### QD®* Style Bushings

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Price</th>
<th>Weight (lb)</th>
<th>Series</th>
<th>Torque Capacity (lb·in)</th>
<th>Bore Size (in)</th>
<th>Dimensions (in)</th>
<th>Cap Screws</th>
<th>Material*</th>
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<tr>
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<td>$11.00</td>
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<td>JA</td>
<td>1750</td>
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<td>JA</td>
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</tbody>
</table>

*QD* is a registered trademark of Emerson Electric.

* S = Steel

Note: Stock bore sizes shown. Bushings may be re-bored up to the maximum size listed. Maximum bores may require a shallow keyway and rectangular key.

www.automationdirect.com/power-transmission
Synchronous Drive Components

Timing (Toothed) Belts
SureMotion timing belts are an excellent choice for many industrial applications. Several pitches and widths are available to cover a wide range of power transmission requirements.
- Neoprene with fiberglass reinforcement
- Polyurethane with polyester reinforcement (MXL pitch only)
- MXL (Mini Xtra Light) pitch = 0.080"
- XL (Xtra Light) pitch = 0.200"
- L (Light) pitch = 0.375"
- Range from 30 - 160 teeth
- 0.25, 0.375, 0.50 and 1.0-inch widths
- Timing belts start at $2.00 (60XL025NG)

Timing Pulleys
Both aluminum and steel pulleys (sprockets) are available with a smooth bore and setscrew. Steel pulleys also available to fit Taper-Lock or QD style drive bushings. Bushings sold separately.
- Aluminum, steel, cast iron, or ductile iron
- MXL pitch = 0.080" with 1/4" width
- XL pitch = 0.200" with 1/4 or 3/8 inch width
- L pitch = 0.375" with 1/2 or 1 inch width
- Plain bores and TL or QD type bore
- Timing pulleys start at $5.25 (APB10XL025BF-250)

Tapered Drive Bushings
Bushings allow the connection of pulleys to different sized shafts.
- TL (Taper-Lock) and QD (quick detach) types are available
- Steel
- Standard bore sizes from 0.50 to 1.375 inch
- Taper-Lock® bushings start at $10.50 (TL-1108-0500)
- QD® style bushings start at $8.75 (QD-JA-0500)

*Taper-Lock® is a registered trademark of Reliance Electric
*QD® is a registered trademark of Emerson Electric

For latest prices, please check AutomationDirect.com.

For more information, visit AutomationDirect.com.
Timing pulleys, bushings, and belts allow you to change speed and torque while connecting mechanically rotating components.

- Select pulley sizes in order to accomplish the speed or torque change that you need.
- Bushings allow you to connect the same pulleys to different sized shafts, or vice versa.
- Synchronous drive belts and pulleys utilize teeth to prevent slippage and unwanted speed variations.

Note: For pulley speeds in excess of 6,000 RPM, pulleys should be dynamically balanced.

**Drive Component Selection**

1. Determine required torque (ft·lbs) and rpm of driven shaft.
2. Determine design horsepower:

\[
\text{DHP} = \frac{T \cdot N \cdot sf}{5,252}
\]

Where:
- \(T\) = torque (ft·lb)
- \(N\) = rpm
- \(sf\) = service factor per table

<table>
<thead>
<tr>
<th>Service Factors</th>
<th>&lt;8hr per day</th>
<th>8-16 hr per day</th>
<th>Continuous</th>
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<tbody>
<tr>
<td>Smooth Running</td>
<td>1.0</td>
<td>1.2</td>
<td>1.4</td>
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<tr>
<td>Light Shock Loads</td>
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</tr>
<tr>
<td>Heavy Shock Loads</td>
<td>1.7</td>
<td>1.9</td>
<td>2.1</td>
</tr>
</tbody>
</table>

3. Determine Pitch (MXL XL or L) and belt width required by reading Design Horsepower Chart.
4. Select driver and driven pulleys to match desired speed or torque change.
5. Determine belt length per belt length calculation.

Note: AutomationDirect provides an online configuration tool to assist with pulley and belt sizing. See: [www.automationdirect.com/selectors/beltandpulley](http://www.automationdirect.com/selectors/beltandpulley)
Belt Length Calculations

Where:

\[ L = 2C + 1.57(D + d) + \frac{(D-d)^2}{4C} \]

Where:
- \( L \) = Length of belt at pitch line (in inches)
- \( C \) = Center distance (in inches)
- \( D \) = Pitch diameter (in inches) of large sprocket
- \( d \) = Pitch diameter (in inches) of small sprocket

Drive Component Selection Continued

**Design Horsepower Chart**

MXL = 0.080” Pitch
XL = 0.200” Pitch
L = 0.375” Pitch

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