions are the factors which produce the severest wear.

Metal wear strips

Metal wear strips have a greater coefficient of friction than those of plastic material but offer higher hardness.

They are, therefore, suited for abrasive applications. Abrasive particles are less likely to imbed.

STEEL

Cold rolled carbon steel is recommended. The surface roughness should be between 1.6 µm and 3.2 µm. Use hardened or cold formed steel with 25-30HRc. The lubricants should contain an anti-rust agent.

STAINLESS STEEL

Here, too, a cold rolled steel with a roughness of 3.2 µm is recommended. Austenitic steels have the best resistance to corrosion.

When plastic chains are in use, the whear strips should have at least 25 HRc. With softer wear strips, the two different materials (steel and plastic) may influence one another and cause the formation of wear debris which is black in colour (similar to graphite). This wear should also be taken into account in trasporting products which require a high degree of cleanliness.

Martensitic steel has the same hardness and virtually the same resistance to wear as austenitic steel. Its resistance to corrosion is however not so high.

ALUMINIUM

Due to its low resistance to wear, aluminium should not be used.

Plastic wear strips

Plastic wear strips have a lower coefficients of friction than metal wear strips. As a rule, they are easily installed and the noise level is lower.

The following materials can be used:

ACETAL

As contact between two identical materials should be avoided, not to be recommended in combination with acetal chains.

NYLATRON

Nylatron (polyamide with molybdenum di-sulphide) is the best wear strip material for dry applications because of its low wear rate and low friction.

Note

Nylatron absorbs moisture and expands. For this reason, room for expansion must be provided and fasteners must allow for movement.

MARBETT RAM-EXTRUDED UHMWPE

This ultra high molecular weight polyethylene is recommended for dry and lubricated operating conditions.

UHMWPE has a wear rate under dry conditions which is similar to that of Nylatron. It is, however, chemically stable and is unaffected by moisture.

It is not recommended for dry operation on corners where the chain load or speed are high.

Compared to standard extruded HMWPE the tendency to embed abrasive particles is reduced, so the wear on chain is much lower.

Abrasive operating conditions

Abrasive materials include broken glass, metal chips, sand atc. which may cause excessive wear to chains and wear strips.

As the abrasive substance may become lodged in the soft plastic and damage the chain, plastic wear strips should not be used under such conditions.

Metal wear strips should be used here.

Carrying way

In figure 1, types A,B and C illustrate possible arrangements for carrying ways and wear strips. The wear strips are attached to the surface of the carrying way.
They should be slightly wider than the underside of the chain plates.
Types A and B show different possibilities for single-strand conveyors.
Type C illustrates the separation of two parallel chains running either in the same or opposite directions.
In order to prevent contact and subsequent damage, a narrow edge separates the chains.
Unless extremely accurate chains guidance is required, chains running in the same direction at the same speed do not require separation.

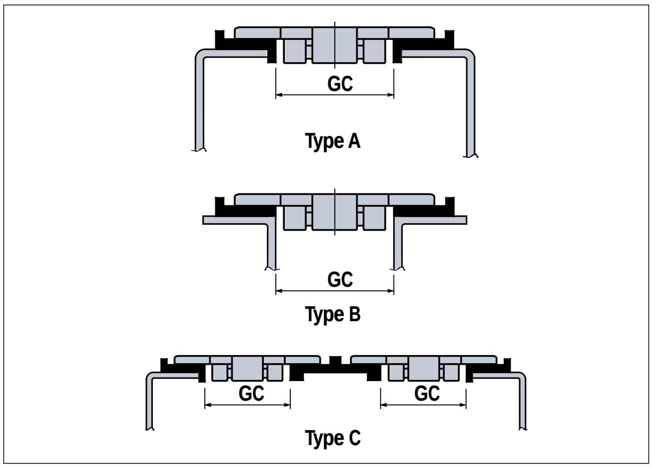


Fig. 1 - Arrangements of chain carrying way and wear strip

Table 1 below gives the recommended clearance (GC)between chains and wear strips.

Chain No.	Guide clearance (GC)
512	44,5
802 - 805	82,5
812 - 815	44
SSR 812 K125/175	24
866	41,3
1864	34,9
820 - 831	44,5
821	140
843 - 845	23,8
963	36,5

Table 1 - guide clearance (GC) for staight running chains

Calculation of thermal expansion

$$Lt = L0 \cdot [\, 1 + a \cdot (\, T \; - 20°C\,)\,]$$

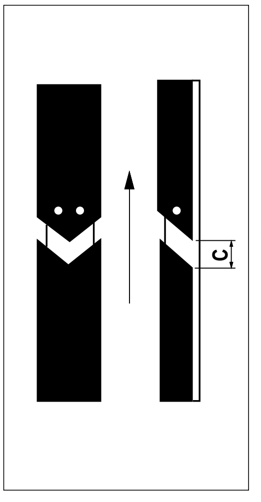
Lt = final length (mm.)
L0 = initial length (mm.)
a = coefficient of linear expansion.
T = operating temperature (°C).
20 °C = ambient temperature.

Example :
a guide having initial length L0 = 1000 mm, coefficient of linear expansion 2×10^{-4}, and an operating temperature of 70 °C, expands by :

Lt = 1000 mm • [1 + 0,0002 • (70 °C - 20 °C)] = 1010 mm

Wearstrips transfers

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 clearance is depending on the expected elongation due to e.g. thermal expansion, see drawing.



Clearance C depends on wearstrip length and environmental temperatures. Example :

For MARBETT UHMWPE material the coefficient of expansion is :

0.2 mm/m/°C

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

40°C • 2 mtr. • 0.2 = 16 mm

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

Note
It is recommended to cut the wearstrips at double 45°. This provides for smooth chain transfers.

When mounting the wearstrips, 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 strips are fixed). Chamfering of wearstrips reduces the risk of chain-obstruction. This way, the chain or belt is smoothly guided through the conveyor.

The wearstrips should be chamfered at the sides and at the top.

In the drawing is shown what a proper chamfered wearstrip should look like.

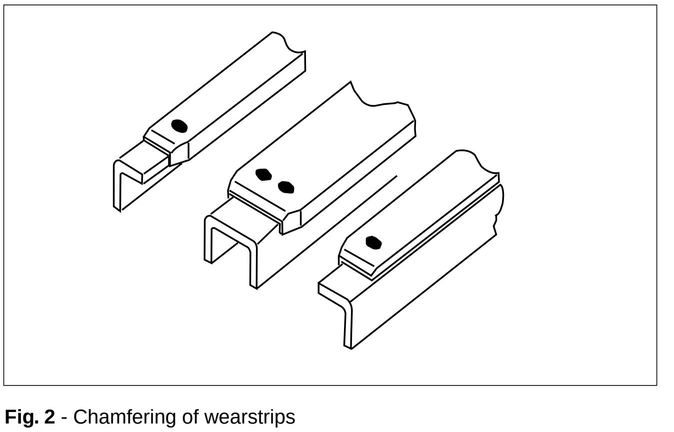


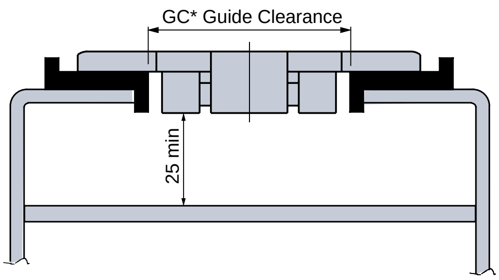
Fig. 2 - Chamfering of wearstrips

Note
Other information and ideas on conveyor design can be found on MARBETT CONVEYOR COMPONENTS catalogue

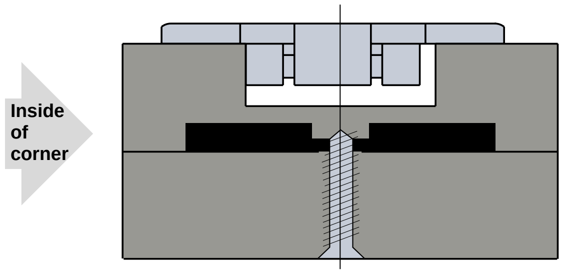
Conveyor Design

Straight Running and Sideflexing Chains

Straight running

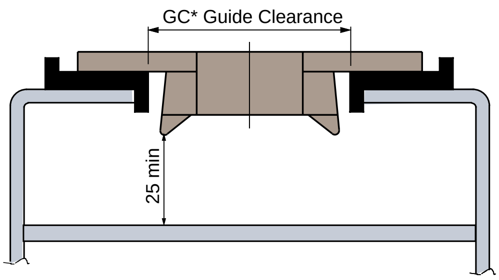


Magnetic sideflexing

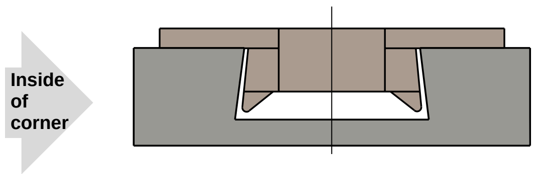


Sideflexing (Bevel design)

Straight running

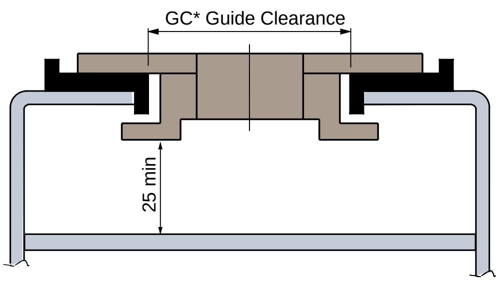


Corner section

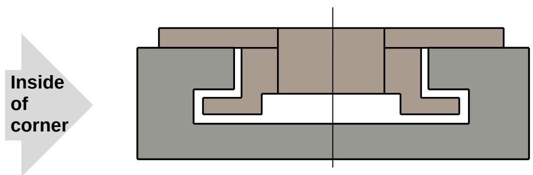


Sideflexing (TAB design)

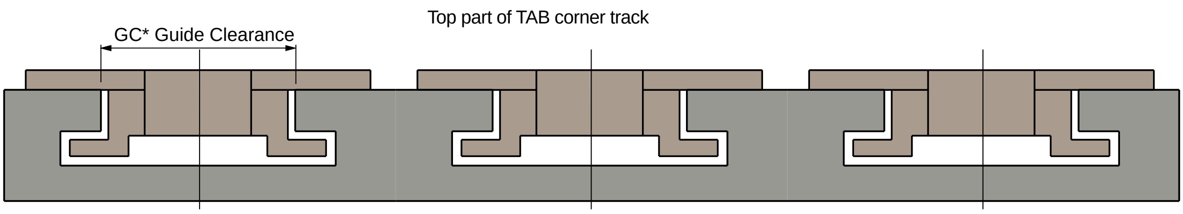
Straight running



Corner section



Multiple strand chains

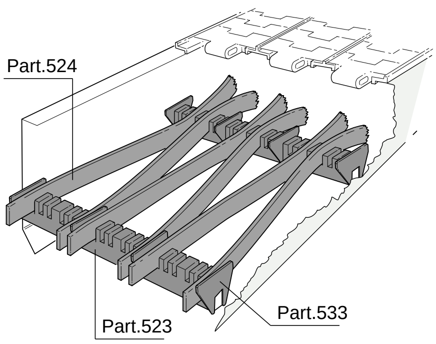


*) the guide clearances (GC) are shown on page 98 and on chain data in the catalogue

Different returnpart constructions

There are several ways to guide a chain or a belt in the returnpart of a conveyor. The most common ways are by means of return rollers, wearstrips or return guide shoes. Below a comparison is given for different systems.

Return Way “serpentine style”



+ Full support of the chain over the lenght of the conveyor.

+ Reduced noise in returnpart.

– More complex construction and less favourable accessibility for maintenance.

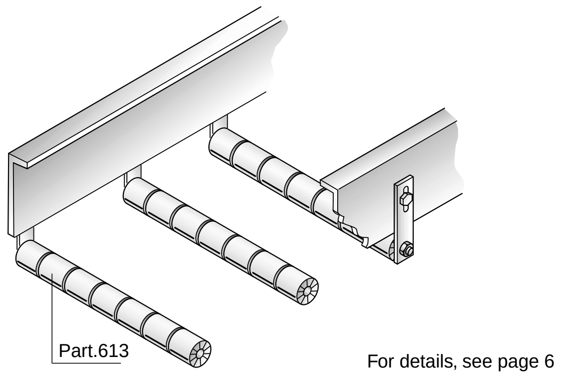
– Less possibility to absorb chain elongation.

– Uneven wear of the chain when not supported over entire width

– Higher friction.

Material used for wearstrips should be UHMWPE

Roller return Way



For details, see page 6

+ Reduced wear of the chain surface due to the reduction in speed difference and the reduced friction.

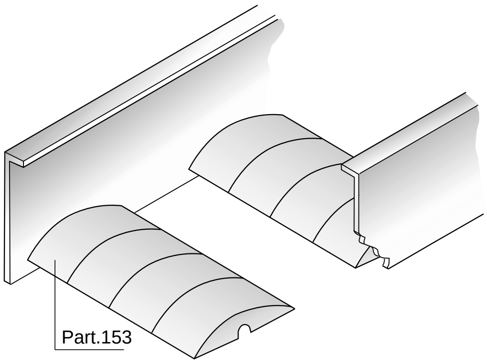
+ Simple construction and good acessibility of returnpart.

+ Debris that falls upon the chain in the returnpart of the conveyor is ejected by the movement of the chain.

– Only point contact between chain and roller.

Rollers must be able to rotate freely at all times. Small roller may cause a rattling sound

Guideshoes return Way



+ Good accessibility of the conveyor returnpart.

+ Simple construction.

+ Debris that falls upon the chain in the returnpart of the conveyor is ejected by the movement of the chain.

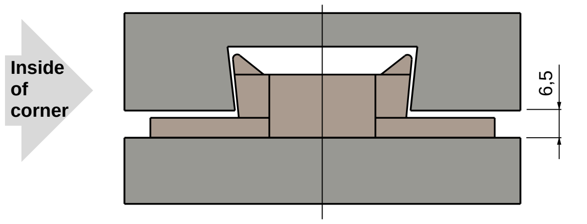
+ Suitable for LBP chains.

– Risk of uneven wear of the chain surface when abrasive particles are embedded in the plastic guideshoes.

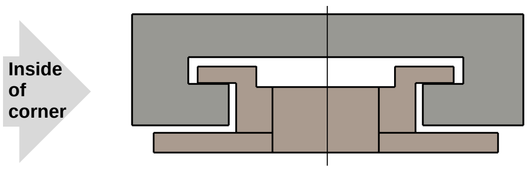
– High friction.

Minimum guide shoe radius is 200 mm

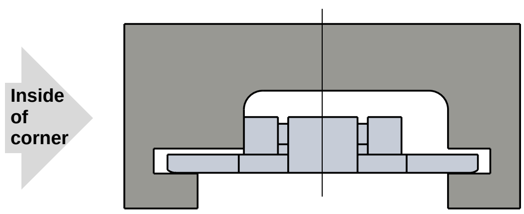
Corners bevel design



Corners TAB design



Corners Magnetic Design



Conveyor Design

Straight Running and Sideflexing Chains

Sprockets

When the chain enters the sprocket, it tends to raise and fall slightly. For this reason, the sprocket should be mounted in such a way that its highest point is no higher than the top of the wear strips. The front edges of the wear strips should be bevelled to allow smooth and free running of the chain. Figure 3 and the following formula and dimensions are intended as a recommendation for aligning the sprocket with the top of the wear strip.

Sprockets for chains 1873, 2873 and 3873:
The minimum number of teeth for chains, 1873 and 3873, is 15 and for chains, 2873, 24 teeth. If the number of teeth is less than this minimum, the distance between the hub of the sprocket and the hold-down tabs is insufficient (see figure 4)

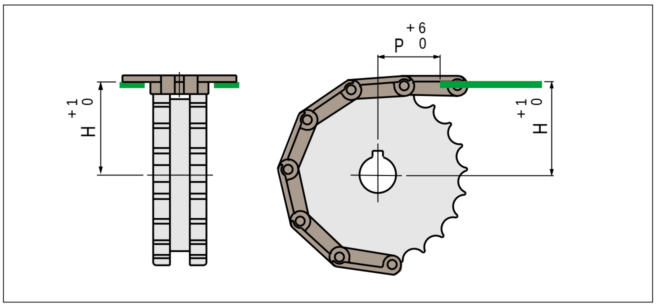


Fig. 3- Alignment of the sprocket

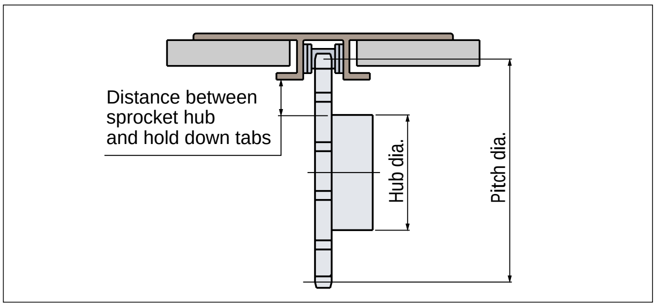


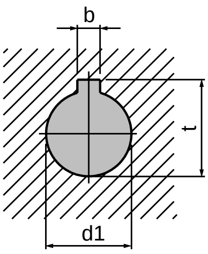
Fig. 4- Minimum number of teeth for TableTop Chains

Chain No.	H - mm	P - mm
512 - 802 - 805 - 812 - 815 - 820 - 821 - 881 - 881 M - 8811 - 8811 TAB - SLBP 821	(Dp:2) + 3,2	40
831 - XLBP 831	(Dp:2) + 2,4	40
880 - 880 TAB - 880 BO	(Dp:2) + 3,6	40
879 - 879 TAB - 879 BO - LBP 879 BO	(Dp:2) + 2,8	40
882 - 882 TAB - SLBP 882 TAB - LBP 883	(Dp:2) + 4,8	40
866 - 963 - 1864 - 1873 - 1874 - 2873 - 3873	(Dp:2) + 11	40
1700K - 1700TABK - AC1700K - 1701 - 1790K - 1790TABK - 1702 - 1716K - 1765 ZeroGap™	(Dp:2) - 12	50
1710K - 1710TABK - 1713K - 1713TABK	(Dp:2) - 12	50

Dp = primitive diameter of drive sprocket - mm.

Table 2- dimensions H and P

Keyway dimensions



d1 mm	b mm		t mm	
	nom.	toll.	nom.	toll.
25	8	+ 0,036 0	28,3	+ 0,2 0
30	8		33,3	
35	10		38,3	
40	12	+ 0,043 0	43,3	
45	14		48,8	
50	14		53,8	
60	18		64,4	

Table 3- Keyway dimensions for metric shaft diameters (UNI 6604 - 69 / ISO 773)

d1 inch	b inch		t inch	
	min	max	min	max
1 "	0,250	0,252	1,114	1,124
1 1/4 "	0,250	0,252	1,367	1,377
1 1/2 "	0,375	0,377	1,669	1,679
1 3/4 "	0,375	0,377	1,922	1,932
2 "	0,500	0,502	2,223	2,233

Table 4- Keyway dimensions for imperial shaft diameters (USA standard)

Idler wheels

Rexnord idler wheels can be used in all straight running conveyors. They are made of high quality plastic material, selflubricating and resistant to most chemical solution and corrosive agents. Installation of most idler wheels in existing conveyors can be carried out without difficulty. Place the idler wheel on a bright drawn stainless steel shaft and attach one set collar to the right and left of the wheel (see figure 5)
Smoothest running is achieved when the idler wheel is installed slightly lower than the top of the wear strip. For sideflexing chains, sprockets should also be used on the idler side. In new conveyors, Rexnord idler wheels should be used throughout the system. Ensure that the correct clearances are observed as shown in figure5.
As the idler wheels run on a shaft, bearings are not necessary.

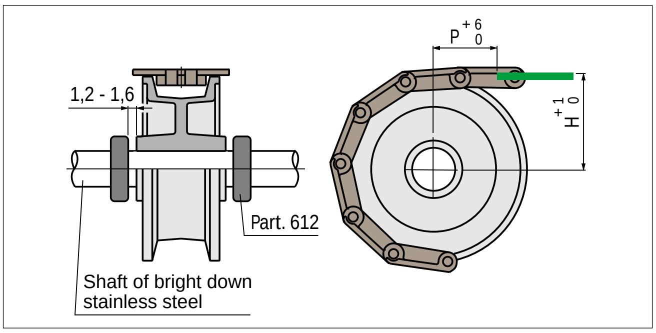


Fig. 5- Installation and alignment of idler wheel

Catenary sag and return way

It is recommended to position the drive at the end of all Rexnord chains and to ensure that the carrying and return strands are well guided.

- If the specified catenary sag is observed, the working load of the chain will be sufficient to ensure that it does not jump out of the sprockets.
- The chain is pulled and not pushed.
- Wear in the chain hinges is reduced, as the return strand adds little or no load. Movement in the hinges is reduced when a smooth return of the chain takes place.
- Greater distances between conveyor centres are possible.

Figure 6 shows a typical conveyor. After the drive sprocket, there is a gap for the catenary sag. The entry radius in the return allows the chain to feed onto it smoothly. During operation, the catenary sag should be between 75 and 125 mm. Should it exceed this figure, one or more links have to be removed.

On conveyors with no catenary sag there is a great deal of wear on the link hinges, and they are subjected to increased loading, which has to be adsorbed either in the bearings or in the chain itself. Excessive sag at the drive sprocket reduces both the angle of wrap and the ability to transfer force. This also causes the chain to pulsate.

Note

The infeed radius should be greater than the backflex radius. In order to ensure good running conditions, the angle of wrap should be no less than 150°

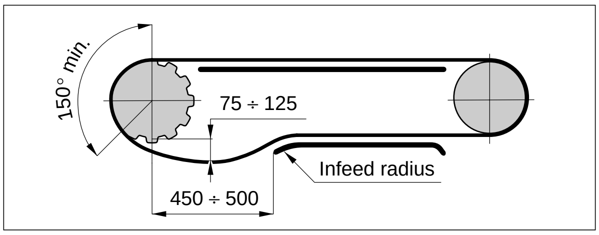


Fig. 6- A Typical conveyor

Chain No.	Minimum backflex radius
512	100
802 - 805	150
SS 812 - SSR 812 - SSX 812	80
SSC 812	150
S 815 - SS 815	150
866	318
1864	305
820 - 821 - 831	40
843 - 963	153
845	458

Table 5- Minimum backflex radius for straight running chains

Chain No.	Minimum backflex radius
881 - 8811 - 8811 TAB	40
881 M	40
1874	254
4874	305
879 - 879 TAB - 880 - 880 TAB	40
879 BO	40
FGM 1050 - FTM 1050 - FTM 1055	130
880 MG	50
882 - 882 TAB	40
RR 882	76
LPC 279	70
1843	102
1873	305
2873	1000
3873	178

Table 6- Minimum backflex radius for sideflexing chains

Roller returns

As shown in figure 7, the chain can also return over rollers or guide shoes instead of wear strips. In order to ensure the required catenary sag, it is important that the first roller or guide shoe is at a sufficient distance from the head drive sprocket. Distance A must be greater than distance B between the rollers. At slow speeds and low loads, rollers should be selected when ease of cleaning is more important than the service life of the chain.The diameter of roller should be at least twice that of the smallest backflex radius of the chain (see Tables 5 and 6). this is an important factor in reducing the noise level. In order to limit the backflexing of chains, if smaller rollers are used for reasons of space, the catenary sag must be reduced. Due to the large backflex radius, roller and guide shoe return are not recommended for TableTop chains of type 845, 1873, 1874, 2873 and 3873.

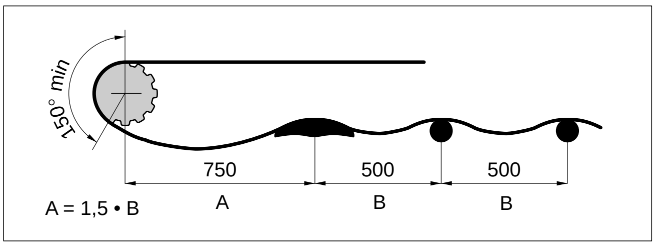


Fig. 7- Roller return

Guide returns

For TAB chains which return on their own TAB guides (see figure 8), a guide with a radius greater than the smallest backflex radius is recommended.

At the entry of the return wear, rounded corners should be provided to prevent the chain from catching.

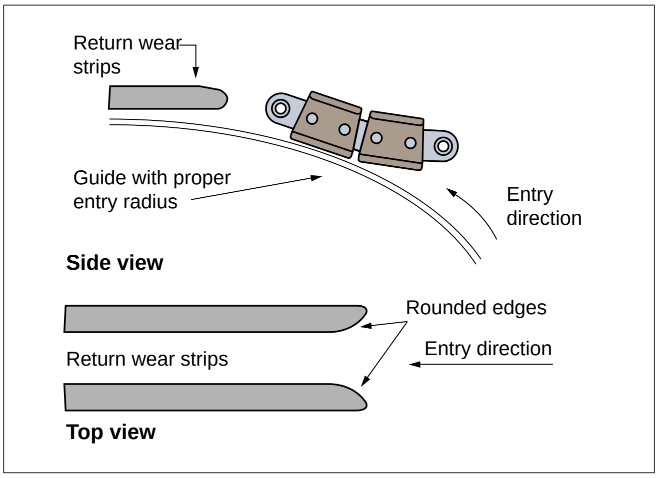


Fig. 8- Return way for sideflexing chains with TAB Guide

Conveyor Design

Straight Running and Sideflexing Chains

Intermediate drive arrangement

An intermediate drive allows the continuous operation of a chain strand over a longer distance than would be possible with only one drive. Each intermediate drive moves the same chain strand onwards to the next drive.
Four different arrangements are possible:
1) Tangential drive
2) Offset wrap drive
3) Continuation drive
4) Carousel with tangential sprockets

Tangential drive

A drive sprocket engages the straight running chain in the same way as a rack and pinion. This approach is relatively simple, but has several drawbacks. Firstly, in order to ensure that the chain does not “bunch up” after leaving the sprocket, the entire conveyor system has to run tightly. Secondly, under peak loads, the chain tends to jump out of the sprocket. This approach is therefore not to be recommended.

Offset drive

Contrary to tangential drive, this arrangement is limited to sideflexing chains. Figures 9 and 10 show two possible variations of this approach. Basically, the chain tension which is not absorbed by the drive sprocket (as well as excess chain) is compensated for by a catenary sag. The chain then engages an idler sprocket or wheel and continues to run as a load strand.

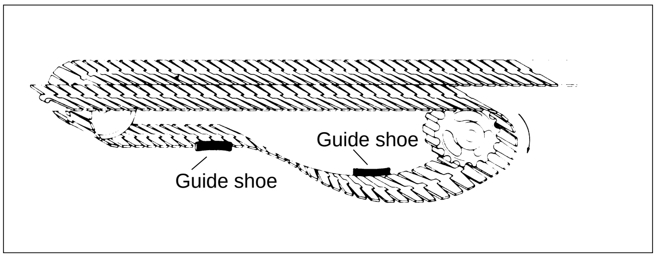


Fig. 9- Offset drive arrangement with side transfer.

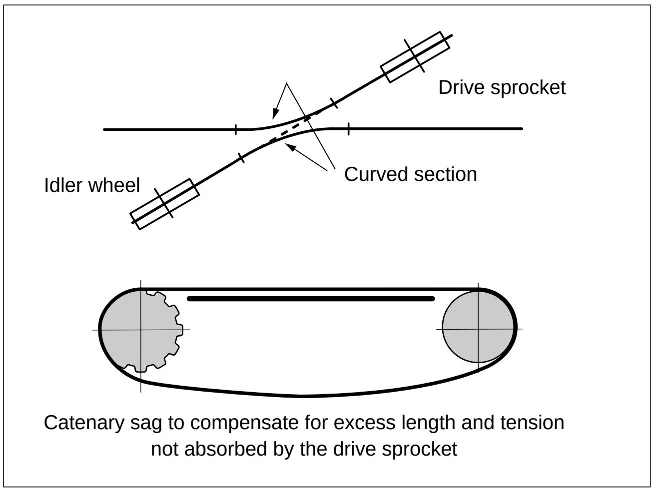


Fig. 10- Offset drive arrangement with inline transfer.

Continuation drive

On the top view this is a straight design, but it requires a transfer plate.

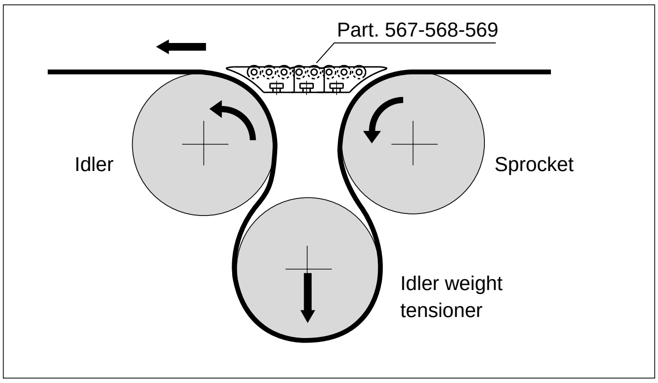


Fig. 11- Continuation drive

Carousel with tangential sprockets

Only with 880 BO, 879 BO and 1080 chains.

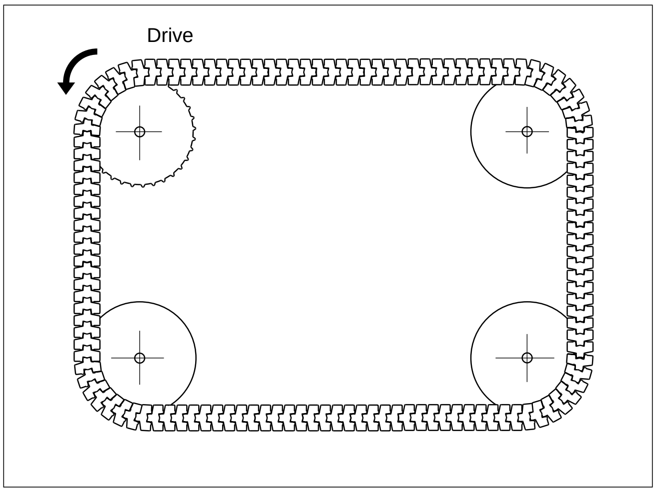


Fig. 12- Carousel with tangential sprockets

Transfers

The smooth transfer from one chain to another is essential for the protection of the product and prevention of down-time. These transfers are carried out by means of turntables and deadplates.

Side transfers

The side transfes are the most popular and economical way of transferring the product from one chain to another. Good design and accurate alignment of the chain and the guide rail are of critical importance. Although this is a relatively simple way of transferring products, it should be ensured that both chains are running at the same height, or that the outfeed chain is slightly lower. The arrangement of the guide rails should be such that the product is conveyed smoothly and at constant speed (see figure 13).

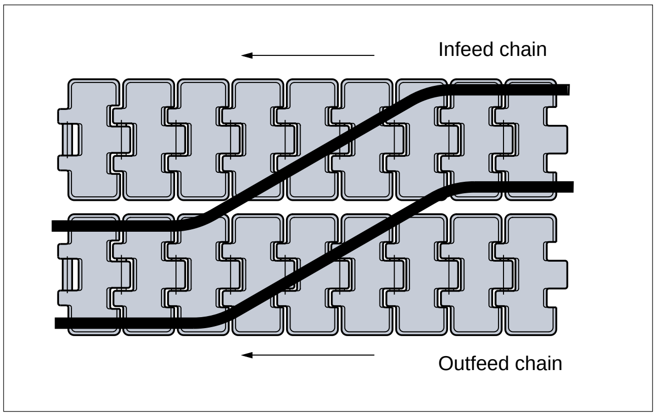


Fig. 13- Side transfer.

Deadplate transfers

Figure 14 shows a deadplate transfer. The deadplate should always be mounted 1 mm lower than the infeed and 1 mm higher than the outfeed chain. The deadplate should be bevelled at the edge.
Flexible deadplates can “float” with the chordal action of the chain on the sprocket without producing excessive wear. Deadplate can cause faults when they are mounted too low. There is then a danger of the chain running against the deadplate, thereby causing damage or wear. Deadplates should therefore be adjusted with extreme care.

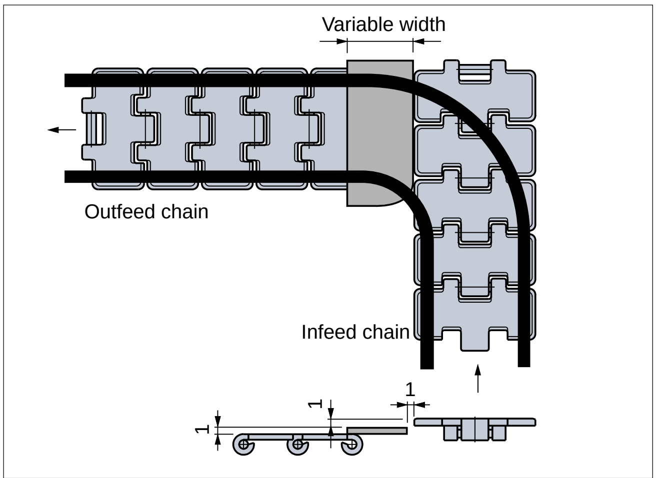


Fig. 14- Transfer using deadplate.

Turntable transfer

Turntables should be installed in accordance with the same principles as deadplates. Smooth transfer of the products is only possible if chain and turntable are in exact alignment with one another. The transfer can be improved by bevelling the outer edge of the turntable (see figure 15) . The turntable should be slightly lower than the infeed and slightly higher than the outfeed chain. In each case, the difference in height in each case should be approximately 1 mm.

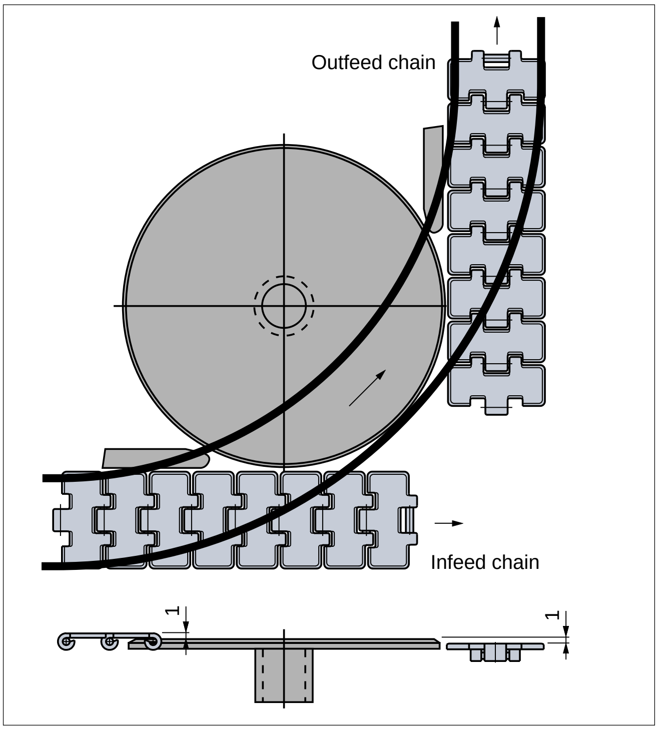


Fig. 15- Transfer using turntable.

Head to tail transfer

Marbett modular transfer roller plates are recommended with big and stabile products. For other products flat dead plates are suggested.

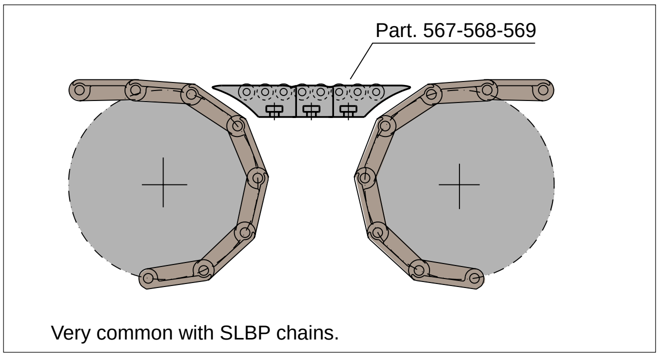


Fig. 16- Head to tail Transfer.

Note

For Dynamic Transfer System™ please refer to our MatTop® catalogue.

Conveyor Design

Multiflex Chains

Straight run

Figure 17 shows a typical straight running section of a conveyor.
Note that the frame is designed to support the chain on the underside of the link. In order to distribute wear evenly over the entire underside of the link, the distance between the wear strips varies. This open design is preferred over full width support since it prevents the built-up of debris in the track. Steel wear strips are used for dry abrasive applications, and stainless steel for wear strips in moist abrasive conditions. In non-abrasive conditions, UHMWPE wear strips should be used.
The chain is fully supported at all points on the conveyor. It is held in place by two side members as shown in Section A-A of figure 18. Chain guides are of such a height that they would not interfere with a product that may overhang the sides of the chain.
Given proper design and mounting of rails (not shown in section A-A), very wide products can be transported using this chain.

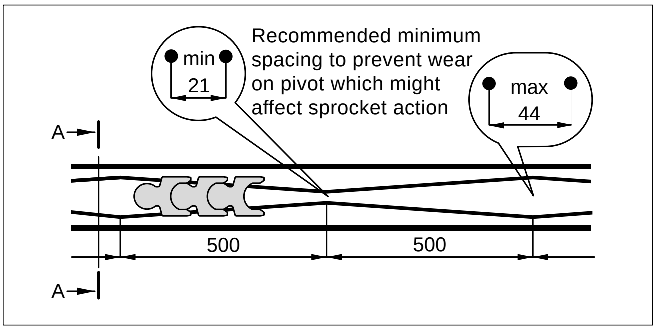


Fig. 17- Typical straight run conveyor (top view).

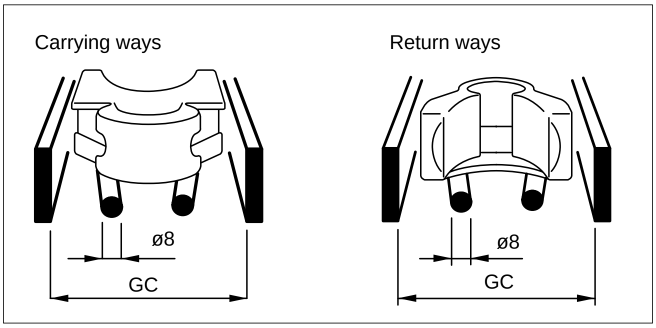


Fig. 18- Section A-A.

Table 7 below gives the recommended clearance (GC) between chains and wear strips.

Chain No.	Guide clearance (GC)
1700 K - 1700 TAB K -1765 ZeroGap™	58
1790 K - 1790 TAB K	58
1720 K - AC 1700 K	58
1716 K - 1702	59,5
1710 K - 1710 TAB K	58
1713 K - 1713 TAB K	58
1755	30,5

Table 7- Guide clearance (GC) for multiflex chains

Corner sections

The corner discs guide the chain around corners. They are used in order to guide the chain without any significant increase in its tension. For corners of 15∞ or less, a conventional stationary curve (wear strip) can be used. For chains 1701 and 1701TAB, stationary corner wear strips can be used for all radii (Rmin = 140). The corner discs are mounted in such a way that they engage the chain while it is still supported by wear strip (see figure 19).
The chain guides are mounted on the outside of the curve, whereas the corner disc provides guidance on the inside of the curve.

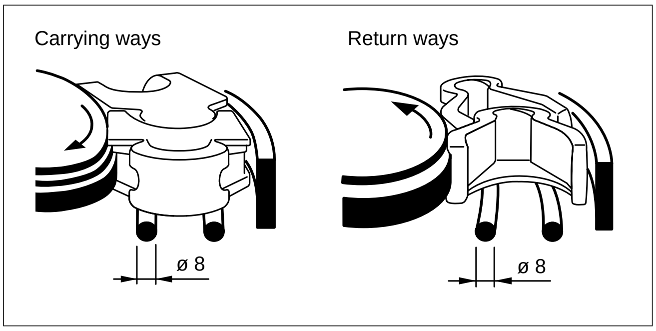


Fig. 19- Typical corner section with chains Series 1700 K - 1700 TAB K - AC 1700 K - 1710 K - 1710 TAB K - 1765 ZeroGap™.

Note

Chain runs at the same height as the disc. This is essential to keep the chain on the disc.

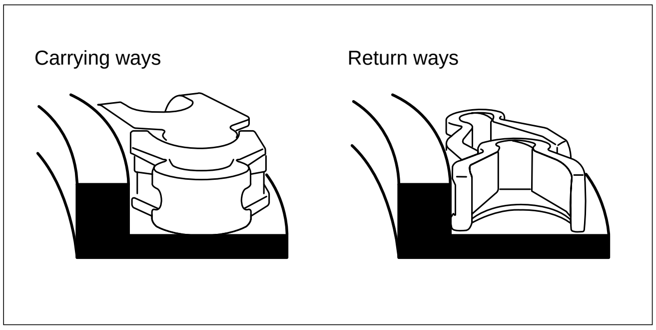


Fig. 20- Typical corner section with chain.

Note

The figures in this section show chain 1700. Most of the data applies equally to the other Multiflex chains.

Chain return

A great variety of chain returns are possible with Rex Multiflex chains. This variety of returns offers considerable conveyor design freedom. The best type of return in any given case depends on the design of the chain and other factors (product flow, available space etc.).

Conventional conveyors

If the chain runs at one level, a conventional return can be provided (see figure 21).

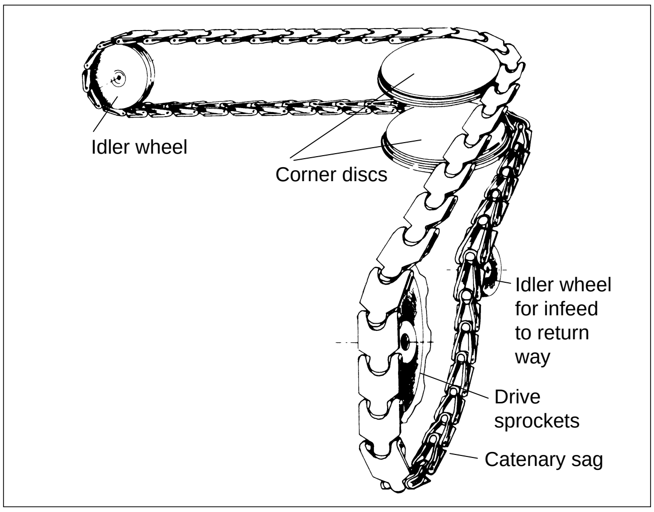


Fig. 21- Conventional return.

Note

In the return section, the corner disc is mounted in the same way as on the load side. It is not mounted upside down.* The upper edge of the disc must be aligned with the lower edge of the returning chain.

Note

Idler wheels are recommended for corner section, not sprockets. In order to hold the chain on the wheel, if the idler wheel has no flange to hold the chain in position, a guide system should be provided in the frame.

*) 1701 is an exception. The return disc is mounted upside down. This applies to bevel style chains only.

Elevating conveyors

Rex Multiflex chains have the ability to elevate or lower products in a very compact area. This figure shows a typical elevating system and how the chain is being returned on such a unit.
Note that the chain hangs straight down from the drive sprocket and side flexes back up into the tail section (there is no sliding return). Elevators can also be designed with combined free-hanging (catenary sag) returns and sliding returns (see figure 22).

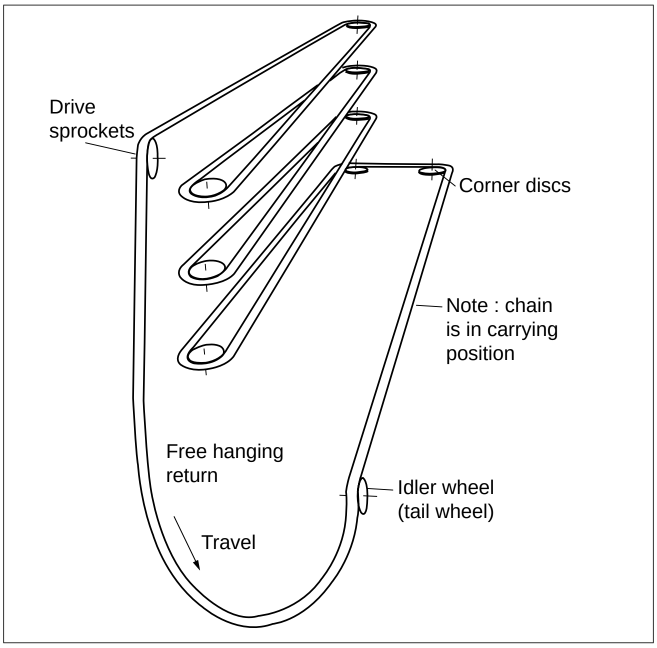


Fig. 22- Sideflexing return on typical elevator

Product transfer

In order to prevent the products from falling over, the out-feed chain must be at the same level or approximately 1 mm lower than the infeed chain. Simple switch systems can be used at different transfer points for a continuous distribution of the products to different locations in the plant (see Figures 23 and 24). The flexibility of Multiflex chains allows the use of different types of transfer. Figures 25 and 26 show different transfers using the Multiflex chain 1700.

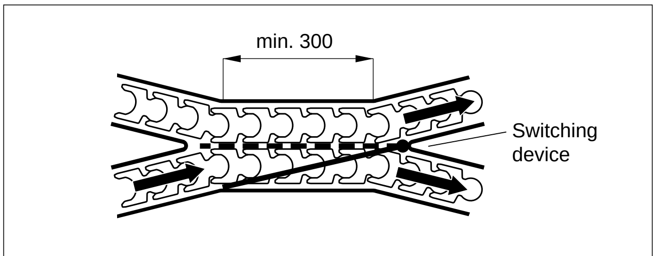


Fig. 23- Cross transfer. Using switches, the products can be transferred from one chain to the other, or transported further on the same chain.

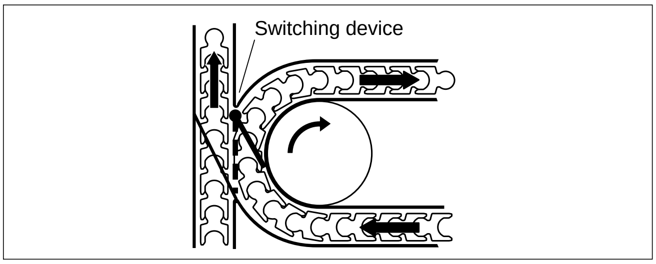


Fig. 24- Curve transfer

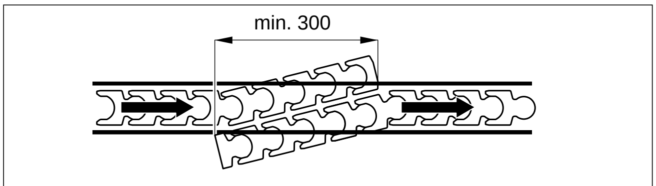


Fig. 25- Transfer point where products are transported further in a straight line.

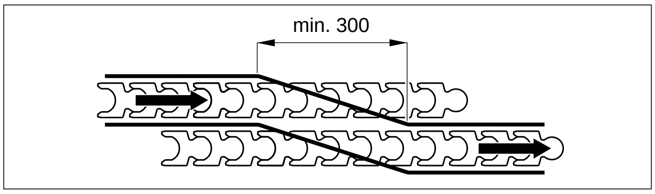


Fig. 26- Transfer point where products move sideways from one chain to another

Multi incline conveyors

As mentioned above, Multiflex chains are ideal for multi-incline conveyors. For smooth operation, the following factor are of importance:
1) That the chain is on the same level as the corner disc,
2) That the change in angle is achieved by bending the chain downwards not upwards - as this would cause the chain to lift out of the frame (see Figures 27 and 28).
The maximum incline for the 1700 chain should not exceed 100 mm per metre. The actual incline for a given application depends on the stability of the product being transported and on the coefficient of friction between product and chain.

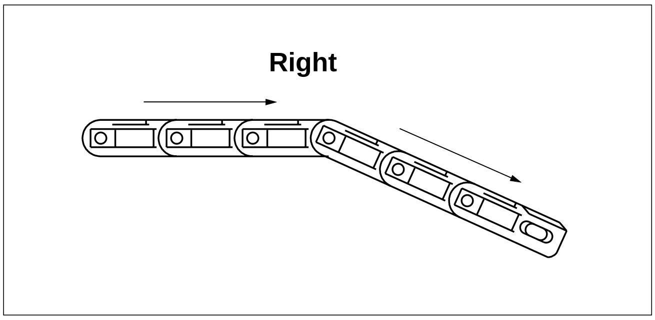


Fig. 27- Chain downflexing

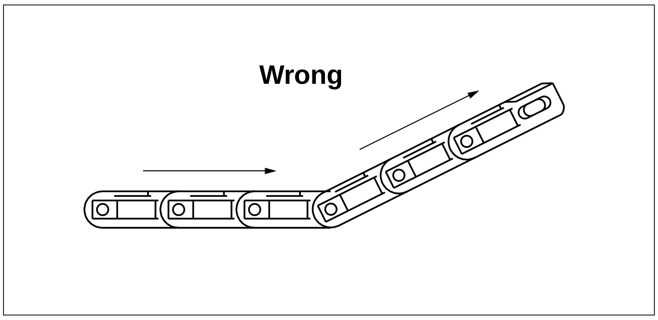
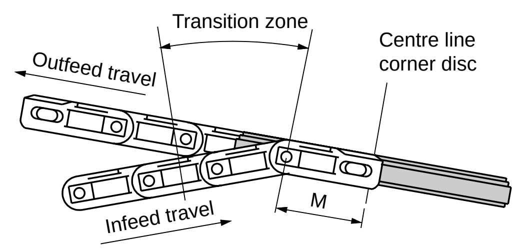


Fig. 28- Chain backflexing

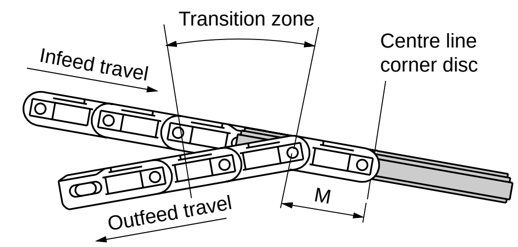
ON AN INCLINE, the chain must pass through a transition zone before entering the disc. The disc should be tilted slightly so that it lies in the same plane as the outfeeding chain. Aside from this, attention should be given the minimum spacing (M) (see figure 29)



M = 0.3 • Corner disc diameter (0.5 for wide products)

Fig. 29- Side view of incline conveyor at corner disc.

In order that the chain lies in the same plane as the infeeding chain, **ON A DECLINE**, after leaving the disc, the chain must pass through a transition zone. Aside from this, on outfeed, attention should be given to the minimum spacing (M) (see Figure 30)



M = 0.3 • Corner disc diameter (0.5 for wide products)

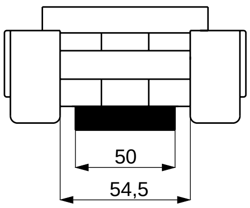
Fig. 30- Side view of decline conveyor at corner disc.

Note

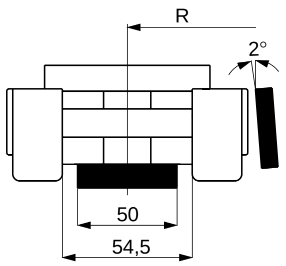
in order to obtain a smooth transition from one conveying plane to another in the transition zone, the wear strips should be curved.

Carrying ways

Straight run

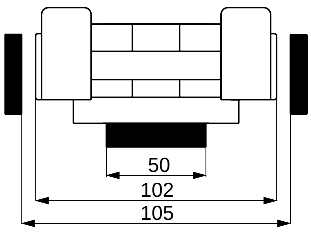


Corner sections

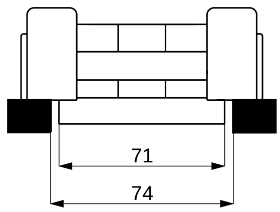


Return ways

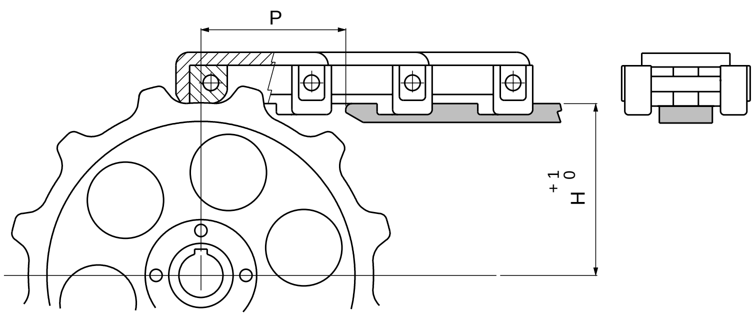
Example 1



Example 2



Sprockets



Chain No.	H - mm	P - mm
3150	(Dp:2) - 16,9	90

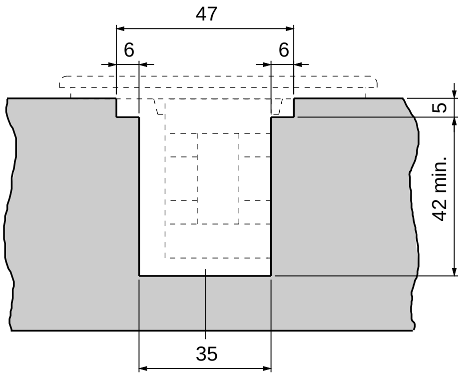
Dp = primitive diameter of drive sprocket - mm.

Table 8- dimensions H and P

Conveyor Design

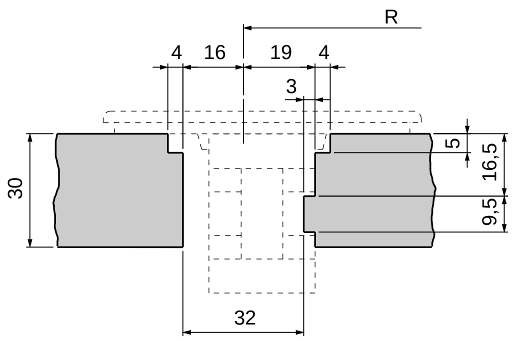
Special Chains Series 1080

Straight running

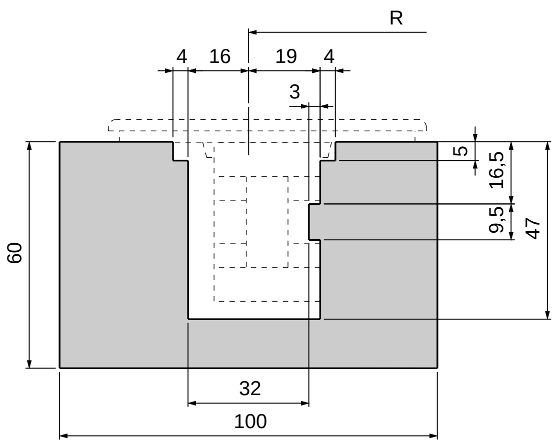


Corner section

Example 1

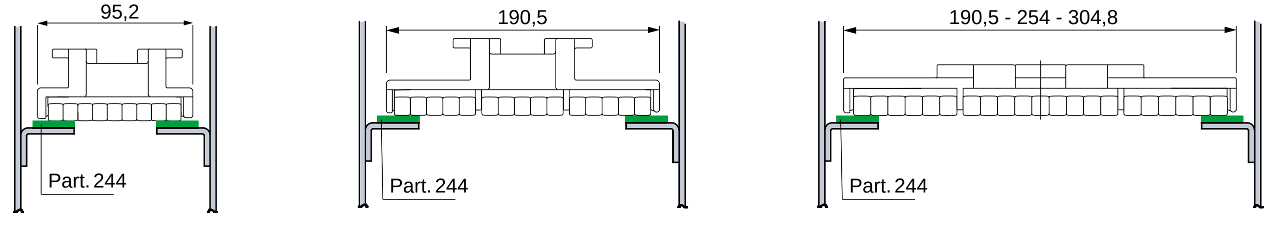


Example 2

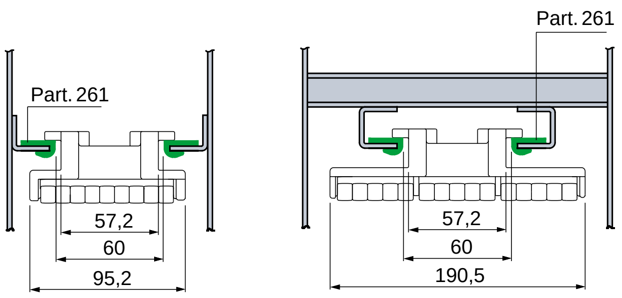


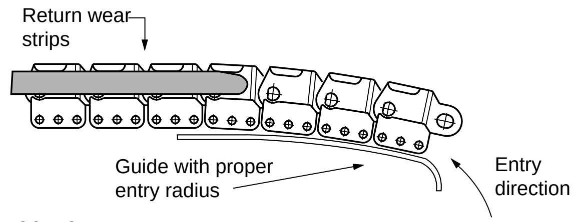
Different Returnpart constructions

Return for use with
SLBP 821 and SLBP 882 TAB

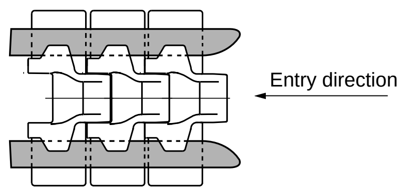


TAB-stile return for
SLBP 882 TAB and LBP 883 TAB chains





Side view



Top view

Maximum recommended conveyor length

The length of a conveyor is not unlimited. There is a certain maximum length for each application. The limits are depending on factors like chain- type, lubrication, kind of product, load.
Generally we have good experiences with maximum tracklength of 12 meters.

Note

On long conveyors, it is recommended to place curves as close to the idler end as possible. This way the chain load in the curve is minimum, resulting in a longer wearlife.

Although longer conveyors mean fewer drives and therefore fewer initials cost, the theoretically calculated maximum conveyor length is not always the optimum conveyor length. For this, there can be several reasons: the available space, control facilities of the conveyor and the backline pressure. Other reason for building conveyors with a shorter conveyor length than maximum are shown below.

Wearlife

A higher chainload will result in higher wear of all conveyor components, as wear is related to the load, speed and running time.

Flow control facilities

Shorter conveyors are built to obtain lower backline pressure by means of better control facilities. The chainspeeds can be controlled using frequency controlled drives. When for instance one conveyor runs full, the chainspeed of the preceding conveyor can then slowly be decreased.

Slip stick effects

Slip-stick is caused by the difference between static friction and dynamic friction. Slip-stick effects can cause a pulsating chain operation. It is very hard to predict whether this phenomenon will occur or not. It depends on the speed, the load, the construction and lubrication. We have the experience that with long conveyor length, the chance of a pulsating operation increases. Therefore, a long conveyor length should be avoided in situations where an unwanted pulsating chain operation is not allowed.

PlateTop chains generally allow for double length compared to conventional TableTop® chains.

Maximum recommended conveyor speeds

Optimum conveyor speed is important to achieve a high efficiency of the conveyor, but the chain speed is not unlimited. The criteria for conveyor speed and the width of the conveyor is the number of products which must be delivered to a location per unit of time. The infeed and outfeed of each process machine will dictate product flow width at the machine. But inbetween two machines the alternatives range from high speed single track to slow speed multiple tracks. In the table below a comparison is given.
Rexnord recommends not exceeding the maximum speeds for chains. Exceeding these speeds, will increase wear unacceptably and decrease the maximum working load. See table below for maximum recommended speeds.

	Maximum recommended speeds (m/min)		
Chain material and type	**Dry**	**Water**	**Water and soap**
Stainless steel chains, straight	50	70	130
Stainless steel chains, Magnetic System	30	40	130
Plastic chains, straight run	80	100	180
Plastic chains, Sideflex, Tab	*	60	120
Plastic chains, Magnetic System	*	90	180
PlateTop chains	100	120	240

***** = No maximum speed is given here. These values depend on the PV-value of the curve.
This value represent the pressure in combination with the velocity and is a value for the amount of heat development and melting of materials. The calculation programme will calculate this value automatically and show recommendations.

Table 9- Maximum recommended speeds of Rex chains

Note

These values represent general conditions. In e.g. abrasive conditions the maximum speeds will decrease.

Product Handling

Reducing build up of static electricity

In dry applications where products are being conveyed on plastic chains, especially when accumulation occurs, sometimes an electrostatical charge can be built up. This electrostatical charge can be inconvenient. It can cause attraction of dust and dirt or an electrical shock when somebody touches the conveyor or a product. It could also cause disturb to sensitive control devides.
In some cases, the electrostatical charge can even be dangerous. It is easy to image what a discharge in the shape of a spark can cause in explosive environments.
To reduce the risk of built up of electrostatical charges, two types of precautions can be taken : passive neutralisation and active neutralisation.
- Passive neutralisation means that the electrical charge is avoided by grounding the complete conveyor (chains, wearstrips, frame and components).
- Active neutralisation means that a positive electrostatical charge is neutralised by negative ions. An easy method is blowing ionised air over the chain and product.

The best way to eliminate build up of static electricity is using steel chains instead of plastic chains. However this is not always possible. Therefore Rexnord has Anti Static plastic chain in the programme. This available material is electrically conductive.

Note

The Anti Static chain must be used in combination with grounded metal wearstrips.

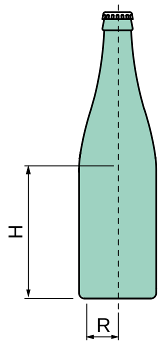
The AS-material that is used for anti static chains has the following properties

Property	AS Polyacetal	Standard Anti static material by DIN 53482
Surface resistance	$\leq 5 \cdot 10^3\ \Omega/\square$	$\leq 10^9\ \Omega/\square$
Volume resistance	$\leq 10^3\ \Omega$.cm	$\leq 10^8\ \Omega$.cm

Other precautions to reduce the risk of electrostatical charges can be :
- Apply lubrication if possible;
- Use anti-static or metal wearstrips, guiderails etc. wherever possible and make sure all metal parts are grounded;
- Avoid product accumulation;
- Avoid slip contacts (make sure that idlers and return rollers are rotating).

Calculate product stability

Each product has a maximum value for acceleration. Start-stop or stop-start conditions are related to the product stability. There are formulas to calculate the stability of a product. On a basis of the outcome of the calculations, it is possible to determine if a 90° deadplate transfer or a Dynamic Transfer System™ can be used or whether a Magnetic System is the only suitable solution. Of every product a so-called critical friction coefficient can be calculated. This critical friction coefficient is the quotient of the radius of the base and the height of the centre of gravity.



In formula : $f_{crit} = R/H$

The critical friction coefficient thus calculated must be compared with the real friction coefficient which is valid in practice (f real). The real friction coefficient strongly depends on product and conditions. It would be best to measure the real friction coefficient for the application in question.

This has been done numerous times at the Rexnord test centre. Experience has shown that, for the same product and in the same conditions, the friction coefficient can still vary within a differential of 30%.

Now, f crit and f real must be compared with each other. The criteria is that if f crit > f real, the stability of the product is sufficient. This means that the product will remain standing stable, even when it is subject to large variations in speed. It will be obvious that obstacles in the conveyor, such as a raised edge for example, still have to be avoided. Please take into account that dirt affects the friction coefficient in practice. Besides, the lubrication may not always be optimum.
If f crit < f real, this does not immediatly imply that transport is not possible. In order to guarantee the stability, however, a maximum variation in speed to which the product can be subjected without tipping must be calculated. In a formula :

$$V_{lim} = \sqrt{2.g.(\sqrt{H^2 + R^2} - H)}$$

V_{lim} = Maximum variation in speed	[m/s]
R = Radius of the base	[m]
H = Height of the centre of gravity	[m]
g = Gravitational acceleration	[m/s^2]

With a deadplate and Dynamic Transfer System™, it may be assumed that the speed of the product will be reduced to almost nil, after which it will be transfered continuously at the full speed of the "outgoing" chain. The speed of the outgoing chain must therefore be lower than V lim to allow for a deadplate transfer.

Product Handling

Reducing noise

In many countries regulations dictate a certain absolute sound level at a workplace. In industrial buildings like breweries where glass is involved, the noise level could be very high at some places. In general there are three areas where something can be done to reduce the noise level : Machines, conveyors and the building itself.

The highest noise levels on conveyors are the result of unfavourable product handling. Collision of bottles against each other or against guiderails produces noise. Increasingly high speeds of bottling lines result in an increase of the noise level, due to the higher collision speed.

Several measures can be taken to reduce the noise level of products.

1) Use curves instead of deadplate transfer. A Dynamic Transfer System™ (refer to our MatTop® catalogue) is much better than a dead plate transfer, also in terms of noise. However, a curve is the optimum solution.

2) Bottles should be handled with care. On zero-pressure combiners, bottles will smoothly move into one row, producing a low noise level. Careful handling is also in the interest of less scuffing and less bottle breakage.

3) Good flow control possibilities, which can be obtained by building conveyors with a certain maximum length. The chainspeed can be controlled by using PLC's and frequency controlled drives. When for instance one conveyor runs full, the chainspeed on the preceding conveyor can be decreased.

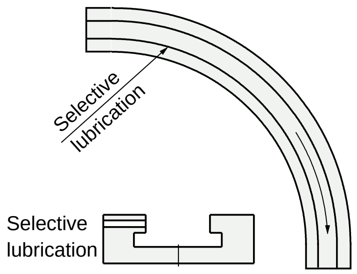
4) Cover guiderails and other components with plastic profiles. In general, plastic materials can result in a decrease of the noise level, compared to metal in contact with glass.

5) Use plastic sprockets and idlers.

6) Use plastic wearstrips in combination with stainless steel chains.

7) When the return part is executed with return rollers, it is recommended to use rollers with a large diameter of +/– 60 mm. The use of small rollers could result in a rattling sound. Rollers with a rubber surface are available. They will contribute to a lower noise level.

8) Plastic chains running dry in curves can sometimes produce noise. In this respect Magnetic System is better than Tab curves. If the cause of the noise cannot be located, consider lubrication.



Maximum temperatures

It is important to check the materials regarding the allowable temperatures. In the Rex catalogue and calculation program, product specifications are based on a temperature of 21°C. When the environmental temperature differs significantly, this will influence the mechanical properties and thermal expansion of chains. This is especially important on plastic products.

In the table below the minimum and maximum temperatures are given for materials. A continuous exceeding of these temperatures can result in product failure.

	Allowable temperature	
Chain material and type	**T min (°C)**	**T max (°C)**
Stainless steel chains	-70	430
Hardened steel chains	-40	180
Stainless steel rubber top chains	-35	100
Acetal plastic chains, dry	-40	80
Acetal plastic chains, wet	-40	65

Table 10- Allowable temperatures

Thermal expansion

Please be aware that plastic chains and belts expand or contract more than metal parts due to temperature changes.
The coefficient of thermal expansioin of the plastics are:

Material	Coefficient of thermal expansion
Acetal LF, HP	0.12 mm/m/°C
AS- material	0.13 mm/m/°C
WPP- material	0.15 mm/m/°C

Table 11- Coefficient of thermal expansion

Environmental Conditions

Chemical resistance

For plastic chains, no cleaning agents with a pH value of less than 4 (acidic) or over 10 (alkali), or chemical containing free chlorine or ammonia should be used. Due to evaporation, these substances may corrode the material or have a negative effect on various processes. In the case of polycarbonate, hydrocarbons and solvents should also be avoided.
refer to the following corrosion and resistance guide.

	Rex -OPTI-Plus® AISI 430		AISI 304		Rex -HP™ Rex -LF® ACETAL D		POLYPROPYLENE PP		POLYAMIDE PA		POLYETHYLENE PE	
CHEMICAL AGENT	Conc.%	23° C	Conc.%	23° C	Conc.%	23° C	Conc.%	23° C	Conc.%	23° C	Conc.%	23° C
ACETIC ACID	20	–	20	+	5	–	40	+	100	+	10	+
ACETONE	100	+	50	+		/		+	100	+		+
ALUMINIUM CHLORIDE				–					10	+		
AMMONIA	50	+	50	+	Sol.	+	30	+	10	+		+
AMMONIA CONC.						–		+	10	+		+
AMMONIUM CHLORIDE			10	/					10	+		
AMYL ALCOHOL				+				+	100	+		
ANILINE	3	+	3	+	3	+	100	+		/	3	+
BEER		+		+		+		+		+		+
BENZENE	70	/	70	/		+		+		+		/
BENZOIC ACID			100	/			Sat.	+	Sat.	/		
BENZOL		+		+		+		/	100	+		/
BORIC ACID	100	/	100	/		+	Sat.	+	10	+	Sat.	+
BRINE		–				/	Sat.	+		/		+
BUTTER		+		+		+		+		+		+
BUTYL ALCOHOL				+				+	100	+		
BUTYRIC ACID	5	+	5	+		–	100	+		–		+
CALCIUM CHLORIDE	10	–	10	–		/	50	+	10	+	Sat.	+
CARBON SULPHIDE		/		+		+		+	100	+		+
CARBON TETRACHLORIDE	10	–	10	–		+		–		+		/
CAUSTIC SODA		+		+	25	–	52	+	10	+	25	+
CHEESE						+		+		–		+
CHLORINATED WATER		–		–		–		–		+		–
CHLOROFORM	100	/	100	+		–		/	100	–		–
CHOCOLATE						+				–		+
CITRIC ACID	5	+	5	+		/	10	+	10	/		+
CUPRIC SULPHATE	5	+	5	+		+	Sat.	+	10	+		+
DISTILLED WATER		+		+		+		+		+		+
ETHYL ACETAT			100	/				+	100	+		
ETHYL ALCOHOL	10	/	10	+		+	96	+	96	+		+
ETHYL CHLORIDE		+		+		+		–	100	+		/
ETHYL ETHER						+		+	100	+		+
FERRIC CHLORIDE			20	–				+	10	+		
FOOD FATS		+		+		+		+		+		+
FOOD OILS		+		+		+		+		+		+
FORMALDEHYDE	100	/	100	+		+	40	+	30	+		/
FORMIC ACID	5	–	5	/	10	–	100	+	10	–	10	+
FREON 12				+						+		
FRESH WATER		+		+		+		+		+		+
FRUIT JUICES		/		+		+		+		+		+
GASOLINE		+		+		+		/		+		/
GLYCERINE		/		+		+		+		+		+
HYDROCHLORIC ACID					2	/	2	+	2	–	2	+
HYDROCHLORIC ACID		–		–	37	–	30	+	10	–	37	+
HYDROFLUORIC ACID		–		–		–	40	+	40	–	70	+
HYDROGEN PEROXIDE	30	+	30	+		–	30	+	3	–		+
IODINE						+		+		–		+
LACTIC ACID	5	/	5	+		+	20	+	10	+		+
LINSEED OIL			100	+				+		+		
MAGNESIUM CHLORIDE			5	+			Sat.	+	10	+		
MERCURY	100	/	100	/		+	100	+		+		+
METHYL ALCOHOL	100	/	100	/		+		+	100	+		+
METHYLENE CHLORIDE		/		/		–		/	100	+		/
MILK		+		+		+		+		+		+
MINERAL OILS		+		+		+		+		+		+

Environmental Conditions

Chemical resistance

CHEMICAL AGENT	Rex -OPTI-Plus® AISI 430 Conc.%	23° C	AISI 304 Conc.%	23° C	Rex -HP™ Rex -LF® ACETAL D Conc.%	23° C	POLYPROPYLENE PP Conc.%	23° C	POLYAMIDE PA Conc.%	23° C	POLYETHYLENE PE Conc.%	23° C
MUSTARD						+		+		–		+
NITRIC ACID	10	/	10	+	5	–		+	10	–	5	/
OLEIC ACID	100	/	100	/		–		+	100	+		/
PARAFFIN		+		+		+	100	/		+		+
PETROLEUM		+		+		+	100	/		+		–
PETROLEUM ETHER				+		+		+		+		+
PHENOL			10	+				+		–		
PHOSFORIC ACID	10	–	10	–	10	–	85	+	10	–	95	+
POTASSIUM HYDROXIDE			50	+					10	+		
SEA WATER		–		+		/		+		+		+
SILICONE OIL								+		+		
SILVER NITRATE			60	/			20	+		+		
SOAP AND WATER		+		+		+		+		+		+
SODIUM CARBONATE	5	+	5	+		+	Sat.	+	10	+		+
SODIUM CHLORIDE	5	/	5	+		+	Sat.	+	10	+		+
SODIUM HYDROXIDE				–	10	+	30	+	10	+		+
SODIUM HYPOCHLORITE		–		–		–	20	+		+		+
SODIUM SILICATE			100	+						+		
SODIUM SULPHATE	5	+	5	+		+	Sat.	+	10	+		+
SOFT DRINKS		+		+		+		+		+		+
SUDS								+		+		
SULPHURIC ACID	10	–	10	–	40	–	98	+	10	–	40	/
TARTARIC ACID	10	+	10	+	30	/	10	+		+		+
TETRALINE								–		+		
TINCTURE OF IODINE						+		+		–		+
TRANSFORMER OIL								/		+		
TRICHLORETHYLENE		+		+		–		/		/		+
TURPENTINE		+		+		–		–		/		–
VASELINE						+		+		+		/
VEGETABLE JUICES		+		+		+		+		+		+
VEGETABLE OILS		+		+		+		+		+		+
VINEGAR		+		+		+		+		+		+
WHISKY		/		+		+		+		+		+
WINE		+		+		+		+		+		+
XILOL		+		+		+		–		+		/
ZINC CHLORIDE			10	–			20	+	10	/		

Abbreviations: *Sat. = saturated.*

Legend..

+ = *Good resistance.*

/ = *Fairly good resistance (limited use depending on working conditions).*

– = *Poor resistance (not recommended).*

N.B. Where tests have not been carried out the spaces are left blank.

The data shown in this table..

are taken from laboratory tests, performed on unstrained test samples. It should be considered as purely indicative since material behaviour under real working conditions depends on different factors: temperature, concentration of the chemical agent, quick or long-lasting effect of the chemical agent.

Environmental Conditions

Assembly and installation

Pull a short section of chain through the entire conveyor to detect any obstructions or areas of tight clearance. Check the conveyor for loose nuts, bolts and any projections.
Ensure that the joints in the wear strips and the support elements are even, and that the clearance between chain and chain guides is correct. Welding metal splashes, metal chips and paint must be removed from the sliding surfaces.
Check also the clearance between chain and guide rail. Ensure that sprockets and idler wheels are correctly aligned. ensure that the entire length of the chain is properly lubricated.

CAUTION:
Install chain in 3 metre sections, making all connections on the conveyor frame. Thread chain onto conveyor carefully to avoid twisting and possible damage to the chain.

Inspection

During day to day operation, the chain, sprockets and conveyor system must be regularly inspected. This prevents defects and allows repairs to be carried out before serious damage is caused. The cost of regular maintenance is more than paid for by the longer service life and the absence of breakdown in the functioning of the conveyor. In order that any adjustments can be carried out at once, additional checks should be carried out during the initial phase. When the preliminary phase is over, only routine inspections are necessary. A fixed inspection schedule should be drawn up:

1) Are there any unusual grooves on the chain?
2) Check that the surface of the chain is even.
3) Check the clearance between the individual links and ensure that this has not increased as a result of overloading or blocking.
4) Pulsating is a sign of insufficient lubrication or of catching by the chain.
5) Check the clearance of deadplates and turntables.
6) Do the sprockets show signs of excessive wear?
7) Is dirt accumulating between sprocket teeth?
8) Check for sprocket guide ring wear and chain misalignment.
9) Check the ways and wear strips for excessive wear.
10) Is the lubrication system working correctly?
11) Check the insides of the corner wear strips and chain guides- excessive heat may indicate tight clearance or high friction.
12) Check return rollers for free rotation.

Lubrication

Special attention should be paid to lubrication. Ensure that there is sufficient lubricant on all areas of the chain and wear strip. Continuous lubrication or application of the lubricant at regular intervals should be provided. Continuous and even lubrication is especially important at the entry to a corner. If the conveyor cannot be lubricated during operation, this should be carried out when it is at a standstill. The service life is of sideflexing chains can be considerably increased by the application of light mineral oil to the sliding surfaces before assembly. in the case of sideflexing TableTop® chains, the roller chain should also be oiled before assembly.
Some lubrication processes and materials are listed below.

LUBRICATING AGENTS

1) Oil Based Lubricant
These are vegetable or mineral oils which have a high lubricity and coat chain parts which are subject to corrosion. If possible, lubricants of this type should be used for all metal chains.

2) Synthetic lubricants
Concentration is not depending on water hardness. Less foam on the conveyor, which makes inspection more easy. No slippery factory floors. Less bacteria growth.

3) Soap besed lubricants
Best possible lubrication because the lubrication sticks on the chains. Feels more greasy. High concentration is less critical.

4) Water
Although pure water is much less effective that the above types, pure water can also be used as a lubricant. In the case of plastic chains which run on stainless steel guides, this may increase the load on the chain since a thin film of water must constantly be sheared.

METHODS OF LUBRICATION

1) A central lubrication system pumps lubricant to the required locations.
2) Sideflexing chains can be lubricated effectively by applying the lubricant at the entry to the curve directly between chain and wear strip.
3) The return chain passes through a bath of lubricant
4) The returning chain contacts wheels made of porous material which turn in a bath of lubricant.
5) The lubricant drips on to the chain from a tank suspended above it.
6) Water drips onto soap and then onto the chain.

DRY RUNNING CONVEYORS

In some positions in a bottling or canning line, running without lubrication is possible. Rexnord has experience with plastic chains in applications with no lubrication. Important aspects of running dry running conveyors are :

+ Savings will be made on investments in lubrication system such as dosing equipment.
+ Elimination of costs of lubricants, clean water and water treatment.
+ Improvement of plant safety due to the elimination of slippery factory floors.
+ No packaging damage cused by wet containers.
+ Biological Oxygen Demand- reduction resulting in a more environment friendly production plant.
– Coefficient of friction increases. Lubrication provides the best product handling.
– Extra cleaning may be necessary, otherwise the coefficient of friction increases.
– Extra wear on components like chains, wearstrips and drives.
– Chance of slip stick effect under certain conditions.
– Chance of built up of static electricity.
– Higher noise level (sometimes a creaking sound running plastic chains in curves).
– Not possible on high speed running conveyors.

Note

It is strongly recommended to clean dry running conveyors regularly. Dirt and debris must be removed by cleaning, in order to keep the friction coefficients between chains optimal.

Environmental Conditions

Repair and replacement

Should such faults as jerky running of the chain, excessive wear on the chain, projection of chain links be noticed, these should be repaired immediately.

Such faults are often due to one of the following causes:

1) Serious overloading, jam-ups or wedging caused by broken glass or bottle caps.
2) Excessive backflexing of the chain during return.
3) Inadequate or no lubrication.
4) Interference and obstruction.
5) Worn sprockets.
6) Poor conveyor design.
7) Seriously damaged or worn chain.
8) Inadequate clearance on deadplates and turntables.
9) Wear on sprocket guide rings or idler wheels.
10) Wear of wear strips on straight or curved sections.

The following guide lines should be observed in determining when to replace chains and sprockets:

1) Elongation of the chain by more than 30 mm per metre.
2) The chain jumps the sprocket.
3) The flights have worn to about one-half of the original thickness.
4) Uneven conveying surface.
5) Serious wear on the guides of sideflexing chains which causes pins protrusion - these may cause damage to the wear strips or other parts of the conveyor.

The sprocket is worn when indentations appear in the toothing on which the chain tends to catch. These recommendations for the care of the conveyor are intended to ensure its smooth and uninterrupted operation. Regular and punctual maintenance of the conveyor are an essential factor in its ultimate productivity.

Cleaning

In many applications, residues of grease, dirt, sand, spilled syrup, beverage etc. may accumulate and cause:
1) Contamination or damage to the products.
2) Additional load on the chain and the motor.
3) Accelerated wear on the sprocket teeth.
4) Jerky running of the conveyor and additional wear.
5) Increased wear on the plates and in the chain hinge.
6) Rapid wear of the wear strips.

Frequent cleaning of the chain and the conveyor is recommended. Steam, warm water and soap are generally used for this purpose. Strongly corrosive agents which may be used for steel chains should not be used for chains consisting of plastic material. If large quantities of syrup or other liquids, broken glass etc. have accumulated, the conveyor should be cleaned and all foreign material removed. In order to immediately remove broken glass, spilled liquid, etc., operating personnel should be provided with brushes and other cleaning materials.

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 or indirectly 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 guarantee the design and function of machines equipped with our products are compliant with applicable local, european or USA federal health and safety laws or regulations.

Chain jumps on the sprocket or does not release well

Possible causes	Remedy
Chain is elongated or sprocket is worn-out. Elongation of the chain can be caused by wear or due to severe overloading, caused by e.g. jams.	Replace chain and sprocket and chek also other conveyor components for severe wear to find exact cause.
Improper catenary sag.	Make sure catenary sag is in right position and has the correct dimension
Sprocket is worn (teeth show a hooked profile).	Replace sprockets.
Wrong sprocket type is installed	Install right sprockets.
Improper sprocket position	Position sprockets at the right height and distance from the wearstrips.

Jerky chain operation

Possible causes	Remedy
This problem can occur with relatively long conveyors, operating at relatively low speeds. This is usually caused by so called "slip stick" effects, which are caused by the differences between the dynamic and static coefficient of friction.	Use lubrication if possible. Reduce chain tension by shortening the conveyor.
Return roller diameter is too small.	Install larger diameter roller.
Chain catches the conveyor.	Remove obstructions in the conveyor and make sure the chain moves smoothly in the returnpart.

Chain hinges are damaged

Possible causes	Remedy
Severe rapid elongation of the chain is usually caused by overloading, due to jams.	Replace chain and check other conveyor components like sprockets, alsofor severe wear.
Blocking and obstruction in conveyor.	Check the conveyor for possible obstructions, by pulling a small piece of chain through the conveyor manually.
Exceeding the minimum backflex radius of the chain in the return section.	Install larger rollers in positions where chains are bent excessively in backflex radius.

Chain is elongated

Possible causes	Remedy
Dirty hinges	Clean chain thoroughly and improve cleaning procedure.

Rapid curve wear

Possible causes	Remedy
In dry running lines with plastic chains, the PV limit can be exceeded.	Check application with calculation programme and replace curve upperpart by NYLATRON upperpart if programme dictates so.
In lubricated lines with abrasive particles (stainless steel chains). These particles can be the cause.	Replace upperpart by NYLATRON upperpart.

Installation & Maintenance

Chain is drifting sideways on sprocket

Possible causes	Remedy
Bad shaft/sprocket alignment.	Improve shaft/sprocket alignment and/or use guiderings.
Conveyors not level.	Put the conveyor level.
Poor design of carrying track or return section, near sprocket.	Change construction according to the guidelines in this manual

Cracked hinge eyes of plastic chain

Possible causes	Remedy
If the chain shows small cracks on the outside hinge eyes, this is usually caused by so-called stress-corrosion. The combination of chain load and the influence of chemicals can cause haircracks on the hinge eyes.	Replace chain and use only compatible chemicals.

Magnetic System chains come out of curve

Possible causes	Remedy
Uneven wear of the curve groove.	Replace curve.
Improper chamfering of infeed or other obstructions in conveyor track where chains catches the conveyor frame.	Make sure the chain can run smoothly through the complete section and check for obstructions.
No controlled startup.	Install a frequency controlled start and stop installation.
Curve is not mounted level.	Check recommendations given regarding the installation of Magnetic curves.

Steel chain is rusted

Possible causes	Remedy
Chain is not, or limited resistant to the liquid to which it has been exposed. Cleaning agents e.g. can sometimes be very aggressive.	Use only compatible chemicals. Consider installing a stainless steel chain with improve corrosion resistance.

Excessive chain wear

Possible causes	Remedy
Pollution.	Clean conveyor thoroughly and improve cleaning procedure.
Failing lubrication.	Contact supplier of lubricant to improve lubrication.
Obstruction in conveyor.	Find obstruction and remove it.
Debris in returnpart.	Cleaning and/or use rollers with a larger diameter.

Note

Of course, this table is not complete. For specific problems which cannot be solved this way, contact Rexnord Marbett or your nearest distributor for advice.

SALES OFFICES:

Austria	- Wien
Denmark	- Copenhagen
France	- Paris - Lyon
Germany	- Betzdorf (with distribution centre)
	- Düsseldorf - Siegen - Stuttgart
Italy	- Correggio (with distribution centre)
Netherlands	- ‘s-Gravenzande (with distribution centre)
United Kingdom	- Warrington
Canada	- Edmonton - Montreal - Toronto - Vancouver
United States	- Atlanta (GA) - Columbus (OH)
	- Dallas (TX) - Fresno (CA) - Grafton (WI)
Mexico	- Cordoba - Guadalajara
	- Mexico City - Queretaro
Brazil	- Sao Leopoldo - Sao Paulo
Australia	- Melbourne - Sydney
Singapore	- Singapore
China	- Shangai

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November/2001