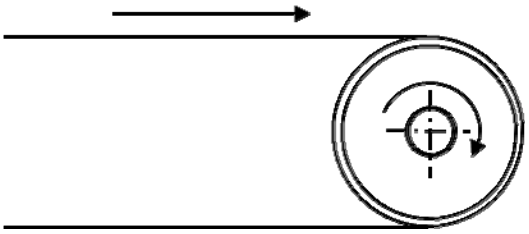
Spiral Woven Belts

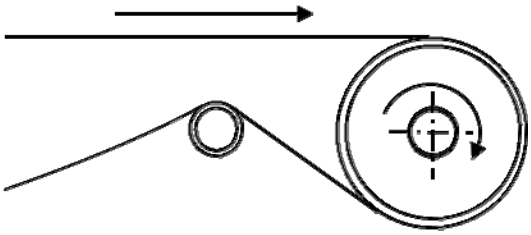
Conveyor Circuit Design Guidelines—Friction Driven

Typical Belt Circuits

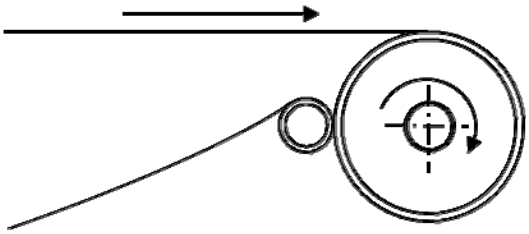
Discharge End Drives



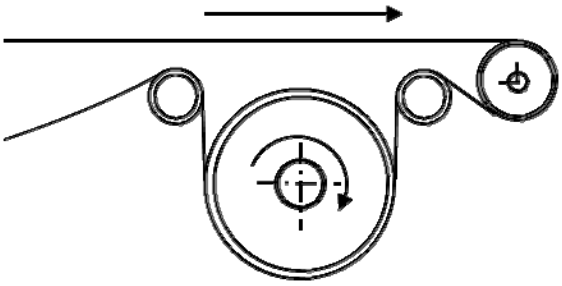
Simple Plain Pulley Drive



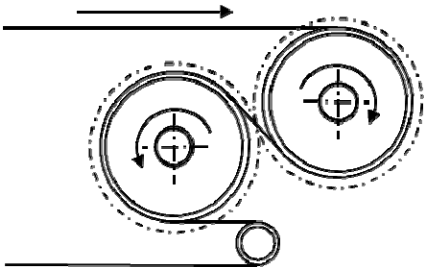
Simple Plain Pulley Drive with Snubbing Roller



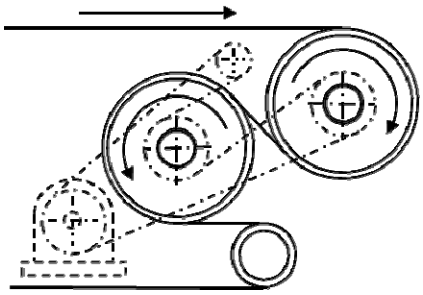
Simple Plain Pulley Drive with Snubbing Pressure Roller



Double Snubbed Pulley Drive

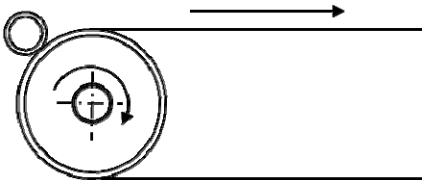


Tandem Pulley Drive with Intermeshing Gears creates a larger contact surface between the belt and the rollers.

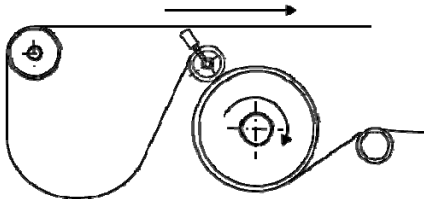


Tandem Pulley Drive with Chain & Sprocket Circuit

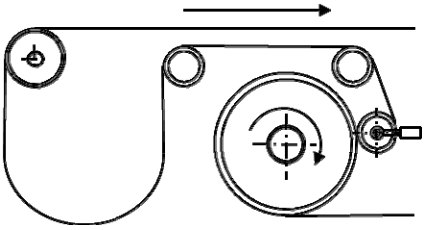
Infeed End Drives – for moderate to high temperature applications.



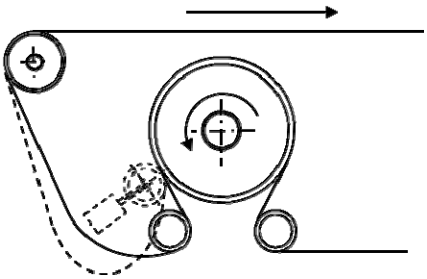
Simple Plain Pulley Drive with Pressure Roller (Belt length adjustment take-up to be at the discharge roller or in the return circuit below the discharge)



Catenary Slack Loop Plain Pulley Drive with Pressure Roller – Layout 1



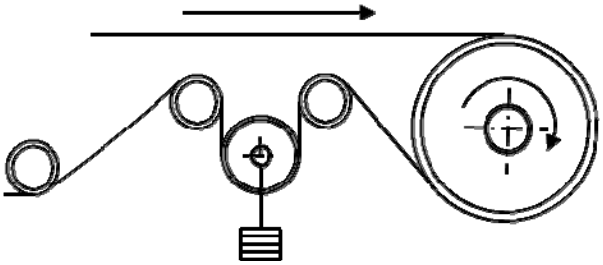
Catenary Slack Loop Plain Pulley Drive with Pressure Roller – Layout 2



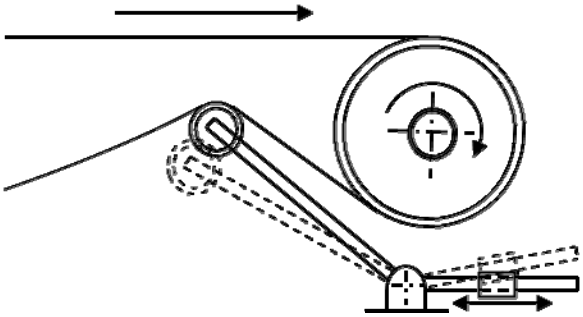
Catenary Slack Loop Reverse Double Snubbed Plain Pulley Drive (Pressure Roller Optional)

Note: Slack side idle rollers should be at least 300mm diameter.

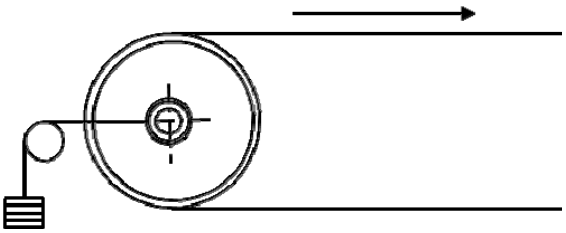
Belt Take-up Systems



Double Snubbed Gravity Weighted Free Rotating Roller

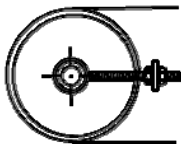


Weighted Pivot Lever Actioned Free Rotating Roller

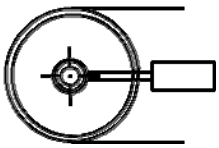


Free Rotating Plain Pulley at Infeed – Gravity Weighted

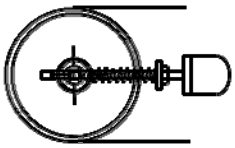
Options:



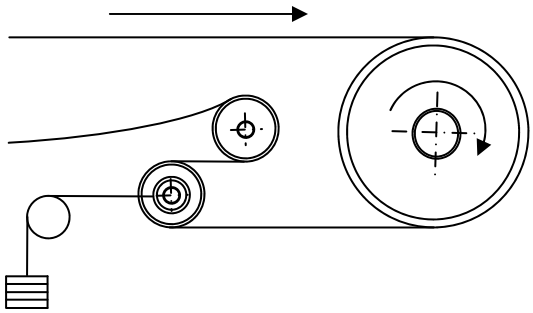
(Screw Adjustable)



(Pneumatically Adjustable)

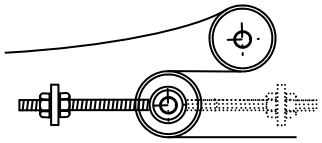


(Spring Adjustable)

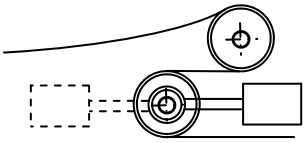


Free Rotating “S” Wrap Take-Up-Gravity Weighted

Options:



(Screw Adjustable)



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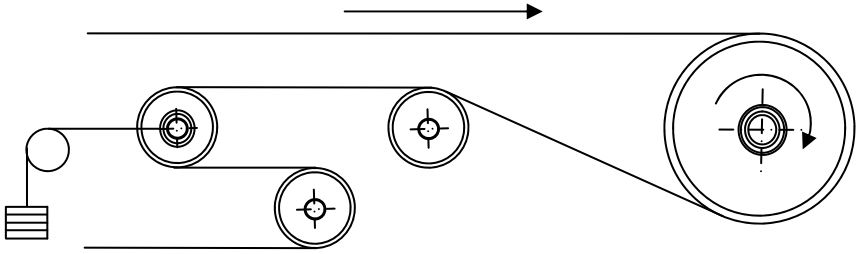
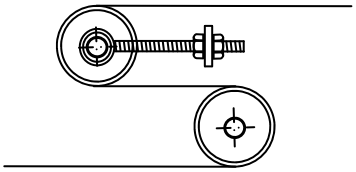
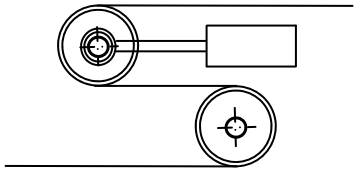


Alternative Free Rotating “S” Wrap Take-Up-Gravity Weighted

Options:



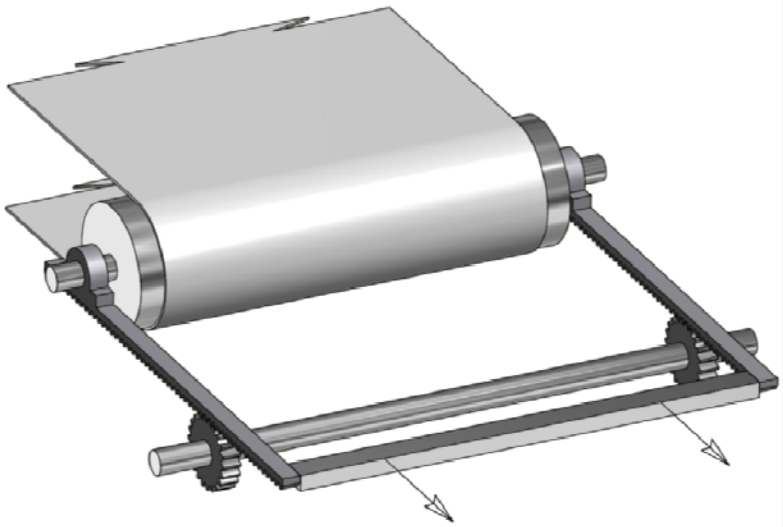
(Screw Adjustable)



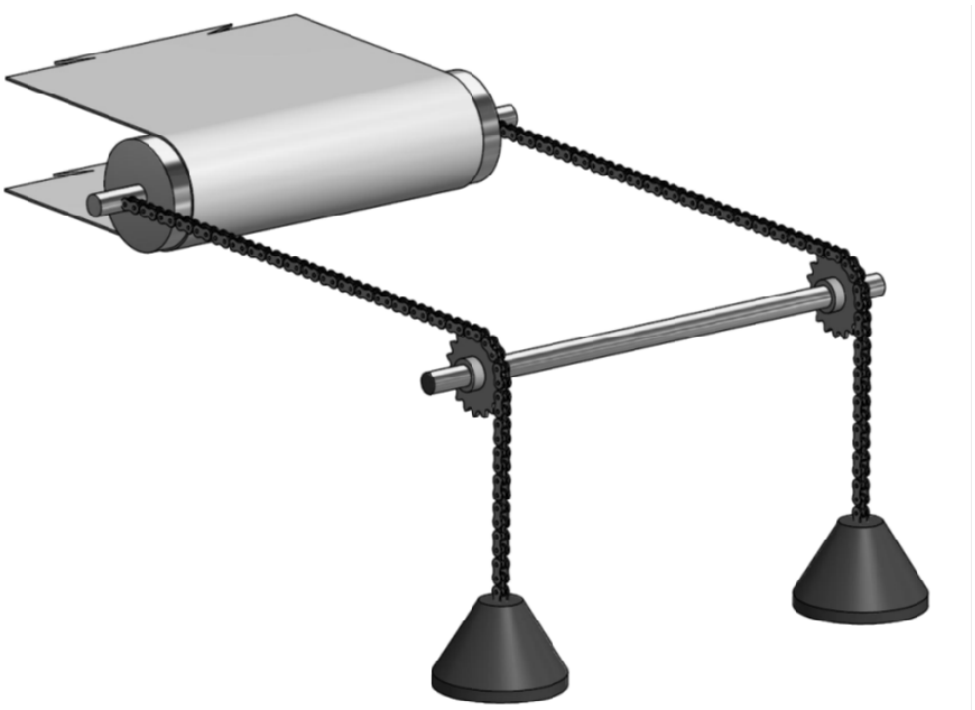
(Pneumatically Adjustable)

Force Activated rack & pinion arrangement (pinions keyed to shaft

Note: Where the belt take-up operates automatically (gravity/pneumatic/spring operated) you should ensure that the amount of take-up roller adjustment is the same on each belt edge. This can be designed into the system by using a rack & pinion or chain & sprocket arrangement (see below) that act evenly at the take-up roller position, or similar.



Gravity weighted chain sprocket arrangement (sprockets keyed to shaft).

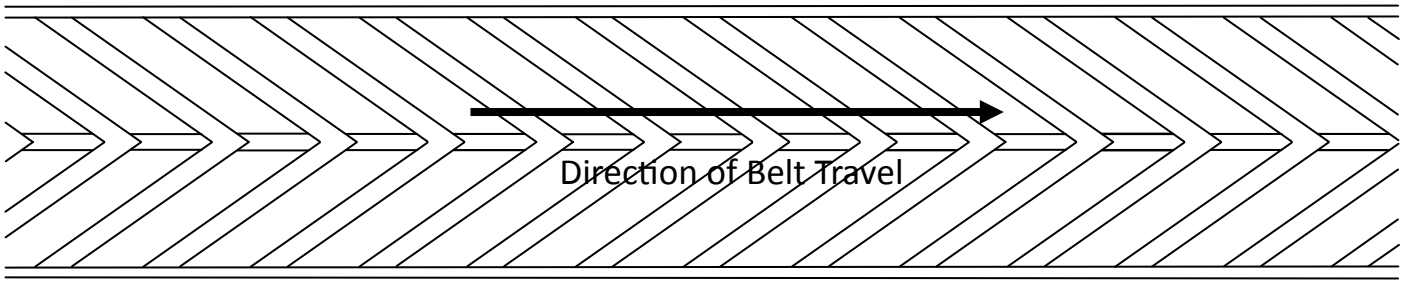


Belt Support—Carry Way

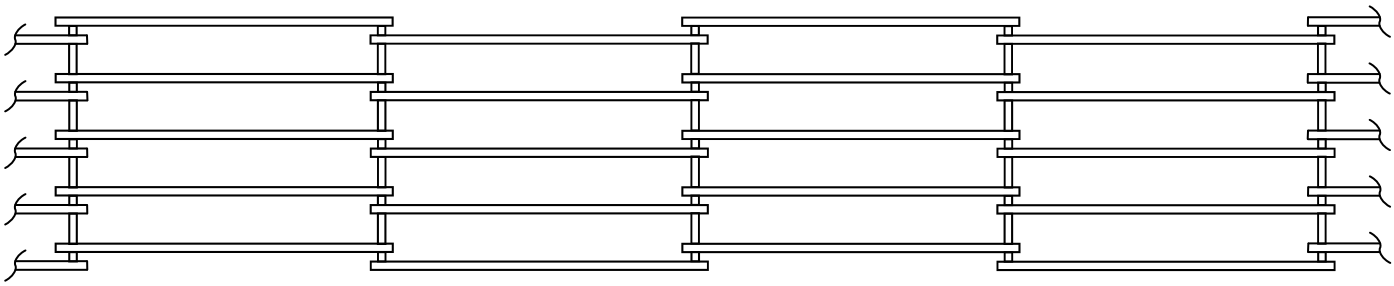
Multiple Free Rotating Roller Belt Support

Note: All support rollers should be free to rotate and set horizontally and perpendicular to the centre line of the conveyor / belt. The roller spacing should be sufficiently close to ensure that the belt lies flat without the need for increased belt tension. The roller diameters normally vary between 50mm and 150mm dependent upon on the width of the belt and the mesh size. In general the smaller the mesh cross wire pitch the smaller the roller diameter and conversely when the cross wire pitch is large then the greater the roller diameter needs to be. However they should have sufficient diameter to suit the width of the belt and application without deflection.

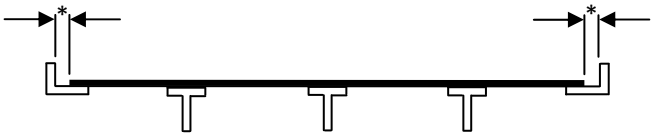
Chevron Pattern Wear Strips



Straight In-line Staggered Wear Strips



Flat Bed Support



Wear Strip Rail & Edge Support

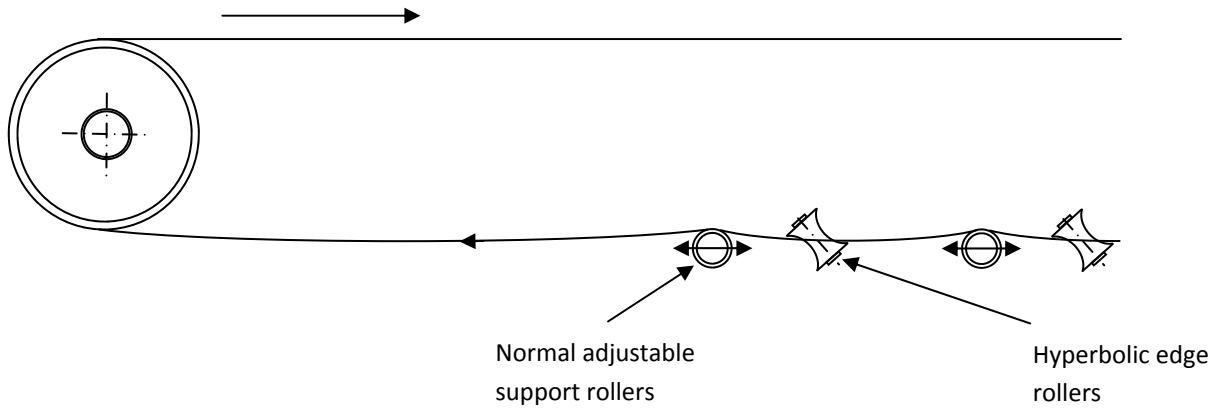
* Ensure adequate clearance between the belt edge and any frame construction to prevent belt edge contact during use.

Note: It is recommended that all wear strip surfaces are faced with low friction material where possible.

Belt Support—Return Way

All support rollers should be free to rotate and set horizontally and perpendicular to the centre line of the conveyor / belt. In general diameters vary between 50mm and 150mm. The diameter is governed by the cross wire mesh pitch. The smaller the mesh pitch then the smaller the roller diameter and conversely the larger the pitch the larger the roller diameter. However they should have sufficient diameter to suit the width of the belt and application without deflection. The spacing can vary between 900mm and 3mtrs, however to limit the catenary belt sag between rollers and belt tension minimise the spacing. The catenary belt sag between rollers also acts as a natural belt take-up mechanism.
Suggested roller mounting: One end to have a pillow block bearing placed on vertical plane with the other end placed in a horizontal plane – both to be adjustable using slots in the conveyor frame structure. This allows the rollers to be adjustable in both vertical and horizontal planes to ensure true alignment of the rollers and the ability to adjust the rollers as necessary to track the belt. For belt tracking procedure refer to the "Friction Driven Mesh Belt Tracking" within the Support Info tab.
It is also possible to use a combination of chevron/straight wear strips & free to rotate rollers however you should ensure that there enough length at the infeed underside to accommodate the tracking adjustment rollers.

Belt tracking can also be achieved by use of Hyperbolic rollers placed at the edge of the belt as shown in the diagram below but must only be used when the normal tracking by adjustable return support rollers cannot be used. Hyperbolic rollers give a longer contact face with the edge of the belt versus standard vertical rollers which only have a single point of belt edge contact. Belt edge wear may increase with the use of hyperbolic rollers due to the different roller circumferential contact points with the roller.



Roller Guidelines

Drive & Idle Infeed Roller

These should be of plain parallel design without edge flanges and have an overall minimum width as follows:-

Up to 1500mm wide belt: Belt width +100mm
Over 1500mm wide belt: Belt width +200mm

The suggested diameters of rollers under tension with at least 30° of contact wrap are as follows:-

Process conveyors up to 815°C (belt no hotter than 260°C when wrapped around any roller):
Minimum: 15 x the effective cross wire pitch of the belt or larger (low loaded, short, low tension systems).
Recommended: 30 x the effective cross wire pitch of the belt or larger (medium to higher loaded belt systems).

High temperature process conveyors (815° to 1150°C):
Recommended: 50 x the effective cross wire pitch of the belt or larger.

Note: These rollers should be as large as practically possible which will maximise the belt contact with the rollers. This in turn will minimise the necessary belt tension to maintain a non-slip drive. Low belt tension will prolong belt life. This will also create a more positive belt tracking arrangement.

Take-up & Snub Rollers

These should be of plain parallel design without edge flanges and have an overall minimum width as follows:-

Up to 1500mm wide belt: Belt width +100mm
Over 1500mm wide belt: Belt width +200mm

The suggested diameters are as follows:-

Process conveyors up to 815°C (belt no hotter than 260°C when wrapped around any roller):
Minimum: 5 x the effective cross wire pitch of the belt (low loaded systems).
Recommended: 10 x the effective cross wire pitch of the belt or larger (medium to higher loaded belt systems).

High temperature process conveyors (815° to 1150°C):
For belts where the cross wire pitch is greater than 7.5mm: 300mm minimum
For belts where the cross wire pitch is less than 7.5mm: 152mm minimum

Note: Where the take-up roller is at the infeed end of the conveyor refer to the "Drive & Idle Roller" conditions above.

Roller Limitations

- Where conveyor design or process limit the roller diameter it will be necessary to establish the cross wire pitch by means of the limitations on roller diameter.
- The roller diameters above are suggested only to prevent damage to the belt and do not necessarily indicate the diameter for proper belt drive in terms of the application. Contact Wire Belt Technical Sales for a full assessment of your proposed conveyor application.
- Always maximise the roller diameter where possible to ensure the best performance from the belt.
- Do not use flanged rollers in any part of the belt circuit as a means of belt tracking. The belt will climb the flanges and cause permanent belt edge damage.
- Do not use crowned rollers as this will stretch the belt centre causing permanent damage.
- As many Cordweave belts are woven tightly flexibility is limited. Please contact Wire Belt Technical Sales to confirm the appropriate roller sizes to suit.

Roller Material

- Steel
- Steel with high friction material – brake lining materials or similar.
- Steel with rubber, neoprene or similar lagging material having a shore hardness of ≈60.

Conveyor Frame Construction

- Do not allow sharp framework parts to come into contact with the edges of the belt.
- Ensure adequate clearance between the edges of the belt and any near framework parts. As a general rule the longer the conveyor the greater the clearance needs to be.
- Do not track the belt with static edge guides. Tracking is achieved by adjustment of the belt support rollers – see "Friction Driven Mesh Belt Tracking" within the Support Info tab of the website.
- Ensure all rollers are horizontally set and at 90° to the line of travel.
- Any bed support for the belt should also be horizontally set with the surface aligning with the surface of the adjacent roller(s), or lower.
- Always taper down the leading edges of any belt support wear strips/bed.

If in any doubt please contact Wire Belt Technical Sales Team