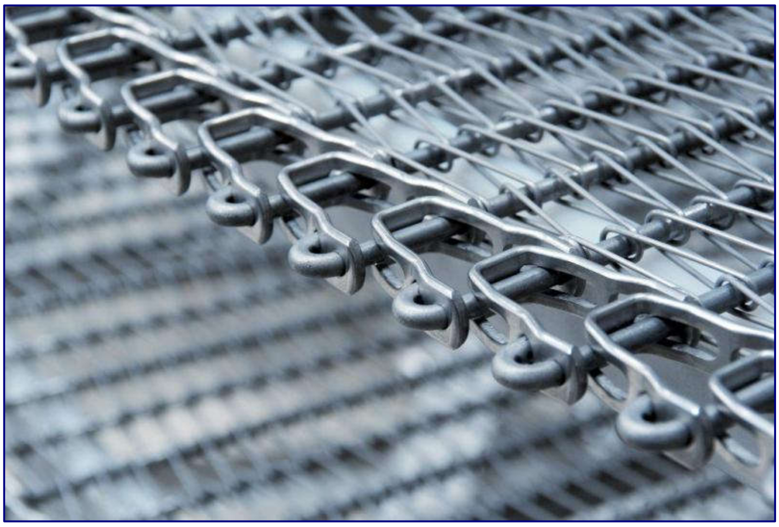
TWENTEFLEX™



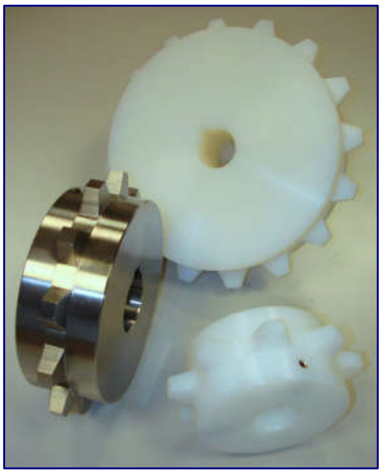
TECHNICAL SUPPORT
AND
RECOMMENDATIONS

V1.3

DRIVE COMPONENTS

TBU 30 Drive Sprockets		PITCH 30 mm		Support Roll	Flange Roll
Number of Teeth	Pitch Circle Diameter [mm]	Hub Diameter [mm]	Outside diameter [mm]	Support Roll Diameter [mm]	Flange Roll Diameter [mm]
12	117,1	100,1	125,1	103,9	100,1
16	155,4	139,4	164,4	143,2	139,4
21	203,4	188,1	213,1	191,9	188,1

TBU 40 Drive Sprockets		PITCH 40 mm		Support Roll	Flange Roll
Number of Teeth	Pitch Circle Diameter [mm]	Hub Diameter [mm]	Outside diameter [mm]	Support Roll Diameter [mm]	Flange Roll Diameter [mm]
12	155,6	135,3	164,3	140,1	135,3
16	206,4	187,4	216,4	192,3	187,4
21	270,1	252,1	281,1	256,9	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:

- 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.
The flange rollers *must* support the outer links. The lack of rollers supporting the links *will* result in mesh damage (breaking of mesh spiral wire).

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 then 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.

Twentebelt B.V. PO-Box 6 7550AA Hengelo ov Phone: +31 (74) 242 47 05 Fax:+31 (74) 243 16 59
Internet: www.twentebelt.com e-mail: sales@twentebelt.com

GENERAL REMARKS

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 infeed 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 a cage overdrive setting of approximately 800 to 1200 mm per tier revolution faster then the inside belt edge is recommended.
Increasing the cage overdrive will decrease the belt tension and increase the possibility of the belt surging (belt hesitation, stick-slip).
The optimum overdrive setting is 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 friction increase 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:

Belt width [mm]	Number of supports
≤ 610	2
611 - 1016	3
1017 ≥	4

The common used belt support material is PE-1000 or PE-500 high density poly ethylene. Other materials are possible depending on 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 then 10 mm are not recommended. The side of the support rail must be rounded.

Twentebelt B.V. PO-Box 6 7550AA Hengelo ov Phone: +31 (74) 242 47 05 Fax:+31 (74) 243 16 59
Internet: www.twentebelt.com e-mail: sales@twentebelt.com

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 approximately 120 mm. At temperatures below 60˚C the recommended material is PE-1000.
For applications over 60˚C stainless steel cage bars or a full stainless steel cage can be used. If stainless steel is used for cage drive surface, the overdrive can be decreased to 400 to 600 mm due to the increased friction coefficient. Keep in mind the belt edge will wear more quickly on a stainless steel cage surface.

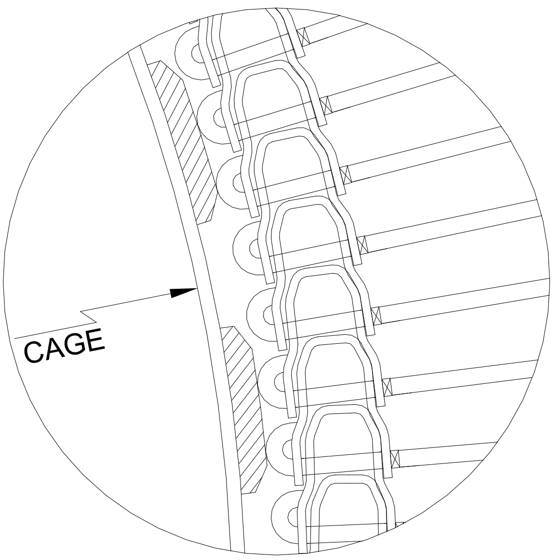
It is recommended that the cage bars are covering at least 30% of the cage.

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. Reducing the bending of the cross rods will optimize the drive generated by the friction between belt and cage bars. The energy needed to bend the rods can not be converted into drive force. Because the cage moves faster then 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.

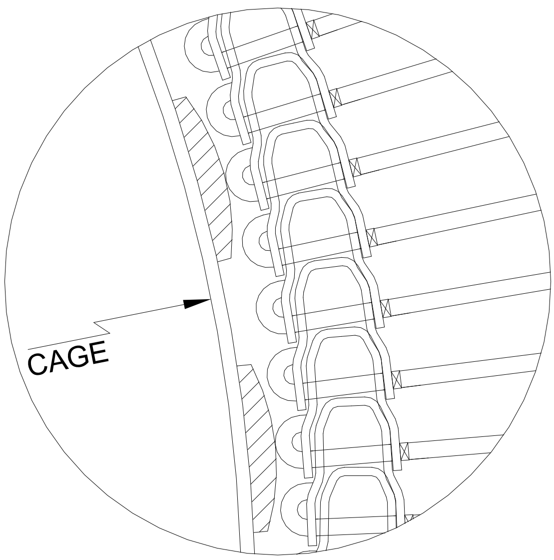
The use of rounded cage bars can result in undesired movement of the inside links. Depending on the radius of the cage bars only one cross rod could be in contact with a cage bar. This can cause sudden undesired movement of this rod when it passes the top of the cage bar radius. A flat drive surface 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:



FLAT CAGE BAR
DRIVING TWO RODS

Not preferred cage bar design:



ROUNDED CAGE BAR
DRIVING ONE ROD ONLY

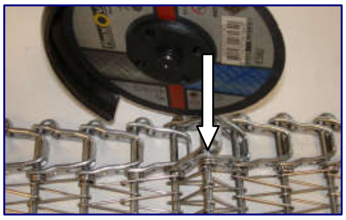
Twentebelt B.V. PO-Box 6 7550AA Hengelo ov Phone: +31 (74) 242 47 05 Fax:+31 (74) 243 16 59
Internet: www.twentebelt.com e-mail: sales@twentebelt.com

CONNECTOR ROD

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 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.
- Tighten the nut making sure the belt still collapses properly.
- Weld the nut to the rod making sure the rod end is smooth.
- Weld the inside legs of both links to the cross rod.
  Make sure the bent side of the rod is inserted in the middle hole of the link as far as possible.
  Make sure both links are flat/parallel to each other.
  The inside welds preferably is a small weld that doesn't compromise the rod or link strength.

For shortening the belt:



- 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 (add) an even number of pitches at a time.

RETROFIT

- When replacing an old belt it is recommended to also re-new the cage bars, belt support rails and sprockets/rollers.
- Check if the new belt will pass the system with enough clearance.
  Especially at 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 links are supported on *every* shaft.
- 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.

Twentebelt B.V. PO-Box 6 7550AA Hengelo ov Phone: +31 (74) 242 47 05 Fax:+31 (74) 243 16 59
Internet: www.twentebelt.com e-mail: sales@twentebelt.com

TWENTEBELT