TWENTEFLEX™
INSIDE DIRECT DRIVE SPIRAL BELTS

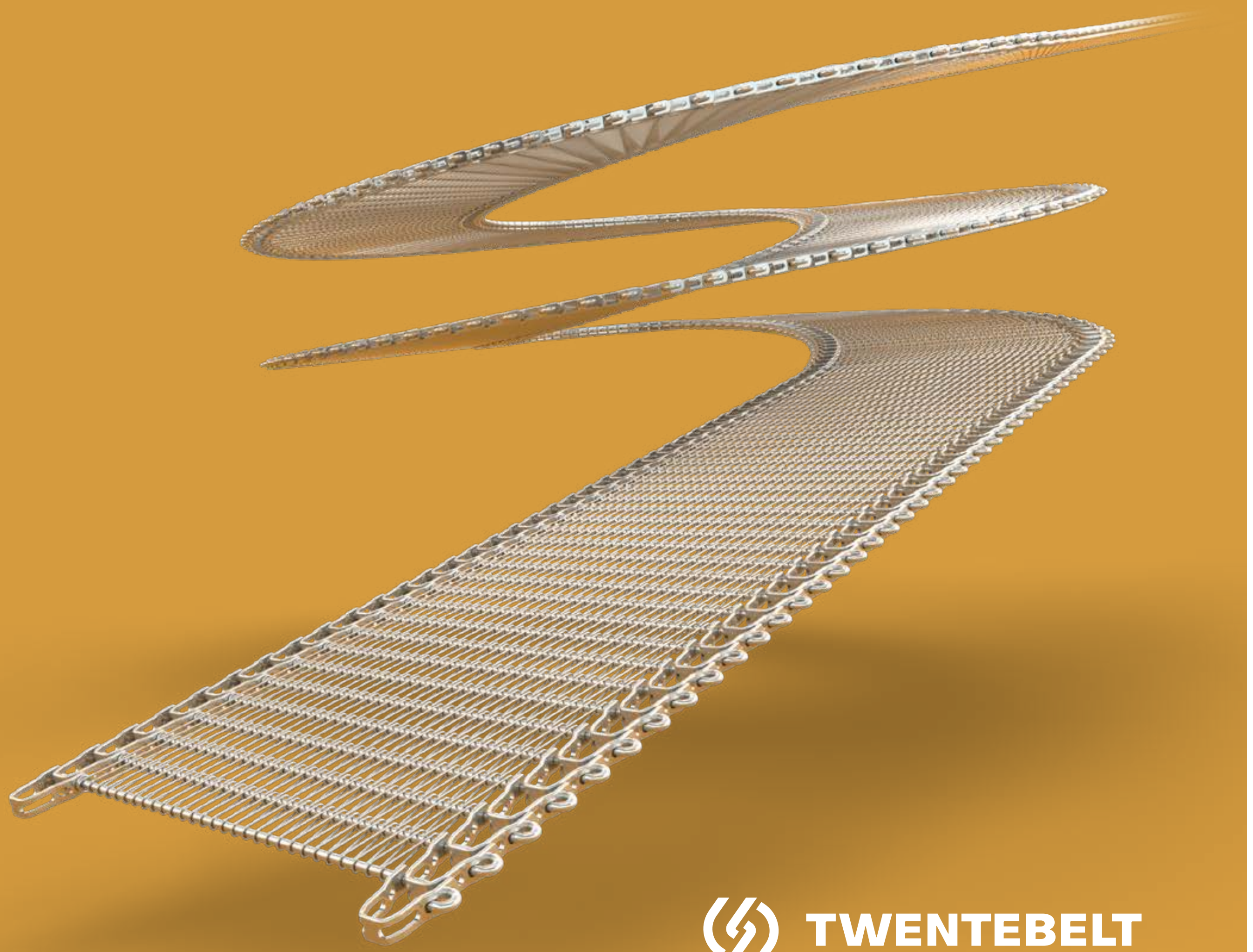
TWENTEBELT

METAL CONVEYOR BELTS

TWENTEBELT
TWENTEFLEX™

FREEZING · COOLING · PROOFING

COOKING · STEAMING · PASTEURIZING



TWENTEBELT

CONTENT

TWENTEFLEX INSIDE DIRECT DRIVE

Our TwenteFlex belt used for inside direct drive is exactly the same belt as used for the common low tension drive. The bended rod edge of our TwenteFlex belt acts as a tooth and is the perfect drive area for a positive engaging cage bar.

COVERING ALL BASES

We believe in adding true value to our market. Which is why we don't just offer inside direct drive as a copy of an existing system. We offer a solution that is far more affordable and operational within a matter of days. TwenteFlex inside direct drive uses the exact same TwenteFlex belt as our TwenteFlex low tension drive does. Therefore it's up to you to choose which drive solution fits your application best; low tension drive ór inside direct drive with our TwenteFlex belt and your existing drum.

- Direct drive significantly reduces product movement.
- Direct drive eliminates friction between the drum and belt.
- Direct drive makes longer production runs possible.
- Fail-safe design.
- Straightforward retrofit, from low tension to direct drive.
- Operational in a matter of days.
- Advantageous, as our standard TwenteFlex belt is used.

THE BELT WITHOUT A WELD

As our TwenteFlex belt has been around for several years, we were ready for the next innovation. We concluded that 'all' we had to do, was create a cage bar to enable direct drive. We did not want to develop a completely new belt. Just make some small adjustments to your system to fit the existing TwenteFlex belt.

For more information on our TwenteFlex belt, please check out the TwenteFlex brochure.

DRIVE PRINCIPLE

Although the low tension principle is a proven technology and applicable for many applications, there are situations where the direct drum drive principle offers advantages.

INSIDE DIRECT DRIVE SPIRAL

The inside direct drive principle eliminates the cage bar/ belt friction factor by using teethed cage bars that give a positive drive. Thus the belt tension only depends on friction between the belt and the support rails. This means that high belt tension due to a slippery drum is history, which results in more predictable and stable belt tensions, especially on longer production runs. The positive cage bar drive also reduces movement of the inside belt edge, significantly reducing miss-alignment or damaging of products that are sensitive to this issue. The belt in the last tier of the spiral must be tensioned by an outfeed helper drive or take-up weight in order to keep the teeth engaged. The recommendation is to use a torque drive at the outfeed of the spiral. In the first one to two tiers of the infeed, conical blocks are fitted to reduce the belt tension to a comfortable level that will prevent tension issues and extend belt life.

COMMON LOW TENSION SPIRAL

The drive principle of the known low tension system is based on a drum having overdrive/slip with the take-up drive being the master drive and controlling the belt speed. Each tier is driven by the friction that exists between the belt and the flat cage bars. The friction coefficient depends on the atmospheric conditions (product residue, freezing, warm, wet, dry, etc.). If the friction coefficient increases during the production run it can create tension problems (flip-up, too much belt in the take-up, etc.). Before this happens the spiral must be cleaned.

When the products are delicate or are not allowed to move/turn on the belt, the low tension principle could be problematic since the cage bars are slipping past the inside belt links. This causes the inside links to stick against a cage bar and release back shortly after causing the spiral overlay to move underneath the product, which can move or damage the product.

SYSTEM DESIGN - MECHANICAL DESIGN

GENERAL RECOMMENDATIONS

- Let the belt follow its desired path as much as possible. (minimize the use of guide plates in order to try to track the belt)
- Avoid long infeed and outfeed sections.
- Make sure that the belt transition from one belt support section to the next is smooth.
- The outer links must be supported at every shaft.
- The minimum advised idle roller diameter for use with the TwenteFlex TBU 40 belt is 135 mm.
- Minimize the number of idle shafts as much as possible. This will reduce belt elongation.
- It is advised to use a small piece of belt to check if the belt will fit correctly throughout the whole system before pulling in the belt.
- Use a hold down rail over the inside links in a down-go spiral.
- Check that if the belt would move away from the drum, the outside links can't catch the frame.

At the outside belt edge the belt must have at least 30 mm free sideways space before it touches any frame parts. (depending on the conical block size)

INSIDE DIRECT DRIVE DRUM

CONICAL BLOCK

At the bottom tier (up-cage) or top tier (down-cage) there must be a conical shaped drive block fitted between every cage bar. The conical block ensures that the second and following tiers use less belt length relieving the belt tension.

Too much relief means the belt will become too loose and could be able to jump teeth. Too little relief will increase the belt tension. In low tension spirals extra belt could quickly be transported to or from the take-up area due to the drum slip. This is not possible with the inside direct drive principle where it takes a full cycle to do this.

When the belt reaches the point where the conical block sinks between the cage bars, the teethed cage bars will take over from the conical blocks.

Please be aware that the actual dimensions of the conical block have to be calculated per application. The specification is crucial to the operation of a TwenteFlex inside direct drive system.

- The minimal block offset at the first point of contact with the belt is 8 mm. (height of the drive bar teeth)
- The minimal width of the conical block is 45 mm. (the advised width of the conical block is 60 to 80 mm)
- The conical blocks need to cover at least 30% of the drum surface.
- The drive surface of the conical block needs to have a slight saw-tooth design to give the belt a positive drive.

Based on the specification of the system (lay-out, belt width, drum diameter, drum design, application, etc.) Twentebelt calculates the recommended dimensions of the conical block. (conical offset, conical angle, effective conical block height)

On request Twentebelt can provide a calculation and drawings for a conical block that will fit your system and/or for the OEM to design the back side fitting to their drum design.

CAGE BARS

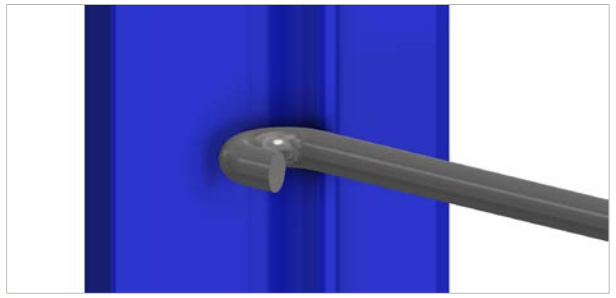
In order to obtain a smooth drive it is recommended to use teethed cage bars that are 60 to 80 mm wide and have a 5x3 chamfer spaced apart by approximately 120 to 160 mm. The cage bars need to cover at least 30% of the drum surface. At temperatures between -60 and +60 ˚C the recommended material is PE-1000. For applications over 60 ˚C, please contact Twentebelt.

Just before the belt leaves the drum (max. 30 degrees before the belt release) the teeth of the cage bars must disengage the belt so the cage bar is flat again. Therefore the last cage bar section must be non-teethed. If this is not done, the belt will not disengage smoothly and this can disrupt the setting of the outfeed drive. For that reason the cage bars must be bolted at the top of the drum (not in the belt path) for an up-cage system. This will give a fixed point where the teeth ends. The space for expansion of the cage bar is consequently at the bottom, between the conical blocks.

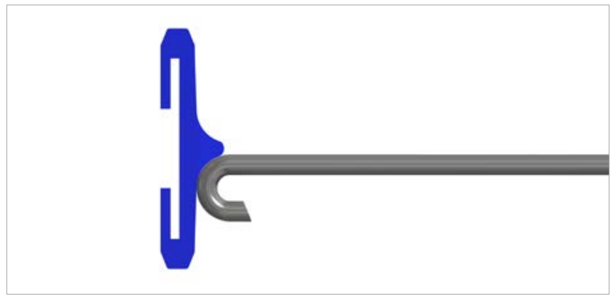
It is advised to only use teethed cage bars, however this will not always be possible due to the distance between the cage bars and maximum collapse of the belt. Twentebelt can advise if every drive strip needs to be a teethed drive strip or that they need to be fitted every second or third cage bar with flat ones in between.

Depending on the drum diameter, cage bar distance and turn ratio of the belt it is possible that incidentally a link will ride on top of a tooth, instead of the tooth falling between the belt edge. TwenteFlex inside direct drive is designed such that this phenomenon will not damage the belt nor cage bar. It is one of the reasons why there must be at least 30 mm sideways clearance at the outer belt edge. If the belt would lose all grip due to an operational error that causes the outfeed to stop, the rounded shape of the belt edge and cage bars ensure the system can cope with this. After restoring the drive issue, the belt will realign itself. The fact that TwenteFlex inside direct drive can cope with situations like this increases the reliability.

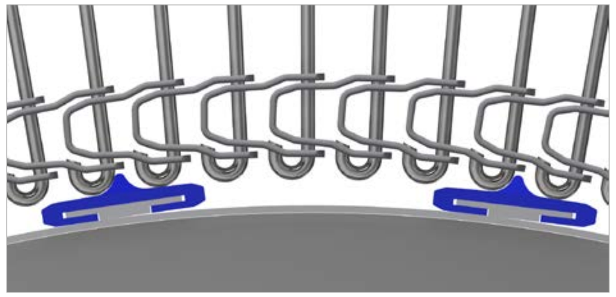
Twentebelt supplies the pictured cage bars. Drawings of the tooth shape are available on request.



OPTIMAL CONTACT AREA DUE TO THE ROUND TOOTH AND BENDED ROD

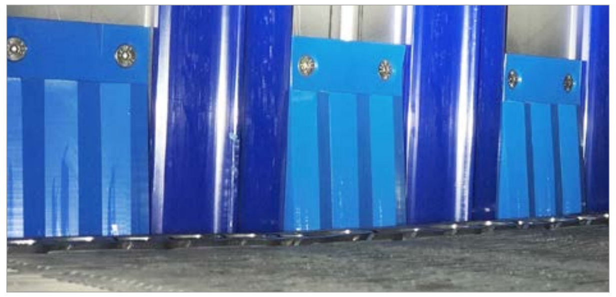


FAIL-SAFE DESIGN DUE TO THE ENGAGEMENT OF ROUND SHAPES



TOP VIEW OF THE CAGE BAR ENGAGING THE BELT

END OF THE CAGE BAR AT THE TOP OF THE DRUM



END OF THE CONICAL BLOCK IN THE BOTTOM PART OF THE DRUM

BELT TENSION

In order to make an estimation on belt tension, people are used in low tension spiral applications to see how easily they can pull the belt away from the drum. Due to the drive teeth on the vertical drum strips it takes more effort to pull the belt from the drum in order to estimate the belt tension. In a low tension spiral the inside links can be pulled along the flat cage bars. This is not possible in an inside direct drive spiral, as the cage bars have drive teeth.
The inside links will hook behind the drive teeth making it harder to pull the belt from the drum. This gives the impression that the belt tension is higher than expected, although the belt tension could be equal to a low tension spiral. A belt tension gage will give the accurate tension.

INFEED BELT TENSION

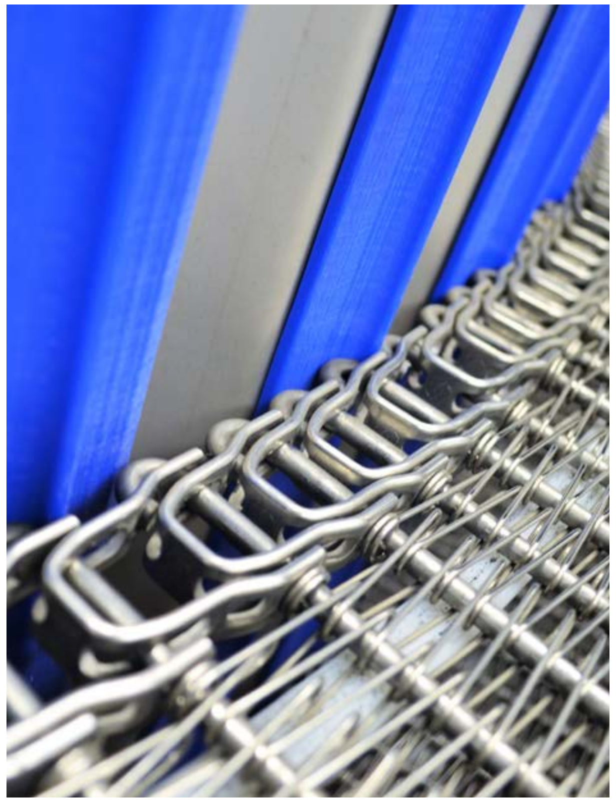
It is important to have a predictable belt tension at the spiral entrance of approximately 15 to 70 kg. This is especially important with systems that have a 90, 180 or 270 degree return. It is strongly advised to minimize the take-up weight as much as possible, in order to minimize the belt tension at the infeed. However a minimum belt tension must be present, otherwise the conical block will reduce the belt tension too much and the cage bars will not engage properly. If the belt tension is too high at the entrance of the first tier, the belt tension cannot be relieved enough and remains high in the following tiers. It is possible to use an infeed drive that pulls (part of) the belt return.

HELPER DRIVE & OUTFEED BELT TENSION

It is strongly advised to fit a torque helper drive at the discharge to make sure the belt is always removed from the straight outfeed and has enough belt tension to stay engaged in the cage bars. Especially when products are frozen to the belt and have to be released by a scraper.
The torque drive is advised over a frequency controlled normal drive for reasons of reliable operation. Only setting the RPM by means of a frequency converter will NOT work since this gives small speed differences, causing too much or too little belt to be pulled into the take-up weight. As a result the belt will flip up or lose its grip.

TAKE UP

A belt take-up is still needed to cope with belt tension and length differences due to temperature, loading, cleaning and changing friction coefficients. The recommended amount of belt the take-up needs to be able to absorb is 1% of the belt length.



BELT SUPPORT RAILS

There must be at least 50 mm free space between the drum and the inner support rails at all times to prevent the links being crushed between those two. The recommended distance between the support rail and the belt edges is 60 to 90 mm. If the inner support is more than 90 mm spaced from the drum, it makes Christmas treeing easier in an up-go spiral.

Our general advise on the number of support rails is:

BELT WIDTH (IN MM)	NUMBER OF SUPPORTS
≤ 610	2
611 - 1016	3
1017 ≥	4

As the number of support rails depends on the belt weight and product load, Twentebelt can provide a recommendation based on a specific application.

The common used belt support material is PE-1000 (UHMW-PE) for applications up to 60 °C. Other materials are possible depending on the application. The recommended width of the support rail is minimal 15 mm. Smaller widths of the rail could increase movement of the spiral overlay.

SYSTEM DESIGN - ELECTRICAL DESIGN
ONLY REGARDING THE OPERATION OF THE BELT

We recommend to fit at a minimum the following sensors:

- Flip-up protection on the first and last three tiers. (preferably sensors under the belt, rather than a vertical bar with fingers)
- A sensor that checks if the belt is pulled correctly from the straight discharge. In case an outfeed torque drive is used this can be a signal from that drive.
- Upper and lower proximity sensors in the take-up loop.
- Maximum torque protection of the drum drive motor. (max. ampere setting)
- Encoders on all drives stopping the spiral when the speed difference of the torque helper drive(s) compared to the primary drum drive is outside a set bandwidth.
- If a free-turning wheel is used in the return, a sensor must check if it is rotating.

We recommend to use a torque drive (preferably a SEW Movigear, or similar) that is able to give the required torque even at stand-still, which can be started a fraction earlier than the master drum drive. The torque drive will adjust its speed so it is pulling the set amount of torque.

When stopping the belt, the torque drive need to be stopped a fraction later in order to make sure the belt does not disengage the teeth.

In freezing applications the belt must always run whilst the temperature is below zero. If the system is stopped during start-up of the freezing process, belt tensions will increase due to the belt shrinking. Ideally the time to get the freezer to operating temperature is at least one cycle of the belt.

If the belt has to be stopped during the freezing process, minimize the time it is stopped to avoid the belt freezing to the belt support rails. In case the spiral is not the cause of the stop we advise to program for the belt to move shortly (<1 m) every 5 to 10 minutes in order to prevent this freezing issue. In a low tension spiral this issue is less important since the drum always starts rotating before the belt starts to move. In that short time the drum pushes the belt sideways slightly (because the drum is never 100% round) releasing the belt if it is frozen to the support rail. The direct drive belt starts running immediately, causing a torque peak in the drum motor if the belt is frozen to the belt support.

OPERATION

The belt, cage bars and support rails must be properly cleaned periodically with hot water (> 40 ˚C) and a detergent. Follow the cleaning procedures prescribed by the supplier of the detergent.

Maintenance must be done in time by skilled personnel. Regarding the correct operation of the belt this includes: shortening the belt in time, replace worn sprockets/idlers in time, make sure all sensors work correctly, etc.
Prevent excessive ice build-up in freezers.

Especially in very dry environments it is advised to minimize the belt tension on idler shafts as much as possible and use bigger diameter idle rollers. This will reduce the polygon of the belt on the rollers, which reduces the wear between the cross rod and link.

In some applications it can be necessary to lubricate the inside of the links in order to reduce belt wear.

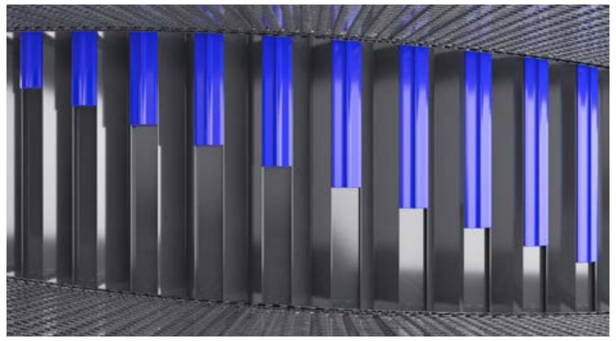
RETROFIT
A LOW TENSION SPIRAL TO A DRUM DRIVEN SPIRAL

The TwenteFlex TBU 40 enables you to retrofit your low tension spiral system to a drum driven spiral without big investments.
Since the belt used for the drum drive principle is exactly the same as used in low tension applications there always is the possibility to build it back to the low tension principle, if the drum driven spiral somehow does not fulfill your expectations.

REMOVE THE FLAT LOW TENSION CAGE BARS

Main actions:

- Replace the cage bars with new teethed cage bars fixed at the discharge end.
- Fit conical blocks between the cage bars at the infeed of the drum.
- Replace the take-up drive with a torque drive motor with encoder.
- If necessary, place a helper drive at the infeed.
- Check if all required safety sensors are present.
- Reprogram the software so the drum is the master drive and it correctly controls the helper drive.



PLACE THE TEETHED CAGE BARS TO ENABLE INSIDE DIRECT DRIVE

DRIVE COMPONENTS

TBU 40 DRIVE SPROCKETS		PITCH 40 MM		SUPPORT ROLL	FLANGE ROLL
NUMBER OF TEETH	PITCH CIRCLE DIAMETER (IN MM)	HUB DIAMETER (IN MM)	OUTSIDE DIAMETER (IN MM)	SUPPORT ROLL DIAMETER (IN MM)	FLANGE ROLL DIAMETER IN MM)
12	155.6	135.3	164.3	140.1	135.3
16	206.4	187.4	216.4	192.2	187.4
21	270.1	252.1	281.1	257.9	252.1

The width of all sprockets is 50 mm for sprockets with two bosses and 31 mm for sprockets with one boss. Sprockets should be placed in the links at both belt edges at the drive shaft only.

Standard drive sprocket materials are:

- UHMW-PE (-60 to +60 ˚C)
- PA6G (Nylon) (-60 to +60 ˚C)
- Stainless Steel

Idler shafts should be fitted with flanged and support rollers. Support rollers should be placed on all shafts every 250 to 300 mm to minimize bending of the cross rods.

Drive sprockets and idler rollers should be placed in such a way that the belt is lifted from the belt support rail by 1 or 2 mm. If the wheels are placed lower than the support rails the belt is pulled into the support rail which can result in excessive wear on belt and support rails, increased belt tension, tracking problems, etc.

The outer links must be supported with a roller or sprocket on all shafts! Even if the wrap is only a few degrees.
If the links are not supported when the belt turns, too much pressure is put between the outer support roller and the spiral mesh wire, causing fatigue breakages in the spiral mesh.

GUIDELINES FOR DESIGN AND OPERATION
DO'S AND DON'TS FOR A SUCCESFUL IMPLEMENTATION

DO'S FOR A SUCCESFUL IMPLEMENTATION

DO Check if the free space between the drum and inside belt support rail is between minimum 50 mm and maximum 90 mm.

DO Check if the outside belt radius has minimal 30 mm clearance to the frame.

DO Recess all drive teeth to disengage the belt 10 to 30 degrees (not more) before the drum outfeed.

DO Minimize the take-up weight (if torque drive is present!) during commissioning, in order to achieve the minimum required belt tension at the conical block that keeps the belt engaged in the drive teeth without jumping the teeth.

DO Bolt the teethed cage bars to the drum at the outfeed end in order to fix the position of the recessed teeth.

DO Check the cage bar c-c distance for enough free space for the width of the conical block. The suitable c-c distance is between 120 and 160 mm.

DO Use cage bars in one piece over the full height of the drum. This will prevent possible catch points.

DO Use sensors under the belt for flip-up protection (recommended is the 3 bottom and 3 top tiers), rather than a vertical bar with fingers. If you do use a vertical bar with fingers as flip-up protection, make sure the belt can move out at least 30 mm and can't catch it!

DO Increase the take-up weight, if the belt hesitates starting at the end of the conical block. (so the bottom 2nd or 3rd tier in an up-go spiral) This hesitation means there is not enough belt tension at the end of the infeed. Increase the take-up weight until the hesitation stops.

DO Monitor the belt at the transfer from the conical block to the vertical strips. The belt must line-up with the drive teeth whilst on the conical block and the transfer from the conical block to the cage bars should be smooth, without vibration or any interference.

DO Use a torque controlled helper drive (preferably a SEW Movigear, or similar) instead of an a-synchronic drive with a standard force transducer. The Movigear is a permanent magnet motor with encoder which gives it better torque setting capabilities and power savings. The drive will give its selected torque even if the drive speed is zero. (also possible with an a-synchronic motor with encoder and suitable frequency control) At start-up the drive can be switched on before the drum starts moving. It will generate the desired torque throughout the startup sequence and needs to be active until the drum has stopped. There is no need to find the correct RPM relation to the drum at time of commissioning. The a-synchronic drive with force transducer needs to start up simultaneously with the drum at the same belt speed/ramp-up and only then the force transducer can adjust the helper drives speed in order to create the desired torque. Twentebelt prefers the Movigear type drive because it does not have a separate load cell. A dis-advantage of an a-synchronic drive type with a separate load cell is that if for any reason the belt is not running smooth at the outfeed, the load cell tends to overcompensate the a-synchronic drive. This can cause serious drive problems. Also at shut-down the simultaneous timing and ramp-down are important. Both drive solutions will work if they are set-up correctly.

DO Make sure the conical block extends minimal 10 mm before the first point of contact with the belt, in order to eliminate the risk that the belt slips on the wrong side of the conical block.

DO Weld all connector rods properly, according the provided guidelines, to assure both side links are fixed to the rod.

DO Monitor the belt tiers for some time. If the belt surges starting at the outfeed and you see the surge travel towards the infeed (so downwards in an up-go spiral), this means the belt has jumped one teeth which is caused by too little belt tension at the outfeed. Increase the amount of torque (or take-up weight in case there is no helper drive) until the hesitation stops. The belt must run the same speed compared to the drum. If you can see the drum going slightly faster than the belt, it means the outfeed belt tension (helper drive torque) is too low. It will cause the belt to slowly jump the teeth. Jumping teeth will eventually cause the belt to fully disengage.

DON'TS FOR A SUCCESFUL IMPLEMENTATION

DON'T Create the recess in the teeth too early at the outfeed, this causes the need for a higher outfeed tension. Creating the recess too late will cause sideways belt movement at the drum discharge.

DON'T Fix the teethed cage bars at the infeed side (near the conical blocks). Due to the expansion/contraction of the drive bars, the position of the recessed teeth end at the drum outfeed will move up or down. This can create problems with the belt release or torque drive in order to keep the belt engaged in the teeth.

DON'T Use split cage bars for higher drums. This could create a catch point for the belt.

DON'T Fix the conical blocks in-line with the drive bars instead of between them like it is intended. However this set-up can work, fixing the conical block on the beginning/end of a vertical strip causes the need for a very smooth transfer from the block on-to the strip. If the transfer is not smooth, it can cause the belt to catch the beginning of the strip. This can cause tension problems, belt movement, damage to the belt and hold-down rail. (for a down-go spiral)

Another effect of placing the conical block in line with the vertical strips is that it is only possible to place the block in line with a toothless, smooth, vertical strip with the teethed drive strip placed at the next vertical bar. Otherwise the belt can't properly line up with the drive teeth. It means the teethed drive bars can only be placed every other vertical strip, meaning that the conical blocks will also have to be fitted every other vertical strip. So the c-c distance of the conical blocks is twice the strip distance. In our recommended set-up the cage bar distance is maximal 160 mm with the blocks placed between the strips. The maximum block distance is then also 160 mm. Placing the blocks in line with the strips every other strip would create a block distance of 320 mm, which is not recommended. Placing the conical blocks in line with the vertical strip is therefore limited to strip distances smaller then 120 mm.

DON'T Interrupt the drive teeth whilst the belt is in engagement for fixing the drive strip to the drum. (do not place a bolt straight through the teeth) This will cause problems when the belt needs to re-engage the teeth.

DON'T Use too high bolts to fix the top side of the conical block. The belt must run smoothly from the conical block onto the cage bars, without touching any bolt heads.

DON'T Fix the connector rod without welding both outside links properly to the rod. (see guideline) If both links are not fixed properly, the inside link will tent upwards which could cause a belt crash.

DON'T Use more take-up weight then necessary. The amount of weight should be adjusted to achieve the minimum required belt tension at the conical block. Too little and the belt will become too loose just after the conical block which causes the belt to jump the drive teeth. Too much and this will cause higher then needed belt tension at the idle rollers, which causes higher belt elongation and may cause the belt to flip up in the first tiers.

DON'T Stop the belt for a longer period during freezing in order to prevent the belt freezing to the support rails. Preferably program to run the belt for < 1 meter every 5 to 10 minutes. (if the reason for the stop is not the spiral) This will prevent an Amperage peak when re-starting.

Twentebelt is always available to advice and assist when you have doubts about a specific application.

SPLICING AND SHORTENING THE BELT

Splicing / Joining

When the belt has to be spliced together it is recommended to use a supplied connector rod. This rod is bent at one end and can be secured with a nut or welding ring at the opposite end.

- Insert the rod from the side that will be running against the drum. This creates a continuous edge without the risk of sharp welds damaging the cage bars.
- Make sure the bent side of the rod is inserted in the middle hole of the link as far as possible.
- Make sure the belt still collapses properly, while tightening the nut.
- Make sure both links are flat/parallel to each other.
- Weld the nut to the rod making sure the rod end is smooth.
- Weld the inside legs of both links to the cross rod. The inside weld is preferably a small weld that doesn't compromise the rod or link strength.

Splice Tabs

Our Splice Tabs have been designed to quickly splice the belt without the need to weld. This makes it a clean and easy solution, which is applicable in a matter of minutes.

Although this creates a very solid connection, it is strongly recommended to weld the cross rod to the Splice Tab (during the next planned maintenance stop) in order to make it a permanent solution.

Shortening

- Use a grinding tool or cutter to carefully cut the cross rod at both belt edges in the space between the inner legs of two links.
- Remove the two short pieces of cross rod from the links.
- Remove the cross rod.
- Preferably remove or add an even number of pitches at a time.

REPLACING THE BELT

- When replacing an old belt it is recommended to also replace the cage bars, conical blocks, belt support rails and sprockets/rollers.
- Check if the new belt will pass through the system with enough clearance. Especially at hold down rails, the inside belt support and the take-up area.
- Check if the drive sprockets engage the links of the new belt properly.
- Check if the belt runs over all idler rollers properly.
- Check throughout the whole system if there are any possible catch points. Especially check that if the belt would move away from the drum, the outside links can't catch the frame.

TECHNICAL DATA SHEET

Materials	AISI 304/302 (standard) and AISI 316	
Belt pitch	40 mm	1.570 inch
Cross rod diameter	6 mm	0.236 inch
Overall belt width	380 - 1480 mm	15 - 58 inch
Inside turn radius	1.6 - 1.9 - 2.2 - 2.5 - 2.8	x belt width
Belt strength in turns	180 kg	400 lbs
Belt strength on straights	360 kg	800 lbs
Link height	15 mm	0.590 inch
Link thickness	3 mm	0.120 inch
Link width	35 mm	1.370 inch
C-C links	Belt width - 55 mm	belt width - 2.16 inch
Usefull belt width between links	Belt width - 90 mm	belt width - 3.54 inch
Available link types	Standard - no guard edge	
	12.5 mm - integral guard edge	0.5 inch above belt surface
	25.0 mm - integral guard edge	1.0 inch above belt surface

TBU 40 / SPIRAL BELT

Available spiral wire diameters

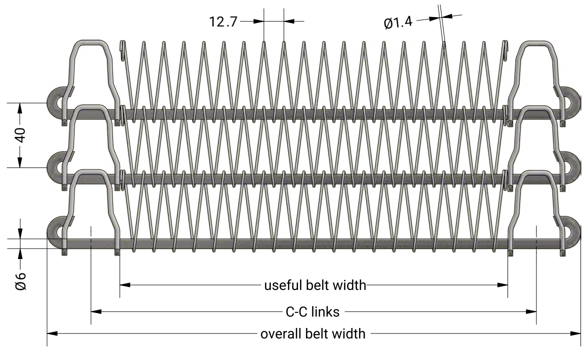
1.2 mm	18 ga	1.6 mm	16 ga
1.4 mm	17 ga		

Available lateral pitch spiral wire

4.2 mm	72 loops / foot	7.3 mm	42 loops / foot
4.6 mm	66 loops / foot	8.5 mm	36 loops / foot
5.1 mm	60 loops / foot	10.2 mm	30 loops / foot
5.6 mm	54 loops / foot	12.7 mm	24 loops / foot
6.4 mm	48 loops / foot	16.9 mm	18 loops / foot

Type designation (example) **TBU 12.7 - 40 - 1.4 - 6 / R2.2**

TBU	TwenteFlex U bended rod
12.7	Lateral pitch spiral wire
40	Pitch
1.4	Spiral wire diameter
6	Cross rod diameter
R2.2	Inside turn radius (2.2 x belt width)



TBU-P 40 / HYBRID BELT

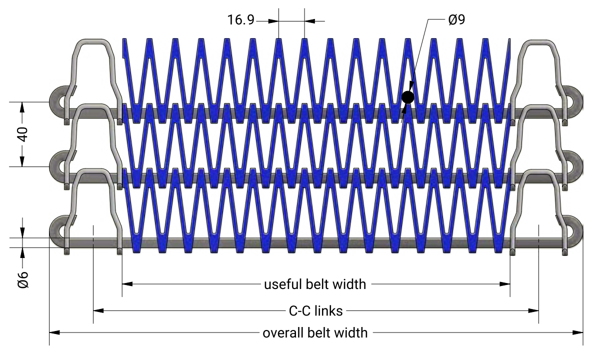
Lateral pitch	16.9 mm	18 loops / foot
Module height	15.0 mm	0.59 inch
Open area	53%	

Available plastic overlay material
(BOTH MATERIALS ARE FOOD APPROVED)

POM (dark blue)	Not flame retardant. (material may catch fire when in contact with flames)
PA6 FR (light blue)	Flame retardant with a UL V2 approval. (material extinguishes when on fire)

Type designation (example) **TBU-P 16.9 - 40 - 6 / R2.2**

TBU	TwenteFlex U bended rod
P	Plastic
16.9	Lateral pitch module loops
40	Pitch
6	Cross rod diameter
R2.2	Inside turn radius (2.2 x belt width)

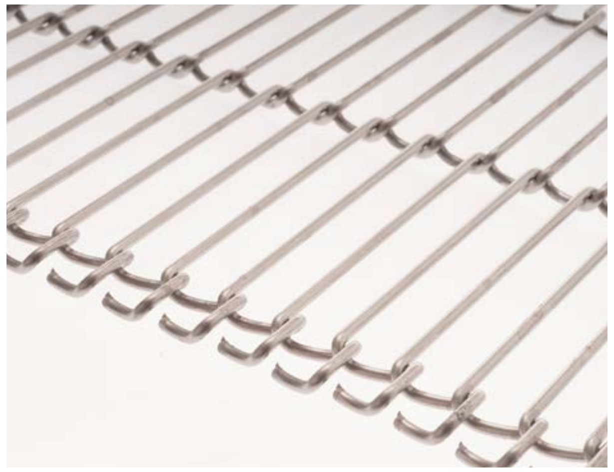


ABOUT TWENTEBELT

Twentebelt of the Netherlands has been specialised in metal conveyor belts for over 100 years. Twentebelt develops, produces, supplies and maintains a wide range of metal belts of different types and alloys. With our products and supporting activities we can meet the various requirements of application in o.a. the food-, chemical-, pharmaceutical- and packaging industries. Practically every belt is produced and adjusted to the specific applications of our customers. In the field of eyelink belts Twentebelt has become the worldwide market leader.

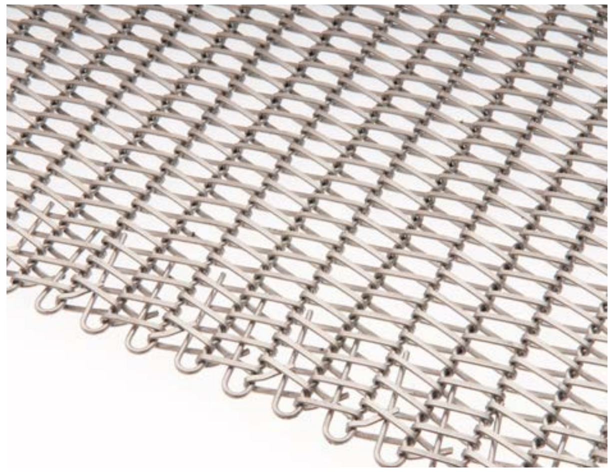
Do you require different or special conveyor belt that is not listed? Please contact us to discuss the possibilities.

IMPRESSIONS OF OTHER PRODUCT GROUPS



Wire mesh belt

Eyelink belt



Spiral woven belt

TwenteSideFlex belt

STRONGLY CONNECTED

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