Selection of Power Transmission Efficiency

The table of transmission performance in this catalogue (P. 2818) is based on minimum load variation. The transmitted kW shown in the table should be corrected as follows depending on the actual magnitude of load variation.

<table>
<thead>
<tr>
<th>Impact Type</th>
<th>Prime Motor Type</th>
<th>Torque Motor</th>
<th>Internal Contact/Engine</th>
<th>With Fluidic Mechanism</th>
<th>With Fluidic Mechanism</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smooth</td>
<td>x1.0</td>
<td>x1.0</td>
<td>x1.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transmission</td>
<td>CP(No.of links)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>with Material</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impact</td>
<td>x1.3</td>
<td>x1.2</td>
<td>x1.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transmission</td>
<td>CP(No.of links)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>with Large</td>
<td>x1.5</td>
<td>x1.4</td>
<td>x1.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impact</td>
<td>CP(No.of links)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Application Coefficient Table**

The power transmission efficiency table (P.2818) is based on minimum load variation. The transmitted kW shown in the table should be corrected as follows depending on the actual magnitude of load variation.

1. Operating Conditions
   - When selecting roller chains, the following 7 parameters should be taken into account.
     1. Machine to be used
     2. Impact Type
     3. Power Transmission
     4. Prime Motor Type
     5. Diameter and Rotary Speed of High-Speed Shaft
     6. Diameter and Rotary Speed of Low-Speed Shaft
     7. Inter-Shaft Distance

2. Application Coefficient
   - Select the application coefficient from the application table (Table 1) that is appropriate for the load to be driven and the prime motor type.

3. Corrected Power Transmission (kW)
   - Correct the power transmission (kW) using the application coefficient.
   - Single Chain...Corrected Power Transmission (kW) = Power Transmission (kW) × Application Coefficient
   - Multiple Chains...Select the appropriate coefficient from the table multiple-chain power transmission coefficients (Table 2).

4. Chain and Number of Sprocket Teeth
   - Using the selection guide table (Table 3) for the power transmission efficiency tables, select the chain and the number of small sprocket teeth that satisfy the rotary speed of the high-speed shaft and the corrected power transmission (kW).
   - The chain pitch should be as small as possible, as long as the required power transmission efficiency is achieved.
   - This should minimize noise and ensure smooth transmission of power.
   - If a single chain does not provide the required power transmission efficiency, use multiple chains instead.
   - If the installation space requires that the inter-shaft distance be as great as possible, select a small-pitch multiple chain.

5. Number of Large Sprocket Teeth
   - Number of Large Sprocket Teeth = Number of Small Sprocket Teeth × Speed Ratio
   - Where the speed ratio is 1:7 or less, and ideally 1:5.

6. Shaft Diameter
   - Ensure the small sprocket selected above is compatible with the diameter of the existing shaft on which it is to be installed. Refer to the specification table in this book. When the shaft diameter is too large for the bore in the sprocket, select a sprocket with a greater number of teeth or a large chain.

7. Inter-Shaft Distance between Sprockets
   - The distance between the shafts can be reduced as long as the sprockets do not interfere with each other and the wrap angle between the small sprocket and the chain is 120° or more.
   - Generally, the inter-shaft distance should preferably be 30-50 times the pitch of the chain used. Under present loading conditions, decrease the distance to 20 times the pitch chain less.

8. Chain Length and Distance between Shaft Centres
   - Once the chain, the number of teeth on both sprockets, and the inter-shaft distance are available, determine the number of chain links as follows.
   - Chain Length (mm) = Number of Links × Chain LengthExpression in Number of Links

**Selection Guide Table**

- Number of Small Sprocket Teeth
- Number of Large Sprocket Teeth
- Distance between Shaft Centers
- Expression in Number of Links

**Example of Selection for Operation under Normal Conditions**

The following is an example of selection when a 3.7 kW, 1,000 r/min electric (motor) is used to drive a compressor.

1. Operating Conditions
   - Machine to be used:
   - Compressor, Fans/hour operation

2. Impact Type
   - Smooth Transmission

3. Prime Motor Type:
   - Electric Motor

4. Power Transmission
   - 3.7 kW

5. Rotary Speed
   - 1000 r/min

**Application Coefficient**

The speed ratio should normally be 1:7 or less, and ideally 1:5.

**Chain and Number of Sprocket Teeth**

- Number of Large Sprocket Teeth
- Number of Small Sprocket Teeth

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2. Impact Type
   - Smooth Transmission

3. Prime Motor Type:
   - Electric Motor

4. Power Transmission
   - 3.7 kW

5. Rotary Speed
   - 1000 r/min

**Application Coefficient**

The speed ratio should normally be 1:7 or less, and ideally 1:5.

**Chain and Number of Sprocket Teeth**

- Number of Large Sprocket Teeth
- Number of Small Sprocket Teeth

**Example of Selection for Operation under Normal Conditions**

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