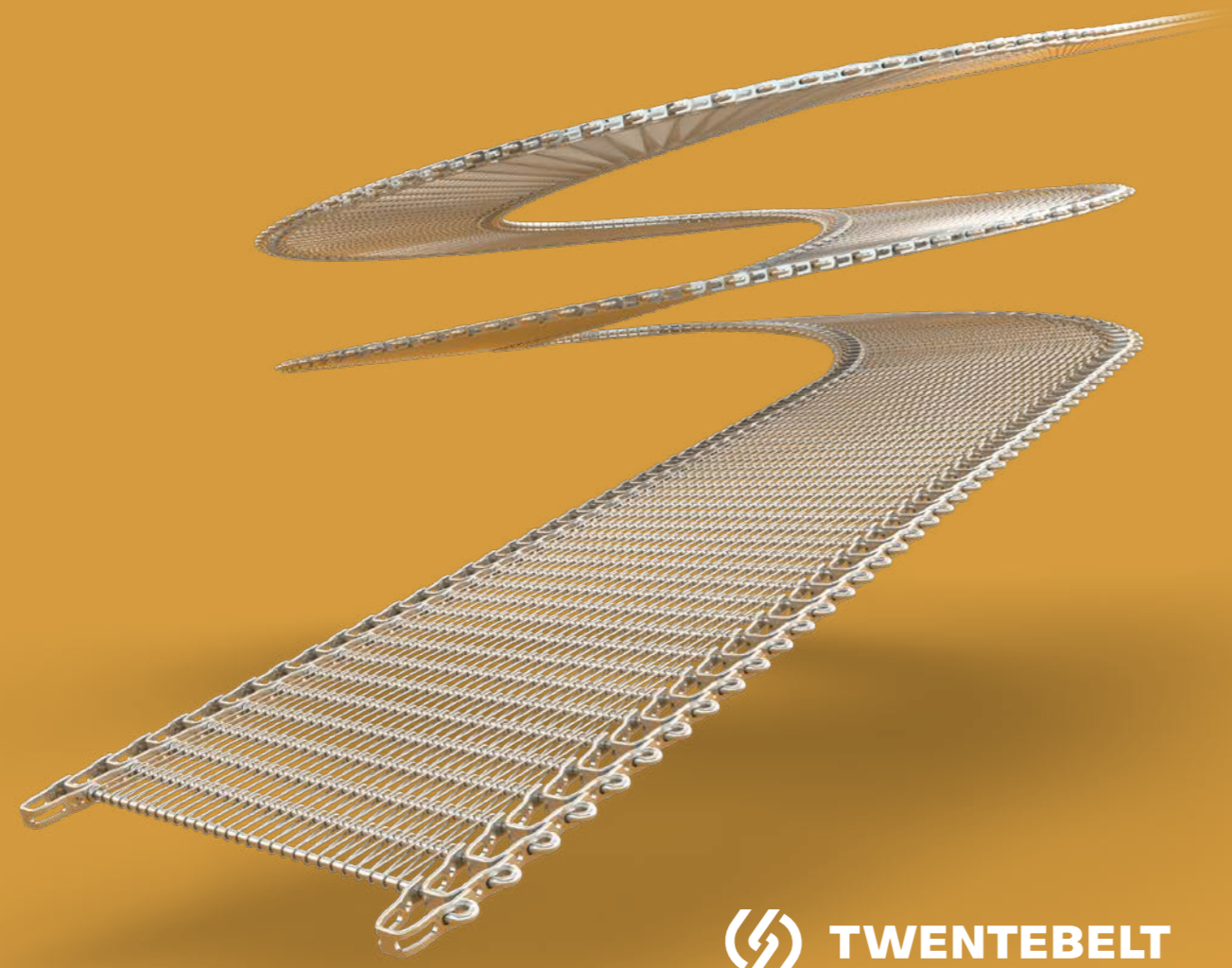




# TWENTEFLEX™ SPIRAL BELTS

# TWENTEBELT TWENTEFLEX™



## CONTENT

- 04 TWENTEFLEX SPIRAL BELTS
- 06 SPECIFICATIONS TBU
- 07 DETAILED DIMENSIONS TBU 30
- 08 DETAILED DIMENSIONS TBU 40
- 09 DETAILED DIMENSIONS TBU-P 40
- 10 SPECIFICATIONS TBW
- 11 DETAILED DIMENSIONS TBW 20
- 12 DETAILED DIMENSIONS TBW-HD 20
- 13 SMALL RADIUS
- 13 SPACE SAVER
- 14 DRIVE SPROCKETS
- 15 CURVED CONVEYOR GUIDELINES
- 15 TECHNICAL RECOMMENDATIONS FOR LOW TENSION DRIVE
- 18 SPLICING AND SHORTENING THE BELT
- 19 RETROFIT
- 20 INSIDE DIRECT DRIVE
- 21 OUTSIDE DIRECT DRIVE (TWENTESIDEFLEX)
- 22 ABOUT TWENTEBELT
- 22 IMPRESSIONS OF OTHER PRODUCT GROUPS

# TWENTEFLEX SPIRAL BELTS

## A UNIQUE SOLUTION IN SPIRAL BELT TECHNOLOGY

With its innovative spiral belt design, TwenteFlex spiral belts are the next step in spiral belt technology. TwenteFlex spiral belts help you focus on food safety while reducing costs of operation, maintenance and cleaning. The effective and efficient TwenteFlex spiral belts from Twentebelt are smart investments with an attractive payback time that are designed to operate on a low cost level.

### FOOD SAFETY

TwenteFlex spiral belts are manufactured in compliance with the latest food safety requirements for food processing equipment such as the framework regulation EC 1935/2004, EC 2023/2006 on good manufacturing practice (GMP) and (EU) No. 10/2011 on plastic implementation measure (PIM). This ensures our customers a belt that is fit for use in the most demanding food processing applications. The innovative and revolutionary TwenteFlex spiral belts are suitable for a wide range of direct food contact applications such as:

- Cooling
- Freezing
- Proofing
- Steam-cooking

### HYGIENIC DESIGN SAVES ON CLEANING COSTS

Cleaning and disinfection of the belt is easier and quicker due to the lack of dead-end cavities. This brings savings on chemical cleaning agents and shortens the cleaning procedure. TwenteFlex belts do not require pickling and passivating due to the lack of welding. This brings additional cost advantages and eliminates the risk of contamination, as pickling fluids are not food approved.

### INNOVATIVE DESIGN

The revolutionary bending of the cross rod and its lock into the connection link form the ideal drive surface, reduces the chances of damaging the drum and has eliminated major reasons for belt problems like:

- Weld breakage.
- Sharp welds damaging the cage bars.
- Cross rod breakage next to the weld.
- Tented inside links due to broken welds.
- Protruding rods.

### RELIABLE DESIGN SAVES ON MAINTENANCE COSTS

The smart design of the TwenteFlex results in less downtime. The bended-edge design is very easy to splice since there is no need to grind out a welded edge. In fact, if a wire cutter is used there is no need for grinding in the food environment at all.

## MATERIALS

TwenteFlex belts are available in a full metal version (300 Series Stainless Steel) and a hybrid version combining metal (300 Series Stainless Steel) with plastic modules.

These plastic modules are available in Acetal (POM) or Nylon (PA6) Flame Retardant (Food Approved).

## VERSIONS



TwenteFlex Full Metal - Stainless Steel



TwenteFlex Hybrid - Stainless Steel and modules of Acetal (POM)



TwenteFlex Hybrid - Stainless Steel and Flame Retardant modules of Nylon (PA6)

## OPTIONS

### GUARD EDGES

Guard edges are available in 12.5 mm and 25 mm height above the belt surface.



TwenteFlex with guard edges



## SPECIFICATIONS TBU

### EXAMPLE OF TYPE DESIGNATION

TBU 10.2 - 30 - 1.4 - 5 / R2.2

Twentebelt U bended rod	: TBU	Spiral wire diameter	: 1.4 mm
Lateral pitch spiral wire	: 10.2 mm	Cross rod diameter	: 5 mm
Belt pitch	: 30 mm	Inside turn radius	: 2.2 x belt width

## DIMENSIONS TBU

	BELT TYPE	MATERIAL	PITCH	LATERAL PITCH	CROSS ROD DIAMETER	SPIRAL WIRE DIAMETER	INSIDE TURN RADIUS	SPROCKETS
TwenteFlex Full Metal	TBU 30	300 Series Stainless Steel	30 mm	Ranging from 4.2 to 16.9 mm	5 mm	1.2 mm, 1.4 mm or 1.6 mm **	Ranging from 1.7 to 3.5 times the belt width	12, 16 or 21 teeth *
TwenteFlex Full Metal	TBU 40	300 Series Stainless Steel	40 mm	Ranging from 4.2 to 16.9 mm	6 mm	1.2 mm, 1.4 mm or 1.6 mm **	Ranging from 1.6 to 3.1 times the belt width	12, 16 or 21 teeth *
TwenteFlex Hybrid	TBU-P 40	300 Series Stainless Steel and Acetal (POM)	40 mm	16.9 mm	6 mm	Not applicable	Ranging from 1.6 to 3.1 times the belt width	12, 16 or 21 teeth *
TwenteFlex Hybrid	TBU-P-FR 40	300 Series Stainless Steel and Nylon (PA6) Flame Retardant	40 mm	16.9 mm	6 mm	Not applicable	Ranging from 1.6 to 3.1 times the belt width	12, 16 or 21 teeth *

\* Other sprocket sizes are available on request.

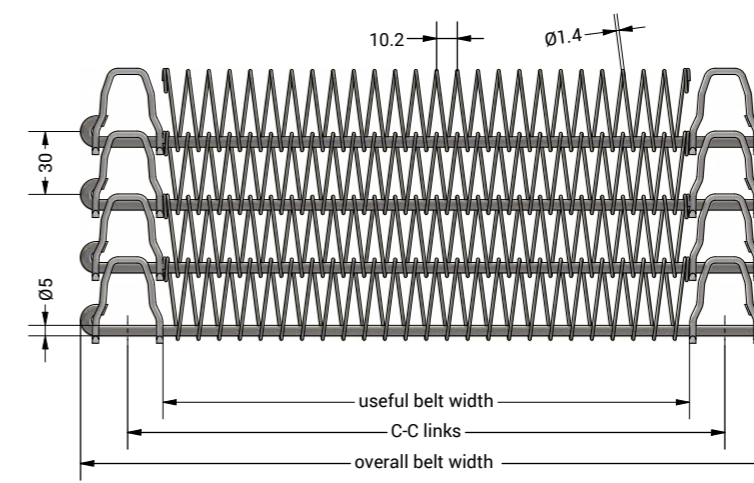
\*\* Other spiral wire diameters are available on request.

## DETAILED DIMENSIONS TBU 30

Belt pitch	30 mm (1.181 inch)		
Cross rod diameter	5 mm (0.197 inch)		
Inside turn radius	1.7 - 2.2 - 2.8 - 3.2 times the belt width (current tooling available)		
Overall belt width	400 - 1526 mm (15.75 - 60 inch)		
Materials	AISI 302 / AISI 304 (standard) and AISI 316		
Belt strength in turns	90 kg (200 lbs)		
Belt strength on straights	180 kg (400 lbs)		
Available spiral wire diameters	1.2 mm (18 ga) - 1.4 mm (17 ga) - 1.6 mm (16 ga)		
Available lateral pitch spiral wire	4.2 mm (72 loops/foot)	6.4 mm (48 loops/foot)	10.2 mm (30 loops/foot)
	4.6 mm (66 loops/foot)	7.3 mm (42 loops/foot)	12.7 mm (24 loops/foot)
	5.1 mm (60 loops/foot)	8.5 mm (36 loops/foot)	16.9 mm (18 loops/foot)
	5.6 mm (54 loops/foot)	(Special spiral shapes are available on request)	

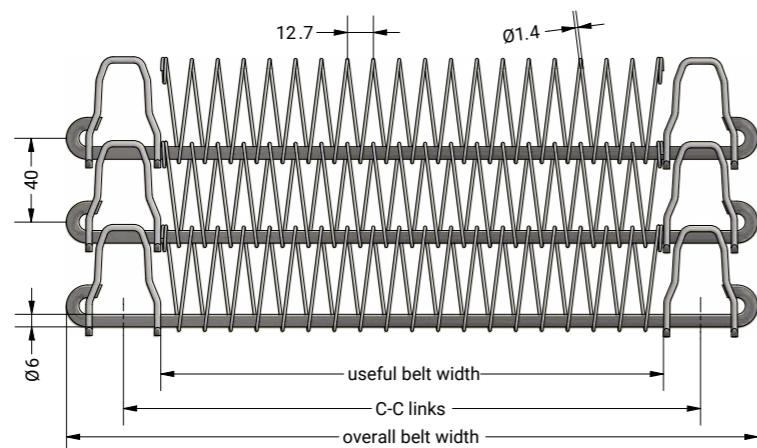
Link height	13 mm (0.51 inch)
Link thickness	3 mm (0.12 inch)
Link width	33 mm (1.30 inch)
C-C links	Belt width - 47 mm (1.85 inch)
Useful belt width between links	Belt width - 78 mm (3.07 inch)
Available link types	Standard, no guard edge
	12.5 mm integral guard edge (0.5 inch above belt surface)
	25.0 mm integral guard edge (1.0 inch above belt surface)
Available sprocket sizes	12, 16 or 21 teeth (other sprocket sizes are available on request)

**Example of type designation** **TBU 10.2 - 30 - 1.4 - 5 / R2.2**  
 Lateral pitch spiral wire: 10.2 mm  
 Pitch: 30 mm  
 Spiral wire diameter: 1.4 mm  
 Cross rod diameter: 5 mm  
 Inside turn radius: 2.2 x belt width



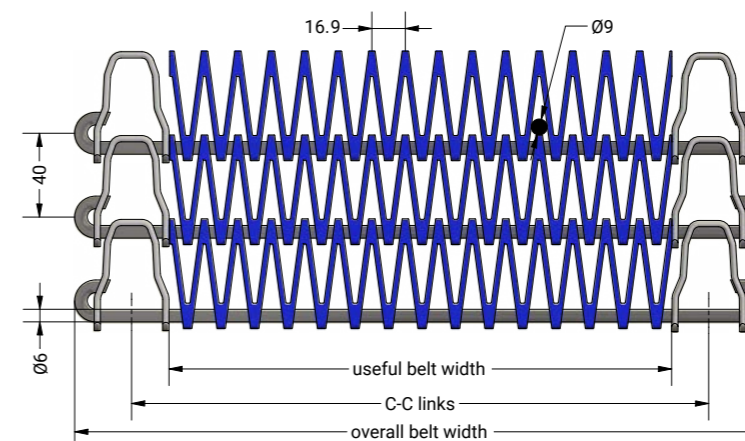
## DETAILED DIMENSIONS TBU 40

Belt pitch	40 mm (1.575 inch)		
Cross rod diameter	6 mm (0.236 inch)		
Inside turn radius	1.6 - 1.9 - 2.2 - 2.5 - 2.8 times the belt width (current tooling available)		
Overall belt width	400 - 1526 mm (15.75 - 60 inch)		
Materials	AISI 304 / 302 (standard) and AISI 316		
Belt strength in turns	180 kg (400 lbs)		
Belt strength on straights	360 kg (800 lbs)		
Available spiral wire diameters	1.2 mm (18 ga) - 1.4 mm (17 ga) - 1.6 mm (16 ga)		
Available lateral pitch spiral wire	4.2 mm (72 loops/foot)	6.4 mm (48 loops/foot)	10.2 mm (30 loops/foot)
	4.6 mm (66 loops/foot)	7.3 mm (42 loops/foot)	12.7 mm (24 loops/foot)
	5.1 mm (60 loops/foot)	8.5 mm (36 loops/foot)	16.9 mm (18 loops/foot)
	5.6 mm (54 loops/foot)	(Special spiral shapes are available on request)	
Link height	15 mm (0.59 inch)		
Link thickness	3 mm (0.12 inch)		
Link width	35 mm (1.37 inch)		
C-C links	Belt width - 55 mm (2.16 inch)		
Useful belt width between links	Belt width - 90 mm (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)		
Available sprocket sizes	12, 16 or 21 teeth (other sprocket sizes are available on request)		
Example of type designation	<b>TBU 12.7 - 40 - 1.4 - 6 / R2.2</b> Lateral pitch spiral wire: 12.7 mm Pitch: 40 mm Spiral wire diameter: 1.4 mm Cross rod diameter: 6 mm Inside turn radius: 2.2 x belt width		



## DETAILED DIMENSIONS TBU-P 40 (TBU-P-FR 40)

Belt pitch	40 mm (1.575 inch)	
Cross rod diameter	6 mm (0.236 inch)	
Inside turn radius	1.6 - 1.9 - 2.2 - 2.5 - 2.8 times the belt width (current tooling available)	
Overall belt width	400 - 1526 mm (15.75 - 60 inch)	
Materials	AISI 304 / 302 (standard) and AISI 316	
Belt strength in turns	180 kg (400 lbs)	
Belt strength on straights	360 kg (800 lbs)	
Available overlay material	Acetal (POM) modules Nylon (PA6) Flame Retardant UL94 V2 modules	
Color	Dark Blue - Acetal (POM) - TBU-P Light Blue - Nylon (PA6) - TBU-P-FR	
Module height	15.0 mm (0.59 inch)	
Lateral pitch	16.9 mm (18 loops/foot)	
Open area	54 %	
Link height	15 mm (0.59 inch)	
Link thickness	3 mm (0.12 inch)	
Link width	35 mm (1.37 inch)	
C-C links	Belt width - 55 mm (2.16 inch)	
Useful belt width between links	Belt width - 90 mm (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)	
Available sprocket sizes	12, 16 or 21 teeth (other sprocket sizes are available on request)	
Example of type designation	<b>TBU-P 16.9 - 40 - 6 / R2.2</b> Lateral pitch module: 16.9 mm - Acetal (POM) Pitch: 40 mm Cross rod diameter: 6 mm Inside turn radius: 2.2 x belt width	



## SPECIFICATIONS TBW

### EXAMPLE OF TYPE DESIGNATION

TBW 10.2 - 20 - 1.4 - 5 / R2.1

Twentebelt welded rod	:	TBW	Spiral wire diameter	:	1.4 mm
Lateral pitch spiral wire	:	10.2 mm	Cross rod diameter	:	5 mm
Belt pitch	:	20 mm	Inside turn radius	:	2.1 x belt width

## DIMENSIONS TBW

	BELT TYPE	MATERIAL	PITCH	LATERAL PITCH	CROSS ROD DIAMETER	SPIRAL WIRE DIAMETER	INSIDE TURN RADIUS	SPROCKETS
TwenteFlex Full Metal	TBW 20	AISI 304 (standard) and 316	20 mm	Ranging from 4.2 to 16.9 mm	5 mm	1.2 mm, 1.4 mm or 1.6 mm **	2.1 to 2.4 x belt width	12, 18 or 25 teeth *
TwenteFlex Full Metal	TBW-HD 20	AISI 304 (standard) and 316	20 mm	Ranging from 4.2 to 16.9 mm	5 mm	1.2 mm, 1.4 mm or 1.6 mm **	3.0 x belt width	12, 18 or 25 teeth *

\* Other sprocket sizes are available on request.

\*\* Other spiral wire diameters are available on request.

## DETAILED DIMENSIONS TBW 20

### Intended for Turn Curve applications

Belt pitch	20 mm (0.787 inch)
Cross rod diameter	5 mm (0.197 inch)
Inside turn radius	2.1 (current tooling available)
Overall belt width	150 - 1016 mm (6 - 40 inch)
Materials	AISI 304 (standard) and AISI 316
Belt strength in turns	68 kg (150 lbs)
Belt strength on straights	136 kg (300 lbs)
Available spiral wire diameters	1.2 mm (18 ga) - 1.4 mm (17 ga) - 1.6 mm (16 ga)

Available lateral pitch spiral wire	4.2 mm (72 loops/foot)	6.4 mm (48 loops/foot)	10.2 mm (30 loops/foot)
	4.6 mm (66 loops/foot)	7.3 mm (42 loops/foot)	12.7 mm (24 loops/foot)
	5.1 mm (60 loops/foot)	8.5 mm (36 loops/foot)	16.9 mm (18 loops/foot)
	5.6 mm (54 loops/foot)		

Link height	11.5 mm (0.45 inch)
Link thickness	2.0 mm (0.08 inch)
Link width	25.0 mm (0.98 inch)
C-C links	Belt width - 33 mm (1.30 inch)
Useful belt width between links	Belt width - 58 mm (2.28 inch)
Available link types	Standard, no guard edge
Available sprocket sizes	12, 18 or 25 teeth (other sprocket sizes are available on request)

### Example of type designation

**TBW 10.2 - 20 - 1.4 - 5 / R2.1**

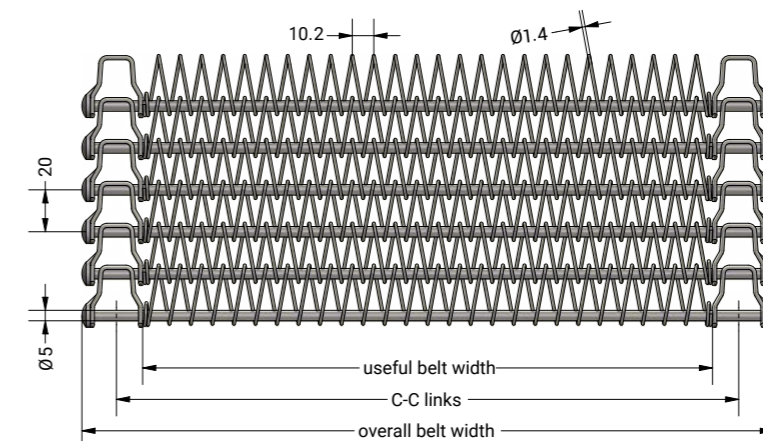
Lateral pitch spiral wire: 10.2 mm

Belt pitch: 20 mm

Spiral wire diameter: 1.4 mm

Cross rod diameter: 5 mm

Inside turn radius: 2.1 x belt width

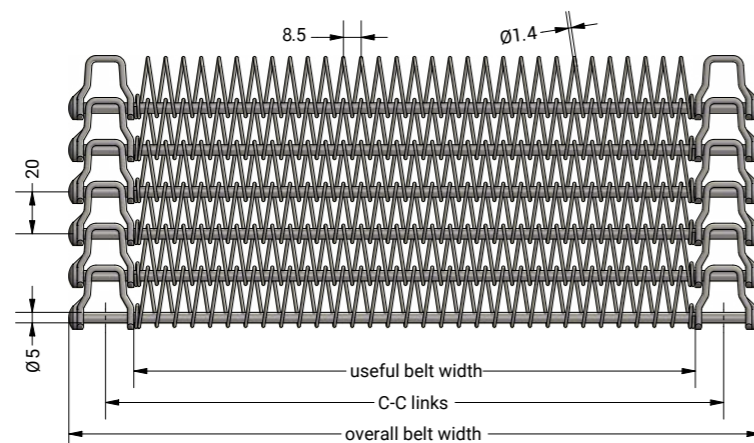


## DETAILED DIMENSIONS TBW-HD 20

### Intended for Straight Run applications

Belt pitch	20 mm (0.787 inch)
Cross rod diameter	5 mm (0.197 inch)
Inside turn radius	3.0
Overall belt width	150 - 1575 mm (6 - 62 inch)
Materials	AISI 304 (standard) and AISI 316
Belt strength in turns	90 kg (200 lbs)
Belt strength on straights	180 kg (400 lbs)
Available spiral wire diameters	1.2 mm (18 ga) - 1.4 mm (17 ga) - 1.6 mm (16 ga)
Available lateral pitch spiral wire	4.2 mm (72 loops/foot)    6.4 mm (48 loops/foot)    10.2 mm (30 loops/foot) 4.6 mm (66 loops/foot)    7.3 mm (42 loops/foot)    12.7 mm (24 loops/foot) 5.1 mm (60 loops/foot)    8.5 mm (36 loops/foot)    16.9 mm (18 loops/foot) 5.6 mm (54 loops/foot)
Link height	13 mm (0.51 inch)
Link thickness	3 mm (0.12 inch)
Link width	27 mm (1.06 inch)
C-C links	Belt width - 35 mm (1.38 inch)
Useful belt width between links	Belt width - 62 mm (2.44 inch)
Available link types	Standard, no guard edge
Available sprocket sizes	12, 18 or 25 teeth (other sprocket sizes are available on request)

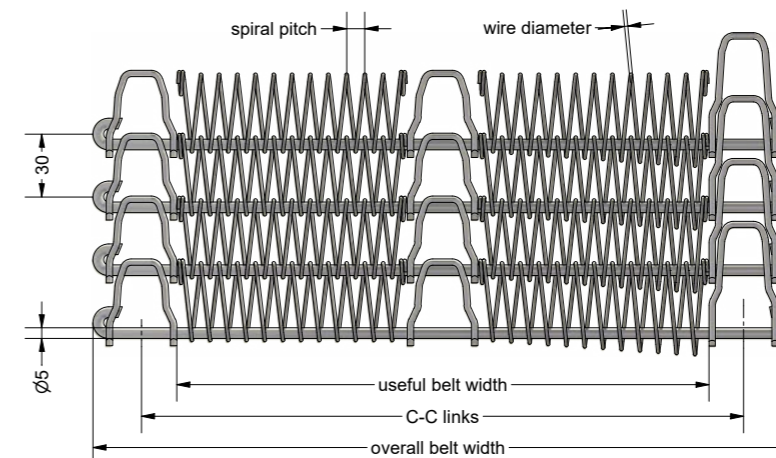
Example of type designation	<b>TBW-HD 8.5 - 20 - 1.4 - 5 / R3.0</b>
	Lateral pitch spiral wire: 8.5 mm
	Pitch: 20 mm
	Spiral wire diameter: 1.4 mm
	Cross rod diameter: 5 mm
	Inside turn radius: 3.0 x belt width



## SMALL RADIUS

Small radius conveyor belts are designed to maximize utilization of available floor space. They are constructed with a center link, to enable the belt to turn tight.

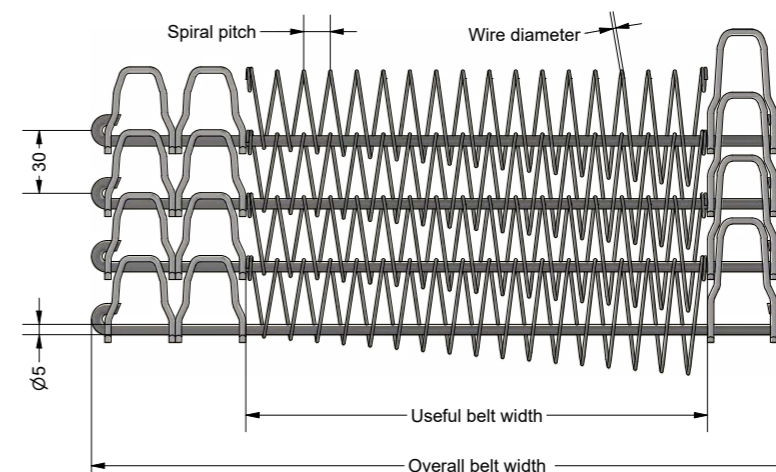
Do you require more information on small radius conveyor belts? Please contact Twentebelt to discuss the possibilities.



## SPACE SAVER

Space saver conveyor belts are constructed with a double row of non-collapsing links on the inside edge and longer expanding links on the outside edge. When turning, the outside edge expands while the inside edge stays extended. Therefore products do not get wrinkled or damaged, because the belt does not collapse.

Do you require more information on space saver conveyor belts? Please contact Twentebelt to discuss the possibilities.





## DRIVE SPROCKETS

Sprockets should be placed in the links at both belt edges at the drive shaft only. Standard drive sprocket materials are:

- POM (-60 to +60 °C)
- Ultra High Density Poly Ethylene (-60 to +60 °C)
- PA6G (Nylon) (-60 to +60 °C)
- Stainless Steel

Idler shafts must 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 and tracking problems.

On every shaft in the system, the links must be supported by a sprocket or flange roller.

### TBU 30 DRIVE SPROCKETS - PITCH 30 MM

NUMBER OF TEETH	SPROCKET WIDTH (IN MM)	PITCH CIRCLE DIAMETER (IN MM)	HUB DIAMETER (IN MM)	OUTSIDE DIAMETER (IN MM)
12	31 or 50	117.1	100.1	125.1
16	31 or 50	155.4	139.4	164.4
21	31 or 50	203.4	188.1	213.1

### TBU 30 IDLER ROLLERS

SUPPORT ROLLER DIAMETER (IN MM)	FLANGE ROLLER DIAMETER (IN MM)
104.3	100.1
143.6	139.4
192.3	188.1

### TBU 40 DRIVE SPROCKETS - PITCH 40 MM

NUMBER OF TEETH	SPROCKET WIDTH (IN MM)	PITCH CIRCLE DIAMETER (IN MM)	HUB DIAMETER (IN MM)	OUTSIDE DIAMETER (IN MM)
12	31 or 50	155.6	135.3	164.3
16	31 or 50	206.4	187.4	216.4
21	31 or 50	270.1	252.1	281.1

### TBU 40 IDLER ROLLERS

SUPPORT ROLLER DIAMETER (IN MM)	FLANGE ROLLER DIAMETER (IN MM)
140.1	* 135.3
192.2	* 187.4
257.9	* 252.1

\* TBU-P 40

### TBW 20 DRIVE SPROCKETS - PITCH 20 MM

NUMBER OF TEETH	SPROCKET WIDTH (IN MM)	PITCH CIRCLE DIAMETER (IN MM)	HUB DIAMETER (IN MM)	OUTSIDE DIAMETER (IN MM)
12	25 or 40	77.3	63.2 * 61.7	85.2 * 86.7
18	25 or 40	115.2	102.0 * 100.5	124.0 * 125.5
25	25 or 40	159.7	146.9 * 145.4	168.9 * 170.4

### TBW 20 IDLER ROLLERS

SUPPORT ROLLER DIAMETER (IN MM)	FLANGE ROLLER DIAMETER (IN MM)
65.5	63.2 * 61.7
104.7	102.0 * 100.5
149.6	146.9 * 145.4

\* TBW-HD 20

## CURVED CONVEYOR GUIDELINES

TwenteFlex spiral belts are developed to obtain optimum contact between the belt edge and inner guide rail. The innovative bended rod design eliminates breakage

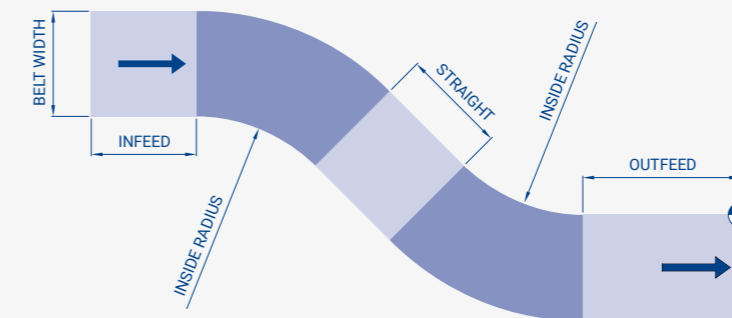
of rods and button heads due to welding. This ensures full material quality and belt strength.

### DESIGN GUIDELINES

**Infeed before curve:** Minimal 1.0 x belt width

**Straight between two opposite curves:** Minimal 2.0 x belt width

**Outfeed after curve, drive section:** Minimal 1.5 x belt width



### TWENTEFLEX TBU 30

**Recommended drive sprockets:**

12 teeth (PCD = 117.1 mm)

**Minimal drive sprocket:**

9 teeth (PCD = 88.6 mm)

**Minimal idler roller diameter:**

80 mm (Recommendation: 100 mm)

**Minimal inside radius:**

1.7 x belt width

### TWENTEFLEX TBU 40

**Recommended drive sprockets:**

12 teeth (PCD = 155.0 mm)

**Minimal drive sprocket:**

9 teeth (PCD = 117.3 mm)

**Minimal idler roller diameter:**

100 mm (Recommendation: 135 mm)

**Minimal inside radius:**

1.6 x belt width

## TECHNICAL RECOMMENDATIONS FOR LOW TENSION DRIVE

### GENERAL RECOMMENDATIONS

- Provide a take-up area after the drive section to absorb temperature and wear length differences
- It is recommended to keep the belt speed under 15 m/min if possible. Although it is possible to run faster, be aware that higher speeds will reduce the life time of the belt, drive sprockets and support rails due to wear, especially in dry environments.
- Use flanged side rollers on all shafts other than the drive shaft.
- Fit support rollers on all shafts at least every 250 to 300 mm.
- Provide an area in the conveyor design for easy assembling/disassembling of the connector rod.

### In case of up-systems

- Provide a hold down rail at the outside belt edge to prevent the belt from flipping up.
- Or fit flip-up detection sensors, at least in the first and last three tiers.

### In case of down-systems

- Provide a hold down rail over the inside links to prevent the belt from climbing the drum.



### GENERAL REMARKS

Low tension drive is the most common and well known drive possibility in spiral belt technology. It has been a proven technology for decades, applicable for many applications and therefore relevant as ever.

The drive principle of the known low tension system is based on a cage 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. This friction coefficient varies with the atmospheric conditions. (product residue, freezing, warm, wet, dry, etc.)

### System design

- Let the belt follow its desired path as much as possible.
- Minimize the use of guide plates to track the belt.
- Avoid long in- and outfeed sections.
- Make sure that the belt transition from one belt support section to the next is smooth.

### Take-up

- The take-up must be able to absorb 1% of the total belt length.
- Minimize added weights in the take-up as much as possible.

### Cage overdrive

In most applications it is recommended to have a cage overdrive setting of approximately 6% to 10% per tier revolution faster than the belt. (measured between the cage and the inside belt edge) Increasing the cage overdrive will decrease the belt tension and increase the possibility of the belt surging. The optimal overdrive setting is reached just before the belt starts surging, making sure the belt can be pulled from the cage by hand force at least 1 to 2 cm.

### Operation

Clean the belt and supports regularly to avoid high belt tensions due to an increased friction caused by product contamination. Prevent excessive ice build-up in freezers.

### 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 them. The advised distance between the support rail and the belt edges is 60 to 90 mm. In general, the advised number of support rails is as follows:

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

For applications where the rails will not be exposed to temperatures over 80 °C, the common used belt support material is PE-1000 or PE-500 High Density Poly Ethylene. Other materials are possible depending on the application. The advised width of the support rail is 15 mm. Smaller widths of the rail could increase movement of the spiral overlay. Widths smaller than 10 mm are therefore not recommended.

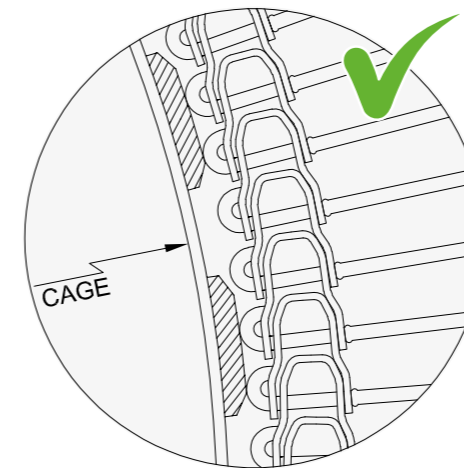
### CAGE / DRUM BARS

In order to obtain a smooth drive it is recommended to use cage bars that are 50 to 60 mm wide with a flat drive surface and a 3x3 chamfer, spaced apart by approximately 120 mm. At temperatures below 60 °C the recommended material is PE-1000. For applications with temperatures over 60 °C stainless steel cage bars or a full stainless steel cage can be used. If stainless steel is used for the cage drive surface, the overdrive can be decreased to 3% to 5% due to the increased friction coefficient. Keep in mind that the belt edge will wear more quickly on a stainless steel cage surface.

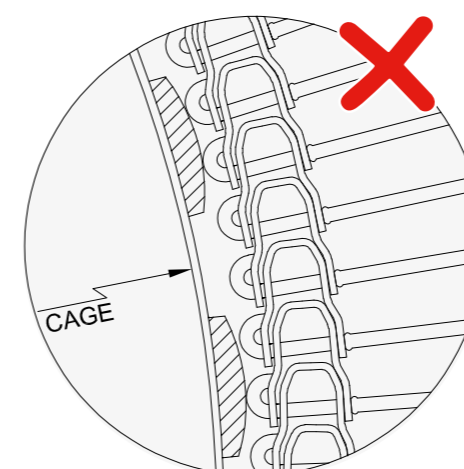
The cage bars must cover at least 30% of the cage. Wider cage bars spread out the total generated friction drive force over more cross rods, which decreases the force per cross rod directed to the cage middle and thus decreases the bending of the cross rod. Because the cage moves faster than the belt, the cross rods are exposed to cyclic loading each time the cross rod passes a cage bar. Reducing cross rod bending will extend belt life and create a smoother belt run.

It is recommended to maximize the width and number of cage bar strips on the cage as much as possible, especially when running spiral systems with high loads.

The use of rounded cage bars can result in undesired movement of the inside links. Depending on the radius of the cage bars it is possible that only one cross rod is in contact with a cage bar. This can cause sudden undesired movement of this rod when it passes the top of the cage bar radius. A flat drive surface almost equals the cage radius. It is recommended to select a cage bar that is wide enough to drive at least two collapsed cross rods.



RECOMMENDED CAGE BAR DESIGN



UNFAVORED CAGE BAR DESIGN

### FITTING THE BELT

When replacing the old belt with a different pitched belt, the pitch circle diameter of the drive sprockets may be different. Be aware that this changes the belt speed and thus the overdrive of the cage. If the new sprocket is smaller in diameter, make sure that the belt is not pulled into the belt support rails. When replacing an old belt it is recommended to re-new the cage bars, belt support rails and sprockets / rollers.

### Instructions:

- Select an accessible and handy place on the spiral to feed in the new belt.
- If present: connect the new belt to the old belt and pull in the new belt carefully.
- Weld the connector rods properly. (including inside welds) Please check page 18 'splicing and shortening the belt'.
- Check if the new belt will pass the system with enough clearance. Pay special attention to the hold down strips, the inside belt support and take-up area.
- Check if the drive sprockets engage the links of the new belt properly. Please note that it may be necessary to reposition the sprockets on the drive shaft.
- Check if the belt runs over all idler rollers properly.
- Make sure that the belt transition from one belt support section to the next is smooth.
- Minimize added weights in the take-up as much as possible.
- Check if there is enough space between the cage and the inside belt support for the link to run properly.
- Check throughout the whole system if there are any possible catch points.
- After fitting the new belt check if the overdrive settings need to be adjusted in regards to the new situation.
- Check if the product dwell time has changed and make adjustments when needed.

Due to the design of this belt there is a possibility that links can lock themselves in a tented position while pulling in the belt. Please check the complete belt after fitting it and remove any such tents before operating the belt. This tenting of links can not occur in operating conditions because links are always extended when bent around rollers.

## 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.

- If possible: insert the rod from the side that will be running against the cage. This creates a continuous edge without the risk of sharp welds damaging the cage bars.
- Make sure the belt still collapses properly, while tightening the nut.
- Make sure both links are flat / parallel to each other before welding.
- Weld the nut to the rod making sure the rod end is smooth.
- Make sure the bent side of the rod is inserted in the middle hole of the link as far as possible.
- Weld the inside legs of both links to the cross rod. The inside welds are preferably small welds that do not 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.

Splice Tabs are designed to fit all TwenteFlex drive solutions; low tension, inside- and outside direct drive.



**Do you require more information on our Splice Tabs? Please contact Twentebelt to discuss the possibilities.**

### Shortening

- Lift the cross rod which will be cut. (this will tent the belt and keep other parts safe from damage)
- 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 pieces of cross rod from the links.
- Remove the cross rod.
- Preferably remove or add an even number of pitches at a time.



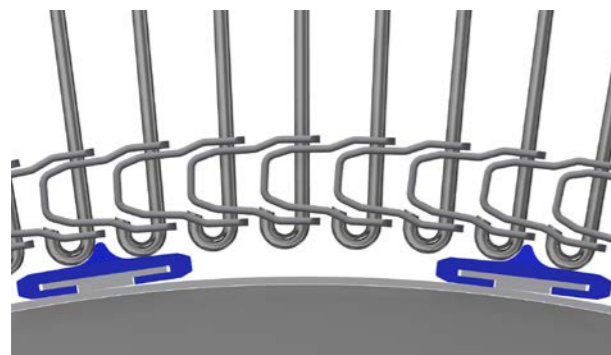
## RETROFIT

- When replacing an old belt it is recommended to also renew the cage bars, belt support rails and sprockets/rollers.
- Check if the new belt will pass the system with enough clearance.
- Check if there is enough free space for the inner link between the drum and inner support rails. (minimal 50 mm)
- Pay special attention to checking the hold down strips, the inside belt support and the take-up area.
- Check if the drive sprockets engage the links of the new belt properly. It may be necessary to reposition the sprockets on the drive shaft.
- When replacing the old belt with a different pitched belt, the pitch circle diameter of the drive sprockets may differ somewhat from the old size. Be aware that this changes the belt speed and thus the overdrive of the cage.
- If the new sprocket is smaller in diameter, check if the belt is not pulled into the belt support rails.
- Check if the belt runs over all idler rollers properly.
- Check throughout the whole system if there are any possible catch points.
- After fitting the new belt, check if the overdrive settings need to be adjusted.
- Check if the product dwell time has changed and adjust if needed.



## INSIDE DIRECT DRIVE

Due to the patented bended-side finish of our TwenteFlex conveyor belt, it mainly requires a different cage bar to enable inside direct drive. Because the exact same belt is used for low tension drive and inside direct drive, a retrofit is quick and affordable. In addition to that, inside direct drive also results in more stable and predicatable belt tensions.



TEETHED CAGE BAR DRIVING TWO BENDED RODS



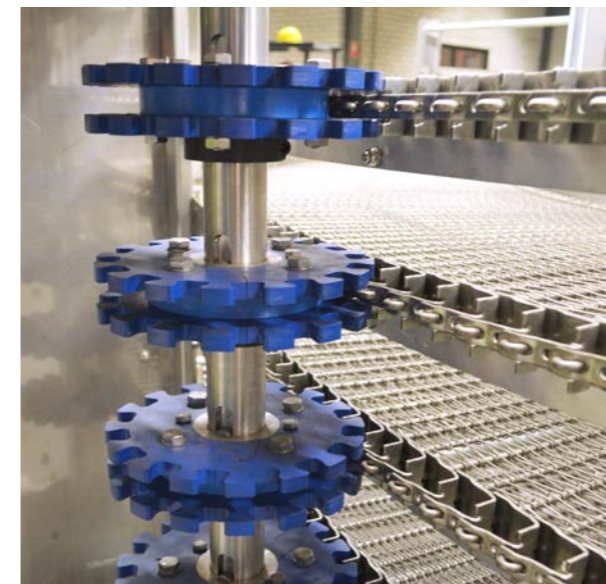
- Direct drive eliminates friction between the drum and belt.
- Advantageous, as our standard TwenteFlex belt is used.
- Direct drive significantly reduces product movement.
- Fail-safe design.
- Direct drive makes longer production runs possible.
- Straightforward retrofit, from low tension to direct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

Do you require more information on inside direct drive? Please check out the TwenteFlex inside direct drive brochure or contact Twentebelt to discuss the possibilities.

## OUTSIDE DIRECT DRIVE (TWENTESIDEFLEX)

TwenteSideFlex is designed to be used in spiral or oval systems without a center drum that drives the belt. Its drive sprockets are fitted on one or two vertical shafts at the outside of the belt, engaging in the outer drive link of the belt.

Because there is no drum in the center when using outside direct drive, you are free to exploit that space in any way you like. Due to its design, a system running TwenteSideFlex is much easier to clean, allows for wider belts and makes it possible to have multiple belts in one system.



- Runs more smooth and more stable compared to friction driven conveyor belts.
- No need for a big and expensive drum.
- Allows for various system layouts.
- Makes it possible to have multiple belts in one system.
- Simple system design.
- Allows for the same belt running up and down in the same spiral. (P-loop)
- Suitable for wide belts.

Do you require more information on outside direct drive? Please check out the TwenteSideFlex brochure or contact Twentebelt to discuss the possibilities.





## 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

