This is basically an articulated metal framework which acts as a continuous conveyor belt for different materials at high, medium or low temperatures, in the presence of any type of work environment or atmosphere.

Belts are constructed with flat or round crosswire spirals and joined or interconnected by straight or wavy rods in the same direction, with a finished belt edge welded or bonded by a variety of methods dependent upon the required design.

### Materials used and recommended maximum temperatures

<table>
<thead>
<tr>
<th>Material</th>
<th>Maximum Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manganese steel (steel)</td>
<td>350°C</td>
</tr>
<tr>
<td>Galvanized steel</td>
<td>180°C</td>
</tr>
<tr>
<td>Chrome steel - AISI502</td>
<td>&lt; 600°C</td>
</tr>
<tr>
<td>Stainless Steel - 18/8 - 1.4307 - AISI304</td>
<td>750°C</td>
</tr>
<tr>
<td>Stainless Steel - 18/8/2 - 1.4401 - AISI316</td>
<td>800°C</td>
</tr>
<tr>
<td>Refractory steel - 25/20 - 1.4841 - AISI314</td>
<td>1150°C</td>
</tr>
<tr>
<td>Refractory steel - 37/18 - 1.4864 - AISI330</td>
<td>1150°C</td>
</tr>
<tr>
<td>Refractory steel - 80/20 - 2.4869</td>
<td>1150°C</td>
</tr>
</tbody>
</table>
Applications

• Metallurgical / Automotive
  - Continuous heat treatment such as hardening, brazing, annealing and tempering.
  - Sintering of metal powders for the automotive industry.
  - Screws and fasteners.
  - Continuous blasting processes.

• Food
  - Freezing tunnels specifically designed for all types of vegetables, fish and dairy etc.
  - Cooling and freezing towers.
  - Ovens for the baking of bread, biscuits, cakes or pastries.
  - The washing of fruits and vegetables.
  - Processing selection, washing and treatment of fruits, vegetables, meat and fish.
  - For cooking pizzas, nuts, chips, snacks, etc...
  - Confectionery: chocolate layers, sugar and cream.
  - Automatic pasteurization lines: for heat treatment or shrink wrapping of food and beverage products that are already packed.

• Glass
  - The annealing of decorated glass bottles.
  - Automatic cleaning and drying tunnels for glass, metal or plastic packs and containers.

• Ceramics and mosaics

• Solar Panels

• Pharmaceutical Industry
  - Hygiene and sterilization processes

• Wood
  - Cellulose Drying Tunnels for fiberglass, textile fibers, cardboard or wood.
  - Dryers for plywood or varnished wooden materials.

• Textiles
  - Continuous inking processes; preparation, stamping and other processes in the textile industry.

• Machines for cleaning sandy beaches.

• Architecture and design.
## CONVEYOR BELT MODELS

<table>
<thead>
<tr>
<th>MODELS</th>
<th>A</th>
<th>A1</th>
<th>A2</th>
<th>A3/A4/A5/A6</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>FEATURES</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>0,90 -5°</td>
<td>0,90 -6°</td>
<td>0,90 -4°</td>
<td>0,50 -4°</td>
<td>0,50 -4°</td>
</tr>
<tr>
<td>B</td>
<td>2 - 20</td>
<td>3 - 45</td>
<td>3 - 15</td>
<td>3 - 20</td>
<td>10 - 60</td>
</tr>
<tr>
<td>C</td>
<td>1 - 6</td>
<td>1 - 7</td>
<td>1 - 4</td>
<td>0,90 - 5</td>
<td>-</td>
</tr>
<tr>
<td>D</td>
<td>5 - 100</td>
<td>5 - 100</td>
<td>5 - 27</td>
<td>2 - 6,5</td>
<td>-</td>
</tr>
<tr>
<td>Max width (m)</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Edge **</td>
<td>S / E / E-A</td>
<td>S / E</td>
<td>S / E</td>
<td>S</td>
<td>S / E</td>
</tr>
<tr>
<td>Edge guards</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Forked chains</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Chains</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
</tbody>
</table>

A: Spirals wire diameter.  
B: Spirals pitch.  
C: Rods wire diameter.  
D: Distance between rods.

A - Spirals on the right and left joined together by a straight rod.  
A1 - Spirals on the right and left joined together by a wavy rod.  
A2 - Double spiral right and left joined together by a straight or wavy rod.  
A3 / A4 / A5 / A6 - Spirals to right and left joined together by a pre-crimped rod.  
B - Groups of spirals in one direction (right or left) woven together. They may also be assembled in sections of alternating directions.  
B1 - Groups of spirals in a single direction (right or left) woven together. A straight rod with a reinforcing spiral between each pair at their point of contact; groups of spirals may be assembled in sections of alternating directions.  
B2 - Groups of double spirals in a single direction (right or left) woven together. A straight rod with a reinforcing spiral between each pair at their point of contact; groups of spirals may also be assembled in sections of alternating directions.  
FIL-PLA - Vertical flats alternately folded, assembled with cross rods.  
MG – Belts consisting of round wire meshes in the direction of conveyance, with ends that are curved in the shape of an eyelet, with cross rods forming hinges.  
Vaucanson - Parallel Rods in pitches, assembled by side loops.  
Interlinked Wire Rods – made with cross wire strands formed in a “Z” shape and linked together.
## CONVEYOR BELT MODELS

<table>
<thead>
<tr>
<th>B1</th>
<th>B2</th>
<th>FILPLA</th>
<th>MG</th>
<th>VAUCASON</th>
<th>ALAMBRES</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Image" /></td>
<td><img src="image2.png" alt="Image" /></td>
<td><img src="image3.png" alt="Image" /></td>
<td><img src="image4.png" alt="Image" /></td>
<td><img src="image5.png" alt="Image" /></td>
<td><img src="image6.png" alt="Image" /></td>
</tr>
<tr>
<td>1,50 - 4*</td>
<td>0,50 - 3,20*</td>
<td>12 x 1,20</td>
<td>1,50 - 3</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>10 - 35</td>
<td>2 - 10</td>
<td>44,64</td>
<td>3 - 30</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1,50 - 6</td>
<td>0,80 - 5</td>
<td>4</td>
<td>3 - 8</td>
<td>4,50 - 6</td>
<td>0,90 - 3</td>
</tr>
<tr>
<td>8 - 30</td>
<td>3,20 - 25</td>
<td>27,92</td>
<td>12,70 - 50,80</td>
<td>15,87 - 25,40</td>
<td>4 - 14</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>4</td>
<td>to be determined</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>S / DS</td>
<td>S</td>
<td>S / E</td>
<td>MC</td>
<td>E / MC</td>
<td>Single / Double</td>
</tr>
</tbody>
</table>

The sections of the spirals can be laminated to achieve greater flatness of the conveyor belt.

**Side finishes**
- S (welded)
- D (bent)
- E (linked)
- MC (chain mesh)
TYPES OF BELT EDGE

S - WELDED

E – LINKED

D – BENT

OTHER
A full range of single standard belts, plus the (non-standard) derived types, can be transformed into belts with accessories, when elements such as chains, forked chains, guards, crosswire strips, etc. are involved in their construction.
CONVEYOR BELTS WITH ACCESSORIES

CHAIRS

They are situated to ease the haulage of the belt and ensure good traction preventing the mesh from suffering from wear and tear of the dynamic movement of the belt.

The most standard pitches are used, such as 9.52 mm, 12.70 mm, 15.87 mm, 19.05 mm, 25.40 mm, 38.10 mm and 50.80 mm. However, the belts can be designed and manufactured to meet customer requirements by linking the chain to the belt at each pitch or at N pitches. Belts with chains can also be constructed with edge guards and crosswire strips.
The forked chain edge facilitates the haulage of the belt and adds versatility due to its ability to alternate from straight to curved sections.

Depending on the pitch of the links you can obtain a varying radius of curvature. Its main applications are in the food industry for cooling towers and freezing.
EDGE GUARDS

Their placement prevents products from falling off the side of the belt. They may be of variable shapes, height or size (CA-L type, C.A1-L, etc.).

POSSIBLE FINISHES WITH EDGE GUARDS

Stabilized
Stabilized alternately
Welded washer

Linked
Welded directly through the side guard

FORMS OF EDGE PLATES

Belts with any shape of edge plate can be made to order.
SPECIAL ACCESSORIES AND FINISHES

In addition to these standard accessories, the belts can be manufactured and equipped with continuous or perforated plates on the inside of the spirals, U-shaped strips, raised spirals, rods in the form of a finished fork, etc. They can incorporate crossed strips to hold the product when working on an incline; normally it has welded corners or is fixed with screws. A continuous bent edge can also be manufactured; this type of finish works as an only guard integrated in the belt. Our Technical Department can investigate any type of application our clients wish to make, whatever their degree of complexity.
INTER-LINKED WIRE RODS TYPE BELTS
Interlinked wire rods belts are widely used in the food industry. The main application of this type is the belt transport of light products at temperatures up to 400°C. This type of belt consists of crosswire rods formed as a 'Z' linked together. It is normally manufactured in stainless steel AISI302 and its high tensile resistance is created using sprockets distributed along the entire width of the belt ensuring a perfect traction with a variety of loading conditions and/or speeds.
BELTS FOR SINTERING PROCESSES

Sintering is a continuous production process in which the metallic or ceramic powder temperature is lower than the melting temperature of the compacted powder mixture. This process is widely used in the automotive industry or in processes where the required volume of production is very high.

The conveyor belts have a key importance in this process whose function is to transport within the high-temperature furnaces which complete the process of sintering. Thus, the selection of a correct belt model and manufacture of this material will be very important in the design of the conveyor belt.

The main materials used for the production of these belts are refractory materials such as:

**AISI 314 / 25-20 / 1.4841:** This material is suitable for implementing in processes where the temperature is between 900°C and 1160°C. However, this material is not suitable for processes where the belt works continuously between at any point between 750°C and 850°C as it becomes fragile by the sigma phase formation.

**UNIKING** can also design and produce these types of conveyors with other materials on request.
BELTS FOR SINTERING PROCESSES

Trays for sintering.
BELTS FOR HEAT TREATMENT PROCESSES

Heat treatment of steels and cast iron production is a process consisting of a set of heating and cooling operations, under controlled conditions of temperature, speed, time and pressure, of metals or alloys in the solid state in order to improve their mechanical properties.

This type of production process significantly improves hardness, strength and elasticity of the metal treated materials.

The belts used for these processes are made primarily to:

AISI 314 / 25-20 / 1.4841: This material is suitable for implementing in processes where the temperature is between 900°C and 1160°C. However, this material is not suitable for processes where the belt works continuously between 750°C and 850°C as it becomes fragile by the sigma phase formation.

AISI 330 / 37-18 / 1.4864: Is a high temperature material which offers high mechanical strength and resistance to corrosion and carburization. It can work at temperatures up to 1160°C. The main property of this austenitic material is that it remains effective over the temperature range of the sigma phase formation (750°C- 850°C) and supports the formation of this phase for a long period of time.

UNIKING can also produce these types of conveyor with other materials on request.
BELTS FOR HEAT TREATMENT PROCESSES

TYPE A5 with side guards

TYPE A15
BELTS FOR BRAZING PROCESSES

Brazing is a metal-joining process whereby a filler metal is heated above melting point and distributed between two or more close-fitting parts by capillary action. The filler metal is brought slightly above its melting (liquidus) temperature while protected by a suitable atmosphere, usually a flux. This type of production process allows designers and production engineers to merge complex simple designs. Some applications include: aerospace components, automotive components, electronic devices, among others. The belts used for these processes are made primarily with:

**AISI 314 / 25-20 / 1.4841**: This material is suitable for implementing in processes where the temperature is between 900°C and 1160°C. However, this material is not suitable for processes where the belt works continuously between 750°C and 850°C as it becomes fragile by the sigma phase formation.

**AISI 330 / 37-18 / 1.4864**: Is a high temperature material which offers high mechanical strength and resistance to corrosion and carburization. It can work at temperatures up to 1160°C. The main property of this austenitic material is that it remains effective over the temperature range of the sigma phase formation (750°C-850°C) and supports the formation of this phase for a long period of time.

**UNIKING** can also produce these types of conveyors with other materials upon request.
BELTS FOR BRAZING PROCESSES

TYPE B1ES

TYPE B1DS
CONVEYOR BELTS FOR THE GLASS INDUSTRY

Processes used in glassmaking (blown glass and others) especially for annealing lehrs (furnaces), decoration tunnels and packaging etc, normally correspond to our A1 type (belts with spirals and left and right alternating wavy rods), with welded edges. They are manufactured with round or flat wire spirals, they may achieve high flatness in the form of spirals to avoid excessive vibration during the transportation of goods (bottles, cups, etc).

The following materials are used depending on the conditions of the process:

**Cr Steels.** Suitable for processes whose implementation temperature is between 500 and 600°C.

These materials, however, may work in good conditions up to 700°C. The presence of Si and Mo in their composition allows for considerable resistance to oxidation and wear.

**AISI 304 / 18-8 / 1.4301.** In the case of a Austenitic Stainless Steel, with 18% Cr and 8% Ni, this material has excellent resistance to breakage and to oxidation, and can work retaining all of its properties to approx. 800°C.

**UNIKING** can also produce these types of conveyors with other materials upon request.
CONVEYOR BELTS FOR THE GLASS INDUSTRY

FLAT WIRE

ROUND WIRE
BELTS FOR FREEZING AND COOLING PROCESSES
Conveyor belts with forked chain edges are widely used in the food industry. Their main function is within the cooling towers for a wide range of products.

The main feature of these types of belt is found in its versatility by alternating straight and curved sections.

The material used for the production of these belts is the **AISI 304 / 18-8 / 1.4301**. As austenitic stainless steel this material has excellent resistance to breakage and oxidation, it can function whilst retaining all of its main properties.

**UNIKING** can also produce these types of conveyors with other materials upon request.
SLIDING SUPPORTS

U-shaped section

I-shaped section

DRIVE HAULAGE SYSTEMS

THRUST HAULAGE (HIGH TEMPERATURES)
BELT INSTALLATION

It is always advisable to carry out some conveyor maintenance before using the new belt. For that purpose, we suggest the following points:

1- Disconnect the old belt at the lower side of the driving cylinder and attach a cable at one end. When the belt is pulled out the cable must be fitted to the conveyor, allowing the new belt to be changed.

2- To check all the conveyor guides and cylinders (driving, return, tensioning, supports, etc) all the cylinders must be at 90° in respect of the middle line of the conveyor and perfectly parallel between themselves.

3- To check the supports or sliding guides of the belt. Ensure there are no sharp edges or elements that could rub and damage the belt.

4- On completion of checking and cleaning the conveyor, we will proceed to introduce the new belt by using the cable that we have previously placed in the conveyor when removing the old belt.

If no maintenance is required, we may just change the belt by joining the new belt to the old one when removing it.

Almost every belt has a running direction, so this must be taken into consideration when placing the new belt into the conveyor.

PRODUCT LOAD

The product load on the belt must be as uniform as possible to evenly distribute the weight on the lower side, thus preventing distortion and premature belt failure.

BELT STARTING

For conveyors that operate at an ambient temperature, we will pre-tense the belt and gradually the speed until reaching the working speed. We must ensure that the belt remains straight, with no friction on the sides. We should never line up or place the belt by scraping along the edges. The lining up must be done by correcting the cylinders (driving, return, supports, etc.)

A high temperature belt must run in a similar way to any other precision part. The oven must increase its temperature gradually and not higher than 148°C per hour. Once the working temperature has been reached, the belt must work for approximately 5 hours without any load to ensure the correct settling-down of the belt elements (spirals and cross bars). Changes in temperature affect the breaking properties of the metal and close attention is needed to determine any belt adjustment that may be required during this period. During the rolling period we must eliminate any tension in the belt to ensure its maximum working life. In addition we must avoid any excess in the growth of the grain by annealing it an adequate temperature.
BELT STARTING

The process of avoiding the tensions may be further achieved with the following two suggestions:

1- For alloys that work at 925°C or over, the treatment of tension elimination must be quite long, so that each section of the belt should work at a minimum 925°C for an hour.

2- For alloys that work at 898°C or under, the treatment of tension elimination must be done at 28°C above the normal temperature for a sufficient amount of time so each section of the belt can reach the temperature of tension elimination for at least one hour.

Once the tension elimination treatment is completed, we continue to increase the oven temperature at a rate of 164°C per hour, until the final working temperature is reached. At that point, the belt must run for a minimum of 5 hours without any load. Generally, the high temperature belts have a certain amount of tension predetermined before a failure in tension occurs. The intentional tension of the belt only saves a few hours of maintenance at the expense of the belts long term durability.

STOPPED BELT

When the belt is stopped the following precautions are essential, in order to obtain the maximum service life:

A.- The belt must be stopped with the operational temperature working.

B.- The belt tension must be reduced to the minimum needed to engage the drive sprockets properly or adjusted according to the manufacturer’s documentation. This applies in particular for high temperature ovens, which are equipped with a counterbalance or air cylinders for the belt take-up at the extreme unloading end. The high counter tension conveys along the belt in such a way that the tension in the heated area may be greater than where the belt carries the load.

C.- A high temperature belt must be maintained in motion, if stopped it may weld to the support of the oven and cause serious damage when restarted.

D.- Regular tests regarding the direction of the belt must be carried out without load, as the changes of temperature induce quite often to changes in the run.

In this chapter “BELT STOP”, stop is understood without any load on the belt.
UNITING THE STRONGEST LINKS

METAL CONVEYOR BELTS
UNITING THE STRONGEST LINKS
TWENTEBELT. MARKET LEADER IN METAL CONVEYOR BELTS

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 such as eyelink belts, wire mesh belts and balanced weave belts in various materials. Twentebelt supplies, among others, the food, chemical, pharmaceutical and packaging industries.

Each belt is designed and built for your specific application and working conditions. Twentebelt is the worldwide market leader in eyelink belts.

Process continuity with Twentebelt metal conveyor belts

The success of Twentebelt and therefore that of its clients is determined by the many advantages of metal conveyor belts, such as longer life, 100% reliability, ease of maintenance, lower cost and extra flexibility. Metal conveyor belts offer a solution for every production process, from cooking, baking, frying or freezing food to pasteurising preserves and drinks to degreasing metal objects, even in extreme conditions, such as temperatures below or far above freezing or when aggressive chemicals are used.
Twentebelt develops, advises and creates to your specifications

Twentebelt responds to specific client requests with unique custom solutions. Twentebelt is aware that the quality of its advice determines the quality of the ultimate application. Put our product specialists to the test!

Prompt, quick service

Twentebelt also has its own service department that is always ready, everywhere, with diagnostics, advice and repairs. Regular inspections and preventive maintenance allow us to optimise your business continuity.

Used worldwide, appreciated worldwide

More and more companies around the world are trusting in the reliability of Twentebelt and its metal conveyor belts.
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Applications and features

Eyelink belts combine a flat, stable surface with the dimensional stability and robustness of metal and are well suited to heavy loads and unstable or fragile products requiring good support. A perfectly straight run is always assured by positive drive with toothed sprockets. A single opening means that eyelink belts are easy to clean. Twentebelt eyelink belts are durable and designed to be flexible.

Versions

There are many types of eyelink belt. The right belt for your application is made based on the type of eyelink, the belt pitch and the various options for finishing the side and installing flights.

Belt structure:
- Eyelink to eyelink (type DO)
- Modular structure with one or more welded underwires (type DP(L) and DL)
- With flattened eyes for small opening (type DP)
- 'Combinox' hybrid construction from eyelink and synthetic modules

Stable flat foundation, perfect for pasteurisers, etc.

Suitable for very low or very high temperatures, such as fryers.
**Side finishing**
- With a welded side (LK)
- Fitted with chain (KH) to be driven by gear wheels at the sides.
- With guide plates (GP) for side protection.
- Or with plastic blocks (KB) for virtually seamless connection to the machine frame.

**Sizes**
- Pitch (15.9 to 76.2 mm)
- Wire diameters (1.6 to 3.2 mm)
- Cross pitch (measured centre-to-centre of eyelinks 2.8 to 50 mm)
- Number of underwires (0 to 8)

Eyelink belts are available in various materials, including AISI 304 stainless steel and bright steel.

**Drive**
Belts depend on the right driving and turning wheels to operate well and without interruption, which is why Twentebelt develops and produces the required sprockets and rollers. Sprockets are equipped with special teeth configured for the belt structure, and tube, disc or strip rollers are available to drive the entire width of the belt.

**Options**
For specific applications, an eyelink belt can be fitted with options, such as edge plates (1) for thicker layers of unsorted products, or flights (2) for ascending and descending belts.
Applications/features

Wire mesh belts have extra large openings and are very well suited to coating processes such as chocolate coating, egg glazing, breading and other applications in which the product should have as little contact with the conveyor belt as possible. This means it is especially suitable for light products. The small radius on the reverse means a good product transfer.

Wire mesh belts are flexible in terms of use and specifications. Twentebelt also supplies 90° conveyor curves in various sizes as well as separate belts.

Versions

Diverse combinations of pitch, wire diameter, mesh length and side finishing create a wide range of fit-for-purpose wire mesh belts.

Even support with large opening for light products.

Wire mesh belts offer diverse solutions not only for the food sector but also in industry.
Wire mesh belts are driven by sprockets of plastic or stainless steel. These drives and turning wheels are developed and produced by Twentebelt for wire mesh belts and are intended to guarantee an optimal uninterrupted run.

Wire mesh belts are available in AISI 302 or 316 stainless steel and bright spring steel.

Wire mesh belts can be equipped with integrated flights or tips, or levels for fixed product spacing. The belt can be made endless simply by pinching shut a connector or by weaving in a pre-bent wire.
**Applications/features**

The balanced weave belt is the ‘mother of all metal belts’ and has a virtually infinite number of versions and applications, from super-strong (for heavy loads over large widths or very hot products) to very dense weaves for small products, unsorted goods or products requiring stable support. The belts have a perfectly round end, even with a small radius, for a good product transfer to the following stage of the process. From transport in glass furnaces and kilns to decorative dividers in architecture, balanced weave belts provide a solution for the most complex applications.

**Versions**

Balanced weave belts can be divided into three main groups:
- Without pins
- With corrugated pins
- With straight pins

**Side finishing**
- With looped edges (can easily be made endless)
- Or welded (small links that cannot be bent)
- Fitted with chains

Balanced weave belts are available in a wide range of materials: not only ferrous metals but also non-ferrous and combinations in a single belt.

Also available in various heat-resistant metal types.
Basic forms

- Balanced weave belt woven on one side (type SP)
- Corrugated wirelink belt, alternately woven left and right for a straight run (type GS)
- Straight wirelink (type RS)
- 'Rod reinforced' structure specifically for applications at temperatures up to 1200 °C (type RR)
- 'Compound belt' with additional pins and spirals for a very densely woven belt (type CB)

Drives

The belt is driven by friction rollers over the entire width of the belt or positively with sprockets in the case of GS belts. The drive is perfectly suited to the application and belt used.

Options

Balanced weave belts can be equipped with edge plates and/or flights. The pins can be bent upwards in some types, resulting in a standing edge.
Innovative design
The revolutionary bending of the cross rod and its lock into the connection link:
- has eliminated major reasons for belt problems like:
  - Weld breakage
  - Cross rod breakage next to the weld
  - Sharp welds damaging the cage bars
  - Tented inside links due to broken welds
- forms the ideal drive surface
- reduces the chance of damaging the drum

Hygienic in use and easy to maintain
By eliminating welded joints the TwenteFlex:
- has no dead-end cavities that are a breeding place for bacteria's
- is easier to clean
- material maintains it original quality and durability
- has no need for pickling and passivating

Durable construction
By bending instead of welding:
- reproducibility and durability are assured
- quality levels are not only high but also constant

Simple retrofit
Although its unique design TwenteFlex can retrofit existing spirals

R&D
Based on our customers needs and experiences we will keep developing our belts and delivery program.
In addition to eyelink belts, wire mesh belts and balanced weave belts, Twentebelt produces specific belt structures and complete solutions such as conveyor curves.

**Plate belts**
Plate belts are well suited to drying processes. The self-supporting structure of these belts means they can be used over large widths without support. Perforations allow the opening in the belt to vary from 0 to very large. Chain-driven plate belts can be fitted with edge plates.

**Filter plates**
The specific structure of metal conveyor belts makes these suitable for use as filter plates, with an opening that is precisely aligned with the product to be filtered. Depending on the filtration process, balanced weave or eyelink belts can be used, or even combinations of both belts.

**Conveyor curves**
Sometimes the process has to turn a corner. Twentebelt’s wire mesh belt conveyor curves offer a space-saving solution that is produced by Twentebelt and can be implemented immediately as a complete system that is hygienic and saves space, with an open or closed table top. The drive with a directly drive axle and integrated frequency control can be installed inside or outside the radius. Conveyor curves are available in different sizes, all adjustable for height.
UNITING THE STRONGEST LINKS

METAL CONVEYOR BELTS
TWENTEFLEX™ SPIRAL BELTS
THE NEXT STEP IN SPIRAL BELT TECHNOLOGY

With its innovative new 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 can be used 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
- Proofing
- Freezing
- Steam-cooking

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

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.

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)

OPTIONS

GUARD EDGES

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

TwenteFlex™ with guard edges
**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° Celsius)
- Ultra High Density Poly Ethylene (-60° to +60° Celsius)
- PA6G (Nylon) (-60° to +60° Celsius)
- Stainless Steel

Idler shafts can be fitted with flanged and support rollers. 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 roll.

### TBU 30 DRIVE SPROCKETS - PITCH 30 MM

<table>
<thead>
<tr>
<th>NUMBER OF TEETH</th>
<th>SPROCKET WIDTH (IN MM)</th>
<th>PITCH CIRCLE DIAMETER (IN INCH)</th>
<th>HUB DIAMETER (IN MM)</th>
<th>OUTSIDE DIAMETER (IN MM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>31 or 50</td>
<td>117.1</td>
<td>100.1</td>
<td>125.1</td>
</tr>
<tr>
<td>16</td>
<td>31 or 50</td>
<td>155.4</td>
<td>139.4</td>
<td>164.4</td>
</tr>
<tr>
<td>22</td>
<td>31 or 50</td>
<td>203.4</td>
<td>188.1</td>
<td>213.1</td>
</tr>
</tbody>
</table>

### TBU 30 IDLER ROLLERS

<table>
<thead>
<tr>
<th>SUPPORT ROLL DIAMETER (IN MM)</th>
<th>FLANGE ROLL DIAMETER (IN MM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>103.9</td>
<td>100.1</td>
</tr>
<tr>
<td>143.2</td>
<td>139.4</td>
</tr>
<tr>
<td>191.9</td>
<td>188.1</td>
</tr>
</tbody>
</table>

### TBU 40 DRIVE SPROCKETS - PITCH 40 MM

<table>
<thead>
<tr>
<th>NUMBER OF TEETH</th>
<th>SPROCKET WIDTH (IN MM)</th>
<th>PITCH CIRCLE DIAMETER (IN INCH)</th>
<th>HUB DIAMETER (IN MM)</th>
<th>OUTSIDE DIAMETER (IN MM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>31 or 50</td>
<td>155.6</td>
<td>135.3</td>
<td>164.3</td>
</tr>
<tr>
<td>16</td>
<td>31 or 50</td>
<td>206.4</td>
<td>187.4</td>
<td>216.4</td>
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<tr>
<td>22</td>
<td>31 or 50</td>
<td>270.1</td>
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* TBU-P 40

### TBU 40 IDLER ROLLERS

<table>
<thead>
<tr>
<th>SUPPORT ROLL DIAMETER (IN MM)</th>
<th>FLANGE ROLL DIAMETER (IN MM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>140.5</td>
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<td>*187.4</td>
</tr>
<tr>
<td>191.9</td>
<td>*252.1</td>
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### TBW 20 DRIVE SPROCKETS - PITCH 20 MM

<table>
<thead>
<tr>
<th>NUMBER OF TEETH</th>
<th>SPROCKET WIDTH (IN MM)</th>
<th>PITCH CIRCLE DIAMETER (IN INCH)</th>
<th>HUB DIAMETER (IN MM)</th>
<th>OUTSIDE DIAMETER (IN MM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
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<td>77.3</td>
<td>63.2 * 61.7</td>
<td>85.2 * 86.7</td>
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<tr>
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<td>102.0 * 100.5</td>
<td>124.0 * 125.5</td>
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<tr>
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<td>25 or 40</td>
<td>159.7</td>
<td>146.9 * 145.4</td>
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* TBW-HD 20

<table>
<thead>
<tr>
<th>SUPPORT ROLL DIAMETER (IN MM)</th>
<th>FLANGE ROLL DIAMETER (IN MM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>65.5</td>
<td>63.2 * 61.7</td>
</tr>
<tr>
<td>104.7</td>
<td>102.0 * 100.5</td>
</tr>
<tr>
<td>149.6</td>
<td>146.9 * 145.4</td>
</tr>
</tbody>
</table>
CURVED CONVEYOR GUIDELINES

TwenteFlex™ spiral belts are developed to obtain optimum contact between belt edge and inner guide rail. The innovative bended rod design eliminates breakage of rod and button head due to welding. The elimination of welding ensures full material quality and belt strength.

DESIGN GUIDELINES

Outfeed after curve, drive section: Minimal 1.5 x belt width
Infeed before curve: Minimal 1.0 x belt width
Straight between two opposite curves: Minimal 2.0 x belt width

BELT SUPPORT

- Advised guide rail and belt support material is Ultra High Density Poly Ethylene (PE-1000) for applications where the rails will not be exposed to temperatures over 80 degrees Celsius.
- Belt support rails should be placed at least every 300 to 400 mm depending on the belt load.

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.
- Provide a hold down rail at the outside belt edge to prevent the belt from flipping up.
- Provide a hold down rail over the inside links to prevent the belt from climbing the drum.
- Due to the design of this belt, there is a possibility that links can lock themselves in a tented position while pulling the belt. This situation can only happen when links are bent in collapsed condition. 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 operation condition because links are always extended when bent around rollers.

TWENTEFLX™ TBU 30
Recommended drive sprockets:
12 teeth (PCD = 155.0 mm)
Minimal drive sprocket:
9 teeth (PCD = 88.6 mm)
Minimal idler diameter:
80 mm (Recommendation: 100 mm)
Minimal inside radius:
1.7 x belt width

TWENTEFLX™ TBU 40
Recommended drive sprockets:
12 teeth (PCD = 155.0 mm)
Minimal drive sprocket:
9 teeth (PCD = 117.3 mm)
Minimal idler diameter:
100 mm (Recommendation: 120 mm)
Minimal inside radius:
1.6 x belt width
TECHNICAL RECOMMENDATIONS

LOTENSION DRIVE
Lotension 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.).

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 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 centimeters.

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:

<table>
<thead>
<tr>
<th>BELT WIDTH (IN MM)</th>
<th>NUMBER OF SUPPORTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 600</td>
<td>2</td>
</tr>
<tr>
<td>610-1016</td>
<td>3</td>
</tr>
<tr>
<td>1017 ≥</td>
<td>4</td>
</tr>
</tbody>
</table>

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 approximately 120 mm. At temperatures below 60° Celsius the recommended material is PE-1000. For applications with temperatures over 60° Celsius 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 3% to 5% due to the increased friction coefficient. Keep in mind 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.
TECHNICAL RECOMMENDATIONS

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.

Below is a picture with two cage bar designs. The cage bar design on the top is recommended, while the design on the bottom is not preferred.

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 see ‘Splicing and shortening the belt’ for further reference
- 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.
TECHNICAL RECOMMENDATIONS

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
- Tighten the nut making sure belt still collapses properly
- 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 afar 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

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 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.

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 lotension drive and inside direct drive, a retrofit is quick and affordable. In addition to that, inside direct drive also results in more stable and predictable belt tensions.

Do you require more information on inside direct drive? Please contact us to discuss the possibilities.

- Direct drive with your existing drum
- Operational within several days
- All advantages of our Twenteflex belt
- Less product movement
- Longer production runs possible
OUTSIDE DIRECT DRIVE (TWENTESIDEFLEX™)

The TwenteSideFlex is designed to be used in spiral or oval systems without a center drum that drives the belt. It’s 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 it’s design, a system running the 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 than friction driven conveyor belts
- Allows for various system layouts
- Allows for the same belt running up and down in the same system (P-loop)
- No need for a big and expensive drum

Do you require more information on outside direct drive? Please contact us 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.

IMPRESSIONS OF OTHER PRODUCT GROUPS

Wire mesh belt  
Eyelink belt

Spiral woven belt  
Plate conveyor belt
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16 IMPRESSION OF PRODUCT GROUPS
In the course of many years, Twentebelt has developed a lot of experience in the field of eyelink belts and their range of application. This brochure will describe the technical features of our eyelink belts. This information is to support your specifications and the selection of eyelink belts. If you miss any information in this brochure, please do not hesitate to contact us, and we will take pleasure in helping you. Eyelink belts are produced of stainless steel or other alloys. They consist of a series of eyelinks or eyelink modules. Joined with cross rods they form a flat, simple surface, which is extremely stable and durable. The qualities of this versatile conveyor belt form a combination of advantages that make it particularly suitable for the most demanding applications in a.o. the food, chemical, pharmaceutical and packaging industries.

The advantages of Twentebelt eyelink belts contribute to more efficient and economic production processes. Its specific qualities distinguish this metal conveyor belt from the other alternatives on the market:

Flat and stable surface
Continuous product support results in a constant final product with a minimal product marking. The products are transported on a flat and stable surface for a consistent processing including packaging.

Single level surface
The single level surface excludes a possible ‘tunnel effect’, which means that products and/or parts will not get entrapped between several layers of the belt. The drainage for air and fluids is excellent, so that the processing circumstances of the different zones hardly influence each other.
Slimline belt surface
The limited height of the belt requires only little overall height.

Remarkably solid
A considerably longer life span, even under the heavy conditions of a 24/7 production line

Easy maintenance
Because of the belt’s open structure and the mainly round shapes of its various elements, eyelink belts are particularly easy to clean and hygienic in use. Because of their modular structure the belts can easily be repaired, if necessary.

Eyelink belts are extremely versatile and can be used in a wide range of applications.
The Twentebelt eyelink belt efficiently meets the requirements of the most various applications, such as:

- baking
- deep-frying
- pasteurisation
- blanching
- cooling
- drying
- cooking
- freezing
- washing
An eyelink belt is composed of calibrated eyelinks, plate links and cross rods. Eyelinks are wire elements produced with great precision, whose far ends are eye-shaped, which explains the name. By assembling the eyes on to cross rods a hinge construction is created. Plate links transfer the load to underlying support sections, and are installed in rows at a regular distance.

### Full eyelinks (DO)
The basic principle of all eyelink belt versions. On a full eyelink belt the eyelinks lie against each other, and the opening is equal to the wire diameter. This method can best be used for products likely to fall, or for applications that require small openings.

### Pressed eyelinks (DP)
Some applications require the smallest opening possible. By flattening the eyes of the eyelinks the opening between the links becomes smaller. This method is very appropriate for small and fine-structured products.

### MATERIALS
- Steel (bright)
- Stainless steel AISI 304
- Stainless steel AISI 316

Other materials are available on demand and/or on advice.
The eyelinks are welded on to an location wire, so that a module is created. Very narrow and very wide openings can be created, depending on the processing of the products concerned. The eyelinks can be set according European or American assembly, depending on the requirements of hygiene. The standard method is the use of one location wire. The use of more than one location wire will not make the belt more solid. Its only function is related to the dimensions of the product (the desired drain). Modular eyelink belts are stable, also in dimensional respect. The minimal opening is equal to the eyelink diameter + 0,05 mm.

**Pressed and welded eyelinks (DPL)**

Some applications require a stable belt in combination with a small opening/drain. The accuracy of our welding process allows us to produce modules with very small intervals between the eyelinks. The modular structure makes the assembly of very broad belts possible.

**Eyelinks with springs (DV)**

The placement of springs between the eyelinks ensures that they are positioned at regular intervals. The result is a relatively light belt with specific qualities, such as a good shock resistance and resistance to lateral forces. This is important in situations when the conveyor belt is loaded manually and/or laterally.

**Eyelinks with bushings or washers (DB)**

Bushings or washers are also meant to create an opening between the eyelinks. When bushings or washers are added the belts become heavier and more rigid.
SIDE FINISHING

- **Welded edge (LK)**
  At both sides the belt is fitted with plate links, and the far ends of the cross rods are fitted with washers and subsequently welded. This results in a thorough finishing of the belt in combination with the desired bearing surface.

- **Side chains (KH)**
  Eyelink belts are usually fitted with chains, if the belt is to perform a negative bend. For this purpose only hollow pin roller chains are used with pitch measurement equal to those of the belt. The selection of the chains depends on the operating conditions.

- **Guide plates (GP)**
  Guide plates serve as a protection for the welding heads. The plates actually function as a “buffer” between the welding heads and the guidance or other constructions the sides of the belt can get in touch with.

- **Plastic blocks**
  Plastic blocks are a patent item of Twentebelt. This product has several functions, which among other things improve the modular qualities of the eyelink belt (no welds), and generally also the hygiene.
  - A substitution for the plate links
  - No weld, a locking screw is placed into the block
  - Closed, smooth finish of the edges
  - The blocks are made of high-quality injected nylon and replace the plastic support strips; metal longitudinal strips will suffice
  - This saves materials with respect to construction
  - A variant (Ryton PPS) for a higher temperature range can be used up to a temperature of 180 °C
Options

Twentebelt eyeline belts can be provided with different options to meet the requirements of the various applications.

All Twentebelt eyeline belts can be provided with edge plates that make it possible to control the layer thickness of the product to be transported. The height and the shape of the edge plates can be adapted to the sort of product and to the process.

For ascending and/or descending belts flights can be fitted. The shape, measurements and structure (open/closed) of the flights will again be adapted to the sort of product and to the process.
## SPECIFICATIONS

### Explanation of Twentebelts specification method

For example: DL-LK 6-50-2,5-5  location wires 1

- DL-LK  =>  welded eyelink belt - welded edges
- 6  =>  cross pitch mm. (centre-to-centre distance of eyelinks)
- 50  =>  pitch mm. (centre-to-centre distance of cross bars)
- 2,5  =>  wire Ø mm
- 5  =>  cross bar Ø mm.
- location wires 0-8

- pitch: centre-to-centre distance of cross rods (15,9 to 76,2 mm)
- cross pitch: centre-to-centre distance of eyelinks (3 to 50mm)
- wire Ø (1,6 to 3,2 mm)
- number of location wires (0-8)

### DIMENSIONS

The table below presents the most common dimensions

<table>
<thead>
<tr>
<th>Pitch mm</th>
<th>Wire diameter</th>
<th>Cross rod diameter</th>
<th>Minimal centre - to - centre distance between 2 eyelinks</th>
<th>Minimal centre - to - centre distance between 2 eyelinks in welded version</th>
</tr>
</thead>
<tbody>
<tr>
<td>15,9</td>
<td>1,8</td>
<td>3,2</td>
<td>3,6</td>
<td>-</td>
</tr>
<tr>
<td>25,4</td>
<td>1,6</td>
<td>5</td>
<td>3,2</td>
<td>3,25 3*</td>
</tr>
<tr>
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<td>1,6</td>
<td>4</td>
<td>3,2</td>
<td>3,25 4,05</td>
</tr>
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<td>2</td>
<td>8</td>
<td>4</td>
<td>4,05 5,05 6,05</td>
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<tr>
<td>50</td>
<td>1,6</td>
<td>5</td>
<td>3,2</td>
<td>3,25 3* 5,05 6,45</td>
</tr>
<tr>
<td>50,8</td>
<td>2</td>
<td>5 - 8</td>
<td>4</td>
<td>3* 5,05 6,05</td>
</tr>
<tr>
<td>75</td>
<td>2,5</td>
<td>5 - 8</td>
<td>5</td>
<td>5,05 6,05</td>
</tr>
<tr>
<td>76,2</td>
<td>3</td>
<td>10 - 13</td>
<td>-</td>
<td>6,05</td>
</tr>
</tbody>
</table>

Of course, deviating specifications are possible. In collaboration with our customers we will always be able to offer an adequate solution.

*Pressed and welded, type DPL
**SUPPORT**

Generally two configurations are possible to provide eyelink belts with support: longitudinal support or herringbone support.

**Longitudinal support**

The longitudinal support consists of support sections fitted in the longitudinal direction of the installation. These sections are placed at both sides and depending on the width and the load, about every 300 mm right across the width of the belt (see drawing). At the height of those support sections, rows of plate links must be fixed, which will convey the load to the underlying support sections. Depending on the load these rows will consist of one or more plates.

**Herringbone support**

In a herringbone support structure the support sections (as the name suggests and the drawing illustrates) are positioned in the form of a fish bone. In this case it will be sufficient to place rows of plate links at the edges only. The bearing function will be taken over by the eyelinks. As all eyelinks hit the support strips some time or other, the wearing pattern will be equally spread across the full width of the belt. With this support the product will be equally processed across the full width of the belt. Possible shadow zones, as is the case in longitudinal support structures, will not occur here.

If hygiene is even a more important issue than usual, we advise you to provide the belt with plate links at the edges only. Because of their round shape eyelinks are easier to clean than plate links. In such a construction the frame will be constructed with a herringbone support, so that filth falling through the belt will immediately be pushed away from the support strips.

**Support return path**

The return path only carries the weight of the belt. This is why a lighter support structure is sufficient here. In the longitudinal construction one of two profiles can be left out. The herringbone support can be executed in a less compact form.
In the return path, the first 500 mm of the belt slacken. There is no support in order to make the formation of a sag possible. The formation of a sag will prevent the belt from climbing on to the drive. It is also necessary in order to prevent the belt from being pushed instead of pulled through the return path. At both ends the support sections should be slightly bent down, in order to establish a gradually guidance of the belt on to and off the profiles.

Rollers can also serve as a support to restrict the frictional coefficient. The rollers must be at right angles to the frame, parallel to each other and level. The distance between the rollers is irregular, in order to prevent an irregular run.

**Frictional coefficient**

Below you find an indication of the frictional coefficient for the different alternatives:

- value of 0,20 - 0,25 with plastic strips, if high-quality
- value of 0,70 with metal strips, the hardness of the strips should be higher than that of the plate links. In this case we advise the use of spring steel material.
- value of 0,10 in case of rollers supported on bearings, only in the return path and for belts provided with plates with the wearing course on top.

### SIDE GUIDANCE

Side guidance is achieved by vertical profiles at both sides of the installation. These profiles should not get in contact with the belt. They are meant to guide the belt in case it deviates from the carrying path. A clearance of 5 to 10 mm between the profiles and the belt is basically sufficient. The geometry of the frame and the load of the belt are points of attention in the design and the adjustment of the installation, because these factors can influence the run of the belt.

The minimal facility at the input side consists of profiles both on top and on the underside, at the discharge side, however, only on top. The maximal facility consists of profiles over the full length of the carrying path and the return path with the exception of the sagging part. The compromise is the placement of profiles of 300 to 500 mm length every 2000 mm.

The appropriate configuration is also determined by the speed, the length, the width and the load of the belt. In case of doubt, please contact us. We will be pleased to think along with you.
**DRIVE**

**Sprockets**

Generally, eyelink belts are driven directly on the eyelinks by means of specially developed drive sprockets. In case of belts with a large cross pitch (centre-to-centre distance of eyelinks) one could consider to place sprockets that are directly driven on the cross rod instead of on the eyelinks. Generally the sprockets are placed at both sides and under each row of plate links. The width, the number of teeth and the material of the sprockets are determined on the basis of the conditions of use.

When a construction of drive sprockets is applied in a freezer, sprockets with special toothing are used. In order to prevent the accumulation of ice, the so-called “ice-crusher” sprockets are used. The special toothing limits the accumulation of ice to the minimum. Sprockets are available in steel, AISI 304, AISI 316, PA6G and POM, or in other materials on request.

**Cage rollers**

Broad and heavily loaded belts are preferably driven by rollers right across the width of the belt, cage rollers in most of the cases. The straps of the roller regularly drive all the eyelinks of the pitch, which is conducive to a longer life span of the belt and also leads to a regular wear pattern.

**Disc rollers**

If there is a risk of accumulation of filth or ice, disc rollers should preferably be used. On a multiple of the cross pitch these rollers are provided with discs. These discs can be produced in different ways, so that different properties can be created:

- drive on the cross rod
- drive on the cross rod with a “lifting function”, where the teeth protrude through the belt and lift the product for discharge.
Tube rollers
The strongest drive drum is the tube drum, a thick-walled carbon steel or stainless steel tube with milled teeth and welded in shaft ends. The biggest advantage of the tube construction is that it limits deflexion which is especially important with long, wide and heavily loaded belts. When drive shaft ends are fitted on both sides of the tube, the drum can be flipped when the teeth are worn out on one side.

Chain sprockets
Eyelink belts can also be produced with chains, whereby the chain fulfils a driving function. Especially when the belt has to perform a negative bend, as is the case with many applications for freezing or blanching, and for ascending belts. In those applications the side - sprockets are replaced by chain sprockets belonging to the chain applied.

In this case, too, the rule applies that for bigger constructions chain sprockets will be placed in combination with a roller.

In all applications with chains a negative bend of the belt can easily be achieved by means of chain sprockets or wear strips of the hollow pin roller chain. Twentebelt prefers the use of sprockets with at least 12 teeth. This is based on the fact that with this number of teeth the so-called polygon effect will exert hardly any influence on the belt run. If the length and the load of the belt are moderate drive sprockets with a minimum of 8 teeth might be used. The ultimate determination of the necessary number of teeth depends on factors like width, length, load and running speed of the belt.

The pitch diameter of sprockets and rollers can be determined by multiplying the number in column n, which is related to the desired number of teeth (column Z), by the pitch of the belt (T).

<table>
<thead>
<tr>
<th>Z - n</th>
<th>Z - n</th>
<th>Z - n</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 - 2,6131</td>
<td>16 - 5,1258</td>
<td>24 - 7,6613</td>
</tr>
<tr>
<td>9 - 2,9238</td>
<td>17 - 5,4422</td>
<td>25 - 7,9787</td>
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<td>10 - 3,2361</td>
<td>18 - 5,7588</td>
<td>26 - 8,2962</td>
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<td>11 - 3,5495</td>
<td>19 - 6,0755</td>
<td>27 - 8,6138</td>
</tr>
<tr>
<td>12 - 3,8637</td>
<td>20 - 6,3925</td>
<td>28 - 8,9314</td>
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<tr>
<td>13 - 4,1786</td>
<td>21 - 6,7095</td>
<td>29 - 9,2491</td>
</tr>
<tr>
<td>14 - 4,494</td>
<td>22 - 7,0267</td>
<td>30 - 9,5668</td>
</tr>
<tr>
<td>15 - 4,8097</td>
<td>23 - 7,3439</td>
<td>31 - 9,8845</td>
</tr>
</tbody>
</table>

Pitch circle diameter value for n (dst = n x T)
As for the return shaft there is a choice between toothed or smooth wheels or rollers. In principle, toothing only has a function in case of accumulation of ice or filth. Tooothing on the return shaft consequently has no drive function. Generally, in small installations one prefers to provide the return shaft with toothed wheels. When, however, a cage roller was chosen to drive the belt, a smooth roller will be chosen for the return shaft. An exception to this is a drive with cage rollers and chain wheels, whereby the same construction is used as a return roller.

If provided with one tooth per pitch the rollers are one-directional and thus only to be used for drive or for return. Rollers with double strips can be used for both drive and return, if the installation is designed for this purpose.

Eyelink belts should run under light tension. However, no exact value can be given for the tensioning of the belt. One should be able to lift the belt with one finger. In operating condition, the formation of a small sag under the drive end is allowed. Of course, this depends on the length and the load.

In general, the return shaft is the one for tensioning and adjustment. In case of short belts and insufficient geometry of the frame this can lead to a bad drive (see drawing).

In most cases a screw tensioning device will suffice. In the case of a continuous tensioning device, hydraulic, pneumatic or with springs, there is always the risk of a certain amount of uncontrolled stretching that tends to elongate the belt.

The table to the left provides the tensioning length per pitch. It has to be taken into account when the shaft has to be adjusted.

The tensioning force \(= (\text{the weight of the belt in the return part} \times \text{the friction coefficient}) \times 9.8\).
OPERATING CONDITIONS

Temperature  Eyelink belts can be used within a relatively broad temperature range. See table.

Speed  The maximum constant speed is 25 m/min. Brief peaks in speed up to 60 m/min. are possible with reservation. Eyelink belts provided with chains limit the maximum speed to 25 m/min.

Load  Because of the many variable factors the permitted load will be determined for you on request.

Negative bend  In case of negative bends of DL belts a point concentrated load can occur in the zone of the location wire. As a result of repeated minimal bends the eyelinks can break. The use of special guidance strips with a wide radius offers a solution.

Cleaning  The materials we use for the production of our belts are suitable for contact with food.

- Twentebelt eyelink belts in principle are delivered without any previous treatment or cleaning. During the production process of both the wire and the belt itself only vegetable oils are used. Afterwards the welding heads are brushed. If you wish so, your Twentebelt eyelink belt can be cleaned before delivery. High pressure steaming or pickling and passivating are appropriate methods.

- PLEASE NOTE: drive and return wheels are often produced in plastic versions. In that case they are not resistant to certain cleansers. You are kindly requested to keep to the valid cleansing procedures during the installation of your machine, and, if necessary, to adjust the choice of your materials to them.

- Caustic soda and citric acid for stainless steel materials or any other suitable cleanser, ask your supplier.

- Combinations of SS belt + C steel side chains should be cleaned with steam or hot water only and appropriate cleansers. Ask your supplier of cleansers. Citric acid corrodes C-steel.

- C-steel belts should be cleaned with steam or hot water and suitable cleansers. Ask your supplier.

Assembly / installation

For this specific information we kindly refer you to our installation manual, which is available on request.
REQUEST FOR QUOTATION SHEET

› CONTACT

Company
Address
Postal code
City
Country
Date
Contact person
Telephone
Fax
Email

› BELT SPECIFICATION

Type:
- Full (DO)
- With welded location wire (DL)
- With springs (DV)
- With bushings (DB)
- Pressed (DP)
- Pressed & welded (DPL)

Length
Width
Material
Number of plate links per row
Number of rows of plate links

- Pitch (centre-to-centre distance cross bars)
- Cross pitch (centre-to-centre distance eyelinks)
- Wire diameter
- Number of location wires

› FINISH OF EDGES

- Welded edge (LK)
- Guide plates (GP)
- Plastic blocks (KB)
- Chain (KH):
  - Type
  - Material
  - Pitch

› OPTIONS

- Edge plates
  - Height
  - Material
- Flights
  - Height
  - Material
  - Number

› AREA OF APPLICATION

- Product
- Min. Temperature
- Other circumstances
- Process
- Max. Temperature

› REMARKS

If possible, please add drawing/sketch
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.

IMPRESSIONS OF PRODUCT GROUPS

Eyelink belts
1) Full eyelink belt
2) Eyelink belt with welded location wire

Wire mesh belts
3) Wire mesh belt with S-side
4) Wire mesh belt with double Z-side

Spiral woven belts
5) One-sided woven spiral belt
6) Corrugated wirelink belt
7) Straight wirelink belt
8) Rod reinforced
9) Compound belt

Special belts
10) Combinox
11) Perforated plate belt
12) Filter belt
13) Twenteflex

Do you require a different or special conveyor belt that is not listed above? Please contact us to discuss the possibilities.
WESTERN CANADA Sales Office

Calgary  Tel: 780-242-0864

CENTRAL CANADA Sales Office

Winnipeg  Tel: 431-334-8334

EASTERN CANADA Sales Office

Montreal  Tel: 514-886-5270
Toronto  Tel: 416-526-0352