Section 5: Drive Couplings

Fenner shaft couplings range from highly resilient to totally rigid and are all precision manufactured using high quality ferrous materials and the latest polymer technology.

- Fenaflex tyre couplings from 24 to 14,675Nm, standard DBSE spacer variant, ATEX approved variant and flywheel version available.
- HRC, resilient couplings from 30 to 3,150Nm, available in Taper Lock and pilot bore variants.
- Jaw couplings from 0.5 to 280Nm with incidental misalignment capacity and quick fit spacer variant.
- Rigid Taper Lock couplings in 8 sizes up to 10,500Nm.

Drive Couplings: Design Data Required

<table>
<thead>
<tr>
<th>Drive Couplings: Design Data Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of prime mover, or driving machine</td>
</tr>
<tr>
<td>Electric motor starting arrangement</td>
</tr>
<tr>
<td>Engine or compressor inertia of both machines (MR² or GD²)</td>
</tr>
<tr>
<td>Rotational speed of prime mover</td>
</tr>
<tr>
<td>Power rating of prime mover</td>
</tr>
<tr>
<td>Type of coupled machine</td>
</tr>
<tr>
<td>Power absorbed by coupled machine</td>
</tr>
<tr>
<td>Hours/day duty &amp; start/stop frequency</td>
</tr>
<tr>
<td>Both coupled shaft diameters</td>
</tr>
<tr>
<td>Distance between shaft ends</td>
</tr>
<tr>
<td>Likely machine alignment quality</td>
</tr>
<tr>
<td>&gt; angular</td>
</tr>
<tr>
<td>&gt; parallel</td>
</tr>
<tr>
<td>&gt; axial</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Drive Couplings</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fenaflex Couplings</td>
<td>113</td>
</tr>
<tr>
<td>Fenaflex Power Ratings</td>
<td>114</td>
</tr>
<tr>
<td>Fenaflex Dimensions</td>
<td>115</td>
</tr>
<tr>
<td>Fenaflex Spacer Couplings</td>
<td>116</td>
</tr>
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<td>Fenaflex Flywheel Couplings</td>
<td>117</td>
</tr>
<tr>
<td>HRC Couplings</td>
<td>119</td>
</tr>
<tr>
<td>HRC Dimensions</td>
<td>120</td>
</tr>
<tr>
<td>Jaw Couplings</td>
<td>121</td>
</tr>
<tr>
<td>Rigid Couplings</td>
<td>123</td>
</tr>
<tr>
<td>Installation</td>
<td>124</td>
</tr>
</tbody>
</table>

Visit www.fptgroup.com for online Fenaflex installation videos.
Fenaflex™ Tyre Couplings
Flexible and Efficient
Less Stress. More Flexibility.

- Simple time saving installation
- Large misalignment capability, 4° angular, up to 6mm parallel and 8mm axial
- Internal load carrying cords are wound in both directions, so there is no problem reversing drives
- Tyres are available in standard and FRAS construction. ATEX approved
- Pump spacer and flywheel fixing variants available

Fenner
THE MARK OF ENGINEERING EXCELLENCE

www.fptgroup.com
The Fenaflex coupling is a highly flexible, torsionally elastic coupling offering versatility to designers and engineers with a choice of flange combinations to suit most applications.

Tyre coupling flanges are available in either F or H Taper Lock™ fitting or pilot bored, which can be finish bored to the required size.

With the addition of a spacer assembly the coupling can be used to accommodate standard distances between shaft ends, (DBSE) facilitating centrifugal pump maintenance.

Fenaflex couplings can accommodate simultaneous maximum misalignment in all planes without imposing undue loads on adjacent bearings and the excellent shock-absorbing properties of the flexible tyre reduce vibration and torsional oscillations.

Fenaflex tyres are available in natural rubber compounds for use in ambient temperatures between –50°C and +50°C. Chloroprene rubber compounds are available for use in adverse operating conditions (e.g. oil or grease contamination) and can be used in temperatures of –15°C to +70°C. The chloroprene compound should also be used when fire-resistance and anti-static (FRAS) properties are required, and it is this tyre material that is used with specific flange modifications in the ATEX approved variant.

**SELECTION**

(a) **Service Factor**
Determine the required Service Factor from table below.

(b) **Design Power**
Multiply the normal running power by the service factor. This gives the design power which is used as a basis for selecting the coupling.

(c) **Coupling Size**
Refer to Power Ratings table (page 114) and from the appropriate speed read across until a power greater than that required in step (b) is found.

The size of Fenaflex coupling required is given at the head of that column.

(d) **Bore Size**
Check from Dimensions table (page 115) that chosen flanges can accommodate required bores.

**EXAMPLE**
A Fenaflex coupling is required to transmit 45kW from an A.C. electric motor which runs at 1440 rev/min to a rotary screen for 12 hours per day. The motor shaft is 60mm diameter and the screen shaft is 55mm diameter. Taper Lock is required.

(a) **Service Factor**
The appropriate service factor is 1.4.

(b) **Design Power**
Design power = 45 x 1.4 = 63kW.

(c) **Coupling Size**
By reading across from 1440 rev/min in the power ratings table the first power figure to exceed the required 63kW in step (b) is 75.4kW. The size of coupling is F90 Fenaflex.

(d) **Bore Size**
By referring to the dimensions table it can be seen that both shaft diameters fall within the bore range available.

**SERVICE FACTORS**

<table>
<thead>
<tr>
<th>SPECIAL CASES</th>
<th>Electric motors</th>
<th>Internal combustion engines†</th>
</tr>
</thead>
<tbody>
<tr>
<td>For applications where substantial shock, vibration and torque fluctuations occur, and for reciprocating machines (e.g. internal combustion engines, piston pumps and compressors) refer to your local Authorised Distributor with full machine details for analysis.</td>
<td>Steam turbines</td>
<td>Steam engines</td>
</tr>
<tr>
<td><strong>Type of Driven Machine</strong></td>
<td><strong>Type of Driving Unit</strong></td>
<td><strong>Hours per day duty</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>10 and under</td>
</tr>
<tr>
<td>CLASS 1</td>
<td>Agitators, Brewing machinery, Centrifugal compressors and pumps. Belt conveyors, Dynamometers, Lineshafts, Fans up to 7.5kW. Blowers and exhausters (except positive displacement), Generators.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.8</td>
</tr>
<tr>
<td>CLASS 2*</td>
<td>Clay working machinery, General machine tools, paper mill beaters and winders, Rotary pumps, Rubber extruders, Rotary screens, Textile machinery, Marine propellers and Fans over 7.5kw.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.3</td>
</tr>
<tr>
<td>CLASS 3*</td>
<td>Bucket elevators, Cooling tower fans, Piston compressors and pumps, Foundry machinery, Metal presses, Paper mill calenders, Hammer mills, Presses and pulp grinders, Rubber calenders, Pulverisers and Positive displacement blowers.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.8</td>
</tr>
<tr>
<td>CLASS 4*</td>
<td>Reciprocating conveyors, Gyroratory crushers, Mills (ball, pebble and rod), Rubber machinery (Banbury mixers and mills) and Vibratory screens.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.3</td>
</tr>
</tbody>
</table>

* It is recommended that keys [with top clearance if in Taper Lock bushes] are fitted on applications where load fluctuation is expected.
† Couplings for use with internal combustion engines may require special consideration, refer to pages 117.
**POWER RATINGS (KW)**

<table>
<thead>
<tr>
<th>Speed rev/min</th>
<th>F40</th>
<th>F50</th>
<th>F60</th>
<th>F70</th>
<th>F80</th>
<th>F90</th>
<th>F100</th>
<th>F110</th>
<th>F120</th>
<th>F140</th>
<th>F160</th>
<th>F180</th>
<th>F200</th>
<th>F220</th>
<th>F250</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>0.25</td>
<td>0.69</td>
<td>1.33</td>
<td>2.62</td>
<td>3.95</td>
<td>5.24</td>
<td>7.07</td>
<td>9.16</td>
<td>13.9</td>
<td>24.3</td>
<td>39.5</td>
<td>65.7</td>
<td>97.6</td>
<td>121.0</td>
<td>154.0</td>
</tr>
<tr>
<td>200</td>
<td>0.50</td>
<td>1.38</td>
<td>2.66</td>
<td>5.24</td>
<td>7.85</td>
<td>10.50</td>
<td>14.10</td>
<td>18.30</td>
<td>29.7</td>
<td>48.7</td>
<td>79.0</td>
<td>131.0</td>
<td>195.0</td>
<td>243.0</td>
<td>307.0</td>
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<tr>
<td>300</td>
<td>0.75</td>
<td>2.07</td>
<td>3.99</td>
<td>7.85</td>
<td>11.80</td>
<td>15.70</td>
<td>21.20</td>
<td>27.50</td>
<td>41.8</td>
<td>73.0</td>
<td>118.0</td>
<td>197.0</td>
<td>293.0</td>
<td>364.0</td>
<td>451.0</td>
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<tr>
<td>400</td>
<td>1.01</td>
<td>2.76</td>
<td>5.32</td>
<td>10.50</td>
<td>15.70</td>
<td>20.90</td>
<td>28.30</td>
<td>36.60</td>
<td>55.7</td>
<td>97.4</td>
<td>158.0</td>
<td>283.0</td>
<td>391.0</td>
<td>486.0</td>
<td>615.0</td>
</tr>
<tr>
<td>500</td>
<td>1.26</td>
<td>3.46</td>
<td>6.65</td>
<td>13.10</td>
<td>19.60</td>
<td>26.20</td>
<td>35.30</td>
<td>45.80</td>
<td>69.6</td>
<td>122.0</td>
<td>197.0</td>
<td>328.0</td>
<td>488.0</td>
<td>607.0</td>
<td>768.0</td>
</tr>
<tr>
<td>600</td>
<td>1.51</td>
<td>4.15</td>
<td>7.98</td>
<td>15.70</td>
<td>23.60</td>
<td>31.40</td>
<td>42.40</td>
<td>55.00</td>
<td>83.6</td>
<td>146.0</td>
<td>237.0</td>
<td>394.0</td>
<td>586.0</td>
<td>729.0</td>
<td>922.0</td>
</tr>
<tr>
<td>700</td>
<td>1.76</td>
<td>4.84</td>
<td>9.31</td>
<td>18.30</td>
<td>27.50</td>
<td>36.60</td>
<td>49.50</td>
<td>64.10</td>
<td>97.5</td>
<td>170.0</td>
<td>278.0</td>
<td>460.0</td>
<td>684.0</td>
<td>850.0</td>
<td>1076.0</td>
</tr>
<tr>
<td>800</td>
<td>2.18</td>
<td>5.18</td>
<td>9.57</td>
<td>18.80</td>
<td>28.30</td>
<td>37.70</td>
<td>50.90</td>
<td>66.00</td>
<td>100.0</td>
<td>175.0</td>
<td>284.0</td>
<td>473.0</td>
<td>703.0</td>
<td>875.0</td>
<td>1106.0</td>
</tr>
</tbody>
</table>

**PHYSICAL CHARACTERISTICS – FLEXIBLE TYRES**

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Coupling Size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F40</td>
</tr>
<tr>
<td>Maximum speed rev/min</td>
<td>4500</td>
</tr>
<tr>
<td>Nominal Torque Nm Tn x 10</td>
<td>24</td>
</tr>
<tr>
<td>Torsional Stiffness Nm x 104</td>
<td>5</td>
</tr>
<tr>
<td>Max. parallel misalignment mm</td>
<td>1.1</td>
</tr>
<tr>
<td>Maximum end float mm ± 0.1</td>
<td>1.3</td>
</tr>
<tr>
<td>Approx. mass kg</td>
<td>0.1</td>
</tr>
<tr>
<td>Alternating Torque Nm @ 10 Hz Tn</td>
<td>11</td>
</tr>
<tr>
<td>Resonance Factor V</td>
<td>7</td>
</tr>
<tr>
<td>Damping Coefficient η</td>
<td>0.9</td>
</tr>
</tbody>
</table>

Maximum torque figures should be regarded as short duration overload ratings for use in such circumstances as direct-on-line motor starting.

**FLEXIBLE TYRE CODE NUMBERS**

Unless otherwise specified Fenaflex flexible tyres will be supplied in a natural rubber compound which is suitable for operation in temperatures –50°C to +50°C. A chloroprene compound is available which is Fire Resistant and Anti-Static (FRAS) and has greater resistance to heat and oil. This is suitable for operation in temperatures –15°C to +70°C. For temperatures outside these ranges – consult your local Authorised Distributor.

The FRAS tyre variant is used with specifically modified metal flanges to create the ATEX approved variant.
DiMenSionS of FenAfLexus FlAnGeS tYPeS B, F & h

* Mass and inertia figures are for single flange with mid range bore and include clamping ring, screws and washers and half tyre.

¶ M is half the distance between flanges. Shaft ends, although normally located twice M apart, can project beyond the flanges as shown. In this event allow sufficient space between shaft ends for end float.

Dimensions in millimetres unless otherwise stated.

1. J is the wrench clearance to allow for tightening/loosening the bush on the shaft and the clamp ring screws on sizes F40, F50 and F60. The use of a shortened wrench will allow this dimension to be reduced.

2. M is half the distance between flanges. Shaft ends, although normally located twice M apart, can project beyond the flanges as shown. In this event allow sufficient space between shaft ends for end float and misalignment.

3. Mass and inertia figures are for single flange with mid range bore and include clamping ring, screws and washers and half tyre.

4. For pilot bores, F and h range code as listed. Flanges also available with finish keyway if required. Bore must be specified on order.

5. Note: On sizes F70, 80, 100 and 120 the F1 direction bush is larger than that in the F1 direction.

Note: Flange assemblies comprise hub, clamp ring and clamp ring screws/washers.
**Fenaflex Spacer Couplings**

Fenaflex spacer couplings consist of a Fenaflex tyre coupling (size F40–F140) plus a spacer flange assembly. They are designed for use on applications where it is an advantage to be able to move either shaft axially without disturbing the driving or driven machine (e.g., centrifugal pump rotors). Fenaflex spacer couplings are primarily designed for standard distance between shaft end dimensions of 80, 100, 140 and 180 mm.

### Selection

1. Select a suitable size of Fenaflex coupling using the method shown on page 113. Read down the first column in table below and locate the size of coupling selected.
2. Read across until the required distance between shaft ends can be accommodated.
3. Note the required spacer coupling designation at head of column.

### Note

- Larger sizes of spacer coupling can be manufactured to order. Consult your local Authorised Distributor.
- Spacer assembly 3 x Taper Lock bushes
- 1 x Fenaflex flanges 1 x Fenaflex tyre

### Distance between Shaft Ends

<table>
<thead>
<tr>
<th>Size</th>
<th>SM12</th>
<th>SM16</th>
<th>SM25</th>
<th>SM30</th>
<th>SM35</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>80</td>
<td>100</td>
<td>140</td>
<td>180</td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>40</td>
<td>60</td>
<td>100</td>
<td>140</td>
<td>180</td>
</tr>
<tr>
<td>Max</td>
<td>55</td>
<td>75</td>
<td>117</td>
<td>157</td>
<td>197</td>
</tr>
</tbody>
</table>

**Note:** Alternative distances between shaft ends may be accommodated. Consult your local Authorised Distributor.

### Spacer Coupling Dimensions

<table>
<thead>
<tr>
<th>Driven Bore</th>
<th>Max End Bore</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>J</th>
<th>K</th>
<th>L</th>
<th>M</th>
<th>S</th>
<th>T</th>
<th>Assembled Weight (kgf)</th>
</tr>
</thead>
<tbody>
<tr>
<td>80</td>
<td>40</td>
<td>0.3351200</td>
<td>1210</td>
<td>32</td>
<td>1/16</td>
<td>1008</td>
<td>25</td>
<td>1&quot;</td>
<td>104</td>
<td>82</td>
<td>118</td>
<td>83</td>
<td>134</td>
<td>25</td>
<td>15</td>
<td>14</td>
</tr>
</tbody>
</table>

**Note:** Larger sizes of spacer coupling can be manufactured to order. Consult your local Authorised Distributor.

* F Flange must be used to fit spacer shaft.
1" Flange must be used to fit spacer shaft.

---

**SECTION 5**

**DRIVE COUPLINGS**

**SPACE COUPLING DIMENSIONS**

**Note:** Larger sizes of spacer coupling can be manufactured to order. Consult your local Authorised Distributor.

* F Flange must be used to fit spacer shaft.
1" Flange must be used to fit spacer shaft.
**Fenaflex Flywheel Couplings**

Designed to fit standard SAE and other popular flywheel configurations, these couplings use chloroprene flexible elements and employ standard B, F or H type driven flanges.

**DIMENSIONS**

<table>
<thead>
<tr>
<th>Code No</th>
<th>Size</th>
<th>PCD</th>
<th>A</th>
<th>H</th>
<th>Mass (kg)</th>
<th>Inertia (kgm²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>033D0010</td>
<td>87</td>
<td>8.750“</td>
<td>240</td>
<td>26</td>
<td>1.41</td>
<td>0.016</td>
</tr>
<tr>
<td>033E0010</td>
<td>96</td>
<td>9.625“</td>
<td>262</td>
<td>30</td>
<td>1.87</td>
<td>0.025</td>
</tr>
<tr>
<td>033F0010</td>
<td>110</td>
<td>11.250“</td>
<td>305</td>
<td>32</td>
<td>2.49</td>
<td>0.048</td>
</tr>
<tr>
<td>033G0010</td>
<td>116</td>
<td>11.750“</td>
<td>313</td>
<td>30</td>
<td>2.51</td>
<td>0.050</td>
</tr>
<tr>
<td>033H0010</td>
<td>131</td>
<td>13.125“</td>
<td>351</td>
<td>39</td>
<td>3.71</td>
<td>0.094</td>
</tr>
<tr>
<td>033I0010</td>
<td>135</td>
<td>13.500“</td>
<td>364</td>
<td>37</td>
<td>4.16</td>
<td>0.113</td>
</tr>
<tr>
<td>033K0010</td>
<td>172</td>
<td>17.250“</td>
<td>465</td>
<td>41</td>
<td>7.10</td>
<td>0.320</td>
</tr>
</tbody>
</table>

**FENAFLEX HIGH SPEED COUPLINGS**

Fenaflex flywheel style elements can be deployed to couple a balanced disc with Taper Lock weld-on-hub shaft fixing (effectively replacing the flywheel in the designs illustrated above) to a standard Fenaflex flange, for use at higher rotational speeds.

Consult your local Authorised Distributor for details.

---

**1W FLANGE—**

Bolt holes are equi-spaced except size 135W shown.

Replacement elements for previously catalogue sizes 192, 213 and 252 are available – Consult your local Authorised Distributor.
HRC™ Couplings

Fenaflex Flywheel Couplings

**Fenaflex Elements—Physical Characteristics and Power Ratings**

<table>
<thead>
<tr>
<th>Coupling Size</th>
<th>Element Part No.</th>
<th>Normal Torque (Nm)</th>
<th>Maximum Torque (Nm)</th>
<th>Maximum Alternating Torque (Nm) ± TW</th>
<th>Resonance Factor VR</th>
<th>Damping Energy Ratio ψ</th>
<th>Dynamic Stiffness (Nm/rad) Cdyn</th>
<th>Power at * 1500 rev/min (kW)</th>
<th>Power at * 1800 rev/min (kW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>87 (SAE 7½)</td>
<td>033D0100</td>
<td>239</td>
<td>717</td>
<td>155</td>
<td>7.0</td>
<td>0.9</td>
<td>6847</td>
<td>37</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>033D0101</td>
<td>478</td>
<td>956</td>
<td>238</td>
<td>7.0</td>
<td>0.9</td>
<td>13695</td>
<td>75</td>
<td>90</td>
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<tr>
<td></td>
<td>033D0102</td>
<td>239</td>
<td>717</td>
<td>120</td>
<td>7.0</td>
<td>0.9</td>
<td>3427</td>
<td>37</td>
<td>45</td>
</tr>
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<td></td>
<td>033D0105</td>
<td>239</td>
<td>717</td>
<td>64</td>
<td>7.0</td>
<td>0.9</td>
<td>1369</td>
<td>37</td>
<td>45</td>
</tr>
<tr>
<td>96 (SAE 8)</td>
<td>033E0100</td>
<td>325</td>
<td>975</td>
<td>211</td>
<td>7.0</td>
<td>0.9</td>
<td>9311</td>
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<td></td>
<td>033E0101</td>
<td>650</td>
<td>1300</td>
<td>324</td>
<td>7.0</td>
<td>0.9</td>
<td>18623</td>
<td>102</td>
<td>122</td>
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<td>975</td>
<td>163</td>
<td>7.0</td>
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<td>4653</td>
<td>51</td>
<td>61</td>
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<tr>
<td></td>
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<td>975</td>
<td>87</td>
<td>7.0</td>
<td>0.9</td>
<td>1862</td>
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<tr>
<td>112</td>
<td>033R0100</td>
<td>592</td>
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</table>

Selection of Fenaflex flywheel couplings should take account of design power (using Service Factors on page 107 and speed and also the torsional characteristics of the coupled machines—consult your local Authorised Distributor.

* Power ratings at other speeds directly proportional to these values.

**All Fenaflex Couplings—Ordering Instructions**

**Shaft to Shaft Coupling Using Flexible Tyre.**

Consists of:
- 2–Flanges (page 115)
- T/L bushes for F and H flanges only (pages 129-130)
- 1–Flexible tyre (page 114)

**Example Order**

Fenaflex coupling F90BH comprising:
- 1–F90B flange bored 70mm (coded at time of order).
- 1–F90H flange code 033F0303
- 1–2517 T/L bush (bore 35mm) code 029M0035
- 1–F90 Flexible tyre (Natural) code 033F0048

**Fenaflex Spacer Coupling**

Consists of:
- 1-standard Fenaflex coupling using B, F or H flanges as desired (2 flanges, 2 T/L Bush, 1 Flexible Tyre)
- 1–Spacer flange
- 1–Taper Lock bushes

**Example Order**

Fenaflex spacer assembly F110FF–SM30/140 comprising:
- 1–F110F flanges – 033H0302 (page 115)
- 1–F110 flexible flange – 033H0048 (page 114)
- 1–SM30 x 140mm spacer flange – 033V3000 (page 115)
- 1–3020 T/L bush to suit motor shaft – 029P0060 (page 129-130)
- 1–3020 x 60mm T/L bush to suit dimension ‘T’ – 029P0060 (page 130)
- 1–3030 T/L bush to suit driven shaft – 029P0060 (page 130)

**Fenaflex Flywheel Coupling**

Consists of:
- 1–Driving (W) flange (page 117)
- 1–Flexible element (above)
- 1–Driven flange (page 117)
- 1–T/L bush to suit driven shaft (F & H driven flanges only)

**Example Order**

Fenaflex 114 flywheel coupling comprising
- 1–116W flange 033G0010
- 1–Bolt pack 033X0203
- 1–Standard element 033G0100
- 1–F100 F flange 033G0302
- 1–3020 T/L bush 60mm bore 029P0060

Bolts for flywheel fixing can be supplied but are not a stock component.
These semi-elastic flexible couplings are designed for general purpose use and permit quick and easy assembly by means of Taper Lock bush fixing. Their characteristics are designed for use particularity on machinery driven from standard IEC electric motors. Fully machined outside diameters allow alignment by simple straight edge methods. Shaft connection is “fail safe” due to interacting dog design.

**SELECTION**

(a) **Service Factor**
Determine appropriate Service Factor from table below

(b) **Design Power**
Multiply running power of driven machinery by the service factor. This gives the design power which is used as a basis for coupling selection.

(c) **Coupling Size**
Refer to Power Ratings table below and read across from the appropriate speed until a power equal to or greater than the design power is found. The size of coupling is given at the head of that column.

(d) **Bore Size**
From Dimensions table on page 120 check that the required bores can be accommodated.

**EXAMPLE**
A shaft coupling is required to transmit 70kW between a 1200 rev/min diesel engine and a hoist running over 16hrs/day. Engine shaft is 70mm and the hoist shaft is 75mm.

(a) **Service Factor**
The appropriate service factor is 2.5.

(b) **Design Power**
Design power 70 x 2.5=175kW.

(c) **Coupling Size**
Reading across from 1200 rev/min in the speed column of Power Ratings table below, 251kW is the first power to exceed the required 175kW (design power). The size of the coupling at the head of this column is 230.

(d) **Bore Size**
The Dimensions table (page 120) shows that both shaft diameters are within the bore range available.

**SERVICE FACTORS**

<table>
<thead>
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<th>Type of Driving Unit</th>
<th>Electric motors</th>
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<th>Water turbines</th>
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**Nominal Torque (Nm)**
31.5
80
160
60
990
260
3150

**Max Torque (Nm)**
72
180
360
720
2350
5000
7200

Fire Resistant/Anti-Static (FRAS) inserts available ex-stock.

For speeds below 100 rev/min, and intermediate speeds, use nominal torque ratings.

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For speeds below 100 rev/min, and intermediate speeds, use nominal torque ratings.

For speeds below 100 rev/min, and intermediate speeds, use nominal torque ratings.
HRC Coupling Dimensions

PHYSICAL DIMENSIONS AND CHARACTERISTICS

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<th>Inertia Mr² (kgm²)</th>
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<th>Maximum Misalignment</th>
<th>Nominal Torque (Nm)</th>
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Note: For details of HRC couplings suitable for application to drives involving SAE engine flywheels, consult your local Authorised Distributor.

ORDERING CODES

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PhYSICAL DiMenSionS AnD chARActeRiSTicS

† ‘J’ is the wrench clearance required for tightening/loosening the bush on the shaft. A shortened wrench will allow this dimension to be reduced.
‡ F,J refers to combinations of flanges: FF, FH, HH, FB, HB, BB.

Bore limits H7 unless otherwise specified.

All dimensions in millimetres unless otherwise stated.

All HRC couplings have an angular misalignment capacity of up to 1°.

Mass is for an FF, FH or HH coupling with mid range Taper Lock Bushes.

ORDERING CODES

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Note: For details of HRC couplings suitable for application to drives involving SAE engine flywheels, consult your local Authorised Distributor.

Type B flanges can be supplied finished bored to H7 tolerance with keyway, if required.

Hub material: GG25 grey cast iron.
Fenner Jaw Couplings offer a range of hub and element variants to meet the demand for low cost, general purpose and spacer type flexible couplings. They cater for incidental misalignment, absorb shock loads and damp out small amplitude vibrations.

**HUBS & SPACERS**

![Diagram](image)

**DIMENSIONS: SX, QF AND QFS**

<table>
<thead>
<tr>
<th>Pilot Bore Hub Code*</th>
<th>Size</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>Set Screw</th>
<th>Approx† mass (kg)</th>
<th>Max. speed (rev/min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>968G0099</td>
<td>035</td>
<td>3</td>
<td>16.0</td>
<td>—</td>
<td>27</td>
<td>13</td>
<td>16.0</td>
<td>M3</td>
<td>0.03</td>
<td>31000</td>
</tr>
<tr>
<td>968A0099</td>
<td>050</td>
<td>6</td>
<td>27.5</td>
<td>—</td>
<td>44</td>
<td>16</td>
<td>27.5</td>
<td>M6</td>
<td>0.10</td>
<td>18000</td>
</tr>
<tr>
<td>968B0099</td>
<td>070</td>
<td>9</td>
<td>35.0</td>
<td>—</td>
<td>51</td>
<td>19</td>
<td>35.0</td>
<td>M6</td>
<td>0.25</td>
<td>14000</td>
</tr>
<tr>
<td>968C0099</td>
<td>075</td>
<td>9</td>
<td>44.5</td>
<td>—</td>
<td>54</td>
<td>21</td>
<td>44.5</td>
<td>M6</td>
<td>0.45</td>
<td>11000</td>
</tr>
<tr>
<td>968D0099</td>
<td>095</td>
<td>9</td>
<td>54.0</td>
<td>—</td>
<td>54</td>
<td>21</td>
<td>54.0</td>
<td>M6</td>
<td>0.65</td>
<td>9000</td>
</tr>
<tr>
<td>968E0099</td>
<td>100</td>
<td>12</td>
<td>65.0</td>
<td>77</td>
<td>89</td>
<td>35</td>
<td>65.0</td>
<td>M8</td>
<td>1.55</td>
<td>7000</td>
</tr>
<tr>
<td>968F0099</td>
<td>110</td>
<td>15</td>
<td>84.0</td>
<td>97</td>
<td>108</td>
<td>43</td>
<td>84.0</td>
<td>M10</td>
<td>3.00</td>
<td>5000</td>
</tr>
<tr>
<td>968G0099</td>
<td>150</td>
<td>15</td>
<td>98.0</td>
<td>112</td>
<td>115</td>
<td>45</td>
<td>98.0</td>
<td>M10</td>
<td>4.85</td>
<td>4000</td>
</tr>
<tr>
<td>968H0099</td>
<td>190</td>
<td>19</td>
<td>115.0</td>
<td>130</td>
<td>133</td>
<td>54</td>
<td>102.0</td>
<td>M12</td>
<td>7.00</td>
<td>3600</td>
</tr>
<tr>
<td>968I0099</td>
<td>225</td>
<td>19</td>
<td>127.0</td>
<td>143</td>
<td>153</td>
<td>64</td>
<td>108.0</td>
<td>M12</td>
<td>9.00</td>
<td>3600</td>
</tr>
</tbody>
</table>

All dimensions in millimetres unless otherwise stated. Hub material is high grade cast iron. Spacer material is aluminium. Mass of complete SX or QF type with pilot bore hubs.

* Bored or bored and keywayed hubs can be supplied.

**ASSEMBLY VARIANTS - SEE DIAGRAM TO RIGHT**

- **SX**
  
  Simple coupling of two close-coupled shafts using 2 x SX hubs + a spider shaped element. The element petals are connected by an inner ring to maintain location between the ‘jaws’ on the hubs. Urethane and Hytrel® spider elements are available to enhance the coupling power rating. (see page 119).

- **QF**
  
  On sizes 095 and above, the SX hubs are drilled/tapped for fixing a pressed steel ‘ring’ or sleeve. The ring retains a QF type nitrile rubber element on which the petals are joined by an outer band. Unscrewing and withdrawing the ring allows the element to be removed for replacement without disturbing the hubs. The retaining ring and element are supplied together as a ‘ring kit’.

- **QFS**
  
  Used when the machine shafts to be coupled are set apart by a DBSE (distance between shaft ends) of 100 or 140mm. This arrangement is common with centrifugal pump applications. A QF coupling is used with a light alloy spacer, which is supplied complete with a second ring kit, to create a spacer coupling which is easily disassembled by removing the two elements.
**JAW COUPLING ELEMENTS**

<table>
<thead>
<tr>
<th>Code</th>
<th>Type</th>
<th>Temperature Range (°C)</th>
<th>Max Misalignment</th>
<th>Power Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>968*9000</td>
<td>Nitrile (Spider) (black)</td>
<td>–40 to 100</td>
<td>1</td>
<td>0.38</td>
</tr>
<tr>
<td>968*9900</td>
<td>Nitrile (QF ring kit) (black)</td>
<td>–40 to 100</td>
<td>1</td>
<td>0.38</td>
</tr>
<tr>
<td>968*9500</td>
<td>Urethane (blue)</td>
<td>–35 to 70</td>
<td>1</td>
<td>0.38</td>
</tr>
<tr>
<td>968*9400</td>
<td>Hytrel (white)</td>
<td>–50 to 120</td>
<td>1/2</td>
<td>0.38</td>
</tr>
</tbody>
</table>

* 4th digit = Alpha character for coupling size, see dimension table on page 121

Note: Sizes 90 and 95 SX couplings use the same spider element.

**SERVICE FACTORS**

<table>
<thead>
<tr>
<th>Driven Load</th>
<th>Prime Mover</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uniform Load</td>
<td>Electric Motor</td>
</tr>
<tr>
<td>Moderate Shock</td>
<td>1.0</td>
</tr>
<tr>
<td>Heavy Shock</td>
<td>2.0</td>
</tr>
</tbody>
</table>

**POWER RATINGS (KW) – NITRILE ELEMENTS**

<table>
<thead>
<tr>
<th>Speed (rev/min)</th>
<th>Coupling Size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>035</td>
</tr>
<tr>
<td>100</td>
<td>0.05</td>
</tr>
<tr>
<td>720</td>
<td>0.04</td>
</tr>
<tr>
<td>960</td>
<td>0.05</td>
</tr>
<tr>
<td>1440</td>
<td>0.07</td>
</tr>
<tr>
<td>2880</td>
<td>0.15</td>
</tr>
<tr>
<td>3600</td>
<td>0.19</td>
</tr>
</tbody>
</table>

Nominal Torque (Nm) = Design power (kW) x 9550 / rev/min

**SPACERS AND OF RETAINING RINGS – CODES**

All codes first 4 digits: 968–
4th digit: Alpha character for coupling size, see dimension table on page 121
5/6th digits: Spacer kit = 33; Retaining ring kit = 99
7/8th digits: Retaining ring kit = 00; Spacer kit 100mm = 10; Spacer kit 140mm = 14
Taper Lock Rigid Couplings provide a convenient method of rigidly connecting ends of shafts. Taper Lock bushes permit easier and quicker fixing to the shafts with the firmness of a shrunk-on-fit. These couplings have a male and female flange fully machined. The male flange can have the bush fitted from the Hub side H or from the Flange side F, the female flange always has the bush fitting F. This gives two possible coupling assemblies HF and FF. When connecting horizontal shafts, the most convenient assembly should be chosen. When connecting vertical shafts use assembly FF only.

**SELECTION**

For all applications using standard mild steel shafting it is sufficiently accurate to select the coupling by consideration of bore size alone. If transmitted torque is known, this should be checked against the allowable torque for the appropriate Taper Lock bush size/bore shown on page 131. For all other applications consult your local Authorised Distributor.

Rotational speed should be limited to a maximum rim speed of 33 m/sec.

**DIMENSIONS**

<table>
<thead>
<tr>
<th>Size</th>
<th>Max Bore</th>
<th>A</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F nominal</th>
<th>G nominal</th>
<th>H†</th>
<th>J*</th>
<th>L</th>
<th>Mass‡ (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RM12</td>
<td>1210</td>
<td>32</td>
<td>1 1/4&quot;)</td>
<td>118</td>
<td>35</td>
<td>83</td>
<td>25</td>
<td>76</td>
<td>102</td>
<td>7</td>
<td>38</td>
</tr>
<tr>
<td>RM16</td>
<td>1610</td>
<td>42</td>
<td>1 1/2&quot;)</td>
<td>127</td>
<td>43</td>
<td>80</td>
<td>25</td>
<td>89</td>
<td>105</td>
<td>7</td>
<td>38</td>
</tr>
<tr>
<td>RM25</td>
<td>2517</td>
<td>60</td>
<td>2&quot;)</td>
<td>178</td>
<td>51</td>
<td>123</td>
<td>45</td>
<td>127</td>
<td>149</td>
<td>7</td>
<td>48</td>
</tr>
<tr>
<td>RM30</td>
<td>3020</td>
<td>75</td>
<td>3&quot;)</td>
<td>216</td>
<td>65</td>
<td>146</td>
<td>51</td>
<td>152</td>
<td>181</td>
<td>7</td>
<td>54</td>
</tr>
<tr>
<td>RM35</td>
<td>3525</td>
<td>100</td>
<td>4&quot;)</td>
<td>248</td>
<td>75</td>
<td>178</td>
<td>65</td>
<td>178</td>
<td>213</td>
<td>7</td>
<td>67</td>
</tr>
<tr>
<td>RM40</td>
<td>4030</td>
<td>110</td>
<td>4 1/2&quot;)</td>
<td>298</td>
<td>76</td>
<td>210</td>
<td>76</td>
<td>216</td>
<td>257</td>
<td>7</td>
<td>79</td>
</tr>
<tr>
<td>RM45</td>
<td>4535</td>
<td>125</td>
<td>5&quot;)</td>
<td>330</td>
<td>86</td>
<td>230</td>
<td>89</td>
<td>241</td>
<td>286</td>
<td>7</td>
<td>89</td>
</tr>
<tr>
<td>RM50</td>
<td>5040</td>
<td>125</td>
<td>5&quot;)</td>
<td>362</td>
<td>92</td>
<td>266</td>
<td>102</td>
<td>267</td>
<td>314</td>
<td>7</td>
<td>92</td>
</tr>
</tbody>
</table>

All dimensions in millimetres unless otherwise stated.

* J is the wrench clearance to allow for tightening and loosening the bushing on the shaft. The use of a shortened wrench will permit this dimension to be reduced.
† H is the distance between shaft ends.
‡ Masses given are for couplings with mid-range bore Taper Lock Bushes.

**CODE NUMBERS**

<table>
<thead>
<tr>
<th>Size</th>
<th>Catalogue Code HF</th>
<th>Catalogue Code FF</th>
</tr>
</thead>
<tbody>
<tr>
<td>RM12</td>
<td>039A0501</td>
<td>039A0502</td>
</tr>
<tr>
<td>RM16</td>
<td>039B0501</td>
<td>039B0502</td>
</tr>
<tr>
<td>RM25</td>
<td>039C0501</td>
<td>039C0502</td>
</tr>
<tr>
<td>RM30</td>
<td>039D0501</td>
<td>039D0502</td>
</tr>
<tr>
<td>RM35</td>
<td>039E0501</td>
<td>039E0502</td>
</tr>
<tr>
<td>RM40</td>
<td>039F0501</td>
<td>039F0502</td>
</tr>
<tr>
<td>RM45</td>
<td>039G0501</td>
<td>039G0502</td>
</tr>
<tr>
<td>RM50</td>
<td>039H0501</td>
<td>039H0502</td>
</tr>
</tbody>
</table>

**FASTENERS**

<table>
<thead>
<tr>
<th>Coupling Size</th>
<th>Screw Size</th>
<th>Quantity</th>
<th>Assembly Torque Nm</th>
</tr>
</thead>
<tbody>
<tr>
<td>RM12</td>
<td>M8 x 35</td>
<td>4</td>
<td>25</td>
</tr>
<tr>
<td>RM16</td>
<td>M10 x 45</td>
<td>4</td>
<td>37</td>
</tr>
<tr>
<td>RM25</td>
<td>M12 x 50</td>
<td>5</td>
<td>65</td>
</tr>
<tr>
<td>RM30</td>
<td>M16 x 65</td>
<td>6</td>
<td>160</td>
</tr>
<tr>
<td>RM35</td>
<td>M16 x 70</td>
<td>6</td>
<td>160</td>
</tr>
<tr>
<td>RM40</td>
<td>M20 x 80</td>
<td>6</td>
<td>325</td>
</tr>
<tr>
<td>RM45</td>
<td>M24 x 90</td>
<td>6</td>
<td>560</td>
</tr>
<tr>
<td>RM50</td>
<td>M24 x 100</td>
<td>7</td>
<td>560</td>
</tr>
</tbody>
</table>

All fasteners are grade 8.8 minimum.
**SHAFT ALIGNMENT**

Appropriate alignment of the coupled shafts (or driven shaft to flywheel) is a fundamental requirement for any coupling installation.

The three basic modes of shaft misalignment are shown right.

Composite i.e. more than one mode, misalignment is available for some couplings (detailed elsewhere in this Manual).

Details of the degrees of misalignment that can be accommodated by different types and sizes of coupling are given throughout this manual.

With some couplings, axial shaft orientation (DBSE) is not critical, whereupon coupling component orientation (given as an ‘assembled length’ or ‘distance between faces’) becomes crucial.

It should be remembered that misalignment can cause extra loading on coupled shaft support bearings and can reduce the operational life of some couplings. Best practical alignment is therefore desirable.

Taper Lock Rigid Couplings cannot accommodate misalignment.

Laser alignment equipment can be supplied, see page 85.

**OTHER CRITERIA**

**Fenaflex** – tyre gap and seating. Tyre/element clamping bolt torque.

**HRC** – do not use to couple resiliently mounted machinery.

**All Elastomeric Couplings** – consider ambient conditions (FRAS or other alternative element material required)?

**All Taper Lock Couplings** – remember bush grips shaft first and draws hub on to taper. This may affect axial alignment.

**All applications** – ensure shaft diameter tolerances are correct.

Note: Fenaflex tyres and flywheel elements are accompanied by detailed installation data.

**TAPER LOCK**

Most of the Fenaflex and HRC couplings, and all Rigid couplings featured in this section use Taper Lock shaft fixing.

For detailed instructions on the fitting and dismounting of Taper Lock products see Shaft Fixings page 132.

**Note:** When fitting Taper Lock coupling flanges it should be noted that the bush grips the shaft initially and draws the flange up the tapered surface.

This may have a small effect on the final axial positioning of flanges on machine shafts, and the resultant distance between coupling flanges, where this is important to the fit and function of flexible coupling elements.

View the Fenner on-line Installation videos for Fenaflex

Visit: [www.fptgroup.com](http://www.fptgroup.com)