Platforms

Interroll Conveyor Roller Series are arranged into five so-called platforms. Each platform is characterized by a certain type of bearing and certain materials – the two key factors for the operation and application possibilities of the products.

The following applies within a platform:
- The bearings and materials for the bearing housing and seal are identical.
- The size of the bearings may differ.
- The versions are produced by the combination of shaft/tube dimensions and drive heads as well as the materials.

Platform 1100

For information about properties and application areas of the polymers used, please refer to the chapter Material Specification page 291.

Bearings and materials

The bearing is made of polymer with balls made of uncoated steel or stainless steel. The outer ring and inner cone of the bearing are made of polyoxymethylene. The bearings are lubricated with a food-safe grease.

Platform 1200

Application
- For gravity applications
- Particularly suitable for gravity applications under normal temperatures.
- Suitable for extreme temperatures with steel bearing housings.
- Particularly smooth operation of conveyor rollers.
- For lightweight and medium-heavy materials to be conveyed.
- Stainless steel version suitable for moist areas.
- For driven and non-driven conveyors.

Properties

Platform 1200 is specifically designed for use in extreme ambient temperatures. All versions are antistatic.

Bearings and materials

The pressed steel bearing seats and internal rings of the ball bearing are hardened and galvanized zinc-plated. The shape of the ball bearing is designed specifically for conveyor rollers and tolerates greater deflection of the bearing than comparable precision ball bearings.

Application
- For temperature ranges outside of the limits for polymer.
- For lightweight and medium-heavy materials to be conveyed.
- For driven and non-driven conveyors.
- Suitable for extreme temperatures with steel bearing housings.

Platform 1450

Application
- For particularly heavy-duty loads and heavy individual loads.
- Suitable for drive conveyors.
- Suitable for driven and non-driven conveyors.
- For temperature ranges outside of the limits for polymer.
- For lightweight and medium-heavy materials to be conveyed.

Properties

Platform 1450 is specifically designed for high loads caused by heavy individual loads. One version is available for freezer applications. The drive elements made of technopolymers are designed to be twist-proof with a form-fit connection with the tube. The steel drive heads and flanges are all galvanized zinc-plated after being welded to the tube for optimum corrosion protection. All of the welds run right around the tube, not just in certain areas.

For information about properties and application areas of the polymers used, please refer to the chapter Material Specification page 291.

Bearings and materials

The standard version bearings are precision ball bearings 6205 2RZ or 6204 2RZ. Depending on the series, the drive elements, such as sprockets or toothed belt drive heads, are made of fiberglass-reinforced polyamide and polyoxymethylene or steel. The bearings are lubricated with a food-safe grease.

Platform 1500

Application
- For wet and hygienic areas.
- For lightweight and medium-heavy materials to be conveyed.
- For driven and non-driven conveyors.

Properties

Platform 1500 is specifically designed for use in hygienic areas and in areas at risk of corrosion.

All of the bearing housings are sealed internally so that liquids or other substances cannot penetrate the rollers. The conveyor rollers can be cleaned with conventional detergents. For information about properties and application areas of the polymers used, please refer to the chapter Material Specification page 291.

Bearings and materials

The bearings are designed as slide bearings and are made of polymer (polyoxymethylene with the addition of polytetrafluorethylene (PTFE)) with a stainless steel shaft pin. The materials and surfaces of the bearing pair are aligned to each other so that the bearings can run dry without lubrication. The tubes are made of polymer or stainless steel. All of the materials are corrosion-proof.
Platform 1700

Application
- For universal use
- For particularly quiet conveyance at high speeds
- For lightweight and medium-heavy materials to be conveyed
- For driven and non-driven conveyors

Properties
Platform 1700 is designed for high loads at very low noise levels and provides the ultimate in flexibility with its different drive options. The bearing design comprising polyamide bearing housing, precision ball bearing and a polypropylene or polyamide seal produces an extremely quiet conveyor roller, which can simultaneously carry heavy loads. Bearing housings and belt drive heads are installed in the tubes in a form-fit way (flanging for steel tube and press-in edge for polymer tube). The unique feature about this platform 1700 is the tapered shaft-shuttle, which combines the benefits of a female threaded shaft and a spring-loaded shaft (cf. shaft-shuttle shaft design page 20).

For information about properties and application areas of the polymers used, please refer to the chapter Material Specification page 291.

Bearings and materials
Sealed DIN precision ball bearings 6002 2RZ, 689 2Z and 6003 2RZ are used. They are greased with a silicon-free lubricant and have a secure bearing housing in the base of the roller thanks to a snap-on edge. In addition, the ball bearing 6002 2RZ is oiled or available in a stainless steel design.

The integral polypropylene seal is fixed in the internal ring of the ball bearing and has three functions: Protection of the ball bearing against coarse dirt and splashing water, diameter compensation of shaft and internal ring as well as diverting axial forces into the ball bearing.

Platform 5000

Application
- For pushing, e.g. of steel or wooden plates
- For aligning medium-heavy and heavy materials

Properties
The platform 5000 is designed for omni-directional pushing or aligning of medium-heavy and heavy materials. The series differ in the following features:
- Housing design
- Fastener
- Material of housing
- Material of support balls
- Material of main balls
- Load capacities

Bearings and materials
The principle of the ball roller consists of several small support balls that support a larger main ball. The main ball can be made of polymer or steel, depending on the series. The housing can be of polyamide or steel.
**Bearings**

Interroll utilizes different bearings, such as slide bearings or special ball bearings made of polypropylene with steel balls. However, the following section describes only the precision ball bearings used by Interroll.

Further information on the bearing assemblies (ball bearings with bearing housings and seals) is provided in the Platforms chapter (page 14) and under Material Specification (page 291).

All precision ball bearings used are designed as 2RS, except for type 689. The steel sealing discs form a narrow sealing gap, but are non-contacting. They ensure an optimal startup of the roller. The steel-reinforced rubber sealing lips (NBR) lie against the inner ring under external pressure and thus provide an exceptional sealing quality comparable to the 2RS version. The oil-lubricated version is characterized by its easy start and exceptional easy-running properties.

Precision ball bearings in accordance with DIN 625 have the following properties:

- Series 689, 60 and 62 standard DIN grooved ball bearings
- Excellent load capacity and operational life
- Precision ball race
- Extremely temperature-resistant
- Low-noise operation
- With stainless steel design: manufactured throughout from corrosion-proof material

All precision ball bearings are specified by Interroll beyond the requirements of DIN 625 for optimum, durable and constant operation. Interroll specifies the bearing play, lubrication and sealing etc.

**Shafts**

**Shaft material**

Interroll offers shafts made of three different materials or finishings:

- Uncoated steel
- Zinc-plated steel
- Stainless steel

All shafts are manufactured from cold-drawn steel. Interroll recommends to match the shaft material to the material of the side profile.

Zinc-plated shafts are cut from galvanized zinc-plated rod material, thus the front faces of the female threaded or spring-loaded shafts are always without zinc plating.

Male threaded shafts cannot be zinc-plated, otherwise they pose a risk of blocked threads due to the zinc layer. For this reason, Interroll recommends selecting either male threaded or flatted shafts in stainless steel to obtain adequate corrosion protection.

**Manufacturing process**

After the sawing process, the shafts are milled. Milling reduces deformations of the shaft ends or damages on the side profile during installation to a minimum. Furthermore, milling removes sharp burrs, thereby ruling out a risk of injuries. Hence, this creates not only safe, but also perfectly manageable rollers.

For threaded holes, the centering holes are drilled in a first step to ensure precisely centered threaded holes in the shaft.

**Versions**

**Spring-loaded shaft**

Spring-loaded shafts can be manufactured from round material or hex material.

- Simple shaft design
- Very fast and simple installation and removal
- Suitable crosslinks have to be provided between the side profiles to reinforce the conveyor.

With driven rollers, play between the shaft and the mounting hole (inevitably due to oblique installation) will create noise, particularly when starting and stopping the turning motion (especially at hex shafts).

Depending on the selection of material pairing (shaft/side profile) and dimensions (size of hole and spring-loaded shaft), it may lead to wear of the shaft (hexagon looses its edges) or the side profile.

Shield for zinc-plated shaft material is not zinc-plated.

**Female threaded shaft**

Female threaded shafts can be manufactured from round material or hex material.

- Lead to a very stable frame construction – generally, no use of crosslinks is required
- A firm connection causes a lot less noise than shafts that are not firmly screwed together.
- The roller shaft and side profile stabilize each other resulting in the conveyor rollers having a greater load capacity than loosely fitted rollers.
- Wear-free towards spring-loaded shafts due to firm connection in the side profile
- Medium-fast installation and removal
- Shield for zinc-plated shaft material not zinc-plated
- Safe discharge of static charges (anti-static design)

Interroll offers the following threads and thread depths:

<table>
<thead>
<tr>
<th>Thread</th>
<th>Thread depths [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>M5</td>
<td>12</td>
</tr>
<tr>
<td>M6</td>
<td>15</td>
</tr>
<tr>
<td>M8</td>
<td>15</td>
</tr>
<tr>
<td>M10</td>
<td>20</td>
</tr>
<tr>
<td>M12</td>
<td>20, 25</td>
</tr>
<tr>
<td>M16</td>
<td>25</td>
</tr>
</tbody>
</table>
**Shaft with shaft-shuttle**

Shafts with shaft-shuttle are made of hex material. Both ends are fitted with the shaft-shuttle made of polyamide. The conical shaft-shuttle reduces the hex surface towards the shaft end.

- Very fast and simple installation and removal
- Similar low noise level as female threaded shafts
- Wear-free towards spring-loaded shafts due to zero-clearance seating of the shaft free in the side profile (11 mm hex hole, +0.3/+0.8 mm)
- Anti-static version
- Particularly suited for modernizing systems; side profiles that have been in use for a long time generally show high tolerances in the holes
- Evenly aligned, anti-rotation shuttles (positioning one side is sufficient)
- Both shaft ends can be pushed in
- Suitable crosslinks have to be provided between the side profiles to reinforce the conveyor
- No scratching of high-quality side profiles during installation and removal

**Male threaded shaft**

Male threaded shafts are made of round material. Male threaded shafts feature a thread cut onto the shaft ends. In each case, a nut is screwed onto the shaft in front of the seal. The two nuts at the seal and two nuts with washers for fastening are part of the scope of delivery.

- The roller and side profile stabilize each other resulting in the conveyor rollers having a greater load capacity than loosely fitted rollers.
- Wear-free towards spring-loaded shafts due to firm connection in the side profile
- The two nuts at the seal and two nuts with washers for fastening are part of the scope of delivery
- Available only in the versions uncoated steel or stainless steel

**Fixed shaft**

Fixed shafts can be manufactured from hexagon or round material. It is possible to fit the round shafts with a flat shaft. The shafts are mostly inserted in fastening holes in the side profile that are open at the top. To rule out that the shaft turns inside the guide of the side profile, Interroll recommends the use of hexagon shafts or round flatted shafts in corresponding side profiles intended for this purpose.

**Installation instructions**

The following should be considered in relation to the selection of a shaft and construction of the side profiles:

1. The hole dimension of the side profile should be as small as possible on conveyor rollers with female threaded shafts. Larger holes can lead to a higher tolerance of the roller pitch and to the height differences of several conveyor rollers. The function of the roller conveyor can be affected by the hole and screw selection.
2. For softer side profiles made out of aluminum or thick powder coatings, female threaded shafts should always be selected with the largest possible diameter and the smallest possible thread. This minimizes the risk of the shaft penetrating the aluminum profile.
3. The installation of conveyor rollers with spring-loaded shaft must be done in an oblique way. That is the spring-loaded shaft must be inserted into the hole on the opposite side only in the horizontal position. The spring-loaded shaft can be inserted into the hole on the opposite side only in the horizontal position. Too small a hole could make installation significantly more difficult.

**Scope of delivery**

Material required for fastening the rollers is not part of the scope of delivery, such as washers, nuts, screws.

**Exceptions**

<table>
<thead>
<tr>
<th>Product</th>
<th>Scope of delivery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rollers with male threaded shafts</td>
<td>Nuts and washers</td>
</tr>
<tr>
<td>Rollers of series 3500K00 light</td>
<td>Taper disks and ball sockets</td>
</tr>
</tbody>
</table>
**General Technical Information**

**Shafts**

**Labeling**

All shafts starting with a length of 100 mm are labeled with the respective production order number. The number is located on the shaft inside the tube. It allows users to order an identical roller without having to provide information about the product, such as the length.

**Axial play**

Conveyor rollers must not be warped during installation or operation. This means that play must exist between the seal of the roller and the side profile. The roller must move in axial direction under load.

The axial play must not be too high. Rollers with tapered shaft-shuttle or RollerDrive with tapered spring-loaded shaft are designed so that they have the best possible fit for the hole in the side profile, even in cases of high hole tolerances. This reduces wear and possible noise. If the axial play is too high, it may pose the risk of insufficient positioning of the hexagon in the hole, which leads to wear and noise.

The maximum play is already taken into account during the manufacture of the rollers.

Example: At the time of ordering, a lane width (EL = installation length) of 500 mm is specified for a roller of series 1700 with female threaded shaft. The dimension from seal to seal measures approx. 499 mm. Hence, the roller has an axial play of approx. 1 mm (see figure above).

The axial play under consideration depends on roller series and roller version. For example, an axial play of approx. 1 mm on the drive side and 0.5 mm on the other side is taken into account for a roller of series 3500 with sprocket head (see figure above).

The axial play stated is only a guide value. There may be slight deviations from this figure in individual cases when production tolerances are added. The function of a correctly installed and used conveyor roller is not being impacted.

**Variable shaft length**

A deviation of the standard shaft length is possible for all roller series. The shafts can be shortened or lengthened. The axial play must not be too high. Rollers with tapered shaft-shuttle or RollerDrive with tapered spring-loaded shaft are designed so that they have the best possible fit for the hole in the side profile, even in cases of high hole tolerances. This reduces wear and possible noise. If the axial play is too high, it may pose the risk of insufficient positioning of the hexagon in the hole, which leads to wear and noise.

The maximum play is already taken into account during the manufacture of the rollers.

A length change is possible for the following shaft versions:

- Female threaded shaft
- Male threaded shaft
- Fixed shaft
- Spring-loaded shaft
- Flattened shaft

The length changes depend on the actual shaft version. Please direct any questions to your Intermroll contact person. Axial support by the seal may no longer be guaranteed with a length change. With greater axial forces, e.g. where there is lateral displacement, suitable replacement structures, such as spacing tubes, may have to be fitted.

With female threaded shafts, the shaft can be lengthened only if the seal is given an axial support. Depending on the thread and shaft diameter, a retaining ring can be inserted. The retaining ring is secured via a groove incorporated in the shaft. The combination of a female threaded shaft with flattened shaft also requires a support of the seal.

In case of a shaft lengthening, the maximum load capacity of the roller is reduced compared to the values that are specified for each side.

**Shaft adapter**

The shaft adapter is a conductive polymer component that can be pressed onto roller shafts. It can be inserted in side profiles with open elongated holes. In this case, the roller is placed from the top. The shaft adapter significantly reduces the noise level compared to the pure steel shaft and increases the installation length of the roller. The shaft adapter is not an alternative to the tapered shaft-shuttle (page 20).

**Technical data**

<table>
<thead>
<tr>
<th>Material</th>
<th>Polyoxymethylene, RAL 9005 (jet black)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature range</td>
<td>0 to +40 °C</td>
</tr>
<tr>
<td>Suitable shafts</td>
<td>Fixed round shafts (Ø 8 and 10 mm)</td>
</tr>
<tr>
<td>Anti-static version</td>
<td>&lt; 10^6 Ω</td>
</tr>
<tr>
<td>Max. static load of a roller with the use of shaft adapters</td>
<td>See load capacity in the corresponding table (load capacity is not reduced by shaft adapter)</td>
</tr>
</tbody>
</table>

**Design versions**

<table>
<thead>
<tr>
<th>Shaft diameter [mm]</th>
<th>Drawing</th>
<th>Longer installation length [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>1</td>
<td>12</td>
</tr>
<tr>
<td>10</td>
<td>2</td>
<td>14</td>
</tr>
</tbody>
</table>

1 Adapter 11 HEX (hexagon)
2 Adapter flat shaft 12

The shaft adapter can be used with the following roller series:

- Series 1100
- Series 1700
- Series 3500 (for drive heads for belts)
GENERAL TECHNICAL INFORMATION
TUBES

Tubes
Tube materials/tube diameters

Steel/stainless steel
The steel tubes used by Interroll are manufactured in accordance with DIN EN 10305-1, DIN EN 10305-3 and DIN EN 10305-7, but with stricter tolerance specifications.

The roller manufacturing and transport may result in minor scoring or scratches to appear on the tube surface. However, they do not have any effect on the functionality of the roller.

Benefits
- Highest resistance and bending stiffness
- Steel = corrosion protection through zinc-plating, chrome-plating or carbonitriding
- Stainless steel = very good and long-life corrosion protection
- Stainless steel = Application also possible in aggressive environments (not suitable for seawater)
- Sprockets and flanges can be welded on (flanges not together with stainless steel tube)

Steel tubes can be flanged over the bearing assembly so that the bearing housing can no longer move out (not for carbonitrided or chrome-plated tube as well as tubes with a wall thickness greater than 1.5 mm)

Versions
- With grooves (not for carbonitrided and chrome-plated tube)
- Covered with PVC or PU sleeve
- With lagging
- With pushed-on tapered elements
- With flanges welded on

When used in belt conveyors, there is noise caused by the pared tube welds coming into contact with the belt. Interroll recommends using a relevant application.

Aluminum
Aluminum tubes have slightly lower strength and only about 33 % of the flexural strength of steel tubes. However, they weigh only 36 % of the weight of comparable steel tubes.

Benefits
- Significantly lighter than steel tube
- Corrosion-resistant
- Aluminum tubes can be flanged over the bearing assembly so that the bearing housing can no longer move out

Versions
- Covered with PVC or PU sleeve
- With pushed-on tapered elements


General technical information
Rollers | Conveying elements | RollerDrive | Controls | Accessories

<table>
<thead>
<tr>
<th>Tube materials/tube diameters</th>
<th>Ø Rollers [mm]</th>
<th>Anodized surface</th>
<th>Anti-static version</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>No</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>

\[ \Delta T = 0.08 \cdot L \cdot \Delta \sigma \]

\[ \Delta L = L \cdot \Delta \sigma / 1000 \]

PVC

Benefits
- Noise-dampering
- Highly impact-resistant
- Very lightweight
- Corrosion-resistant, no surface treatment required
- Easy to clean

Polymer tubes have a significantly lower load capacity compared with steel and aluminum tubes with the same diameter. With polymer tubes with a diameter of 30 mm and larger, the bearing assemblies are connected form-fit with the tube so that an absolutely safe seating is ensured.

An ambient temperature range from -5 to +40 °C applies to polymer tubes. With a high ambient temperature (from 30 °C) and high continuous static load (over hours), a permanent deformation of the rollers cannot be ruled out.

When dimensioning the rollers for an existing width between the side profiles (lane width), a thermal expansion must be taken into account. In case of large temperature differences, the length of the roller changes based on the following formula:

\[ \Delta L = L \cdot \Delta \sigma / 1000 \]

\[ \Delta T = \text{change in length due to temperature change (mm)} \]

\[ \Delta \sigma = \text{temperature difference (°C)} \]

\[ L = \text{tube length (mm)} \]

A proper functioning requires that a warping of the roller at high temperature is being avoided.

Finishing of shell materials

<table>
<thead>
<tr>
<th>Material</th>
<th>Surface finishing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steel</td>
<td>Zinc-plating</td>
</tr>
<tr>
<td>Steel</td>
<td>Chrome-plating</td>
</tr>
<tr>
<td>Steel</td>
<td>Carbonitriding</td>
</tr>
<tr>
<td>Aluminum</td>
<td>Anodizing</td>
</tr>
</tbody>
</table>

Polymer tubes are available in the following colors:

<table>
<thead>
<tr>
<th>Color</th>
<th>RAL number</th>
<th>Ø Tube [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stone gray</td>
<td>7030</td>
<td>16, 20, 30, 40, 50, 63</td>
</tr>
<tr>
<td>Graphite gray</td>
<td>7024</td>
<td>20</td>
</tr>
<tr>
<td>Sky blue</td>
<td>5015</td>
<td>30, 40, 50, 63</td>
</tr>
</tbody>
</table>

Zinc-plating

Galvanized zinc-plating of steel tubes is a cost-efficient corrosion protection.

Application
- For dry application areas with normal temperatures
- Conditional suitability for environments with salt and humidity, e.g., installations in harbor areas or in sub-tropical countries
- Conditional suitability in applications with moist or wet materials

Besides zinc-plated tubes, Interroll also offers zinc-plated shafts and zinc-plated sprocket heads. Front sides of shafts cannot be zinc-plated.

Procedure
The surface of the steel tube material is galvanically zinc-plated (using electrolysis). The electrolysis produces an extremely even, thin sleeve. The entire process involves pre-treatment, zinc-plating, passivating and drying.

Properties
Zinc-plated tubes are suitable for flanging and applying grooves. The galvanized zinc-plating is a temporary protection of the steel tube against corrosion.

The duration of the corrosion protection is reduced by the mechanical and thermal loads to which it is subjected. Particles of the zinc layer may be carried off when transporting materials over zinc-plated steel rollers.

Zinc-plated surfaces are sensitive to scratching and abrasion. Damage can result in point corrosion. Extreme changes in temperature must be avoided as they can cause internal tension. Furthermore, corrosion resistance becomes reduced as the temperature rises.

In order to maintain the limited protective effects of zinc-plating, special packaging must be used for sea freight, for example.

Special measures must also be employed if the materials are to be stored for a longer period of time. Zinc-plating is not food-compatible.

A zinc-plated and passivated surfaced reacts with the following substances:
- Humidity
- Acidic environment (exhaust fumes, salts, wood acid etc.)
- Alkaline substances (lime, chalk, cleaning agents, CO2)
- Perspiration
- Solutions of other metals (copper, iron etc.)
GENERAL TECHNICAL INFORMATION
TUBES

General technical information
Rollers | Conveying elements | RollerDrive | Controls | Accessories

The long material is zinc-plated. When the tube is sawed off, the front sides are not zinc-plated.

Chrome-plating
Bright chrome-plating of steel tubes is a corrosion protection that do not leave behind any abrasion on materials or other locations in contrast to zinc-plated tubes.

Properties
Chrome-plated tubes are suitable for flanging or applying grooves.

The chrome-plating is a good protection of the steel tube against corrosion. The duration of the corrosion protection is reduced by the mechanical and thermal loads to which it is subjected. Damages of the chrome layer can result in point corrosion.

Extreme changes in temperature must be avoided as they can cause internal tension. In order to maintain the protective effects of chrome-plating, special packaging must be used for the rollers, e.g. for sea freight (salt water). Special measures must also be employed if the materials are to be stored for a longer period of time.

A chrome-plated surface can react with the following substances:
- Acids environment (exhaust fumes, salts, wood acid etc.)
- Alkaline substances (lime, chalk, cleaning agents, CO₂)
- Solutions of other metals (copper, iron etc.)

Chrome-plating is performed on the tube section that has been cut to the correct length. This will also chrome-plate the front sides.

Carbonitriding
Carbonitriding is a wear-resistant corrosion protection for steel tubes.

Application
- For highly stressed conveyor rollers, e.g. from the transport of steel containers
- For applications where materials must be transported axially on rollers

Procedure
Carbonitriding is a thermochromical process. For this purpose, the surface of the tube is enriched with nitrogen which creates a wear-resistant ceramic coating.

Properties
Carbonitrided tubes are partially suitable (up to 1.5 mm wall thickness) for flanging, but not for the application of grooves.

The ceramic coating is not food-compatible. The carbonitrided surface does not create any abrasion, but can leave color traces behind.

A carbonitrided surface can react with the following substances:
- Acidic environment (exhaust fumes, salts, wood acid etc.)
- Alkaline substances (lime, chalk, cleaning agents, CO₂)
- Perspiration
- Solutions of other metals (copper, iron etc.)

Carbonitriding is performed on the tube section that has already been cut to the correct length. This will also carbonitride the front sides.

Anodizing
Anodizing is a corrosion protection for aluminum tubes.

Application
- For weight-sensitive applications, e.g. shuttle systems.
- For aluminum tubes with diameters of 16 and 20 mm

Procedure
The surface of the aluminum tube is given an acidic protective coating. Compared to galvanizing procedures, the top material layer is transformed and an oxide is formed.

Properties
The duration of the corrosion protection is reduced by the mechanical and thermal loads to which it is subjected. Particles may be carried off when transporting materials over anodized rollers.

Anodized surfaces are low-sensitive to scratching and abrasion. Mechanical damage can result in point corrosion.

An anodized surface can react with solutions of other metals, such as copper, iron, etc.
Tubes with grooves

Grooves are running grooves that can be placed in steel or aluminum tubes. They are used to guide round belts. When using the corresponding round belt, they are below the roller surface and, as such, do not contact the material.

When the round belt is moved, the conveyor roller also moves. Two options are differentiated here:

- Wrapping from roller to roller
- Wrapping of a driven shaft that is positioned below the conveyor rollers. The guide rollers required for guiding the round belts on the drive shaft are located on page 168.

They are driven by round belts guided by grooves — in straight sections via cylindrical rollers or in curve sections via cylindrical rollers or rollers with tapered elements.

Grooves can be applied for the following roller and RollerDrive series:

<table>
<thead>
<tr>
<th>Roller or RollerDrive series</th>
<th>Catalog page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Universal conveyor roller</td>
<td>1700 page 68</td>
</tr>
<tr>
<td>Universal conveyor roller heavy</td>
<td>1700 heavy page 82</td>
</tr>
<tr>
<td>Tapered universal conveyor roller</td>
<td>1700KKO page 76</td>
</tr>
<tr>
<td>RollerDrive EC310</td>
<td>page 200</td>
</tr>
</tbody>
</table>

Please contact your Interroll contact person if grooves need to be applied to other roller series.

Rollers with grooves always contain an antistatic element. The maximum conveyor force of the round belt measures 300 N. The maximum load capacity per conveyor roller with groove measures 300 N due to the low conveyor force of the round belt. The load capacity information in the individual roller series refers to rollers without grooves.

The maximum load capacity of the conveyor roller is lower with tube lengths of greater than 1400 mm. Interroll recommends a shaft version that is secured against twisting for round belt drives, such as a female threaded shaft. Grooves can be applied to tubes with a wall thickness of up to 2 mm.

It is possible to apply one to four grooves for each tube. The dimensions A and up to D, as needed, must be specified accordingly at the time of ordering. Version-dependent limitations of the groove positions are located in the respective chapters of the roller and RollerDrive series.

Grooves reduce the concentric precision and load capacity of conveyor rollers. Interroll recommends conveyor rollers with round belt drive heads or PolyVee drive heads of the Series 3500 to ensure that concentric precision is adhered to (page 90).

Concentric precision

Convoy rollers and RollerDrive are manufactured from tubes according to DIN standard. This standard allows deviations in form and straightness, which give rise to the concentric precision.

The concentric deviation is the maximum radial deviation of the diameter of the tube from a perfect circle.

Example: A concentric deviation t = 0.3 mm means that the maximum radial deviation of the entire tube is 0.3 mm.

![Concentric deviation t](image)

In principle, concentric deviation depends on the length and material of the tube. It is all the greater the longer a tube is, especially with polymer tubes.

The average concentric deviation of Interroll conveyor rollers can be found in the following diagrams.

Steel tubes

For steel tubes ≤ 2 mm wall thickness, Interroll offers a 100 % check. In the process, the concentric precision of every roller ordered is checked and, if needed, the tube is straightened. Carbonitrided and chrome-plated tubes cannot be straightened.

Please note that DIN-compliant tubes are permitted significantly higher concentric tolerances. For this reason, the empirically determined guide values represented in the diagrams can be exceeded in individual cases.

<table>
<thead>
<tr>
<th>Ø Tube [mm]</th>
<th>Max. tube length [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>300</td>
</tr>
<tr>
<td>20</td>
<td>400</td>
</tr>
<tr>
<td>30</td>
<td>500</td>
</tr>
<tr>
<td>40/50</td>
<td>600</td>
</tr>
<tr>
<td>63</td>
<td>800</td>
</tr>
</tbody>
</table>

Polymer tubes

With polymer tubes, the concentric deviation increases disproportionately to the length of the tube. The following lengths should not be exceeded:

For steel tubes ≤ 2 mm wall thickness, Interroll offers a 100 % check. In the process, the concentric precision of every roller ordered is checked and, if needed, the tube is straightened. Carbonitrided and chrome-plated tubes cannot be straightened.

Please note that DIN-compliant tubes are permitted significantly higher concentric tolerances. For this reason, the empirically determined guide values represented in the diagrams can be exceeded in individual cases.
Straightened rollers / roller lengths

In principle, the rollers manufactured by Interroll have a high concentric precision. The concentric precision is sufficient for almost all applications. On top of that, Interroll offers a 100% inspection for rollers made out of steel.

During the inspection, the concentric precision of each roller is measured. If the concentric precision falls outside the specified tolerance (page 28), the tube is straightened. The concentric deviation is corrected only if it falls outside the tolerance.

When measuring the concentric precision and also for the straightening process, the tube is the reference point. The concentricity between shaft and tube is not checked.

Technical data

Straightening is possible for tubes with a thickness up to 3 mm made of uncoated steel, zinc-plated steel, chrome-plated steel, stainless steel, aluminum and anodized aluminum.

Straightening is possible for the following tubes or tube lengths:

- Stainless steel, aluminum and anodized aluminum.
- Made of uncoated steel, zinc-plated steel, chrome-plated steel.
- Straightening is possible for tubes with a thickness up to 3 mm.

Technical data

<table>
<thead>
<tr>
<th>Ø Tube</th>
<th>Tube wall thickness</th>
<th>Min. length</th>
<th>Max. length</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>1</td>
<td>300</td>
<td>1000</td>
</tr>
<tr>
<td>20</td>
<td>1.5</td>
<td>490</td>
<td>1200</td>
</tr>
<tr>
<td>30</td>
<td>1.2</td>
<td>400</td>
<td>1200</td>
</tr>
<tr>
<td>40</td>
<td>1.5</td>
<td>600</td>
<td>1700</td>
</tr>
<tr>
<td>50</td>
<td>1.5</td>
<td>800</td>
<td>2000</td>
</tr>
<tr>
<td>51</td>
<td>2</td>
<td>600</td>
<td>1500</td>
</tr>
<tr>
<td>60</td>
<td>1.5</td>
<td>1000</td>
<td>2000</td>
</tr>
<tr>
<td>80</td>
<td>2</td>
<td>1500</td>
<td>2000</td>
</tr>
</tbody>
</table>

Roller lengths

The Interroll conveyor rollers can be manufactured in different lengths utilizing millimeter increments. Most versions can be manufactured starting at a length of approx. 200 mm. The longest dimension for many series is approx. 2000 mm. The shortest and longest dimension depends on many factors, such as shaft design, tube material, production process or packaging options.

Definitions

<table>
<thead>
<tr>
<th>EL</th>
<th>Reference length/ordering length</th>
</tr>
</thead>
<tbody>
<tr>
<td>U</td>
<td>Usable tube length, length without bearing housing and for flanged metal tube without length of flanging</td>
</tr>
</tbody>
</table>

For conveyor rollers with female threaded shaft, the total shaft length corresponds to the installation length.

The installation length can be measured via the total shaft length only for rollers with female threaded shaft. For all other shaft designs, the installation length cannot be measured precisely at the conveyor roller. The axial play of approx. 0.5 mm or at the driven sides of approx. 1 mm is part of the installation length and does not allow an exact measurement of the installation length.

The reference length/ordering length has measurable reference edges on the conveyor roller for the following series:

- 1100
- 1700
- 1700 light (exception: Ø 20 mm)
- 3500 light
- 3500
- 3500 heavy
- 3800

The PVC sleeve ensures a particularly high noise reduction and offers a high level of protection for sensitive materials. An improved conveyance of materials is achieved with the higher coefficient of friction compared with a steel tube. Materials can easily be separated since the larger diameter leads to a higher speed with the same rotational speed.

Technical data

The PVC sleeve is not glued onto the conveyor roller. The conveyor roller is pushed into the sleeve widened with compressed air by using a pressing machine. Then the sleeve is cut to the length of the tube or to the specified dimension.

Conveyor rollers with welded drive element can also be fitted with a PVC sleeve. This requires a drive element whose diameter is not greater than 12 mm of the tube.

Friction rollers (Series 3800, 3800 light, 3870) can be fitted only with 2 mm PVC sleeve. Rollers with PVC sleeve are always designed with an antistatic element. The PVC sleeve is not antistatic.
The PU sleeve ensures a high level of noise reduction, particularly for steel containers, and offers a high level of protection of sensitive materials. An improved conveyance of materials is achieved with the higher coefficient of friction compared with a steel tube. Materials can easily be separated since the larger diameter leads to a higher speed with the same rotational speed. With mechanical stress, e.g. with abrasion, it offers a higher robustness than a PVC sleeve.

**Technical data**

<table>
<thead>
<tr>
<th>General technical data</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. sleeve length</td>
<td>50 mm</td>
</tr>
<tr>
<td>Max. installation length of the conveyor roller</td>
<td>1500 mm</td>
</tr>
<tr>
<td>Min. installation length of the conveyor roller</td>
<td>100 mm</td>
</tr>
<tr>
<td>Temperature range</td>
<td>-28 to +80 °C</td>
</tr>
<tr>
<td>Material</td>
<td></td>
</tr>
<tr>
<td>Tube</td>
<td>PVC, zinc-plated steel, chrome-plated steel, stainless steel, aluminum</td>
</tr>
<tr>
<td>PU sleeve</td>
<td></td>
</tr>
<tr>
<td>• Polynorthane, RAL9005 (jet black), glass</td>
<td></td>
</tr>
<tr>
<td>• Sulfur-free</td>
<td></td>
</tr>
<tr>
<td>• Silicone and halogen-free</td>
<td></td>
</tr>
<tr>
<td>• FDA-compliant</td>
<td></td>
</tr>
<tr>
<td>• RoHS-compliant</td>
<td></td>
</tr>
<tr>
<td>• Non-conductive</td>
<td></td>
</tr>
<tr>
<td>• Oil or gasoline-resistant</td>
<td></td>
</tr>
<tr>
<td>Sleeve hardness</td>
<td>75 ± 5 Shore A (at 20 °C); the hardness increases at lower temperatures</td>
</tr>
</tbody>
</table>

With the lower elasticity, the PU sleeve cannot be applied to any other tube diameters or tubes with welded-on elements.

The PU sleeve is not glued onto the conveyor roller. The conveyor roller is pushed into the sleeve widened with compressed air by using a pressing machine. Then the sleeve is cut to the length of the tube or to the specified dimension. Rollers with PU sleeve are always designed with an antistatic element. The PU sleeve is not antistatic.

**Dimensions**

The PU sleeve generally covers the entire tube length. It is possible not to fit sections of the roller with the PU sleeve, e.g. the free space for grooves. A minimum length of 50 mm is required for a firm seating of the sleeve. With existing axial forces, a greater minimum length must be selected.

When ordering a roller with sleeve, always specify the dimensions A to D.

**Split PU sleeve and PolyVee drive head**

---

The PVC sleeve generally covers the entire tube length. It is possible not to fit sections of the roller with the PVC sleeve, e.g. the free space for grooves. A minimum length of 50 mm is required for a firm seating of the sleeve. With existing axial forces, a greater minimum length must be selected.

When ordering a roller with sleeve, always specify the dimensions A to D.

**Split PVC sleeve and PolyVee drive head**

---

Tapered rollers cannot be fitted with a PU sleeve.

**Design versions**

<table>
<thead>
<tr>
<th>Ø Tube [mm]</th>
<th>Sleeve material thickness [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>2</td>
</tr>
<tr>
<td>50</td>
<td>2</td>
</tr>
<tr>
<td>51</td>
<td>2</td>
</tr>
<tr>
<td>60</td>
<td>2</td>
</tr>
</tbody>
</table>

With the lower elasticity, the PVC sleeve cannot be applied to any other tube diameters or tubes with welded-on elements.

The PU sleeve is not glued onto the conveyor roller. The conveyor roller is pushed into the sleeve widened with compressed air by using a pressing machine. Then the sleeve is cut to the length of the tube or to the specified dimension. Rollers with PU sleeve are always designed with an antistatic element. The PU sleeve is not antistatic.

**Dimensions**

The PVC sleeve generally covers the entire tube length. It is possible not to fit sections of the roller with the PU sleeve, e.g. the free space for grooves. A minimum length of 50 mm is required for a firm seating of the sleeve. With existing axial forces, a greater minimum length must be selected.

When ordering a roller with sleeve, always specify the dimensions A to D.

**Split PVC sleeve and PolyVee drive head**

---

**PVC sleeve with clean cuts**

---

**PVC sleeve and 2 grooves**
The lagging ensures a high level of noise reduction and offers a high protection of medium-heavy to heavy materials. An improved conveyance of materials is achieved with the higher coefficient of friction compared with a steel tube. Materials can easily be separated since the larger diameter leads to a higher speed with the same rotational speed. The lagging offers a high robustness under mechanical stress and is very abrasion-proof. Compared to sleeves, that are not connected to the tube, axial forces are also allowed.

### Technical data

<table>
<thead>
<tr>
<th>General technical data</th>
<th>Min. reference length of the roller 112 mm</th>
<th>Max. reference length of the roller 1350 mm</th>
<th>Temperature range −30 to +80 °C</th>
<th>Min. installation length of the conveyor roller 110 mm</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Material</th>
<th>Tube</th>
<th>Uncoated steel</th>
<th>Stainless steel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black lagging</td>
<td>Nitrile rubber</td>
<td>Silicone- and halogen-free</td>
<td>Good resistance to alkalis</td>
</tr>
<tr>
<td>White or blue lagging</td>
<td>Nitrile rubber</td>
<td>Silicone- and halogen-free</td>
<td>Good resistance to alkalis</td>
</tr>
</tbody>
</table>

### Design versions

For tube diameters 40, 50, 51, 60, 80 and 89, a lagging of 2 to 5 mm thickness in increments of 0.1 mm is possible.

### Dimensions

Stainless steel tube with 2 grooves and split lagging

Uncoated steel tube with 1/2" polymer double sprocket head with 14 teeth and lagging

### tapered rollers cannot be fitted with a lagging. By default, rollers with lagging do not contain any antistatic element.

The lagging is applied through hot vulcanization and reground. This creates a high-strength joint of the lagging with the tube, resulting in a surface that is highly resistant to abrasion and very precise. For uncoated steel material, projecting tube sections are protected against corrosion with a black paint coating. For welded drive heads, the tube and drive head remain untreated.

Friction rollers (Series 3800, 3800 light, 3870, 3880) can be fitted only with 2 mm lagging.
Flanges

Flanges guide materials and prevent their lateral wandering. Circumferential welds ensure a high stability.

Technical data

The number of flanges and the roller pitch has to be selected in such a way that at least two flanges always guide the material at any given time.

Max. reference length 1600 mm
Material Zinc-plated steel, uncoated steel
Max. number of flanges/rollers 4
Temperature range Depending on roller series

Design versions

<table>
<thead>
<tr>
<th>Ø Tube [mm]</th>
<th>Ø Flange, outside d2 [mm]</th>
<th>Flange material thickness s [mm]</th>
<th>Flange width b [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>75</td>
<td>3</td>
<td>8.5</td>
</tr>
<tr>
<td>60</td>
<td>100</td>
<td>3</td>
<td>8.5</td>
</tr>
<tr>
<td>80</td>
<td>150</td>
<td>4</td>
<td>18.0</td>
</tr>
<tr>
<td>89</td>
<td>150</td>
<td>4</td>
<td>18.0</td>
</tr>
</tbody>
</table>

Dimensions

When ordering a roller with flange, always specify the dimensions A to D.

Flange

The following roller series can be delivered with flanges:
- 1200
- 1450
- 1700
- 1700 heavy
- 3500
- 3500 heavy
- 3600
- 3950

Series 1450, 1700 and 1700 heavy with 2 flanges

<table>
<thead>
<tr>
<th>d1 [mm]</th>
<th>d2 [mm]</th>
<th>s [mm]</th>
<th>b [mm]</th>
<th>Amin [mm]</th>
<th>Dmin [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>75</td>
<td>3</td>
<td>8.5</td>
<td>23</td>
<td>23</td>
</tr>
<tr>
<td>60</td>
<td>100</td>
<td>3</td>
<td>8.5</td>
<td>23</td>
<td>23</td>
</tr>
<tr>
<td>80/89</td>
<td>150</td>
<td>4</td>
<td>18</td>
<td>25</td>
<td>25</td>
</tr>
</tbody>
</table>

Series 3600 with 2 flanges

<table>
<thead>
<tr>
<th>d1 [mm]</th>
<th>d2 [mm]</th>
<th>s [mm]</th>
<th>b [mm]</th>
<th>Amin [mm]</th>
<th>Dmin [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>80/89</td>
<td>150</td>
<td>4</td>
<td>18</td>
<td>25</td>
<td>25</td>
</tr>
</tbody>
</table>

Series 3950 with 2 flanges

<table>
<thead>
<tr>
<th>d1 [mm]</th>
<th>d2 [mm]</th>
<th>s [mm]</th>
<th>b [mm]</th>
<th>Amin [mm]</th>
<th>Dmin [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>80/89</td>
<td>150</td>
<td>4</td>
<td>18</td>
<td>23</td>
<td>25</td>
</tr>
</tbody>
</table>
**Antistatic element**

The antistatic element creates a permanent electrical connection between the metal tube and the shaft of the roller. If the side profile is grounded accordingly and an electrical connection is established between the shaft of the roller and the side profile, no static charge is created on the metal tube surface.

The antistatic element can be applied for the following tube materials or tube finishings:

<table>
<thead>
<tr>
<th>Material</th>
<th>Surface finishing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steel</td>
<td>None</td>
</tr>
<tr>
<td>Steel</td>
<td>Zinc-plating</td>
</tr>
<tr>
<td>Steel</td>
<td>Chrome-plating</td>
</tr>
<tr>
<td>Steel</td>
<td>Carbonitriding</td>
</tr>
<tr>
<td>Stainless steel</td>
<td>None (no anodic oxide layer)</td>
</tr>
<tr>
<td>Aluminum</td>
<td>None</td>
</tr>
</tbody>
</table>

By default, the antistatic element is applied for all conveyor rollers with integrated groove or tapered elements and can be selected as an option for the following roller series:

- Series 1100
- Series 1450
- Series 1700 light
- Series 1700
- Series 1700KXIO
- Series 1700 heavy
- Series 3500
- Series 3500KXIO light
- Series 3500KXIO
- Series 3600
- Series 3950

The antistatic element is available for the following roller diameters:

- 20 mm
- 30 mm
- 40 mm
- 50 mm
- 60 mm
- 80 mm
- 89 mm

Interroll recommends to ensure the electrical connection of the roller shaft to the side profile and to check the grounding potential on the roller surface before and after the use of the roller. Threaded shafts are best suited to establish a reliable electrical connection.

**Tubes with noise reduction**

**Benefits**

- High noise reduction, particularly with steel containers
- Reduces the frequency level and resonance when the rollers hit the end stop

**Technical data**

| Min. reference length for attenuation | 250 mm |
| Max. reference length for attenuation* | 2000 mm |
| Ø Tube | 50 mm |
| Temperature range | −28 to +80 °C |
| Tube Materials | Uncoated steel, zinc-plated steel, stainless steel, aluminum |

* The insulating material is inserted in the tube with a maximum length of 1,000 mm. This length is sufficient for noise reduction.

**Design versions**

The following series can be equipped with noise reduction:

- Series 1100
- Series 1200
- Series 1500
- Series 1700
- Series 1700 heavy
- Series 3500

Rollers with noise reduction are fitted with a foam inner tube. The foam is pressed into the tube during the production process of the roller. The noise reduction is also possible for rollers with grooves.