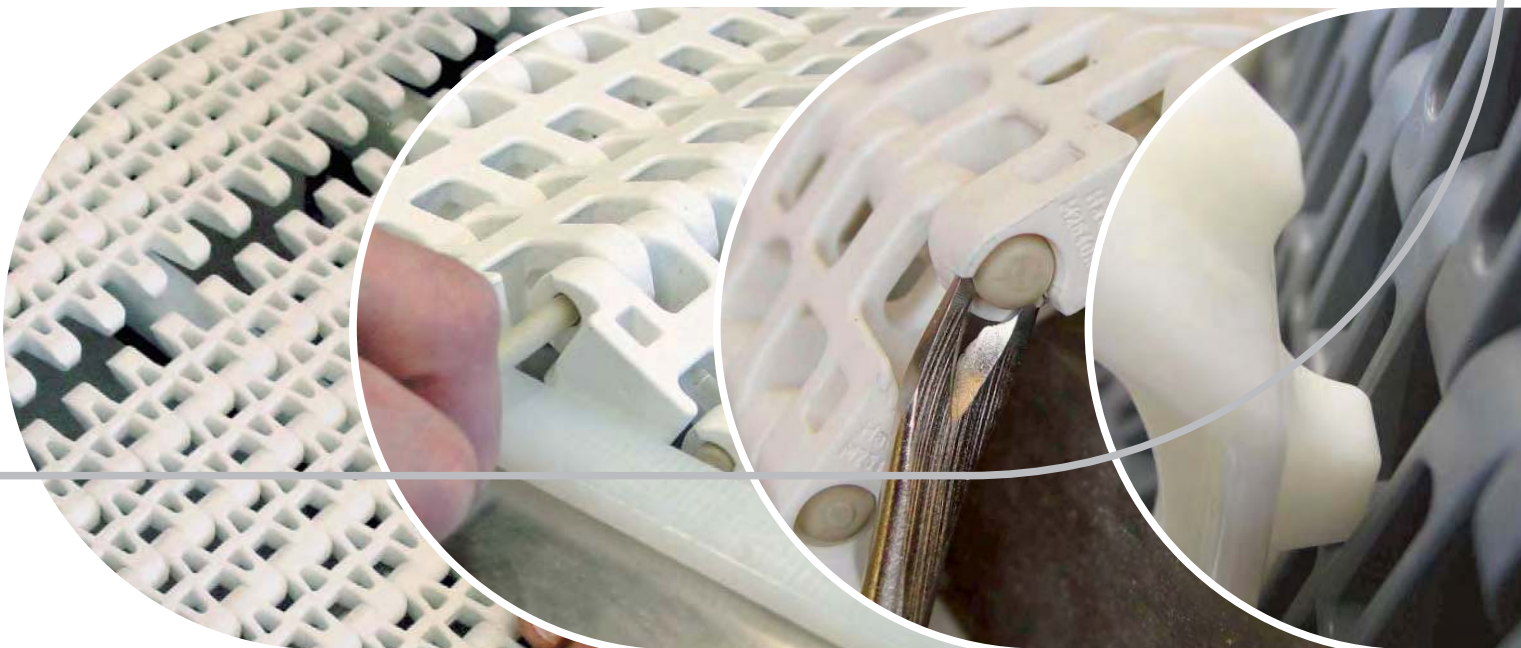


# Installation Guide HabasitLINK<sup>®</sup> Plastic Modular Belts

Habasit – Solutions in motion



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### Product liability, application considerations

If the proper selection and application of Habasit products are not recommended by an authorized Habasit sales specialist, the selection and application of Habasit products, including the related area of product safety, are the responsibility of the customer. All indications / information are recommendations and believed to be reliable, but no representations, guarantees, or warranties of any kind are made as to their accuracy or suitability for particular applications. The data provided herein are based on laboratory work with small-scale test equipment, running at standard conditions, and do not necessarily match product performance in industrial use. New knowledge and experiences can lead to modifications and changes within a short time without prior notice.

BECAUSE CONDITIONS OF USE ARE OUTSIDE OF HABASIT'S AND ITS AFFILIATED COMPANIES' CONTROL, WE CANNOT ASSUME ANY LIABILITY CONCERNING THE SUITABILITY AND PROCESS ABILITY OF THE PRODUCTS MENTIONED HEREIN. THIS ALSO APPLIES TO PROCESS RESULTS / OUTPUT / MANUFACTURING GOODS AS WELL AS TO POSSIBLE DEFECTS, DAMAGES, CONSEQUENTIAL DAMAGES, AND FURTHER-REACHING CONSEQUENCES.

### WARNING

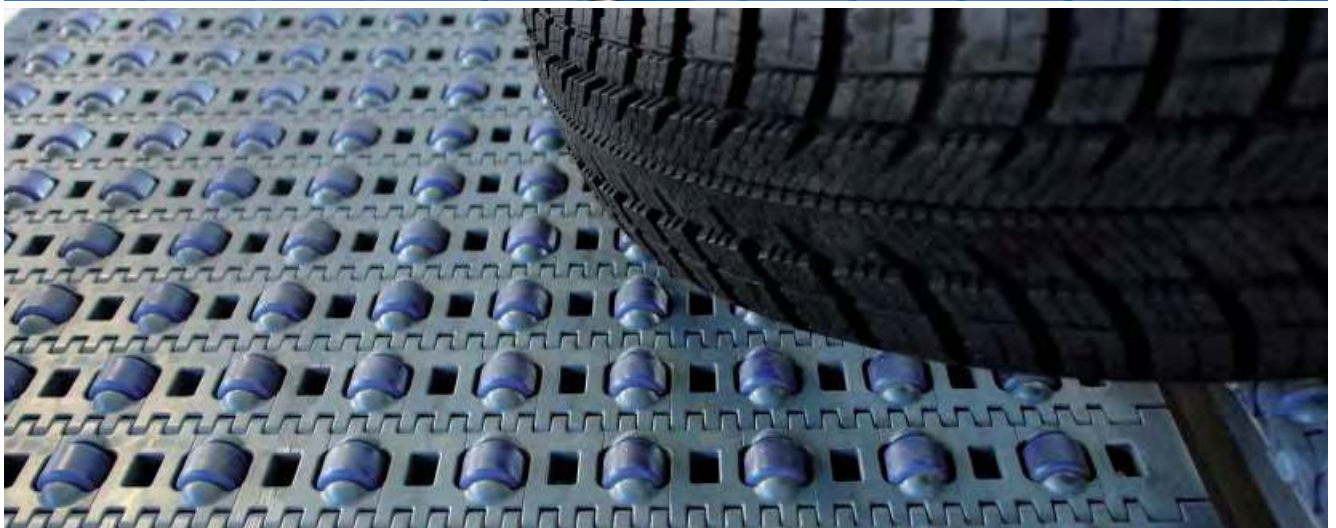
Habasit belts and chains are made of various plastics that WILL BURN if exposed to sparks, incendiaries, open flame or excessive heat. NEVER expose plastic belts and chains to a potential source of ignition. Flames resulting from burning plastics may emit TOXIC SMOKE and gasses as well as cause SERIOUS INJURIES and PROPERTY DAMAGE. See the Fire Hazard Data Sheet for additional information.

Habasit the market leader in the belting business is also constantly seeking the best possible solutions for our customers as regards easy maintenance, cleaning, joining and repairs.

There are many ways of installing and servicing belts; in the present brochure you will find clear and precise step-by-step descriptions on how to proceed in the most efficient way. In addition, hints and advice are given on possible sources of malfunctions and how to remedy them.

To guarantee the long service life of our belts preventive measures and proper maintenance are equally important. In this brochure you will find information and advice on these aspects as well.

We hope that this brochure will assist your staff in their daily tasks. And always bear in mind: "Habasit is there where you are". In the event of problems or when new innovative solutions are required, Habasit experts from our world wide net of subsidiaries and representatives are at hand to share their technical know-how and experience with you.



## Shaft installation and alignment

Correct shaft alignment is important for proper belt function and improves life expectancy.

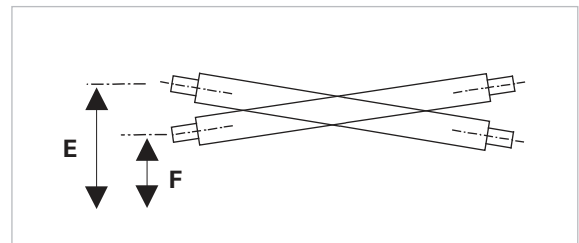
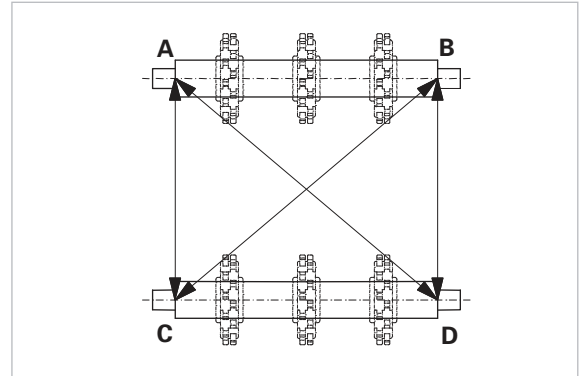
Conditions to be maintained:

Correct belt tracking  $AD = BC$

If the shafts are not placed in correct relation to each other, belt mistracking can occur.

End view:

For proper belt function and sprocket engagement maintain  $E = F$  (shaft shall be horizontal).

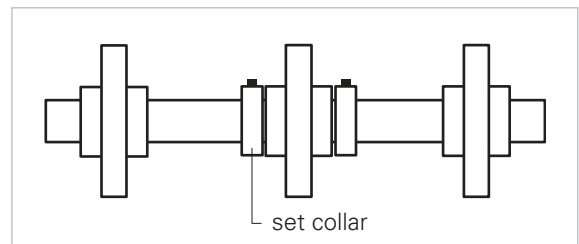


## Sprocket installation: General

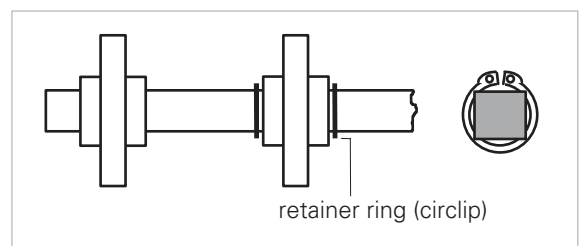
In order to allow the belt to expand / contract, only the center sprocket on each shaft is fixed. For shafts with two sprockets, the sprocket on the drive side is fixed. Various locking methods are possible:

- Set screws and set collars  
Mainly used with round shafts on key-ways
- Retainer rings  
For square shafts (no key-ways needed)
- Retaining plate  
Simple low-cost method for square shafts

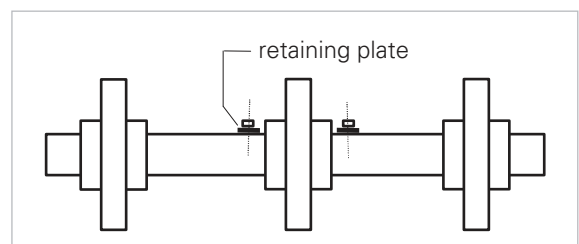
There should be a gap of at least 0.3 mm (0.01") between sprocket hub and retaining device. All devices must be securely fastened.



Type: Set screws and set collars



Type: Retaining rings



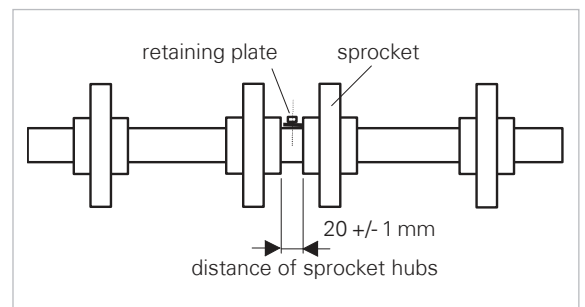
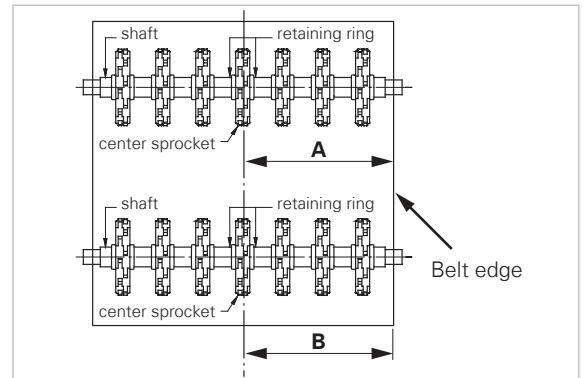
Type: Retaining plate

### Tracking

For proper belt tracking and straight belt run it is important to install the fixed sprockets perfectly aligned. A and B must be equal

### Tracking of M5010, M5011, M5013, M5014, M5060, M5064

The molded standard sprockets are tracking the belt leaving some transversal clearance to the belt (approx.  $\pm 2.5$  mm (0.10")). This is of advantage in food applications with very critical cleaning requirements, e. g. in the meat industry. For other applications it might be desirable to reduce this clearance in order to provide accurate tracking performance. The most common way to do this is to use a pair of center sprockets instead of one only. These two sprockets are both located on the shaft at a fixed distance by one center fixing plate. The width of this plate is 20mm (0.79") for M5010, M5011, M5013, M5014 and 14mm (0.55") for M5060, M5064



Various design versions are possible. The following are commonly used:

- A** The parallel wearstrip arrangement. This is the most economic method. For lower belt wear, the parallel wearstrip segments may be arranged alternating offset instead of in-line or as serpentine strip. For number of wearstrips please refer to the Product Data Sheets.
- B** The V-shaped arrangement of wearstrips (Chevron or Herringbone type). This provides equal distribution of load and wear over the total belt width. The max. distances between the wearstrips have to be 100 mm (4") for 2" belts and 50 mm (2") for 1" / 0.5" belts.  
Max. angle  $\beta = 45^\circ$ .

The supports consist of strips made from high density polyethylene, other suitable low wearing plastics or metal.

For **proposed number of wearstrips see Product Data Sheets**. For both versions A and B it is important to allow for thermal expansion or contraction of the strips.

Formula to calculate the necessary clearance d:

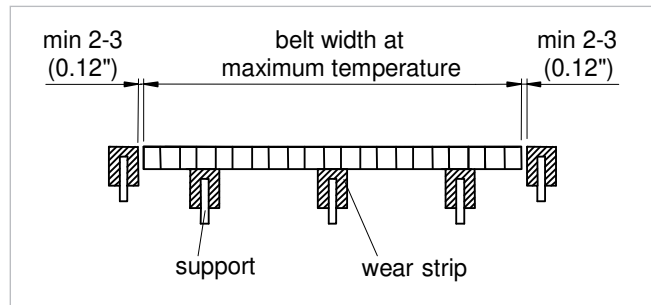
$$d > \Delta l = l / 1000 \cdot \alpha \cdot (T - 20 \text{ }^\circ\text{C}) \text{ [mm]}$$

l = length at installation temperature (20 °C) [mm]

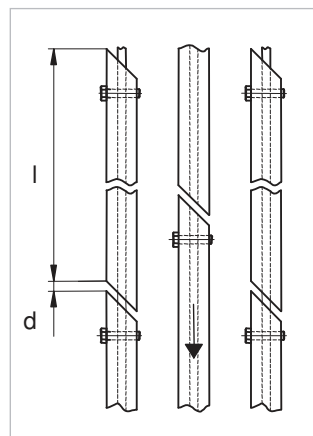
T = max. operation temperature [°C]

Material	Coeff. of linear thermal expansion $\alpha$ [mm/m · °C]	
	-73 – 30 °C	31 – 100 °C
	100 – 86 °F	87 – 210 °F
UHMW PE, HDPE	0.14	0.20
PA6, PA6.6	0.12	0.12
PA6.6 prelubricated	0.06	0.06
Steel	0.01	0.01

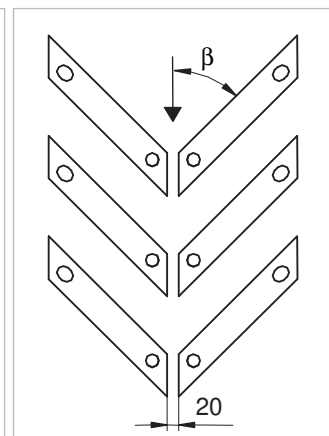
For straight running belts:



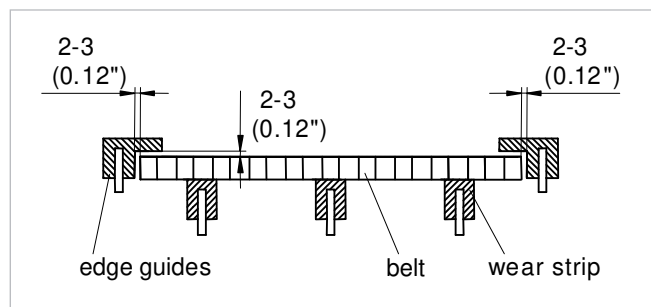
Version A



Version B

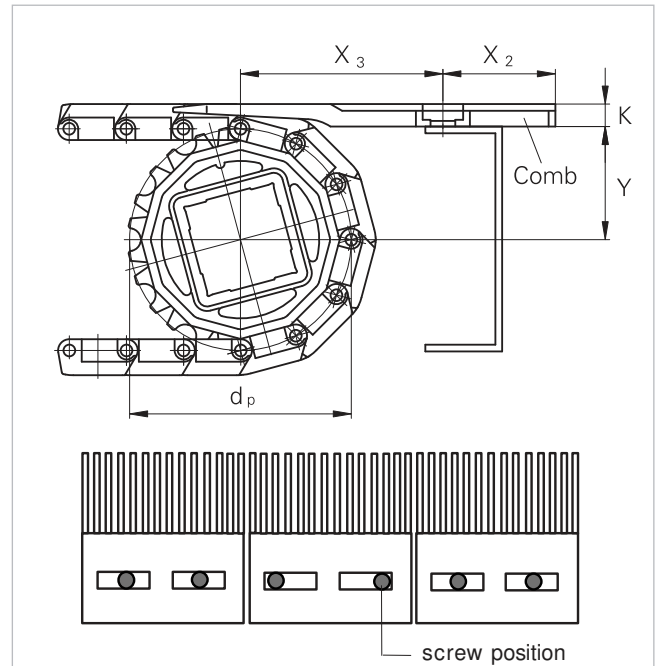


For straight running belts:



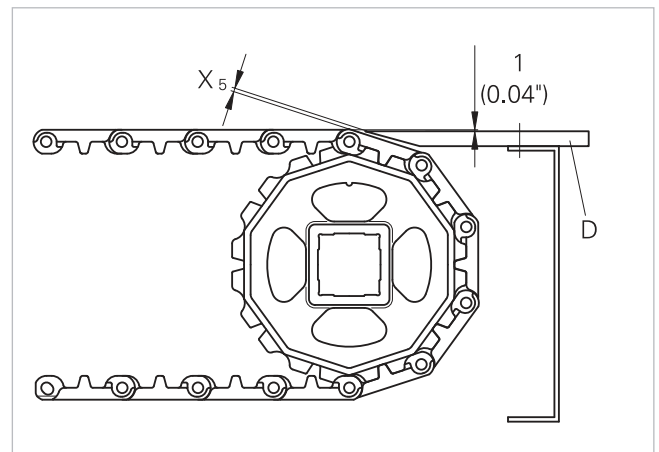
## Comb (finger plate) installation

Main dimensions and instructions for combs see Product Data Sheet. The plates contain slots. Special bushings and screws are delivered with the plates; they allow free lateral movement for compensation of thermal expansion or contraction of the belt. For belt widths up to 300 mm (12"), the plates can be firmly fixed.



## Dead plates for product transfer

Dead plates D are used for product transfer at the conveyor ends of Flat Top and Flush Grid belts. The discharge end should be adjusted to 1 mm (0.04") below the belt surface and the infeed end 1 mm (0.04") above the belt surface. The gap (X5) varies during belt movement, but should be as small as possible when the belt hinge passes the edge of the plate.

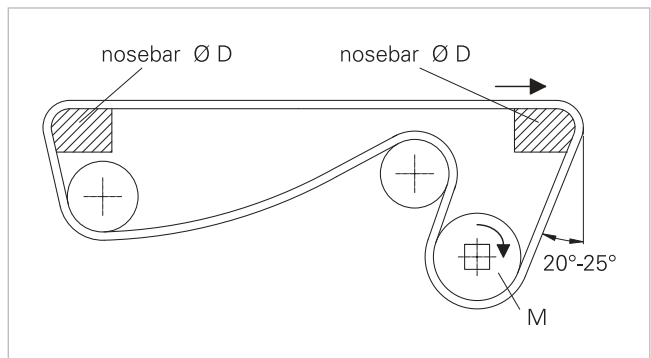
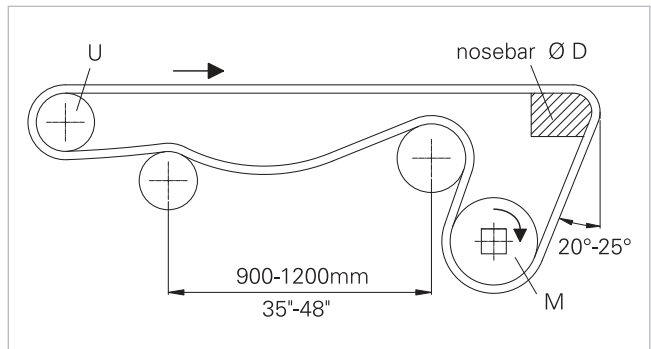
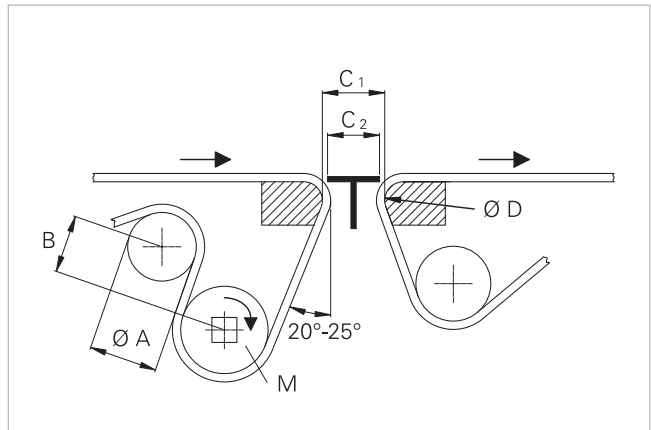


## Nosebar transfer for micropitch and minipitch belts

The micropitch belt (Series M0800) and the minipitch belts (Series M1100 and M1200) are perfectly suitable for dynamic or static nosebars. This allows a smooth and gentle transfer of the product with short sliding distance to the following belt or table. For certain transfer conditions a minimum diameter is possible. In this case the smoothness of the transfer may be reduced to some extent.

Please respect the correct geometric dimensions of rollers and transfer components.

Series	M0800	M1100	M1200
	mm <i>inch</i>	mm <i>inch</i>	mm <i>inch</i>
Minimal backbending roller diameter A	50 2	75 3	75 3
Minimal straight belt section B between drive and snub roller	50 2	50 2	50 2
Distance C1 between nosebars	16 0.63	22 0.9	30 1.2
Distance C2 Max. width of transport plate	-	16 0.6	25 1
Recommended nosebar diameter D	7 0.12	12.7 0.5	18 0.71
Minimal nosebar diameter Dmin	7 0.12	12.7 0.5	16 0.63



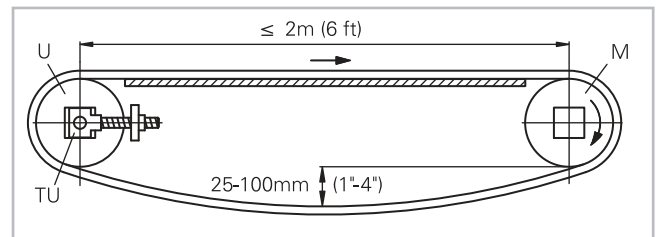


Modular belts typically change their length under varying operational conditions of temperature and load. The extra belt length is accommodated by providing an unsupported section of the return way for catenary sag.

The design of the conveyor frame is dependent on the total belt length. A screw take-up is used on the idler shaft for initial adjustment of the catenary sag only and not for adjustment of the belt tension.

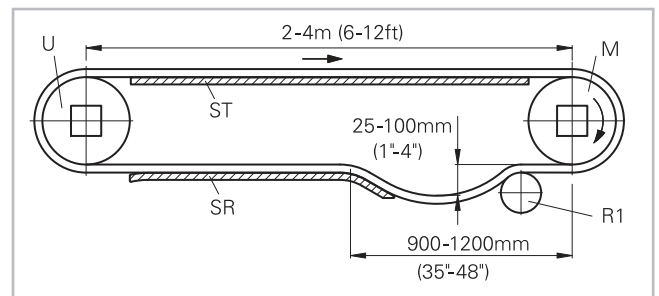
**Short conveyors** (maximum 2 m (6 ft))

In this case belt support on the return side can be omitted. Screw type take-up (TU) can be necessary for adjustment of catenary sag. Observe perfect parallel alignment of shafts.



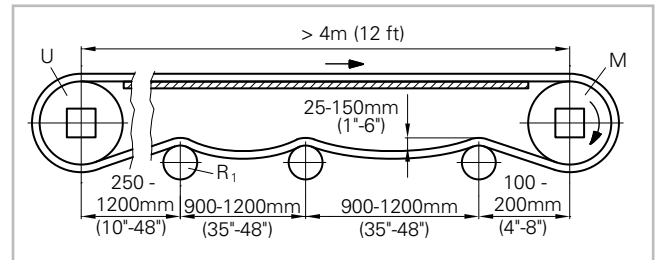
**Medium length conveyors** (2 to 4 m (6 to 12 ft))

Common design; belt on return way supported by slider frame (SR) or wear strips. Rollers (R1) can be used as well. A catenary sag near the driving sprockets is sufficient for moderate temperature changes.



**Long conveyors** (over 4 m (12 ft))

Longer lengths and greater temperature changes require more than one section for catenary sag. In this case vary roller spacing (e. g. 1200/900/1200/ 900 ...).



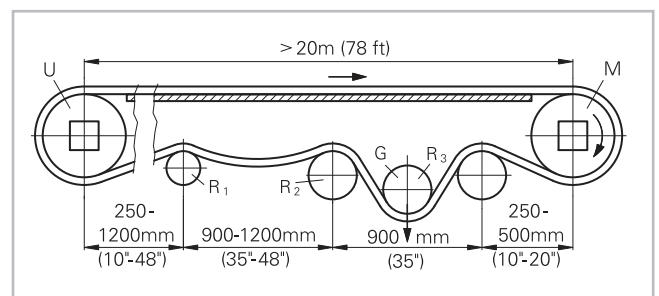
Admissible speeds of long conveyors:

Length	max. speed
up to 15 m (45 ft)	50 m/min (150 ft/min)
15 - 15 m (45 - 75 ft)	30 m/min (90 ft/min)
over 25 m (75 ft)	15 m/min (45 ft/min)

For speeds higher than 50 m/min (150 ft/min), always consult a Habasit specialist.

**Gravity take-up**

For heavily loaded long belts and/or high speed (over 15 m/min) and/or with frequent starts the catenary sags may not sufficiently tension the belt to prevent sprockets from disengaging. In such cases the gravity take-up (G) can be an adequate solution.



Recommended tensioner weight:

Belt type	Tensioner weight per m (ft) belt
for 0.3" belts	10 kg/m (7 lb/ft)
for 0.5" and 1" belts	15 kg/m (10 lb/ft)
for 1.5" and 2" belts	20 kg/m (14 lb/ft)
for 2.5" belts	25 kg/m (17 lb/ft)

HabasitLINK® modular belts are designed to be as maintenance-free as possible. However, as with all dynamic machinery, conveyors can be exposed to impacts, abrasive conditions and wear that require attention. This guide offers you assistance in diagnosing and solving any mechanically related problem that may arise.

## Which incidents should be reported?

- In case of belt edge damage, an immediate investigation is necessary to prevent further, more serious damage.
- Any mistracking or sprocket disengagement, as well as excessive wear, should be corrected as soon as possible. If left uncorrected, more serious damage can occur.
- Take corrective action in case of missing or damaged return rollers, shoes, or wearstrips.
- Damaged or missing belt modules should be replaced as soon as they are discovered. The belt will probably continue to operate adequately. However, this kind of damage can affect the strength integrity of the belt and contribute to further damage, and the conveyed product could also be damaged.
- Replace any rods that are protruding out of the belt (or missing rods) as soon as they are discovered.

## Inspection after one month

After one month of operation, it is recommended that belt performance and installation be checked as follows:

- Check the catenary sag height and adjust if necessary. One or more module rows might have to be taken out in order to adjust for normal belt lengthening after start up.
- Check the belt (top and bottom), sprockets, and wearstrips for signs of wear or damage (cuts, gouges, etc.).
- Check sprockets for proper engagement with the belt and location (transversely) on the shafts.
- Check belt return system for worn or damaged rollers, shoes, or wearstrips.
- Check connecting rods for damage or excessive wear.

Investigate the cause of any accelerated wear and plan for adjustments or take corrective action in a timely manner. A thirty-day inspection interval is recommended for maximum lifetime of the system. This will also allow you to spot any wear trends and develop a “feel” for the operational characteristics of your HabasitLINK® belt.

Observation, timely reporting of operational problems,

and regular inspection and maintenance at roughly thirty-day intervals should ensure a maximum useful lifetime.

## Cleaning

In order to avoid contamination, build-up of material, or abrasion from carried products, frequent cleaning is recommended. Such contamination can cause increased wear of the modular belt, sprockets, and wearstrips. Thorough and regular cleaning is therefore very important.

Conveyors that sit idle for a long time before start-up should be covered to prevent accumulation of dirt and debris on chain and tracks.

## Recommended cleaning frequency

1. Food lines: These lines should be cleaned very frequently and in accordance with local requirements or regulations to obtain maximum hygiene and performance. For cleaning procedures please follow OEM instructions.
2. Non-food lines: For cleaning procedures please follow OEM instructions.

## General guidelines for cleaning solutions

Recommended pH of 4–10. Avoid chlorine and iodine. With POM and PA, avoid strong acids such as hydrochloric acid, sulfuric acid, phosphoric acid, etc. For quick reference concerning chemical resistance, see HabasitLINK® Engineering Guide.

## Normal belt and sprocket wear

The lifetime of a belt and sprocket is influenced by many factors, such as environmental conditions, contact with chemical agents, maintenance, etc. Good knowledge of the operation and environment is important to ensure a better lifetime prediction and a longer lifetime. For the correct belt and sprocket selection and methods to ensure appropriate belt life, refer to the Habasit Engineering Guide.

Belt and sprockets need to be replaced before excessive wear affects proper driving performance and sprocket engagement.

## Tracking problems

Possible cause	Proposed measures
Sprockets are not "timed" correctly 16.66 mm	If the total number of teeth are not divisible by 4, the sprockets must be "timed" by alignment of the timing marks.
Sprockets on drive and idle shaft misaligned; locked sprocket on drive or idle has incorrect placement or is loose	The center sprocket on the drive and idle shafts must be aligned and engaging the belt. Check the retaining devices to ensure the sprockets are secured.
Conveyor frame not level and square	Check and adjust if necessary.
Drive and Idle shafts are not level and square with each other	Check and adjust if necessary to ensure that drive and idle shafts are level and square.
Missplice in belt	Inspect belt for a missplice.

## Sprocket engagement fails

Possible cause	Proposed measures
Incorrect "A" and "C" dimensions (see Engineering Guide 6031, Sprocket evaluation)	Check to see that the shaft is adjusted to provide for the recommended "A" and "C" dimensions.
Sprockets not timed correctly	If the total number of teeth are not divisible by 4, the sprockets must be "timed" by alignment of the timing marks.
Insufficient belt tension	Check to see that there is sufficient length for catenary sag located at the recommended area.
Arc of contact too small	Min. arc of contact between belt and sprocket approx 150°. In critical cases increase the arc of contact to $\geq 180^\circ$ by installation of support roller.

## Excessive sprocket wear

Possible cause	Proposed measures
Abrasive material	Improve cleaning or add protective shields to reduce the amount of abrasive material contacting the belt and sprockets.
Incorrect number of sprockets	Check to see if the minimum number of recommended sprockets are used. Too few sprockets will cause premature sprocket wear.
Sprockets not timed correctly	If the total number of teeth are not divisible by 4, the sprockets must be "timed" by alignment of the timing marks.
Incorrect "A" and "C" dimensions	Check to see that the shaft is adjusted to provide for the recommended "A" and "C" dimensions.
Locked sprocket on drive or idle has incorrect placement or is loose (sprockets misaligned)	The center sprocket on the drive and idle shafts must be aligned and engaging the belt. Check the retaining devices to ensure the sprockets are secured.
High belt speed	High belt speeds will increase the wear especially on conveyors with short centerline distances. Reduce belt speed if possible.
High belt tension	High belt tension will increase belt wear. Check to ensure that recommended catenary sag is present.

**Excessive belt wear**

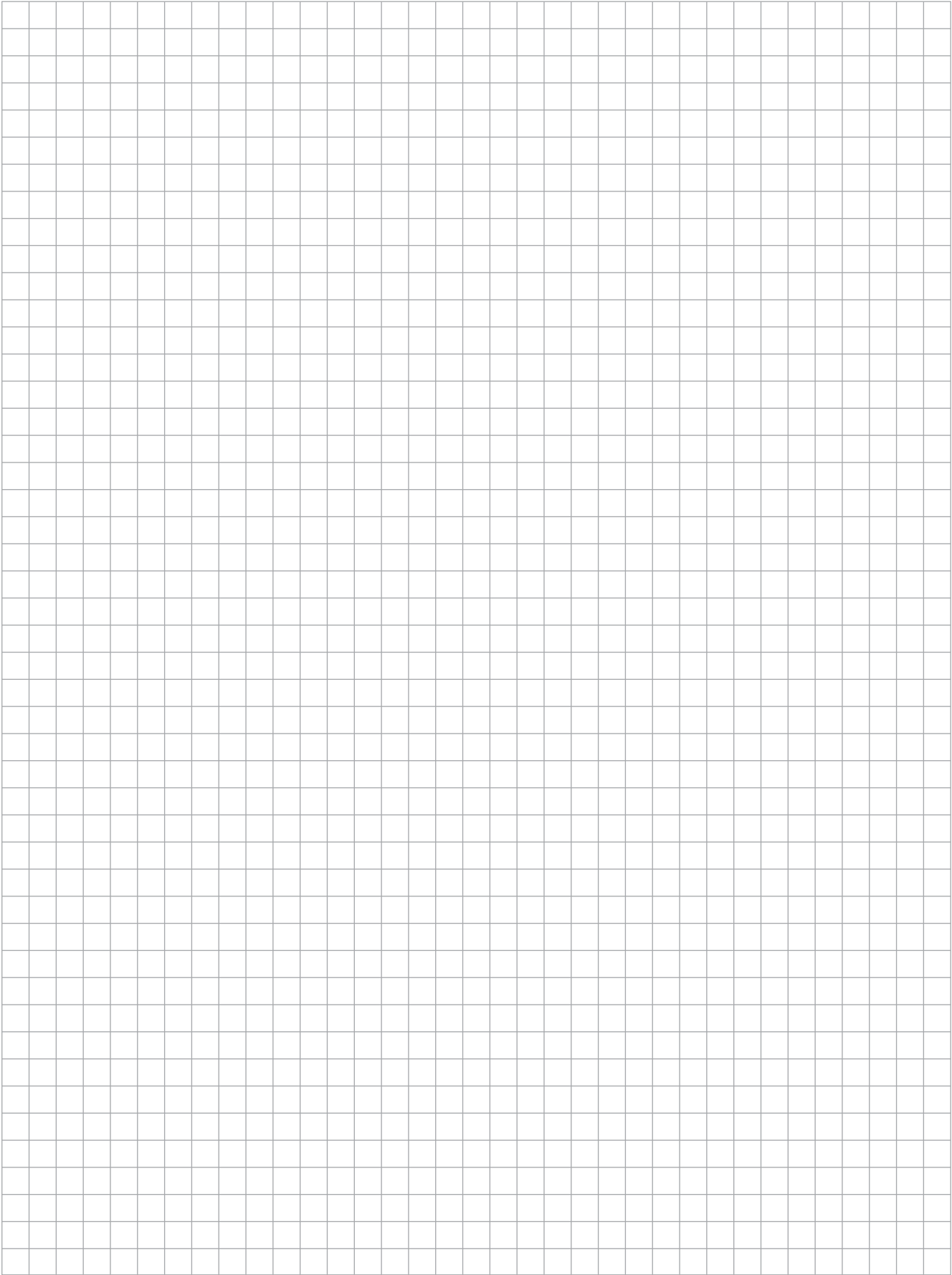
Possible cause	Proposed measures
Abrasive material	Improve cleaning or add protective shields to reduce the amount of abrasive material contacting the belt and sprockets.
Incorrect belt material	Check material specifications to ensure that the optimal material is used. Call Habasit technical service for a recommendation.
Incorrect wearstrip material	Check material specifications to ensure that the optimal material is used. Call Habasit technical service for a recommendation.
Incorrect wearstrip placement	Check material specifications to ensure that the optimal material is used. Call Habasit technical service for a recommendation.
Method of product loading	Reduce the distance that product is deposited on the belt. If product sliding occurs, refer to material specifications.
High belt speed	High belt speeds will increase the wear especially on conveyors with short centerline distances. Reduce belt speed if possible.

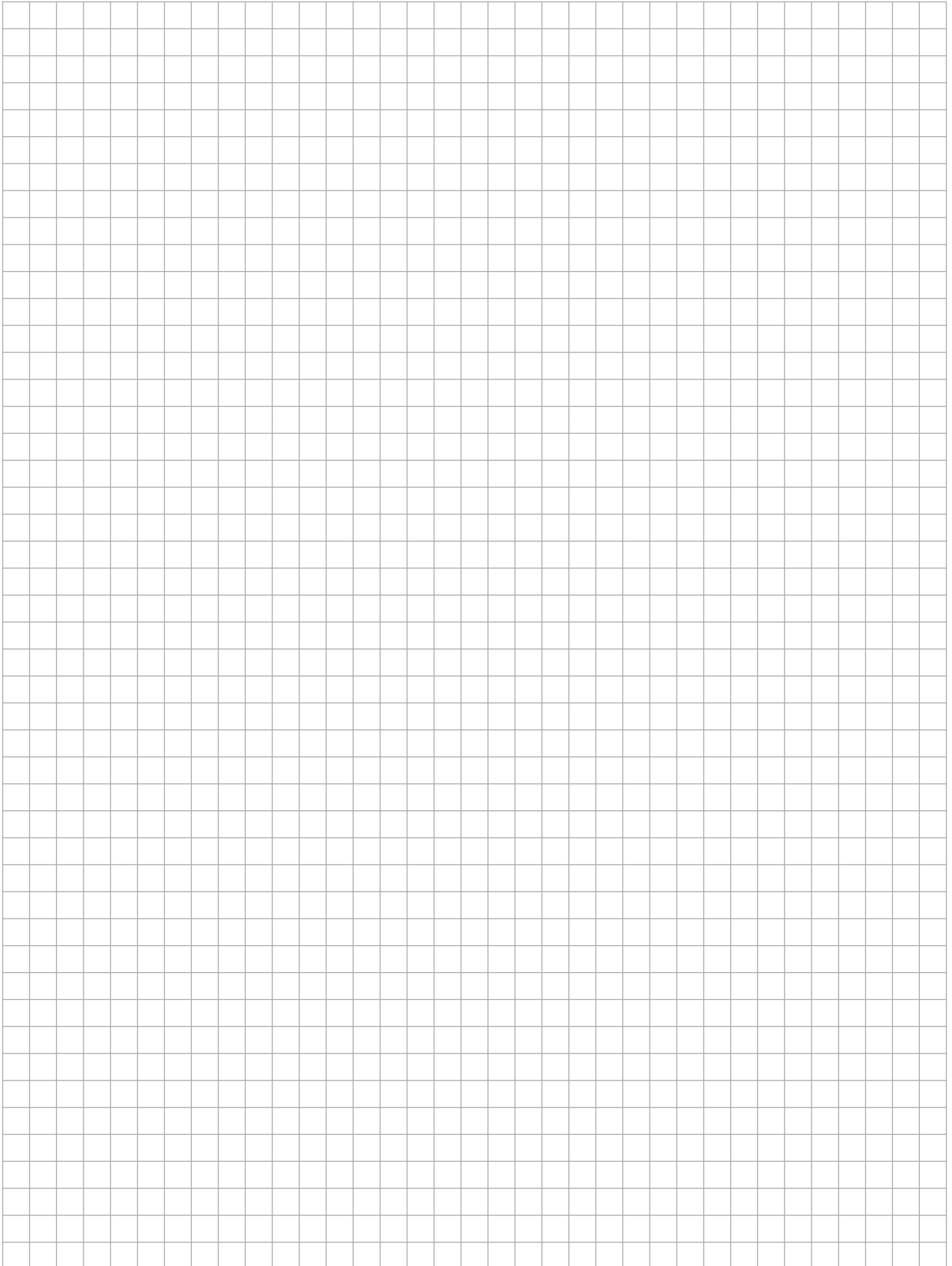
**Belt stretching and excessive catenary sag**

Possible cause	Proposed measures
Abrasive material	Improve cleaning or add protective shields to reduce the amount of abrasive material contacting the belt and sprockets.
Incorrect tension	Adjust tension.
Incorrect belt / rod material	Check the material combinations used and call Habasit to confirm the correct material application.
High temperatures	High temperatures cause the belt to elongate a large percentage. Check if the catenary sag is long enough to compensate the elongation. It might be necessary to install a gravity or pneumatic tensioning device.

**Pivot rod (hinge pin) migrating out of belt**

Possible cause	Proposed measures
Rod not headed on both ends	Replace rod secure its ends with soldering gun (fuse rod head).
Rods not properly seated in snap-in position	Check if rod head and / or edge module is damaged; if necessary replace. Reinstall properly.
Rod elongates due to high load and / or high temperature	Shorten rod and reinstall or replace by new and shorter rod.







### Customers first

At Habasit we understand that our success depends on your success. This is why we offer solutions, not just products; partnership, not just sales. Since our foundation in 1946, Habasit has brought this understanding of customer needs to life every day and for every application. That's why we're the No. 1 in belting today. Worldwide. Learn more on [www.habasit.com](http://www.habasit.com)

### Committed to innovation

Habasit is strongly committed to the continuous development of innovative, value-added solutions. Over 3% of our staff are dedicated exclusively to R&D, and our annual investment in this area exceeds 8% of turnover.

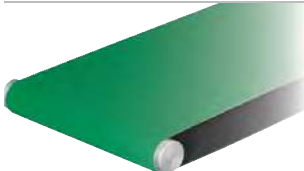
### Certified for quality

We deliver the highest quality standards not only in our products and solutions, but also in our employees' daily work processes. Habasit AG is certified according to ISO 9001:2000.



### Worldwide leading product range

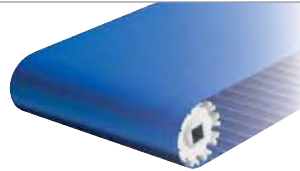
Habasit offers the largest selection of belting, conveying, processing and complementary products in the industry. Our response to any request is nothing less than a specific, tailor-made solution.



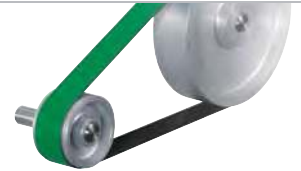
Fabric based conveyor and processing belts  
**HabaFLOW®**



Plastic modular belts  
**HabasitLINK® /KVP®**



Positive drive conveyor and processing belts  
**Habasit Cleandrive™**



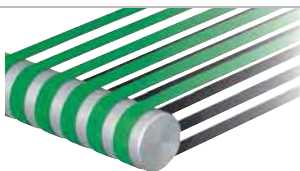
Power transmission belts  
**HabaDRIVE®**



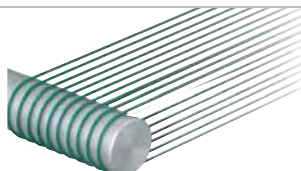
Timing belts  
**HabaSYNC®**



Chains (slat and conveyor chains)  
**HabaCHAIN®**



Machine tapes



Round belts



Seamless belts



Profiles, Guides, Wear strips  
**HabiPLAST®**



Fabrication tools (joining tools)



Gearmotors  
Electric motors  
Motion control

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Subject to alterations  
Printed in Switzerland  
Publication data:  
6001BRO.MOD-en0312HOR