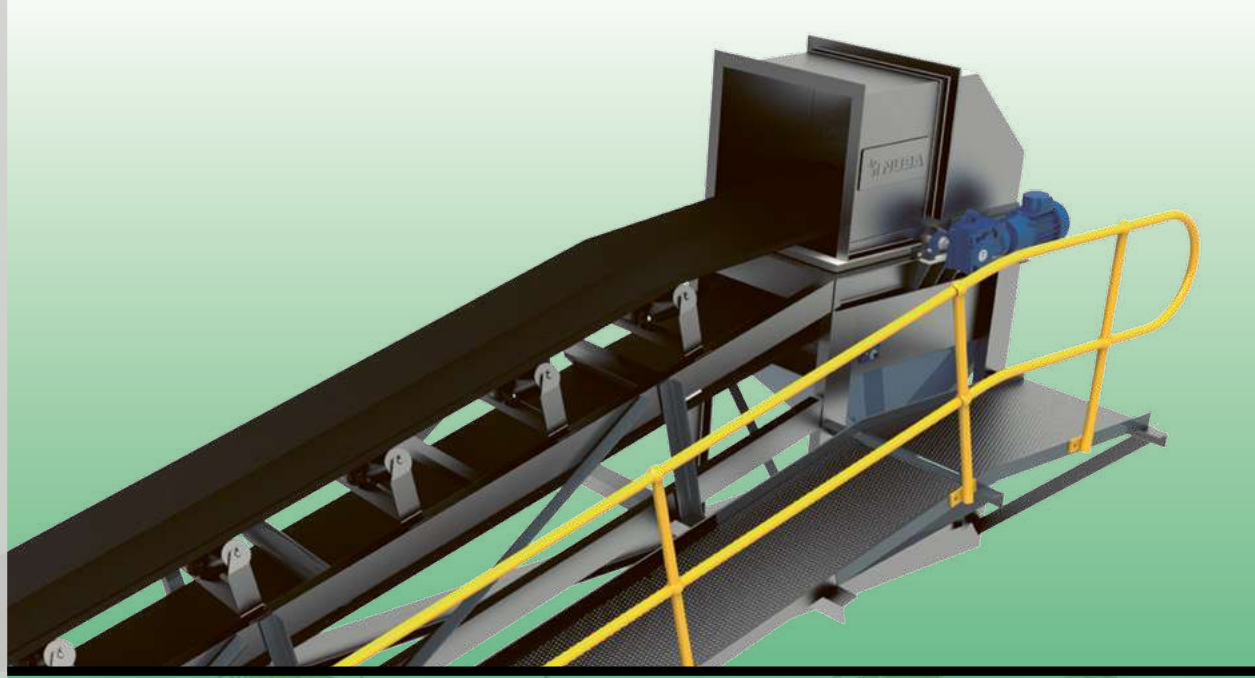
Conveyor Belts



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Conveyor Belts

When material needs to be moved from one point to another, conveyor belts are used. Acting as a unifying element between different processes within the installation, until the final stockpiling of the material.

In principle, when there is not enough information about the conveyor belt that we need, certain basic data should be given, such as:

- The material to be transported.
- Granulometry.
- Flow (T/h).
- Bandwidth and length.
- Inclination.

Technical characteristics

Composition of the conveyor belts:

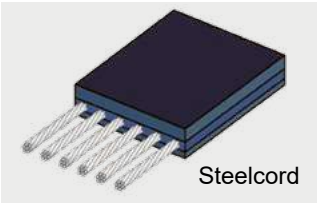
Conveyor belts are made up of a central core: Carcass, and a protective coating: Cover

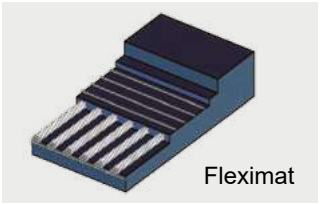
Carcass:

When the belt is manufactured, the carcass is the essential part, as it provides the breaking strength of the conveyor belt. This Carcass can be manufactured from Fabrics (Textile) or metal cords (Metallic).

- **Textile:** It is made up of Synthetic Fabrics (EP) Polyester longitudinally, warp, and nylon transversally, weft. This type of fabric is suitable for high stress absorption and breaking strength, high impact and moisture resistance, and is manufactured in different qualities depending on the application.

- **Metallic:**
  Steel Cord: Its carcass is made up of steel cords, and it is designated with the letters ST. These belts are highly resistant to tension and impacts, have low elongation values and are therefore used in very long belts or for heavy duty work, strong impacts, etc. They are used in mining, quarries, etc.
  Fleximat: Like the ST belts, its carcass is made up of metal cords with transversal steel cords which multiply their properties in the toughest working conditions.


Steelcord


Fleximat

Cover:

Covers are the rubber coatings that protect the belt's carcass from damage due to impacts, from chemicals, temperature and others. They are manufactured with different rubber composition qualities, and should have a suitable thickness for covering the needs of the materials to be conveyed. They may be manufactured with different profiles on the top surface.

- **Rubber properties:** Covers are made with rubbers adapted to the materials to be conveyed and according to international standards. The properties of the rubber are determined according to the resistance to the materials to be conveyed, such as: Grease and mineral, animal and vegetable fat resistant, temperature resistant, abrasion resistant, flame resistant and others manufactured to meet the client's needs.


Flat Conveyor Belt

According to these properties, there are different technical names detailed in the following table:

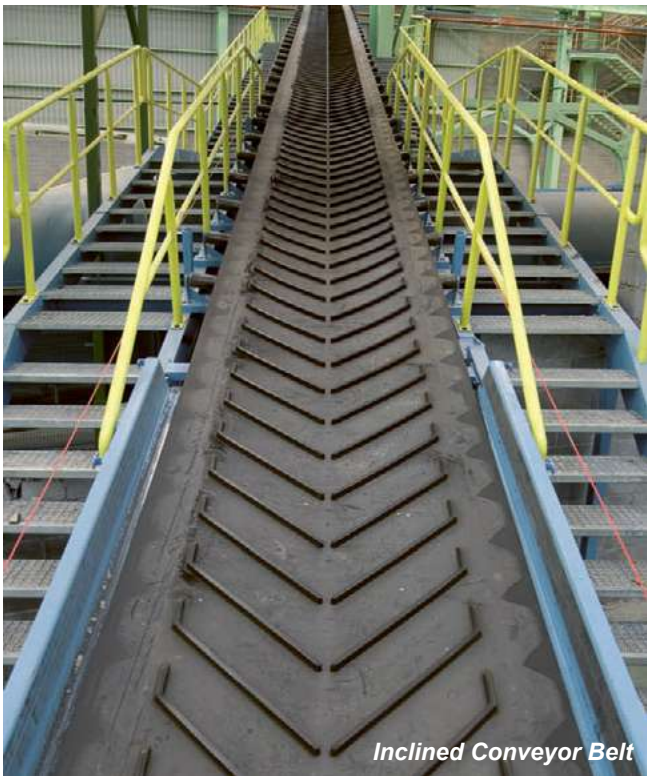
Quality	Type	Description
ABRASION	Y	For material conveying in normal conditions
	X	For conveying heavy materials with knocking and sharp edges
	W	For conveying highly abrasive materials
	RI	Anti-impact for heavy and bulky materials
HEAT RESISTANT	RC130	Resistant to materials with medium temperatures, up to 130ºC
	RC150	Resistant to materials with high temperatures, up to 150ºC
	RC200	Resistant to materials with very high temperatures, up to 200ºC
OIL AND GREASE RESISTANT	BG	For materials with mineral oils
	BGM	For materials with animal and mineral oils
	BGF	For materials that give off oil and C re protection
FLAME RESISTANT	K	For conveying materials with C re and explosion hazard
	S	For materials with explosion hazard and inside mines
ACID RESISTANT	C	Resistant to materials with acid content
FOOD	FOOD	With white rubber covers and for conveying food materials
	BLUE	With blue rubber covers, for foods and oil resistant
WHITE NON-FOOD	WHITE	Belt with white covers for materials that cannot be contaminated by colour and that are not for food

- **According to the cover construction:** Covers may be produced without profiles, smooth, and with profiles. These may be ribbed with different shaped and sized profiles, Grip Top with rough profiles, Special with profiles made to order, and according to the materials to be conveyed and the work inclination.

- **Regarding the inclination:** There are different types depending on the inclination of the band (smooth, ribbed and Grip Top).

1. **Flat:** degree inclination and with smooth covers.
2. **Inclined:** 10-35 degree inclination.
   a. Ribbed with different thicknesses:
      - 15 mm
      - 25 mm
      - 32 mm
      - 50 mm

   b. Ribbed or Grip Top that prevents the material from sliding down the belt
3. **Vertical:** > 35 degrees inclination.



Inclined Conveyor Belt

Knowing all the previous technical data, the type of conveyor belt required is precisely identified, it's denomination is as follows:

Denomination belt: E.g. 800 EP500/4 4+2 Y	
800	Belt width in mm
EP500/4	Type of carcass
EP	Synthetic fabrics called EP (polyester for the tensioning warp and nylon for the weft)
500	Carcass breaking strength expressed in Newtons/mm
/4	Carcass manufactured with 4 fabrics EP
4	Working face coat in mm
2	Conveying surface coat in mm
Y	Rubber type and quality

Belt identification is perfectly described in its denomination, where all its characteristics are defined.

Vertical Conveyor Belt

Accessories

In addition to the tapes we have other complementary accessories such as:

- Chains
- Bearings
- Straps
- Lubricating elements
- Bonding rubber
- Cover rubber
- Solutions
- Glue

Magnets

There are different equipments for the separation, elimination and / or classification of metals, required for the protection of crushers and / or improvement of the quality of the final product.

According to its purpose we find:

- **Metal detectors**. Applicable to the aggregate, cement and mining industry.

  - With **one detector coil**: For granulometry between 150 and 200mm.
  - With **two detector coils**, a transmitter and a signal receiver. It is installed on the conveyor belt.
  - With **one high sensitivity detector coil**: For granulometry <200mm.
  - With **two high sensitivity detector coils**. It disassembles in order to not have to cut the conveyor belt.

Metal detector with two coils

- **Magnetic separators**. For standard and special applications, facilitating the continuous process.

  - **Permanent magnet**: they house fixed magnets, require little maintenance and are installed suspended above the conveyor belt.
  - **Electromagnet**: coil made of aluminium plate fed with electrical panel. Once the electrical current is cut it stops magnetizing.
  - ***Overband* with permanent magnet**: magnet attached to a conveyor belt structure, making the magnet self-cleaning.
  - ***Overband* with electromagnet**: electromagnet coupled to a conveyor belt structure, making the magnet self-cleaning.

Fixed separator with a coil

- **Magnetic drums**. It is made up of a magnetic section and a non-magnetic section, in such a way that it allows the material that circulates above the magnetic sector to be discharged.

- **Magnetic pulleys**. they replace the drive drum at the end of the belt.

- **Magnetic bars**. for iron removal or for highly viscous product applications. Very common in the plastic and food industry.

Conveyor Belt Rollers

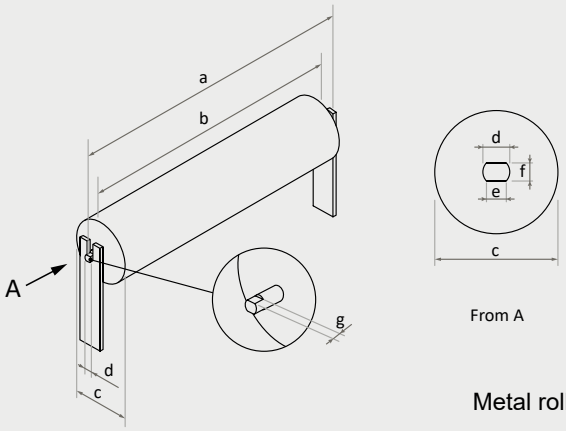
Technical characteristics

According to the type of belt we select, we can distinguish three types of rollers: **metallic**, **coated** (polyurethane and rubber) and **special** (shock absorbers, and centering).

Metallic:

To correctly identify a roller, it is necessary to provide the following data:

- Length of the roller and shaft (a, b).
- Ø of the roller (c).
- Ø of the shaft (d).
- Dimension of the pocket (e, f, g).



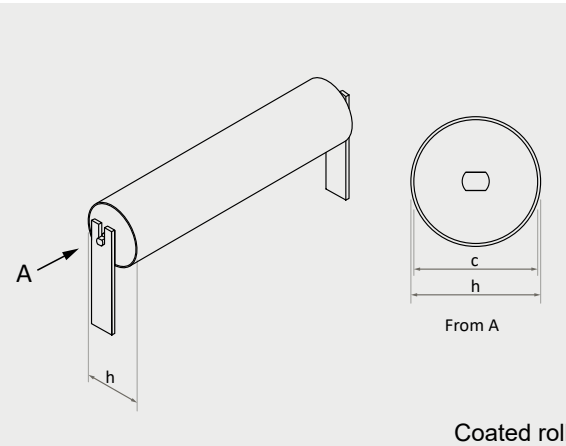
Metal roller

Coated:

Metallic rollers coated with polyurethane or rubber for greater resistance to wear.

In addition to the above data, it is necessary to determine:

- Final coating Ø (h).



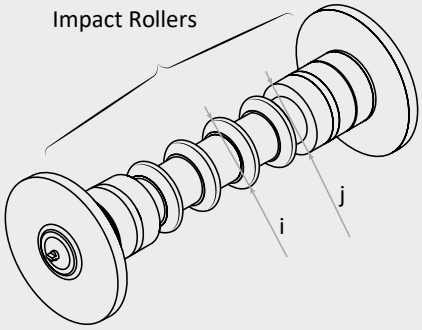
Coated roller

Specials:

Shock absorbers: metal rollers coated with polyurethane or rubber for better impact resistance and transport of abrasive materials.

Data required:

- Ø of the flat ring (j).
- Ø del anillo ovalado (i).
- Thickness of the flat ring (j).
- Thickness of the oval ring (i).

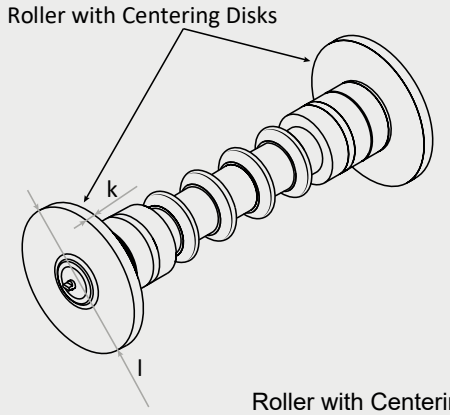


Impact Rollers

Centering disks: Centering disks prevent off-track running of the conveyor belts.

Data required:

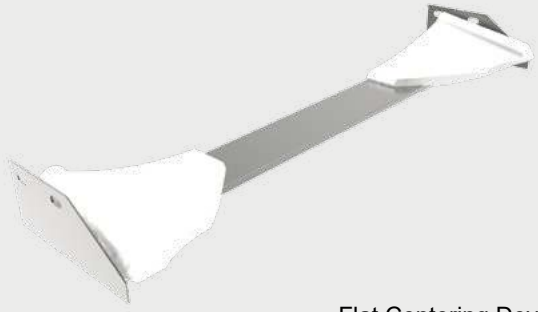
- Ø of the centering discs (k).
- Thickness of the centering discs (l).



Roller with Centering Disks

In addition to this type of centering device, there are Flat Centering Devices.

The Flat Centering Device is another solution that allows the use of standard rollers for transport while keeping the conveyor belt on-track.



Flat Centering Device

Support for roller replacement

Technical characteristics

Inflatable element to replace rollers.

To facilitate the task, we have an innovative, lightweight, easy and transportable device that lifts the belt of the tracks for the replacement of a roller, providing greater safety and significantly shortening the installation time.

Available for belts between 500 and 2000 mm wide.

More information on request.

Drive roller or drum

Technical characteristics

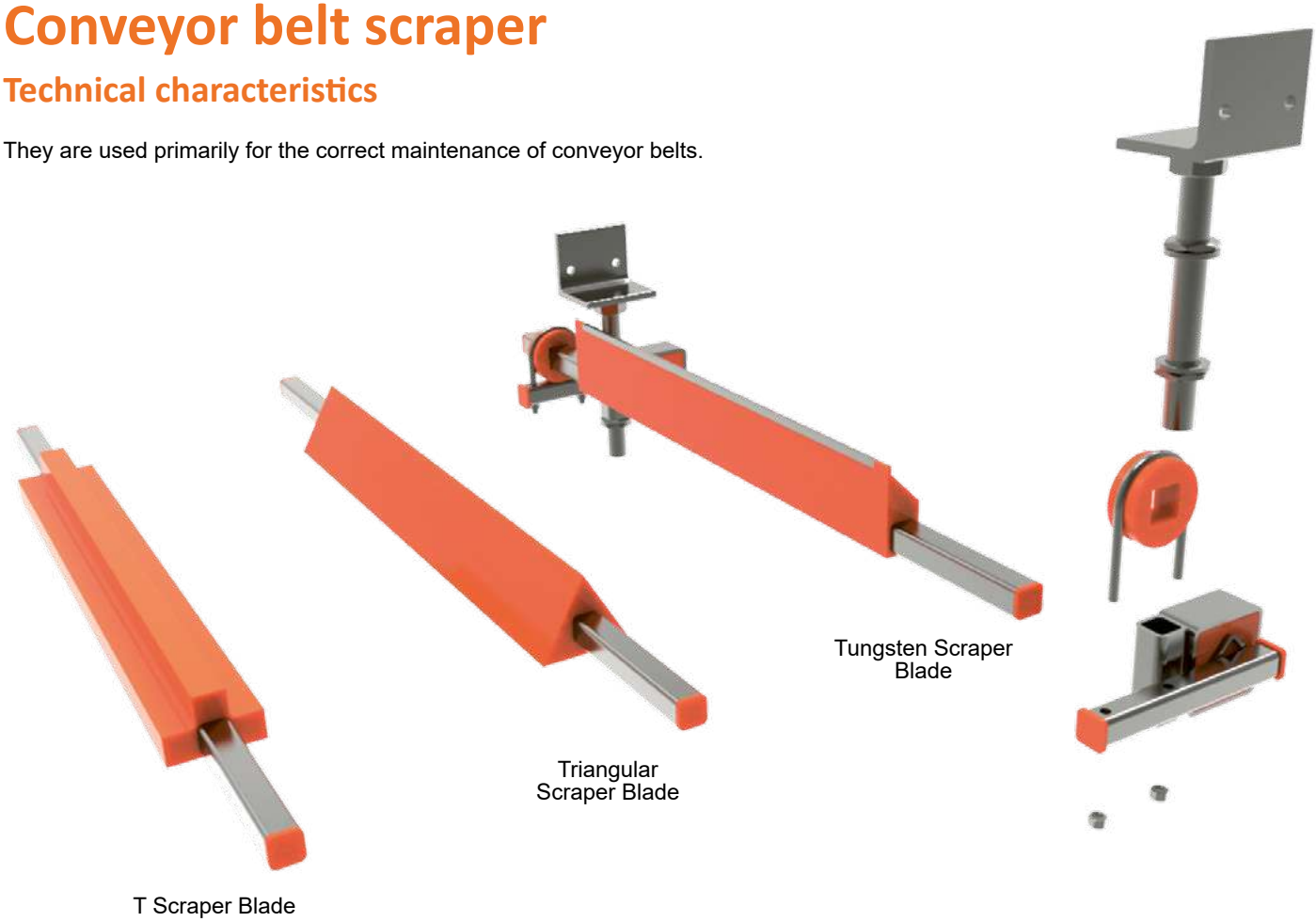
This element normally located at the end of the circuit, attached to the motor, is characterized by the fingerprints of the knurling and its rubberized material to be able to give it a grip with the tape and prevent slipping.

Drive roller

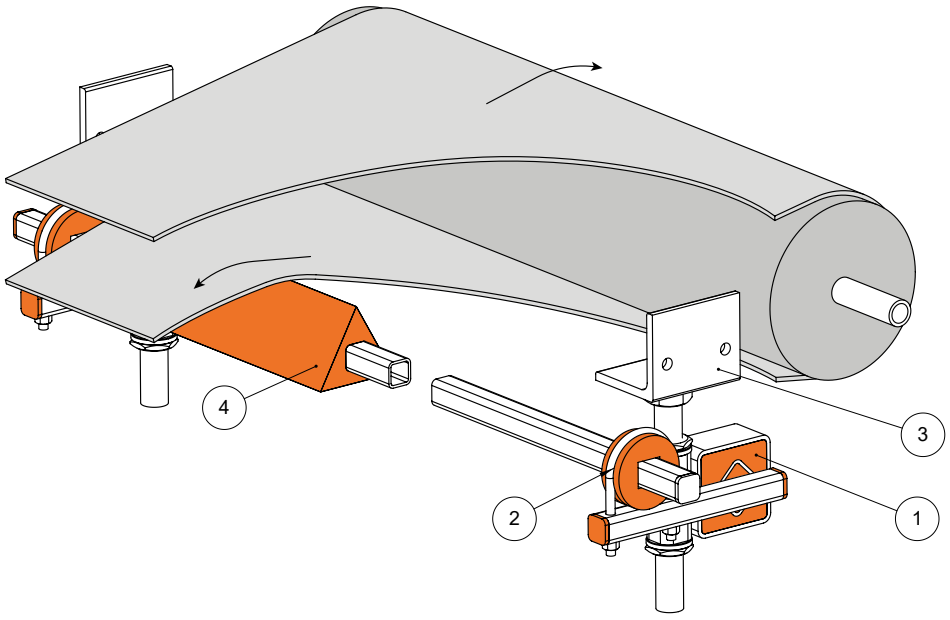
Conveyor belt scraper

Technical characteristics

They are used primarily for the correct maintenance of conveyor belts.



Scraper parts

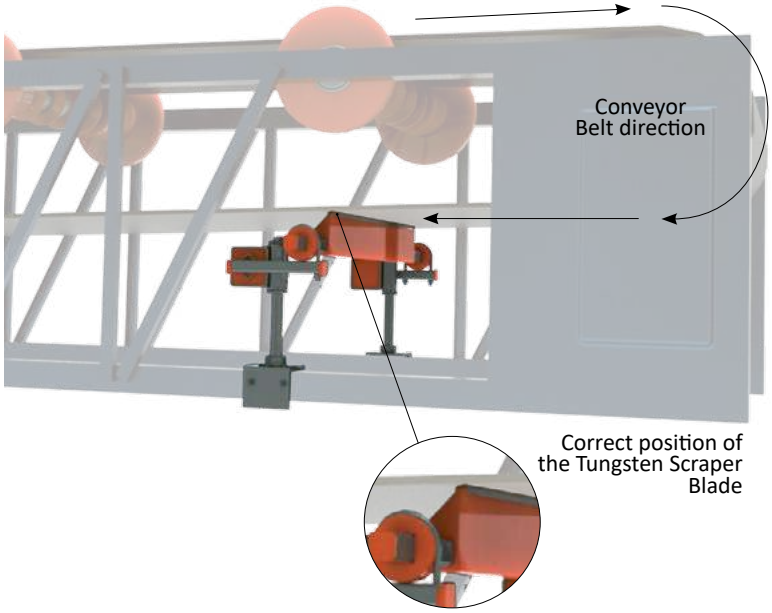


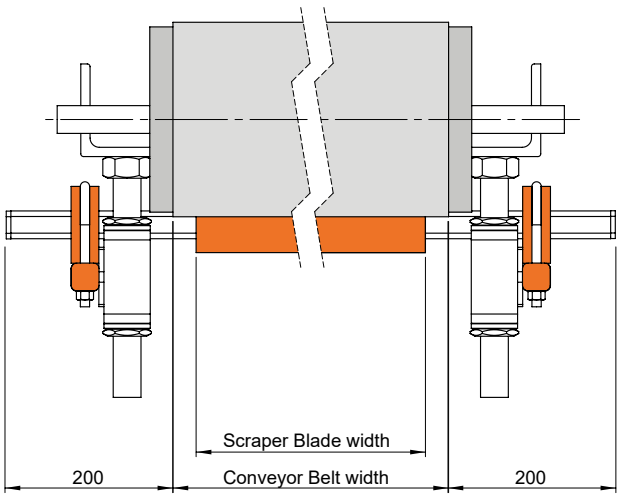
1 Silentblock 2 U-Bolt 3 Support 4 Scraper Blade

Correct Installation

T Scraper Blades and Triangular Scraper Blades can be installed in either direction with respect to the direction of the conveyor belt.

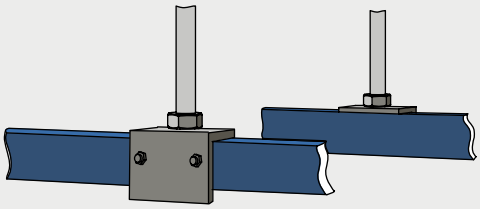
Tungsten Scraper Blades need to be installed with the Tungsten inserts facing the direction of the conveyor belt as seen on the image.



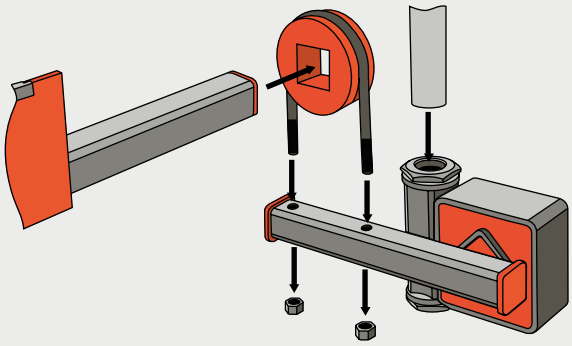


Steps for installation

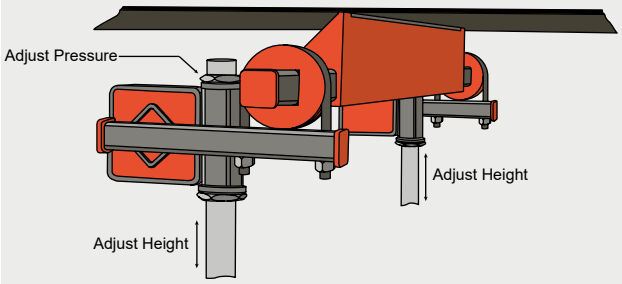
1. Screw or weld the angle brackets to the machines' structure.



2. Assemble all the components of the Scrapers Support with the Scraper Blade.



3. Insert the complete assembly into the angle brackets, adjusting with enough pressure.



Dimensions

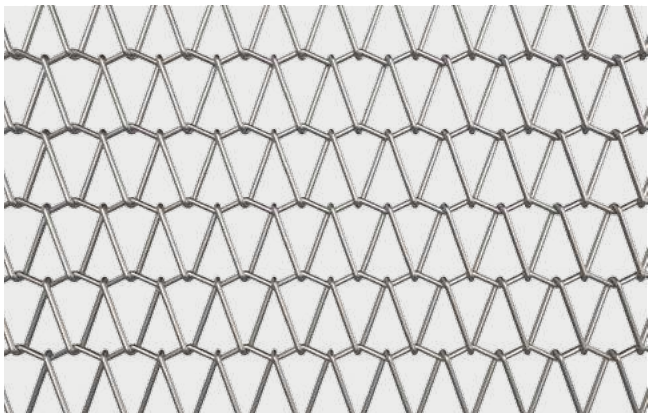
Conveyor Belt Width A	Scraper Blade Width B
500	500
650	625
800	750
1000	950

Conveyor Belt Width A	Scraper Blade Width B
1200	1150
1400	1300
1600*	1500*

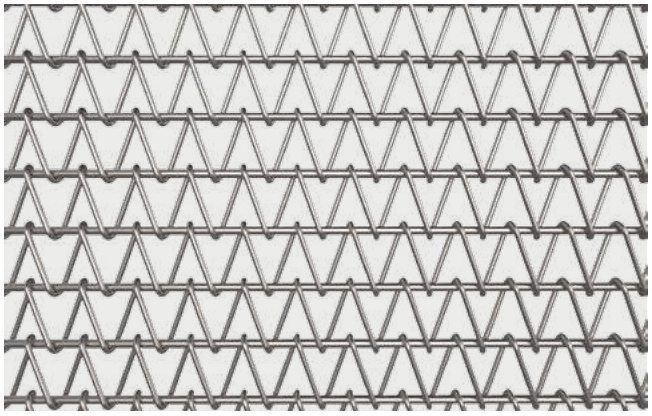
* Not available for T Scraper Blades

Metallic Conveyor belts

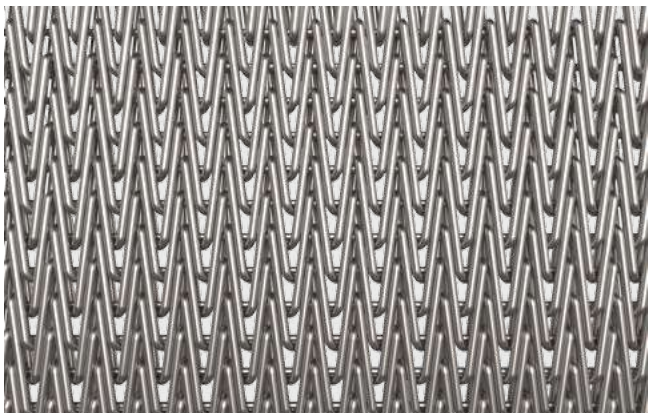
They have a wide range of uses in industries as varied as food, agricultural industry, canning, metallurgy, fishing, wood mills, etc., providing a solution to the continuous transport requirements in its production procedures.



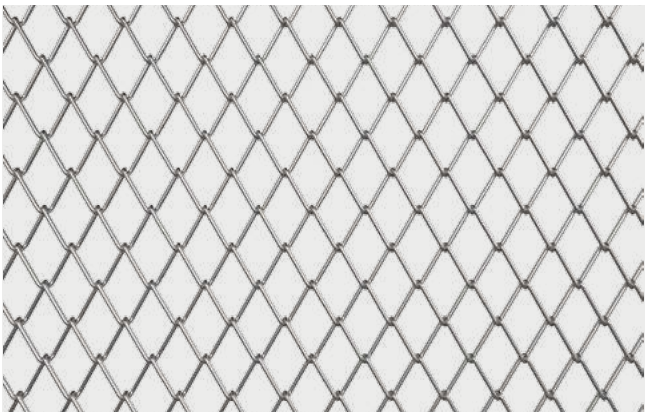
Type TN-DI



Type TN-DD



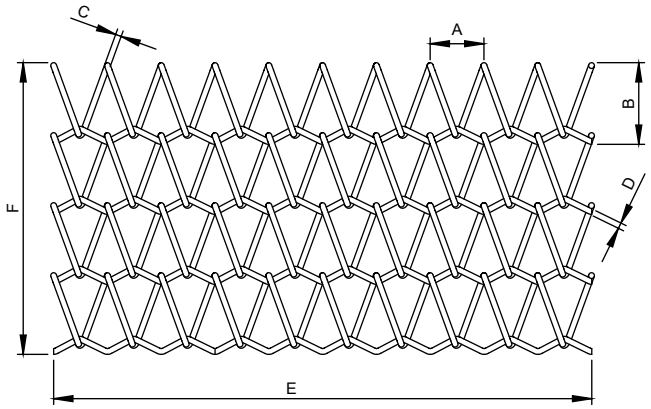
Type TN-MU



Type TN-BI

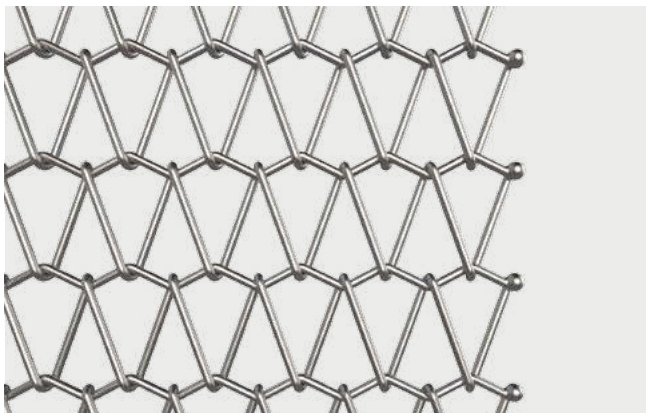
Aspects to consider for a conveyor belt

1. Determine basic measurements.

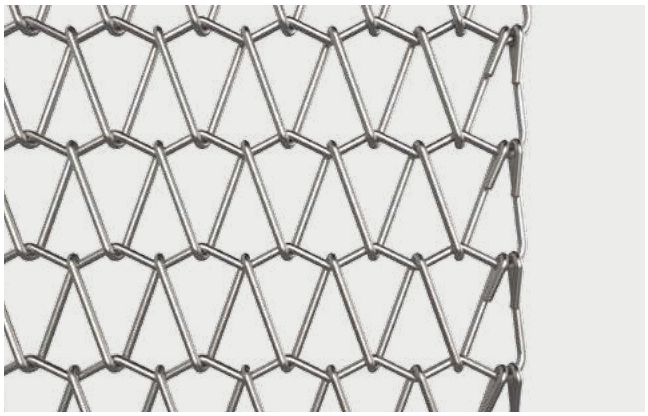


A: Spiral pitch
B: Distance between pins
C: Spiral diameter (Wire)
D: Pin diameter (Wire)
E: Width in meters
F: Length in meters

2. Conveyor Belt Termination.



Welded tips



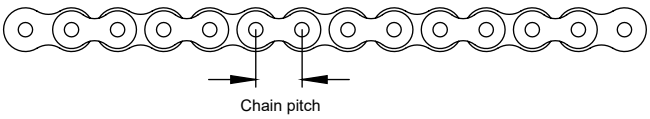
Bent tips

3. Drive chains and accessories.

We have developed different types of accessories to suit your conveyor belts in order to improve their durability and functionality. The use of a drive chain is intended to move the traction effort from the conveyor belt to the chain, improving the conveyors durability and operability.

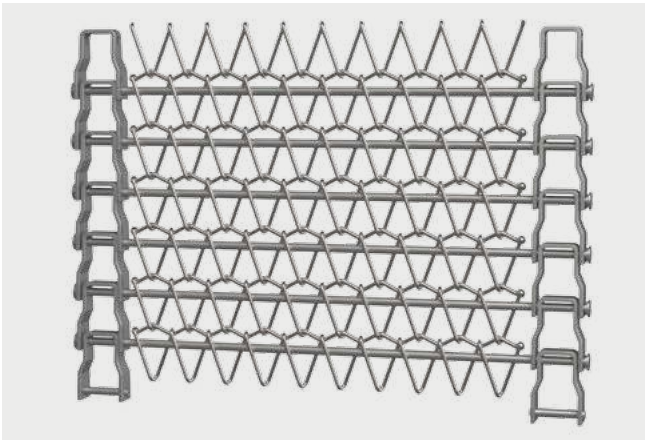
The use of drive chains and other types of accessories usually require minor modifications to existing equipment, but generate significant improvement on operation and durability.

We have experience in creating solutions for extreme work environments such as drying, tempering and freezer tunnels.

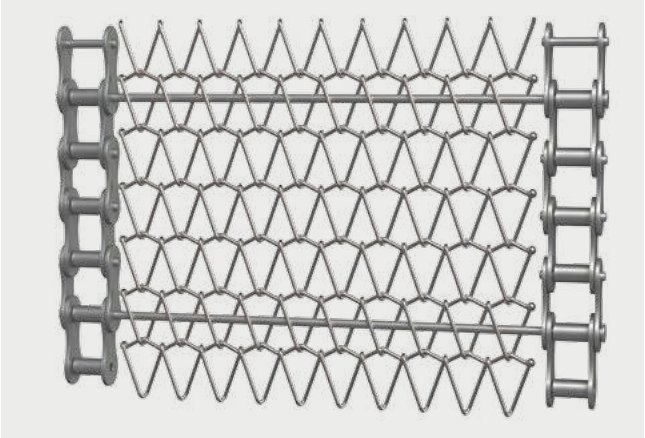


3.1 Arrangement of drive pins.

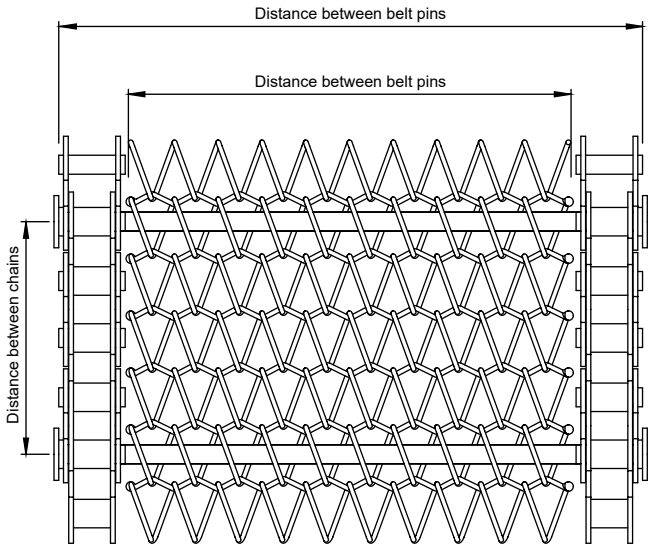
a) All the belt pins are inserted into every drive chain pitch.

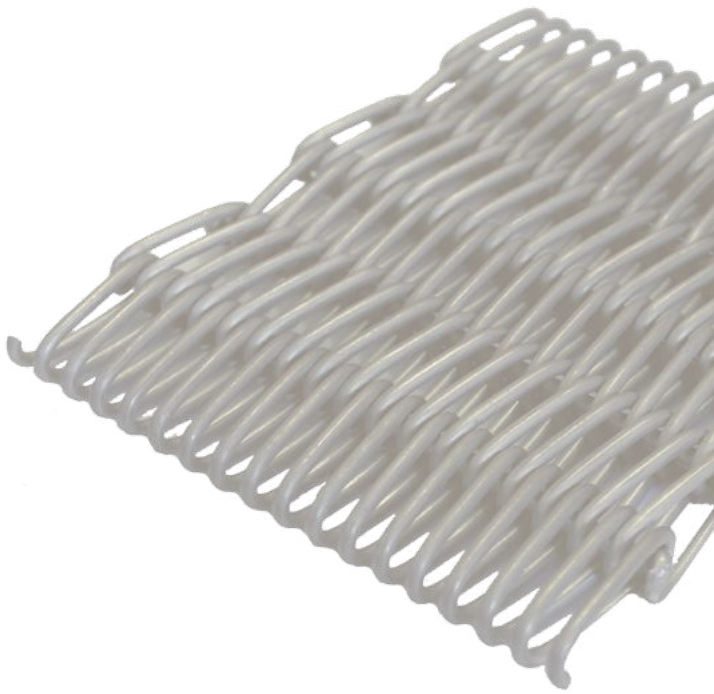


b) Belt Pins are inserted every certain number of chain pitches.



3.2. How to specify a drive chain?





How to use a Conveyor Belt?

1. Process description.
a. Product to be transported.
b. Short description of the process.
c. Maximum load in kg/m².
d. Measurements of the product to be transported.

2. Technical characteristics.
Look for the information from certain basic measurements.

3. Belt measurement.
a. Length/width in meters.

4. Material and wire type.
a. Single galvanised wire.
b. Triple galvanised wire.
c. Stainless steel AISI 304L.
d. Stainless steel AISI 310.
c. Stainless steel AISI 306L.

5. Belt termination.
a. Bent tip.
b. Welded tip.

6. Chain.
a. No chain.
b. All the pins inserted in the chain.
c. Every certain number of pitches.

7. If working with temperature specify:

Load area Load area: ..... mm Temperature: C	**Preheating area** Length: ..... mm Temperature: C
Working atmosphere Stated in m/sec.	**Heating area** Length: ..... mm Temperature: C
Cooling area Length: ..... mm Temperature: C	**Speed** Humidity, Salinity, Acidity etc .....

Maintenance guidelines

Although it is hard to determine how long a belt will last, the causes of its premature breaks are very well known.
We would recommend compliance with certain minimum maintenance actions to increase its working life.

- Inspect the belt periodically, particularly its edges.
- Avoid lateral deviation as otherwise the edges will be damaged, reducing the working life of the belt.
- Keep the belt clean of foreign bodies.
- Pulleys and cylinders must be kept clean and in their original forms and measurements.
- Rapidly repair the damaged sectors of your belt with spirals and pins.
- By following these simple instructions and recommendations, the installation of your belt will be easier and it will work appropriately.

Installation guide

Before installation.

- Check the equipment, making sure that it is disconnected from the power.
- Check that the pulleys, cylinders and affixation supports are parallel and in good operating conditions in both directions.
- Check that the equipment is levelled and aligned.
- Release the tensioning system.

During installation.

- Carry out the installation at room temperature
- It is vital to develop the belt by keeping it slightly tensioned to prevent the windings from moving.

Before starting their operation.

- Check the guide mechanisms and the space between the edges of the belt and the guide bar.

Start-up.

- Recheck the alignment of the edges and laterally adjust where necessary.
- Set the belt in operation at a low speed and without any load for a few minutes.
- Once the belt has settled, start operating at working speed.
- Finally, if working at temperature, increase it gradually until attaining the work temperature. As a consequence of the temperature, there may be elongation of the material and so a final adjustment may prove necessary.

How to identify early breakage factors

- Owing to their design, conveyor belts are required to have a certain working life. Although it is hard to determine how long a belt will last, the causes of its premature breaks are very well known
- By knowing the three main fault factors, you will be in a position to identify the problems that reduce the working life of your conveyor belt. These factors are: **stretching, wear and tear and fatigue.**
  - Many belts fail owing to stretching which occurs when the belt is permanently working in deformed fashion (curved, freighted, misaligned). These faults usually occur owing to accidents or misuse.
  - Wear and tear occurs as a natural consequence of being an articulated mechanism or when the belt rubs against other equipment components. This results in a minor, but constant, loss in material and weakening of the area concerned.
  - Fatigue is the consequence of the development of micro cracks in the material caused by repeated loading and unloading.
- To maximise the working life of its conveyor belt, we recommend you to follow the tips during the various stages of its installation and carry out certain minimum maintenance actions.

Notes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