SELECTION GUIDE

1) Compute HP / 100 RPM or torque to be transmitted.

Determine HP / 100 RPM as follows:

$$\text{HP / 100 RPM} = \frac{\text{HP Transmitted x 100 x Service Factor}}{\text{RPM}}$$

or determine torque (IN·LBS) as follows:

$$\text{Torque} = \text{HP / 100 x 630 x Service Factor}$$

or

$$\text{Torque} = \frac{\text{HP Transmitted x 63000 x Service Factor}}{\text{RPM}}$$

Now determine the coupling type from section 2.

2) Important considerations for selection of coupling type:

a. Maximum permissible diameter.
b. Maximum allowable speed (RPM).
c. Maximum allowable misalignment (angular and parallel).
d. Affect of inertia values.
e. Backlash limitations.
f. Noise considerations.
g. Electrical isolation.
h. Ease of service (i.e. replacement of wear elements without disturbing the alignment of driving or driven equipment).
i. Ease of installation.
j. Shock absorption capability.
k. Torsional tuning [a must for internal combustion engines (especially diesel engines) and reciprocating compressors]
l. Environmental requirements (low or high ambient temperatures no lubricant allowed, oil or chemical environment).
m. Tradition (on certain types of equipment the use of specific types of couplings has become customary).
n. Price.

3) Having now determined the required HP / 100 RPM rating and the type of coupling (gear type - sleeve or flange, elastomeric) the coupling size can now be selected from the appropriate catalog page. Compare its listed maximum bore with the specified shaft sizes of the driving and driven equipment. If one or both shaft sizes are larger than the maximum allowed bore, select a larger size coupling.

EXAMPLE:

Selection - Gear type Coupling.

Hoist application, reversing main hoist drive. Motor rating 250 HP at 1800 RPM with a 3 3/8" shaft diameter, driven shaft 2 3/4" diameter.

The service factor guide shows a value of 2.0 for main hoist drives with reversing, therefore:

$$\text{HP / 100 RPM} = \frac{250 \times 100 \times 2}{1800} = 28 \text{ HP / 100 RPM}$$

Main hoist drives traditionally employ gear couplings. Using the required HP / 100 RPM figure of 28 we could select a size 1 1/2 coupling but the maximum allowable bore is unacceptable. Therefore, a size 2 1/2 must be selected which allows a maximum bore of 3.50".

The proper choice is therefore a size 2 1/2 series F flange type, full flex double engagement coupling.

EXAMPLE:

Selection - Elastomeric Coupling.

Diesel engine driving a centrifugal blower. Engine: 4 cyl., turbocharged, rated 40 HP at 3200 RPM, with a 1 1/2" diameter flywheel stubshaft and a minimum operating speed of 1200 RPM.
Driven equipment: centrifugal blower, with a 1 3/4" shaft diameter.

The service factor guide advises to consult the factory for the proper value. A service factor of 2.0 was obtained. Therefore:

$$\text{HP / 100 RPM} = \frac{40 \times 100 \times 2}{1200} = 6.7 \text{ HP / 100 RPM.}$$

For optimum life of the engine and the driven equipment components, an elastomeric coupling should be used. Normally the diesel engine manufacturer or other capable institutions will run a torsional analysis of the system to determine the required stiffness range of the coupling. In the above case a stiffness rate of $.08 \times 10^{6}$ to $.6 \times 10^{6}$ IN·LBS/Radian was considered desirable.

The FLEXTORK size 40 EL elastomeric coupling fits the above application perfectly. The coupling is rated for 10.1 HP / 100 RPM, which is above the minimum required rating of 6.7 HP / 100 RPM and the maximum bore of 2.63" is well above the required 1 3/4". The stiffness rate also falls within the specified range.