Tyreflex Couplings
Renold Gears has been manufacturing high quality, high specification gear units for over 100 years and has always been at the leading edge of gear technology with innovative products and power transmission solutions.

**Interchangeability**
Many of the products from Renold Gears are dimensionally interchangeable with other manufacturers gear units, allowing a trouble free replacement of gearboxes, in most cases upgrading the capacity through state of the art technology and materials.

**Custom Made**
Renold Gears is unique in its ability to offer custom made products designed to meet customers exacting requirements without compromise on availability and cost. From complete package solutions to individual precision replacement gears, all can be tailor made to meet specific applicational requirements.

**Available**
The most popular ranges of gearboxes are available from local distribution stock, backed up by extensive stocks from our manufacturing plant in the UK.
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Flexible Couplings should be used to accommodate any combination of misalignment conditions described below.

At installation all couplings should be aligned as near to perfect as possible.

1. Angular
Angular misalignment is present when the shaft axes are inclined one to the other. Its magnitude can be measured at the coupling faces.

2. Parallel Offset
Axial misalignment is present when the axes of the driving and driven shafts are parallel but laterally displaced.

3. End float (axial)
End float is the ability to accommodate a relative axial displacement of the connected shafts; achieved by sliding members or flexing of resilient components.

4. Torsional flexibility
Torsional flexibility is a design feature necessary to permit shock and impulsive loadings to be suitably dampened. It is achieved by the provision of a flexible medium such as rubber, springs, etc., between the two halves of the coupling.

Selection
In order to select the correct type and size of coupling, the following basic information should be known:

Power to be transmitted
(a) Normal.
(b) Maximum.
(c) Whether continuous or intermittent.

Characteristics of the drive
(a) Type of prime mover and associated equipment.
(b) Degree of impulsiveness of driven load.

Speed in revolutions per minute
(a) At which normal power is transmitted.
(b) At which maximum power is transmitted.
(c) Maximum speed.

Dimensions of shafts to be connected
(a) Actual diameter.
(b) Length of shaft extension.
(c) Full keyway particulars.

Selection Procedure
1. Nominal power in kW to be transmitted = K.
2. Select appropriate load classification from Table 1, denoted as either S, M or H.
3. From Table 2, establish Service Factor(s) to be applied, taking into account hours of operation/day and prime mover = fD.
4. From Table 3 select factor for the required frequency of starts/hr = fS.
5. Selection Power Ks = K x fD x fS
6. Equivalent power at 100 RPM = Ks x 100
7. Check that coupling selected will accept the required shaft diameters. Should shaft diameter exceed maximum permissible, then re-select using next larger size of coupling.
## Load Classification by Application

### Table 1

<table>
<thead>
<tr>
<th>Industry</th>
<th>Overview</th>
<th>Applications</th>
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</thead>
<tbody>
<tr>
<td>Agitators</td>
<td><strong>Agitators</strong></td>
<td>\begin{itemize} \item Pure liquids \item Liquids and solids \item Liquids - variable density \end{itemize}</td>
</tr>
<tr>
<td>Centrifuges</td>
<td><strong>Centrifugal</strong></td>
<td>\begin{itemize} \item Lobe \item Vane \end{itemize}</td>
</tr>
<tr>
<td>Brewing and distilling</td>
<td><strong>Bottling machinery</strong></td>
<td>\begin{itemize} \item Brew kettles - continuous duty \item Cookers - continuous duty \end{itemize}</td>
</tr>
<tr>
<td><strong>Conveyors</strong></td>
<td><strong>Conveyors</strong></td>
<td>\begin{itemize} \item Centrifugal \item Lobe \item Reciprocating - multi-cylinder \item Reciprocating - single cylinder \end{itemize}</td>
</tr>
<tr>
<td><strong>Conveyors</strong></td>
<td><strong>Conveyors</strong></td>
<td>\begin{itemize} \item Apron \item Assembly \item Belt \item Bucket \item Chain \item Flight \item Oven \item Screw \end{itemize}</td>
</tr>
<tr>
<td><strong>Conveyors</strong></td>
<td><strong>Conveyors</strong></td>
<td>\begin{itemize} \item Centrifugal \item Lobe \item Reciprocating - multi-cylinder \item Reciprocating - single cylinder \end{itemize}</td>
</tr>
<tr>
<td><strong>Main hoists</strong></td>
<td><strong>Main hoists</strong></td>
<td>\begin{itemize} \item Light \item Heavy duty \item Uniformly loaded or fed \end{itemize}</td>
</tr>
<tr>
<td><strong>Main hoists</strong></td>
<td><strong>Main hoists</strong></td>
<td>\begin{itemize} \item Apron \item Assembly \item Belt \item Buckets \item Chain \item Screw \end{itemize}</td>
</tr>
<tr>
<td><strong>Main hoists</strong></td>
<td><strong>Main hoists</strong></td>
<td>\begin{itemize} \item Centrifugal \item Lobe \item Reciprocating - multi-cylinder \item Reciprocating - single cylinder \end{itemize}</td>
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<td><strong>Main hoists</strong></td>
<td><strong>Main hoists</strong></td>
<td>\begin{itemize} \item Apron \item Assembly \item Belt \item Buckets \item Chain \item Flight \item Oven \item Screw \end{itemize}</td>
</tr>
<tr>
<td><strong>Main hoists</strong></td>
<td><strong>Main hoists</strong></td>
<td>\begin{itemize} \item Drive \item Pumps \item Manoeuvring winches \item Cutter head drives \item Manoeuvring winches \item Pumps \item Screen drive \item Stackers \item Utility winches \end{itemize}</td>
</tr>
</tbody>
</table>

### Key

- **S** = Steady
- **M** = Medium Impulsive
- **H** = Highly Impulsive
- * = Refer to Renold

**Note**

Machinery characteristics and service factors listed in this catalogue are a guide only. Some applications (e.g. constant power) may require special considerations. Please consult Renold.
Service Factors and Selection

Example of Selection
Coupling is required to transmit 7.5 kW at 1440 RPM to connect an electric motor to a gear box driving a chain conveyor running for 18 hours/day and starting 15 times/hour. Shaft diameters 55 mm respectively.

From Table 1 Load Classification = M (medium impulsive)
From Table 2 Service Factor $f_D = 1.5$
From Table 3 $f_S = 1.2$
Therefore selection $K_S$ is:

$$K_S = K \times f_D \times f_S$$

$$= 7.5 \times 1.5 \times 1.2$$

$$= 13.5 \text{ kW}$$

Equivalent power at 100 RPM =

$$K_S \times \frac{100}{1440}$$

$$= 13.5 \times \frac{100}{1440}$$

$$= 0.9375 \text{ kW @ 100 RPM}$$

From page 17 selection is RSC110 (644911) (maximum bore 55 mm).

<table>
<thead>
<tr>
<th>Prime mover (Drive input)</th>
<th>Driven machinery characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Duration service hours/day</td>
</tr>
<tr>
<td>Electric, air &amp; hydraulic Motors or steam turbine (Steady input)</td>
<td>Intermittent - 3hrs/day max 3 - 10</td>
</tr>
<tr>
<td></td>
<td>over 10</td>
</tr>
<tr>
<td>Multi-cylinder I.C. engine (Medium impulsive input)</td>
<td>Intermittent - 3hrs/day max 3 - 10</td>
</tr>
<tr>
<td></td>
<td>over 10</td>
</tr>
<tr>
<td>Single-cylinder I.C. engine (Highly impulsive input)</td>
<td>Intermittent - 3hrs/day max 3 - 10</td>
</tr>
<tr>
<td></td>
<td>over 10</td>
</tr>
</tbody>
</table>

Table 2 Service Factor ($f_D$)

<table>
<thead>
<tr>
<th>No of starts per hour</th>
<th>0-1</th>
<th>1-30</th>
<th>30-60</th>
<th>60-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factor</td>
<td>1.0</td>
<td>1.2</td>
<td>1.3</td>
<td>1.5</td>
</tr>
</tbody>
</table>

Table 3 Factor for Starts/Hour ($f_S$)

Key Stress
1. Permissible key stress = 70 N/mm²
2. Nominal torque $T_{KM} = K \times 9550 / \text{RPM Nm}$
3. Force at key $F = T_{KM} / r$
4. Shaft Rad $r$ metres
5. Key area $A = J \times \text{HUB length mm}$ (Obtain from relevant catalogue page).
6. Key stress $f_k = F / A \text{ N/mm}^2$
7. If resultant stress is less than 70 N/mm² key stress is acceptable.
   If resultant $f_k$ is greater than 70, consider either two keyways or extending hub length.
8. Example:
   $T_{KM} = 7.5 \times 9550 / 1440 = 49.7 \text{Nm}$
   $r = 55/2 = 27.5 \text{mm} / 1000 = 0.0275 \text{m}$
   $F = 49.7/0.0275 = 1741 \text{N}$
   $A = 16 \times 45 = 720 \text{mm}^2$
   $f_k = 1741/720 = 2.4 \text{M/mm}^2$
   Selection is therefore good.

For operation above 80% of the declared maximum coupling speed it is recommended that the coupling is dynamically balanced.

WARNING
It is the responsibility of the system designer to ensure that the application of the coupling does not endanger the other constituent components in the system. Service factors given are an initial selection guide.

WARNING
Rotating equipment must be provided with a suitable guard before operating or injury may result.
## Key and Keyway Dimensions

### Metric (mm)

Keyways comply with BS4235: Part 1: 1972

<table>
<thead>
<tr>
<th>Shaft dia.</th>
<th>Key &amp; keyway</th>
</tr>
</thead>
<tbody>
<tr>
<td>Over</td>
<td>Incl.</td>
</tr>
<tr>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>8</td>
<td>10</td>
</tr>
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<td>10</td>
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<td>12</td>
<td>17</td>
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<td>170</td>
<td>200</td>
</tr>
<tr>
<td>200</td>
<td>230</td>
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</tbody>
</table>

### Imperial (inches)

Keyways comply with BS46: Part 1: 1958

<table>
<thead>
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<th>Shaft dia.</th>
<th>Key &amp; keyway</th>
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</thead>
<tbody>
<tr>
<td>Over</td>
<td>Incl.</td>
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<tr>
<td>0.25</td>
<td>0.05</td>
</tr>
<tr>
<td>0.50</td>
<td>0.75</td>
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<td>5.00</td>
</tr>
<tr>
<td>5.00</td>
<td>6.00</td>
</tr>
</tbody>
</table>

### Keyway dimensions

Parallel keyways are supplied unless customer states otherwise.

ogramm
A range of highly flexible couplings offering excellent misalignment capacity and suitable to absorb both shock loads and vibrations.

Coupling capacity
- Maximum power @ 100RPM: 65.8 kW
- Maximum torque: 6270 Nm

Features and benefits
- High misalignment capabilities - high flexibility.
- Shock absorbing - extending machine life.
- Maintenance free - minimum number of wearing parts.
- Fire retardent, anti-static elements available for use in a flameproof environment.
- Interchangeability means no re-engineering.

- Pump spacer option for easy pump maintenance.
- Taper bush bores available for ease of replacement.
- Easy replacement of tyre element without any need to move hubs axially on driven or driving shafts.

Standard range comprises
- Shaft to Shaft
- Pump Spacer Type

Applications
- Compressors
- Generator Sets
- Pumps
- Roller Table Drives
- General Industrial Applications

Construction details
Steel or S.G. Iron Half Bodies
Rubber Tyres:
Temp Range -50°C to +50°C
Chloroprene Tyres:
Temp Range -15°C to +70°C

Can be certified for use in potentially explosive atmospheres containing gas or dust, according to ATEX directive 94/9/EC.
The couplings are classified for equipment group II, categories 2 and 3.
Contact Renold for further details.
### Coupling Power Torque Speed

<table>
<thead>
<tr>
<th>Type</th>
<th>Bore Size</th>
<th>Bush Size</th>
<th>Offset</th>
<th>Angular Float</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type B</td>
<td>Max</td>
<td>Min</td>
<td>Max</td>
<td>Min</td>
</tr>
<tr>
<td>Type F</td>
<td>Max</td>
<td>Min</td>
<td>Max</td>
<td>Min</td>
</tr>
<tr>
<td>Type H</td>
<td>Max</td>
<td>Min</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Dimensions

<table>
<thead>
<tr>
<th>Coupling Size</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>TY40-60</td>
<td>C1 mm</td>
</tr>
<tr>
<td>TY70-180</td>
<td>C1 mm</td>
</tr>
</tbody>
</table>

### Torsional Stiffness

<table>
<thead>
<tr>
<th>Coupling Size</th>
<th>Type B</th>
<th>Type F</th>
<th>Type H</th>
</tr>
</thead>
<tbody>
<tr>
<td>kW</td>
<td>Nm</td>
<td>Nm</td>
<td>Nm</td>
</tr>
<tr>
<td>Mass*</td>
<td>kg</td>
<td>Mass*</td>
<td>kg</td>
</tr>
</tbody>
</table>

**NOTE:** M is distance by which clamping screws need to be withdrawn to release tyres. P is wrench clearance for taper bush screws when large end is outboard Type H. *Mass is for single hub assembly and half tyre.
## Component Spares

<table>
<thead>
<tr>
<th>Coupling size</th>
<th>Tyre flexible element</th>
<th>Half body unbored B</th>
<th>Half body unbored F</th>
<th>Half body unbored H</th>
<th>Half body taper bored B</th>
<th>Half body taper bored F</th>
<th>Half body taper bored H</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Catalogue no</td>
<td>Product no</td>
<td>Catalogue no</td>
<td>Product no</td>
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<tr>
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<td>7131104/1</td>
<td>TY40 B</td>
<td>7131104/HB02</td>
<td>TY40 F</td>
<td>7131104/HB77</td>
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<td>TY50</td>
<td>7131105/1</td>
<td>TY50 B</td>
<td>7131105/HB02</td>
<td>TY50 F</td>
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<td>TY50 H</td>
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<td>TY60 B</td>
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<td>TY70 B</td>
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<td>TY70 F</td>
<td>7132107/HB77</td>
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<td>TY90 F</td>
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<tr>
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<td>7132118/1</td>
<td>TY180 B</td>
<td>7132118/HB02</td>
<td>TY180 F</td>
<td>7132118/HB77</td>
<td>TY180 H</td>
</tr>
</tbody>
</table>

Tyreflex Couplings
The best range of solution chain products available anywhere

**Synergy™**
- High performance
- Superior wear life
- Outstanding fatigue resistance

**Syno™**
- Maintenance free
- Self-lubricating chain
- Food industry-approved lubricant

**RENOld**
- Best premium chain
- Leading performance
- Solid bush / solid roller / end softened pin

**Hydro-Service™**
- Superior corrosion resistant coating
- Alternative choice to stainless steel chain
- Will not chip or peel
- Hexavalent chrome-free

**Steel Pin Bush Roller Chain**
- Manufactured to international stds
- Full range of pitch alternatives
- Breaking loads 13 to 900 kN as std
- Attachments to suit varied applications

**Leaf Chain**
- Comprehensive ranges used worldwide for safety critical lifting applications
- 100 years experience in developing and maintaining lifting chain

**Steel Knuckle Chain**
- Heavy duty, detachable elevator chains
- Integral K type attachments
- Breaking loads from 642kN to 1724kN
- Sealed joint to extend chain life

**Roll-Ring™**
- Revolutionary chain tensioner
- Installed in seconds and self adjusting
- Maintenance free
- Also acts as noise damper

**Customised Engineering Chain**
- Wide range to suit specialised applications using high specification materials and treatment processes
- Designed in close collaboration with customer

**Smartlink™**
- Load monitoring technology
- Technical reports & data logging

www.renold.com
AUSTRALIA
Melbourne (Victoria)
Tel + 61 (03) 9262 3333
Fax + 61 (03) 9561 8561
also at: Sydney, Brisbane, Adelaide, Perth, Newcastle, Wollongong, Townsville

AUSTRIA
Vienna
Tel + 43 (0) 1 3303484 0
Fax + 43 (0) 1 3303484 5

BELGIUM
Brussels
Tel + 32 (0) 2 201 1262
Fax + 32 (0) 2 203 2210

CANADA
Brantford (Ontario)
Tel + 1 519 756 6118
Fax + 1 519 756 1767
also at: Montreal

CHINA
Shanghai
Tel + 86 21 5046 2696
Fax + 86 21 5046 2695

CZECH REPUBLIC
Jaroslavice
Tel + 42 67 7211074
Fax + 42 67 7211074

DENMARK
Brøndby (Copenhagen)
Tel + 45 43 452611
Fax + 45 43 456592

FRANCE
Seclin
Tel + 33 (0) 320 16 29 29
Fax + 33 (0) 320 16 29 00
Calais (chain only)
Tel + 33 (0) 321 97 99 45
Fax + 33 (0) 321 97 83 45

GERMANY
Mechernich
Tel + 49 (0) 2256 95 90 74
Fax + 49 (0) 2256 95 91 69
renold.deutschland@renold.com

HUNGARY
Budapest
Tel + 36 30 228 3269
Fax + 36 1 287 808
peter.toka@renold.com

INDIA
Colmbatore
Tel +91 422 2532 357
Tel +91 422 2532 358
marketing@renold.in

MALAYSIA
Petaling Jaya
Tel + 603 5191 9880
Fax + 603 5191 9881
also at: Johor Bharu, Ipoh, Butterworth

NETHERLANDS
Amsterdam
Tel + 31 206 146661
Fax + 31 206 146391

NEW ZEALAND
Auckland
Tel + (0) 64 9 828 5018
Fax + (0) 64 9 828 5019
also at: Christchurch

SINGAPORE
Singapore
Tel + 65 6760 2422
Fax + 65 6760 1507

SOUTH AFRICA
Benoni
Tel + (0) 27 11 747 9500
Fax + (0) 27 11 747 9505
also at: Durban, Cape Town, Port Elizabeth, Witbank

SPAIN
Renold Hi-Tec Couplings SA
Tel + 34 93 6380558
Fax + 34 93 6380737
renold@renold-hitec.com

SWEDEN
Brøndby (Copenhagen)
Tel + 45 43 245028
Fax + 45 43 456592

SWITZERLAND
Dübendorf (Zürich)
Tel + 41 (0) 1 824 8484
Fax + 41 (0) 1 824 8411
also at: Crissier (Lausanne)

UK
Renold Clutches & Couplings, Wales
Tel + 44 (0) 29 20792737
Fax + 44 (0) 29 20791360
couplings@cc.renold.com
Renold Hi-Tec Couplings, Halifax
Tel + 44 (0) 1422 255000
Fax + 44 (0) 1422 320273
couplings@hitec.renold.com
Renold Gears, Milnrow
Tel + 44 (0) 1706 751000
Fax + 44 (0) 1706 751001
sales@gears.renold.com

USA
Renold Ajax
Westfield, New York
Tel + 1 716 326 3121
Fax + 1 716 326 6121

WEB
www.renold.com

E-MAIL
enquiry@renold.com

For other country distributors please contact Renold UK or visit the renold website.

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