



**NS  
POWERTRANS  
PVT.LTD.**

**EXPERTS IN TRANSMISSION ENGINEERING**



**Industrial Timing Belts  
Pulley & Metal parts**

**Going ahead with an  
Innovative Thinking**



# Thermoplastic Polyurethane

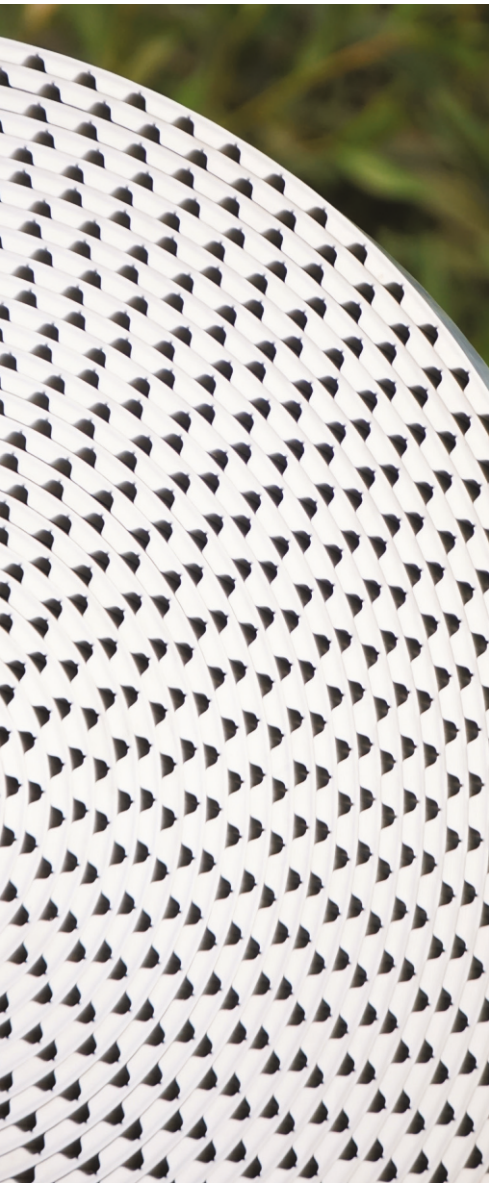
## Linear Timing belt

Long Length or Open end timing belts with various type of Pitch with different features are available. General shore hardness of belts is 92 ShA, Parallel S & Z type steel cord, Kevlar cord, hybride cord and various type of construction are available according to application request of breaking strength, abrasion resistance, Wear resistance and Temperature ranging of belts is up to 80 Degree Celsius.



### Available pitches

Metric Pitch	T5, TT5, T10, T20, AT5, AT10, AT20,
Metric Pitch	HTD 3M, HTD 5M, HTD 8M, HTD 14M, RPP5M, RPP8M,
Imperial Pitch	XL, L, H,



This belts are generally used for Accurate type of Conveying Application, Linear Application, Lifting, Reverse n Forward mechanism etc.

Endless Jointed belts are produced according to customer request in available width and Length, tolerance we follow of international standard according to possibility in Polymers.

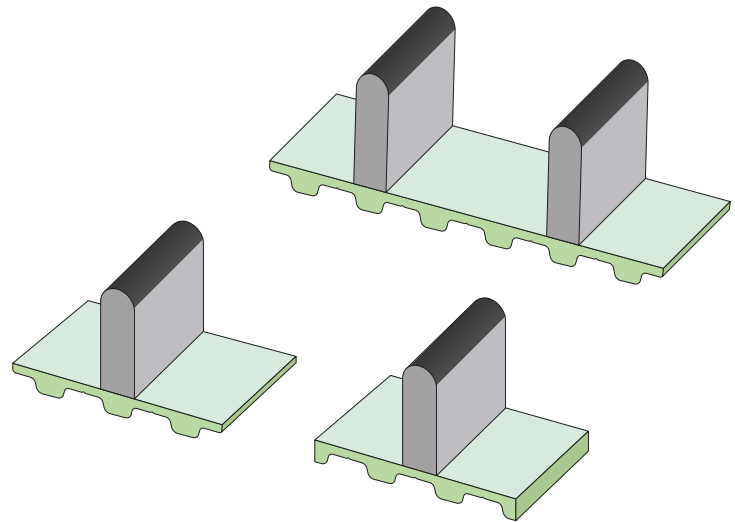
TPU Linear belts are reworked with additional feature of various type of extra thickness coating, for example PU in different Shore hardness, PU AVAFC, Ribs, Fishbone, Hypalone, PVC Super Grip (Rough top) for materials conveying applications. Also Rubber polymers are used for coating in different shore hardness, the kind of coating help in application to increase co-efcient of friction while conveying of materials.

Nylon Fabric also can be used on top side (NFB/ PAR) of belts as well as teeth side of belts (NFT/ PAZ), Nylon fabric are used for better abrasion resistance n better life of belts.



Different kind of cleats profile are used to x with belt for materials handling application. The materials of Profile are generally used of Thermoplastic Grade, which can be x with belts by High frequency technology. Profile request is according to customer need. It also can be x by mechanical reworking false tooth technology.

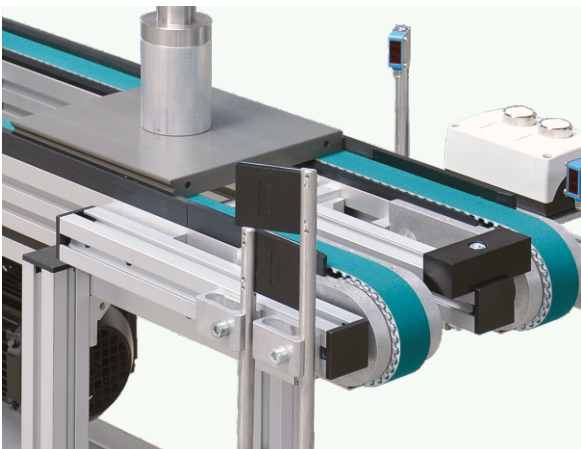
Mechanical Pin spliced joint belts also can be possible. Generally, it is used for easy- quick timing belts installation in specic conveying application; not for power transmission



## Type of Applications

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- Glass Industries
- Tyre Industries
- Automotive Industries
- Automation N Robotic Industries
- Textile Screen printing
- Auto doors
- Ceramic Application
- Note Book N Paper Industries
- Reverse N Forward applications
- Linear Application



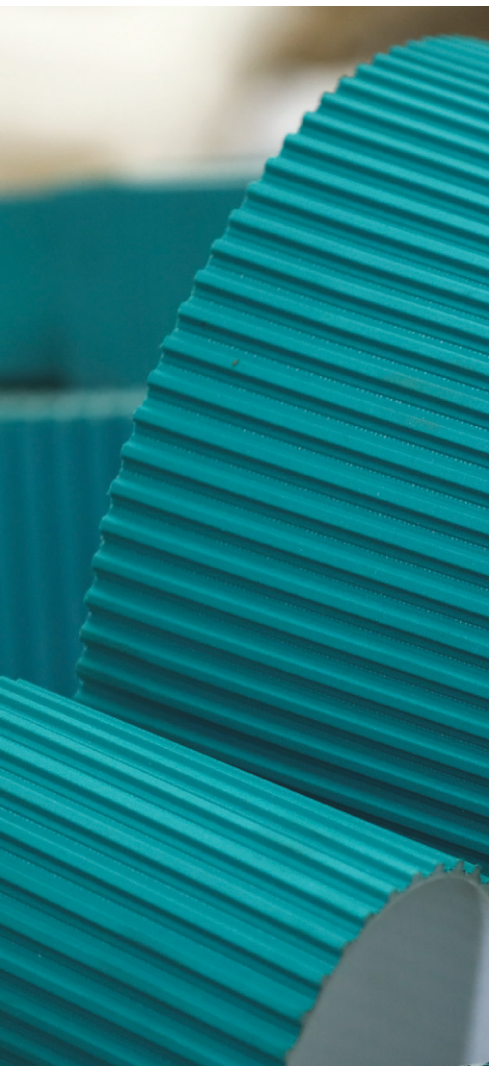
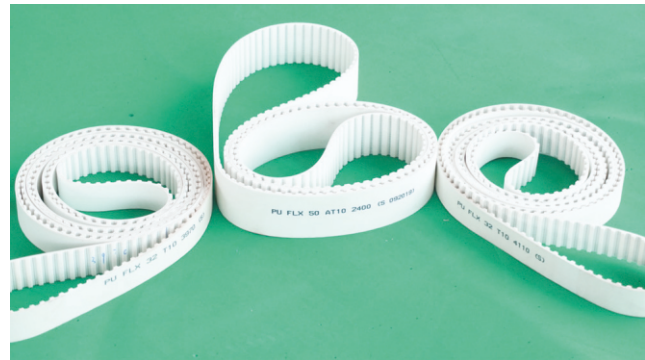
# Thermoplastic Polyurethane

## Truly Endless timing belts

Belts are made from Thermoplastic materials with spiral winding steel cord by extrusion process. Similar to Linear belts the various Metric T5, T10, T20, AT5, AT10, AT20) Curvilinear pitch (HTD 5M, HTD 8M, HTD 14M) and Imperial pitch (XL, L, H) are available in these belts, TPU materials of 92 ShA are used in belts, Temperature ranging are up to 80 Degree Celsius.

Generally, these belts used for power transmissions with very good running characteristic, Low elongations. Nylon fabric (NFT) of teeth side also can be possible for low frictions, better abrasion, which give better stability, low frictions, Low noise, smooth tooth engagement.

TPU Truly endless belts are reworked with additional future of various type of extra thickness of coating, for example AVAFC, Ribs, Fishbone, Hypalone, Super Grip (Rough top) for materials. Also Rubber polymers are used for coating in different shore hardness. Extra coating can be x by either Molding process or Gluing Technique.

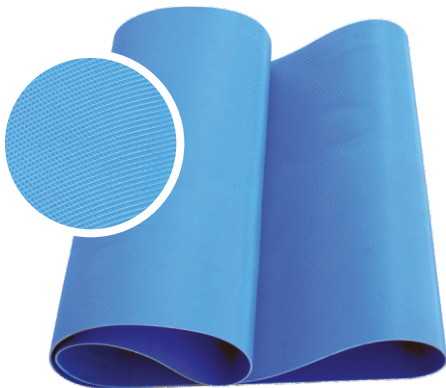


## Type of Applications

- Glass Industries
- Tyre Industries
- Textile Industries
- Ceramic Application
- Power Transmission Industries
- Stone Industries

## PVC-PU Conveyor Belts

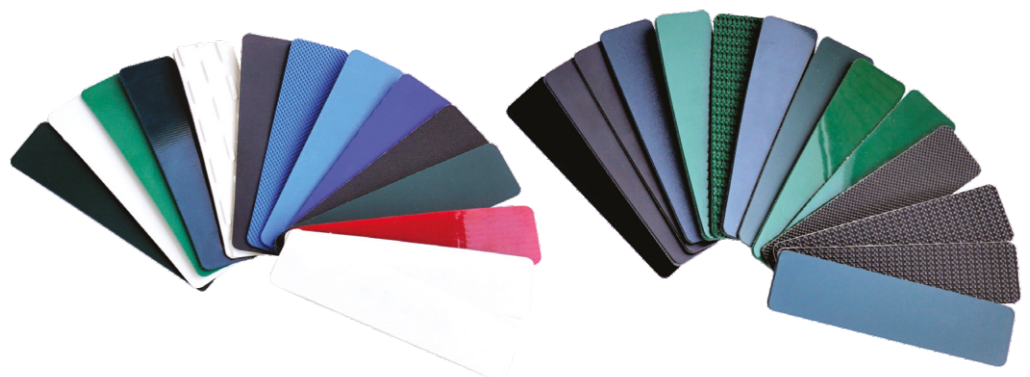
PVC-PU Conveyor belts are generally used for materials handling, products conveying in wide industrial segments. PVC-Polyurethane belts are made from Thermoplastic type of materials. We offer conveyor belts having characteristics of Abrasion- tear resistances, resistance to chemical according to norms, Low elongations etc. The food-grade range complies with the most stringent hygiene standards.



**Conveyor belts are also suitable for systems - inclined, bi-directional, swan-neck or z-type and troughed conveyor and can be fitted with guides, proles, sidewalls, perforations and other accessories.**

State of art machinery to perform all required operations in workshop including Press for vulcanizations, modern high frequency welding machine for additional features, Skiving, cutting, Grinding and so on for fabrications of endless belts according to customer's applications. Specialize belts can be supplied with sidewall, guide, proles fitted by means of high frequency, hot air bonding process, and mechanical fasteners which ensures very good product appearance .

## Patterns available for various applications



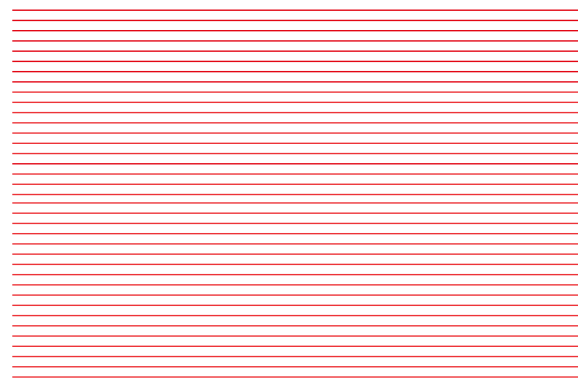
## PVC- PU Conveyor Belts Properties

- High and low temperature resistance
- Food compliant according to norms
- Abrasion, Oils, Chemical resistance
- Surface coefficient of friction
- According to request
- Smooth and different proled surface
- Low Noise
- Antistatic and non-conductive
- Very good transverse rigidity
- Dimensional accuracy

## Applications are

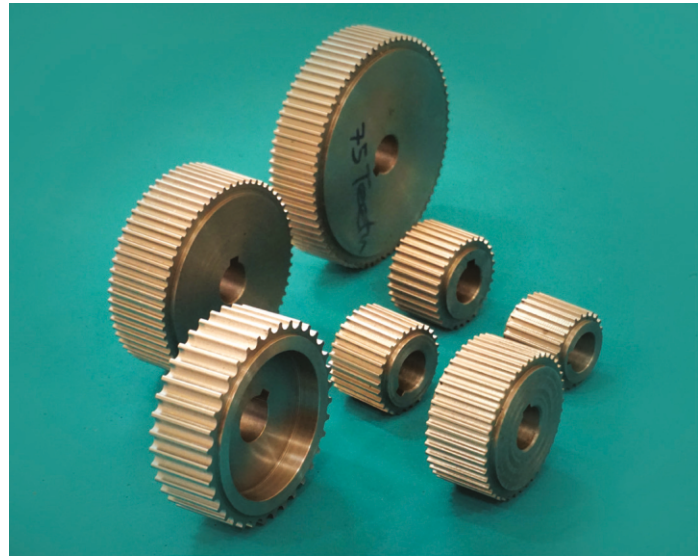
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- Food industry (bakery, meat and seafood, confectionary, dairy)
- Fruit and vegetables
- Paper and box folding industry
- Printing and publishing
- Postal automation
- Logistic (airports, materials handling, commercial distribution)
- Textile industry
- Packaging and wrapping
- Chemicals and pharmaceuticals
- Woodworking and furniture
- Mechanical, metallurgical and automobile
- Marble, granite, brick, ceramics and glass
- Sports equipment
- Renewable energy



## Pulley overview

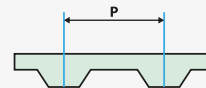
'NS POWERTRANS' set to producing program of Metal shaft, pulley & its accessory. Since industry standards have its own way of representations, each manufacturer has own manufacturing standard. For better life of belts - easy handling of drive, it is necessary to meet geometry of belts and pulley according to ISO standard in order to get better performance of drive. We offer precision made to close tolerance of standard proled pulley, Shafts together with different specied of mechanical drive metal component. Yderwidth offers customized pulley with unlimited design possibility & its component which allows for additional features according to applications request.



### Imperial Pitches

(Trapezoidal teeth shape)

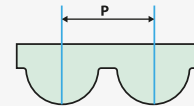
- o MXL, XL, L, H, XH



### Metric Pitches

(Curvilinear teeth shape)

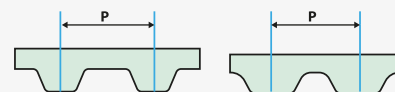
- o 2M, 3M, 5M, 8M, 14M



### Metric Pitches

(Trapezoidal teeth shape)

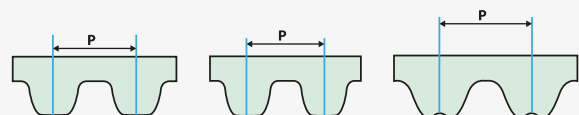
- o T2.5, T5, T10, T20, AT3, AT5, AT10, AT20



### Metric Pitches

(Semi Curvilinear teeth shape)

- o Power Grip Type (2M, 5M, 8M, 14M)
- o Polychain Type (8M, 14M)
- o RPP Type (5M, 8M, 14M)



Involute tooth geometry dimensions, groove angle is slightly changed while no. of teeth changes in similar type of pitch.

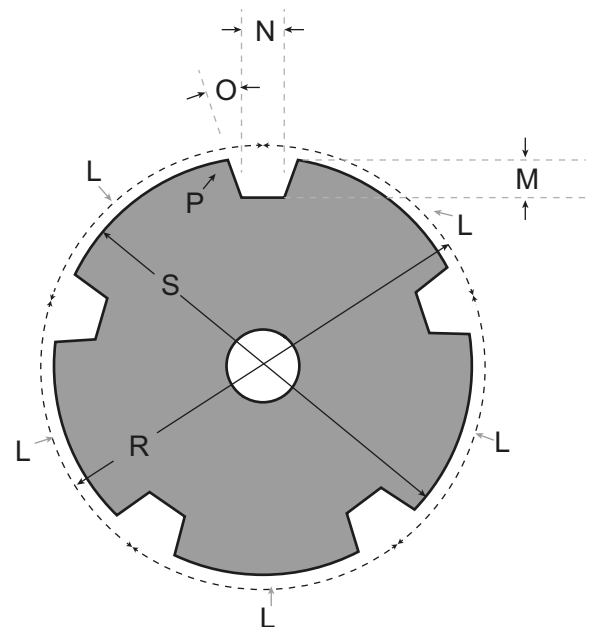
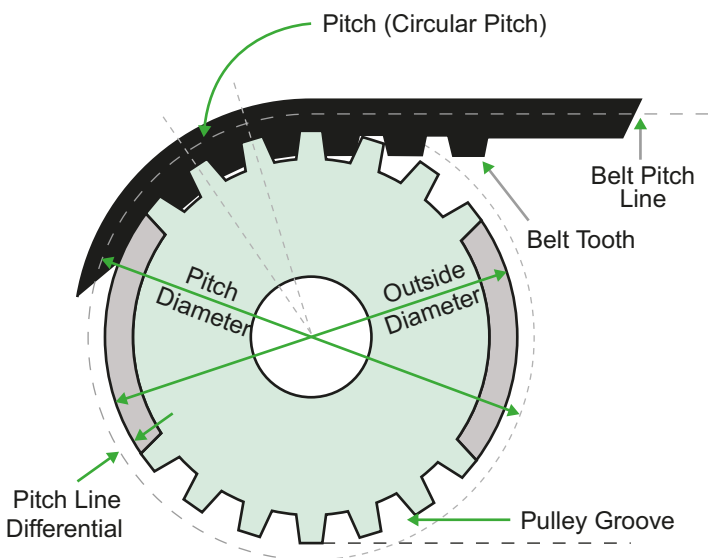


# Timing Pulley Terminology

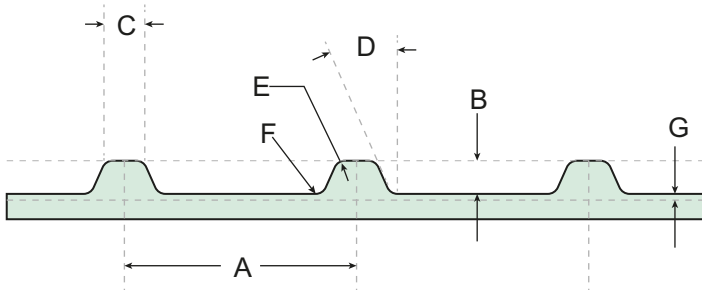
Timing Pulley & timing shafts have basic terminology,

- Type of Profile
- Pitch
- No. of Grooves
- Belts width to be used

Pitch is the distance between centers of corresponding two teeth and it is measured on the pitch circle diameter, Pitch circle of pulley coincides with pitch line of belts engaging with it. The pulley pitch diameter is always greater than its outside diameter. OD of sprockets should be according to standard for better synchronous of teeth. Timing pulley need to produce as per type of belt to be used in Mechanical drive. The profile Geometry of Sprocket should be the same of Synchronous belt to be used.



- L Circular Pitch of Groove
- M Minimum Depth of Groove, Including Clearance
- N Width of Groove at Minimum Depth, Including Clearance
- O Pressure Angle
- P Top Radius of Groove
- R Pitch Diameter (Always  $> s$ )
- S Outside Diameter



- A Pitch of Teeth
- B Depth of Teeth
- C Width at Bottom of Teeth
- D Pressure Angle
- E Radius at Bottom of Teeth
- F Radius at Top of Teeth
- G Pitch Line Differential



## Type of materials used for constructions

- Aluminium
- Steel
- Stainless steel
- Cast Iron, Ductile Iron, Gray Iron
- Cast Nylon, PP



## Surface heat treatment

### Advantage of surface treatment/ coating of Pulley

Surface heat treatment process will increase...

- Corrosion-Chemical resistance
- Surface hardness for better abrasion
- Surface nish resulting in better belt life
- Aesthetic looks



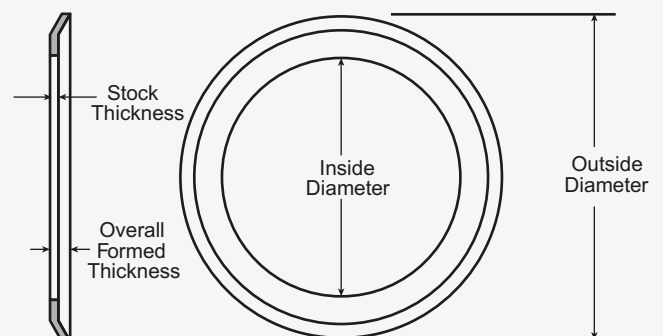
## Type of Heat treatment

- Clear Anodize
- Black Anodize
- Black Oxide
- Zinc Passivation
- Electroless Nickel
- Clear hard coat

## Use of anges on pulley

According to request of customers, Flanges are needed in order to keep the belt on the pulley due to tracking characteristic of belt even on the best aligned drives, belts wide off to edge of pulley, anges will prevent belts to ride off.

- In Two pulley drive system, minimum two anges are required either on one pulley or one ange on each pulley either side.
- On the drives with more than two pulleys, minimum ange requirement are two on every other pulley or one ange on every pulley either side around whole system.



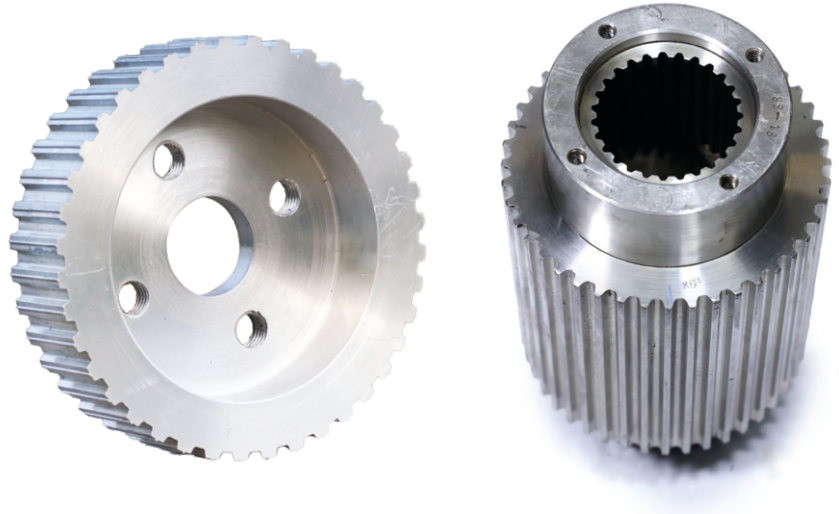
## Type of materials for constructions

- Steel
- Stainless steel for SS pulley
- Aluminium
- Cast Nylon

## Customized pulley

Made to order pulley can be customized according to suitable drive applications, it need to be precisely manufactured under certain tolerances with static balance.

The possibility of materials of constructions, surface heat treatment and other parameters as per requirement of applications.



## Pulley Tolerances

NS POWERTRANS suggests that Pulley are tailor made, custom products, which should have precise to close recommended tolerances. Inaccurate manufacturing pulley resulted in poor belts drive performances. Permissible tolerances details are shown in below tables. Important is working surface of pulley teeth should be free from any kind of defect.

Bore Diameter Tolerances, MM		
Bore DIA	DELTA +	DELTA -
- 25	0.0250	0.0000
26 - 50	0.0380	0.0000
51 - 74	0.0500	0.0000
75 +	0.0620	0.0000

Outside Diameter Tolerances, MM			
OD		DELTA +	DELTA -
-	25.40	0.0000	0.050
25.50	- 51.00	0.0000	0.050
51.10	- 100.00	0.0000	0.080
101.00	- 175.00	0.0000	0.080
176.00	- 300.00	0.0000	0.10
301.00	- 500.00	0.0000	0.10
501.00	+	0.0000	0.15

PITCH Accuracy Tolerances, MM		
OD mm		DELTA +/-
-	25.40	0.03
25.50	- 51.00	0.03
51.10	- 102.00	0.03
102.10	- 178.00	0.03
178.10	- 305.00	0.03
305.10	- 508.00	0.03
508.10	+	0.03

ECCENTRICITY	
Outside Diameter, MM	Total Eccentricity, MM
Up to 100	0.10
100 - 250	0.001 per mm of OD
Over 250	0.25 + 0.0005 per mm of OD > 250 mm

For any further clarification or more details, please connect with Yderwidth technical team:  
sales@nspowertrans.com

## Drive tensioners

Mechanical belt drives need to work under proper tension to ensure better performance of drive and to avoid tooth jumps-slippages of belts in drive pulley. When the center distance is not adjustable or FIX, IDLERS are generally used to apply the tension on belts.

IDLERS should be located on the slack side of belt drive. In two ways, we can x idler, Inside- Outside of belts drive. We recommend, for Inside idlers grooved pulley are used up to 40 nos. of teeth. In case of largest diameter, Flat uncrowned idlers are used. Most important is Inside Idler diameter should not be smaller than the smallest pulley in the drive system.

For, Outside/ Backside idlers should be at and uncrowned. Diameter should usually not be smaller than smallest pulley in the drive system. Spring loaded tension are also used on the slack side.

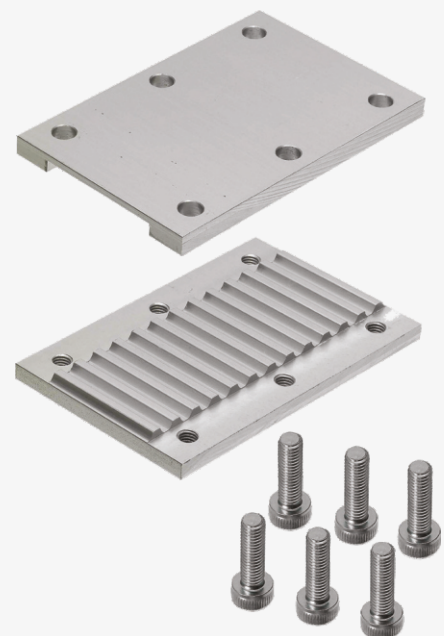


## Fixing clamp plates

Fixing plates are often used in motion control linear applications to x both ends of open linear belts. According to load to be moved, we have to x belt's no of teeth with xing plate, ideally minimum 8 nos of teeth are required to handle stress - wear out of belt.

Mainly, steel reinforced polyurethane belts are used in motion control linear applications. The plates are delivered in aluminium alloy unless customer mentions in other type of materials. All metal plates are machining according to precise in advanced turning, milling machine with specially developed ZERO backless milling cutter. Plates will be supplied with xing holes n fasteners.

We also produce custom made xing plates according to application need, with other components to x with object.



## Type of Prole

**T5, T10, AT5, AT10, HTD5, HTD8M, HTD14M, H Type, L Type, other on request.**

For any further clarification or more details, please connect with Yderwidth technical team:  
[sales@nspowertrans.com](mailto:sales@nspowertrans.com)

## Making the shaft connections

### With bushing

Securing a belt pulley to a drive shaft often seems like such a general activity, but before installing belt drive component, we have to understand about various type of mounting devices used to attach pulley to shaft. It helps us to prevent installation error, drive component will not be damaged and we save downtime.



### Tapered bushing (keyway type)

A common device for attaching pulley to motor, gearbox, shaft is keyed tapered bushing. Materials of construction generally we use Gray Iron, Steel, Ductile Iron, or SS. In this type of bushing, a tapered bore in the pulley fits over a mating tapered outside diameter on the bushing. To attach pulley, we have to tighten mounting screws, hence tapered surface of bushing and pulley mating together which creates a wedging action between bushing and pulley, and between bushing and driver shaft, the bushing has a radial slot or saw cut that sets it tightly grip shaft under wedging action. The gripping force between bushing and shaft is comparable to that of press fit, so the bushing transmit full torque and resist slippage. To remove a pulley, we have to use removal screw to separate pulley and bushing without damaging shaft or drive component.

### Flanged type bushing

**This type of bushing is well suited for high power drives subject to high vibrating loads.**

#### Advantages

Long bore length minimizes axial runout.

Symmetrical hole pattern and saw slot opposite set screw provides good balance.

Set screw keeps key in place, which is good for vertical shaft and for high power transmission drives with higher vibrating loads.

#### Disadvantages

Flange increases weight and requires more space for mounting.

Some pulley sizes and shapes can only be mounted one way.

### Flangeless type bushing

**They are also used in many types of hygienic industries, for easy to clean surface which is generally made from S.S.**

#### Advantages

Larger taper angle permits tightening pulley with less displacement along the shaft. This makes it easier to accurately locate pulley on the shaft where precise position is required.

Safer operation due to lack of protruding screw heads. Full length of bushing supports the pulley.

#### Disadvantages

Cannot be installed as quickly in smaller sizes.

There is no set screw to lock the key in place.

## Shaft keyways and keys

During assembly a Key is inserted in to machined keyways in the bushing and shaft to lock them together. The Key are generally made from Bar stock and available in Square – Rectangular Tapered shapes.

An improperly fitted keys cause Key or hub failure, therefore to ensure a snug fitting of key between shaft and hub, width, height dimension of both key and keyway must be held under tolerance according to standard.

## Keyless bushing

Besides the keyed type bushing, there are several type of keyless locking device that also use the tapered wedge principle. These keyless bushing convert clamping action between inner and outer rings in to radial pressure that locks the device to the shaft and pulley.

The main advantage of Keyless bushing is their ability to transmit high torque, but they are available in limited number of bore sizes and tend to cost more than keyed types bushing. Many of these keyless bushing are found in industrial applications where high axial forces or shocks occur. Some type can be used over damaged shaft keyways, but must be carefully locked and centered. Others require a smooth shaft without a keyway.

Keyless bushing applies locking pressure uniformly around the shaft circumference, thereby enabling the use of hollow shaft for weight reduction, as long as the shaft has adequate strength.

These bushing also let you use solid shaft that are smaller in diameter but equal in strength to keyed shafts. The ease of positioning these bushing in axial and angular directions makes installation and removal a fast and simple operation.

GENERAL CAUSES OF PREMATURE BELT FAILURE IN POWER TRANSMISSION		
TYPE OF FAILURE	CAUSES	CORRECTIONS
Irregular wear of belts, Shear of belts teeth	Profile of pulley are not as per norms, incorrect pulley diameter/lts design-mfg. Defect, over or under design of drive, Excessive tension of belt, less than 6 teeth in mesh	Check pulley diameter, Geometry of teeth profile, Corrective design, Reduce belts tension or corrective belt tension, In case of teeth in mesh correction-use smaller diameter of pulley, Increase width of belt or rated power of belt
Excessive drive noise, Irregular running of belts	Misalignment of mechanical drive, Wrong selection of pulley diameter, Excessive load to be transmitted, tensioning of belt	Align pulley and belt drive, Increase pulley diameter, Reduce tension, Check geometry of pulley teeth profile
Elongation of belt	Shaft of pulley bearing not fixed correctly, More tension on belt, Smaller width of belt than required rated power of belt	Fix bearing properly with pulley or shaft, Restore centre distance of mechanical drive, Use proper belt according to application need
Wearing of pulley teeth	Excessive tension of belt, Materials of construction of pulley, Geometry of tooth profile, Improper surface heat treatment of pulley	Reduce tension of belt, Check pulley geometry and tooth profile, Use proper surface heat treatment of pulley



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