# HOW TO SELECT A FLEXIBLE JAW COUPLING

The selection process for determining the proper jaw coupling size and elastomer requires using the charts shown on the following pages. There are three components to be selected, two hubs and one elastomer. When the shaft size of the driver and driver of the application are of the same diameter, the hubs selected will be the same. When shaft diameters differ, hubs selected will differ accordingly.

Information necessary before a coupling can be selected:
HP (or KW) and RPM or Torque of driver
Shaft sizes of driver and driven equipment and corresponding keyways
Application description
Environmental conditions (i.e. extreme temperature, corrosive conditions, space limitations)

List of charts provided for Selection

Chart 1 - Application Service Factors
Chart 2 - Spider Performance Data
Chart 3 - Coupling Nominal Rated Torque
Formulas: Nominal Torque= in-lb = $\frac{(HP \times 63025)}{RPM}$

Nm = $\frac{(KW \times 9550)}{RPM}$

Design Torque=Nominal Torque x Application Service Factor

**Steps in Selecting a Jaw Coupling**

**Step 1**: Determine the Nominal Torque of your application by using the following formula:
Nominal Torque= in-lb = $\frac{(HP \times 63025)}{RPM}$

Nm = $\frac{(KW \times 9550)}{RPM}$

**Step 2**: Using the Application Service Factors Chart 1 select the service factor which best corresponds to your application.

**Step 3**: Calculate the Design Torque of your application by multiplying the Nominal Torque calculated in Step 1 by the application Service Factor determined in Step 2.
Design Torque=Nominal Torque x Application Service Factor

**Step 4**: Using the Spider Performance Data Chart 2, select the elastomer material which best corresponds to your application.

**Step 5**: Using the coupling Nominal Rated Torque Chart 3, locate the appropriate elastomer material column for the elastomer selected in Step 4.

Scan down this column to the first entry where the Torque Value in the appropriate column is greater than or equal to the Design Torque calculated in Step 3.

Once this value is located, refer to the corresponding coupling size in the first column of the Coupling Nominal Rated Torque Chart 3.

Refer to the maximum RPM value for this elastomer torque capability to ensure that the application requirements are met. If the requirement is not satisfied at this point, another type of coupling may be required for the application. Please consult our engineers.

**Step 6**: Compare the application driver/driven shaft sizes to the maximum bore size available on the coupling selected. If coupling bore size is not large enough for the shaft diameter, select the next largest coupling that will accommodate the drive/driven shaft diameters. Refer to Chart 3.

**Step 7**: Using the item Number Selection Charts, find the appropriate Bore and keyway sizes required and locate the item number.

**Selection Example**
A coupling is needed to connect a 20HP standard electric motor rated at 1800 RPM to a rotary pump. The shaft sizes of the electric motor (driver) is 2.0 inches and the pump (driven) is 1.75 inches. There are no special environmental conditions and the general operating temperature is normal room temperature, 72°F. Less than 1° of misalignment is expected.

**Step 1**: Determi = $\frac{(HP \times 63025)}{RPM}$ orque:
Nominal Torque = $\frac{(20 \times 63025)}{180}$
= 700.28 in-lb

**Step 2**: Using the Application Service Factor Chart 1, select the service factor which best correspond's to your application. The application Service Factor for an electric motor with standard torque driving a rotary pump is 1.25. The value of 1.25 is found under the application category Pumps, Rotary, column: Electric Motor w/Standard Torque in Chart 1.

**Step 3**: Calcul = Nominal Torque x Application Service Factor
Design Torque = 700.28 x 1.25
= 875.35 in-lb

**Step 4**: Using the Elastomer Performance Data Chart 2, select the elastomer material which best corresponds to your application. Since there are not special environmental conditions, the operating temperature is 72°F and less than 1° of angular misalignment is required, the NBR elastomer material is selected.

**Step 5**: Using the Coupling Nominal Rated Torque Chart 3, the NBR elastomer column is used to determine the proper coupling size. Scanning down the NBR column, the first entry to accommodate the Design Torque value of 875.35 in-lb is the size L150 with a nominal torque rating of 1,240 in-lb. Referring to the maximum RPM of 1800 on the electric motor of the application does not exceed the 5000 RPM maximum allowed for the L150 size coupling with an NBR elastomer.

**Step 6**: Compare the application driver/driven shaft size to the maximum bore available in the coupling selected. The electric motor (driver) of this application has a shaft size of 2.0 inches and the pump (driven) has a shaft size of 1.75 inches. The L150 coupling has a maximum bore less than the driver shaft size. Continuing down the Maximum Bore column, in Chart 3, the L190 size is found to have a maximum bore size 2.125 and is able to accommodate the driver/driven shaft sizes. Therefore the proper coupling size for the application is a L190 coupling with an NBR elastomer.

**Step 7**: Using the item number Selection charts, locate the appropriate item numbers. The L Type Coupling Elastomer Chart, and the L Type Coupling Inch Hubs Chart, provides easy reference to the item numbers.

Locate the L Type Coupling Inch Hubs Elastomer Chart.

The elastomer is selected by scanning down the type column and locating the NBR (Solid) entry. Read across to the L190 column and locate the item number 12274.

Locate the L Type coupling Inch Hubs selection chart.

The first bore size to be located is for the 2 inch shaft on the electric motor. Scan down the Bore/Keyway column to the 2 inch bore entry. Read across to the L190 column to locate item number of 12303.

The second bore size is located for the 1.75 inch shaft on the pump. Scan down the Bore/Keyway column to the 1 3/4 inch bore entry. Read across to the L190 column to locate the item number of 12299.

# FLEXIBLE SHAFT COUPLINGS

## Flexible Jaw Coupling - Chart 1

| | Service Factors | | | | |
|---|---|---|---|---|---|
| | Electric Motor w / Standard Torque | Electric Motor w / High Torque | Steam Turbines & Engines w / 4 or more cyl. | Reciprocating Engines | |
| | | | | 1-Cyl | 2-Cyl |
| Agitators | 1.00 | 1.25 | 1.00 | 1.7 | 1.3 |
| Band Resaw (lumber) | 1.50 | 1.75 | 1.50 | 2.2 | 1.8 |
| Barge Haul Puller | 2.00 | 2.25 | 2.00 | 2.7 | 2.3 |
| Beaters | 1.50 | 1.75 | 1.50 | 2.2 | 1.8 |
| Blowers | | | | | |
| Centrifugal | 1.00 | 1.25 | 1.00 | 1.7 | 1.3 |
| Lobe, Vane | 1.25 | 1.50 | 1.25 | 2.0 | 1.6 |
| Bottling Machinery | 1.25 | 1.50 | 1.25 | 2.0 | 1.6 |
| Brew Kettles (distilling) | 1.25 | 1.50 | 1.25 | 2.0 | 1.6 |
| Can Filling Machinery | 1.00 | 1.25 | 1.00 | 1.7 | 1.3 |
| Car Dumpers | 2.50 | 2.75 | 2.50 | 3.2 | 2.8 |
| Car Pullers | 1.50 | 1.75 | 1.50 | 2.2 | 1.8 |
| Card Machine | 1.75 | 2.00 | 1.75 | 2.5 | 2.0 |
| Chiller (oil) | 1.50 | 2.00 | 1.25 | 2.0 | 2.0 |
| Compressors | | | | | |
| Centrifugal | 1.00 | 1.25 | 1.00 | 1.7 | 1.3 |
| Screw, Lobe | 1.25 | 1.50 | 1.25 | 2.0 | 1.6 |
| Reciprocating | See Note | | | | |
| Conveyors, Uniformly Fed | | | | | |
| Assembly, Belt Screw | 1.00 | 1.25 | 1.00 | 1.7 | 1.3 |
| Bucket, Sawdust | 1.25 | 1.50 | 1.25 | 2.0 | 1.6 |
| Live Roll, Shaker, Reciprocating | 3.00 | 3.25 | 3.00 | 3.7 | 3.3 |
| Conveyors, Not Uniformly Fed | | | | | |
| Assembly, Belt, Oven, Screw | 1.20 | 1.45 | 1.20 | 1.9 | 1.5 |
| Reciprocating | 2.50 | 2.75 | 2.50 | 3.2 | 2.8 |
| Shaker | 3.00 | 3.25 | 3.00 | 3.7 | 3.3 |
| Cookers-Brewing, Distilling | | | | | |
| Food | 1.25 | 1.50 | 1.25 | 2.0 | 1.6 |
| Cranes and Hoist | 2.00 | 2.75 | 2.00 | 2.7 | 2.3 |
| Crushers-Cane (Sugar, Stone, or Ore) | 3.00 | 3.25 | 3.00 | 3.7 | 3.3 |
| Dredges | | | | | |
| Cable Reels | 2.00 | 2.25 | 2.00 | 2.7 | 2.3 |
| Conveyors, Pumps | | | | | |
| Maneuvering Winches | 1.50 | 1.75 | 1.50 | 2.2 | 1.8 |
| Cutter Head Drives | 2.50 | 2.75 | 2.50 | 3.2 | 2.8 |
| Dynamometer | 1.50 | 1.75 | 1.50 | 2.2 | 1.8 |
| Evaporators | 1.00 | 1.25 | 1.00 | 1.7 | 1.3 |
| Fans | | | | | |
| Centrifugal | 1.00 | 1.25 | 1.00 | 1.7 | 1.3 |
| Cooling Towers | 2.00 | 2.25 | 2.00 | 2.7 | 2.3 |
| Forced Draft, Propeller | 1.50 | 1.75 | 1.50 | 2.2 | 1.8 |
| Induced Draft w/dampener control | 2.00 | 2.25 | 2.00 | 2.7 | 2.3 |
| Induced Draft w/o damper control | 1.25 | 1.50 | 1.25 | 2.0 | 1.6 |
| Feeders | | | | | |
| Belt, Screw | 1.00 | 1.25 | 1.00 | 1.7 | 1.3 |
| Reciprocating | 2.50 | 2.75 | 2.50 | 3.2 | 2.8 |
| Filter, press-oil | 1.50 | 1.75 | 1.50 | 2.2 | 1.8 |
| Generators | | | | | |
| Not Welding | 1.00 | 1.25 | 1.00 | 1.7 | 1.3 |
| Welding | 2.00 | 2.25 | 2.00 | 2.7 | 2.3 |
| Hoist | 1.50 | 1.75 | 1.50 | 2.2 | 1.8 |
| Hammermills | 2.00 | 2.25 | 2.00 | 2.7 | 2.3 |
| Kilns | 1.50 | 1.75 | 1.50 | 2.2 | 1.8 |
| Laundry Washers-Reversing | 2.00 | 2.25 | 2.00 | 2.7 | 2.3 |
| Lumber Machinery | | | | | |
| Barkers, Edger Feeder, Live Roll | 2.00 | 2.25 | 2.00 | 2.7 | 2.3 |
| Planer, Slab Conveyor | 2.00 | 2.25 | 2.00 | 2.7 | 2.3 |

| | Service Factors | | | | |
|---|---|---|---|---|---|
| | Electric Motor w / Standard Torque | Electric Motor w / High Torque | Steam Turbines & Engines w / 4 or more cyl. | Reciprocating Engines | |
| | | | | 1-Cyl | 2-Cyl |
| Machine Tools | | | | | |
| Punch Press-Gear Driven, | | | | | |
| Plate Planer | 2.00 | 2.25 | 2.00 | 2.7 | 2.3 |
| Tapping Machinery, Bending Roll | 2.00 | 2.25 | 2.00 | 2.7 | 2.3 |
| Main Drive | 1.50 | 1.75 | 1.50 | 2.2 | 1.8 |
| Auxiliary Drives | 1.00 | 1.25 | 1.00 | 1.7 | 1.3 |
| Metal Forming Machines | | | | | |
| Draw Bench-carriage & Main Drive | 2.00 | 2.25 | 2.00 | 2.7 | 2.3 |
| Extruder, Forming Machine, | | | | | |
| Wire Drawing | 2.00 | 2.25 | 2.00 | 2.7 | 2.3 |
| Table Conveyors | 2.50 | 2.75 | 2.50 | 3.2 | 2.8 |
| Wire Winding, Coilers, Slitters | 1.50 | 1.75 | 1.50 | 2.2 | 1.8 |
| Mills, Rotary Type | | | | | |
| Ball, Kilns, Pebble, Rolling, Tube | 2.00 | 2.25 | 2.00 | 2.7 | 2.3 |
| Cement Kilns, Dryers, Coolers | 2.00 | 2.25 | 2.00 | 2.7 | 2.3 |
| Tumbling | 1.50 | 1.75 | 1.50 | 2.2 | 1.8 |
| Mixers | | | | | |
| Concrete, continuous | 1.75 | 2.00 | 1.75 | 2.5 | 2.0 |
| Muller | 1.50 | 1.75 | 1.50 | 2.2 | 1.8 |
| Paper Mills | | | | | |
| Agitator (mixers), Reel, Winder | 1.20 | 1.45 | 1.20 | 1.9 | 1.5 |
| Winder | 1.20 | 1.45 | 1.20 | 1.9 | 1.5 |
| Barker (mechanical), Log Haul | | | | | |
| Chipper | 2.00 | 2.25 | 2.00 | 2.7 | 2.3 |
| Barking Drum (spur gear) | 2.50 | 2.75 | 2.50 | 3.2 | 2.8 |
| Beater, Pulper, Jordans, Dresses | 2.00 | 2.25 | 2.00 | 2.7 | 2.3 |
| Calendars, Dryers, Washers, | | | | | |
| Thickener | 1.50 | 1.75 | 1.50 | 2.2 | 1.8 |
| Converting Machines, Conveyors | 1.20 | 1.45 | 1.20 | 1.9 | 1.5 |
| Printing Presses | 1.50 | 1.75 | 1.50 | 1.7 | 1.3 |
| Pug Mill | 1.75 | 2.00 | 1.75 | 2.0 | 1.6 |
| Pumps | | | | | |
| Centrifugal | 1.00 | 1.25 | 1.00 | 1.7 | 1.3 |
| Gear, Rotary, Vane | 1.25 | 1.50 | 1.25 | 2.0 | 1.6 |
| Reciprocating: | | | | | |
| 1-Cyl. Single or Double Acting | 2.00 | 2.25 | 2.00 | 2.7 | 2.3 |
| 2-Cyl. Single Acting | 2.00 | 2.25 | 2.00 | 2.7 | 2.3 |
| 2-Cyl. Double Acting | 1.75 | 2.00 | 1.75 | 2.5 | 2.0 |
| 3 or more Cyl. | 1.50 | 1.75 | 1.50 | 2.2 | 1.8 |
| Rubber Machinery | | | | | |
| Mixers | 2.50 | 2.75 | 2.50 | 3.2 | 2.8 |
| Rubber Calendar | 2.00 | 2.25 | 2.00 | 2.7 | 2.3 |
| Screens | | | | | |
| Air washing, Water | 1.00 | 1.25 | 1.00 | 1.7 | 1.3 |
| Rotary-stone or gravel, Dewatering | 1.50 | 1.75 | 1.50 | 2.2 | 1.8 |
| Vibrating | 2.50 | 2.75 | 2.50 | 3.2 | 2.8 |
| Grizzly | 2.00 | 2.25 | 2.00 | 2.7 | 2.3 |
| Shredders | 1.50 | 1.75 | 1.50 | 2.2 | 1.8 |
| Steering Gears | 1.00 | 1.25 | 1.00 | 1.7 | 1.3 |
| Stokers | 1.00 | 1.25 | 1.00 | 1.7 | 1.3 |
| Suction Roll (paper) | 1.50 | 1.75 | 1.50 | 2.2 | 1.8 |
| Textile Machinery | | | | | |
| Dryers, Dyeing Machinery, Mangle | 1.20 | 1.45 | 1.20 | 2.0 | 1.6 |
| Loom Spinner, Tenter Frames | 1.50 | 1.75 | 1.50 | 2.2 | 1.8 |
| Tumbling Barrels | 1.75 | 2.00 | 1.75 | 2.5 | 2.0 |
| Windlass | 2.00 | 2.25 | 2.00 | 2.7 | 2.3 |
| Woodworking Machine | 1.00 | 1.25 | 1.00 | 1.7 | 1.3 |

**NOTE:** Applications involving reciprocating engines and reciprocating driven devices are subject to critical rotational speeds which may damage the coupling and/or connected equipment. Contact engineering with specific requirements.

*Dimensions and specifications are subject to change without notice. Not all items are Made-To-Stock, contact us for availability.*

02/15

# FLEXIBLE SHAFT COUPLINGS

## Flexible Jaw Coupling - Chart 2

| Characteristics | Temperature Range | Misalignment | | Shore Hardness | Dampening Capacity | Chemical Resistance | Color |
|---|---|---|---|---|---|---|---|
| | | Angular Degree | Parallel Inch | | | | |
| **SOX(NBR) Rubber** - Nitrile Butadiene (Buna N) Rubber is a flexible elastomer material that is oil resistant resembles natural rubber in resilience and elasticity. Good resistance to oil. Standard elastomer. (Also applies to SXB Cushions.) | -40° to +212°F<br>-40° to +100°C | 1° | .015 | 80A | High | Good | Black |
| **URETHANE** - Urethane has greater torque capability than NBR (1.5 times) and provides less dampening effect. Good resistance to oil and chemicals | -30° to +160°F<br>-34° to +71°C | 1° | .015 | 55D<br>L050-L095<br>40D<br>L099-L225 | Low | Very Good | Blue |
| **HYTREL** - Hytrel is a flexible elastomer designed for high torque and high temperature operations. Has an excellent resistance to oil and chemicals. Not recommended for cyclic or start/stop applications | -60° to +250°F<br>-51° to +121°C | 1/2° | .015 | 55D | Low | Excellent | Tan |
| **BRONZE** - Bronze is a rigid, porous oil-impregnated metal insert exclusively for slow speed (maximum 250 RPM) applications requiring high torque capabilities. Bronze operations are not affected by extreme temperatures, water, oil or dirt. | -40° to +450°F<br>-40° to +232°C | 1/2° | .010 | - | None | Excellent | Bronze |

**NOTE:** NBR standard shore hardness is 80A±5A-except L035=60A. Other softer or harder designs are available in NBR material, consult engineering

## Flexible Jaw Coupling - Chart 3

| Size | Maximum Bore | | SOX (NBR) Torque | | Spider Material<br>Urethane Torque | | Hytrel Torque | | Bronze Torque | |
|---|---|---|---|---|---|---|---|---|---|---|
| | inch | mm | in-lbs | Nm | in-lbs | Nm | in-lbs | Nm | in-lbs | Nm |
| L035 | .375 | 9 | 3.5 | 0.4 | N/A | N/A | N/A | N/A | N/A | N/A |
| L/AL050 | .625 | 16 | 26.3 | 3.0 | 39 | 4.5 | 50 | 5.6 | 50 | 5.6 |
| L/AL070 | .750 | 19 | 43.2 | 4.9 | 65 | 7.3 | 114 | 12.9 | 114 | 12.9 |
| L/AL075 | .875 | 22 | 90.0 | 10.2 | 135 | 15.3 | 227 | 25.6 | 227 | 25.6 |
| L/AL090 | 1.000 | 25 | 144.0 | 16.3 | 216 | 24.4 | 401 | 45.3 | 401 | 45.3 |
| L/AL095 | 1.125 | 28 | 194.0 | 21.9 | 291 | 32.9 | 561 | 63.4 | 561 | 63.4 |
| L/AL099 | 1.188 | 30 | 318.0 | 35.9 | 477 | 53.9 | 792 | 89.5 | 792 | 89.5 |
| L/AL100 | 1.375 | 35 | 417.0 | 47.1 | 626 | 70.7 | 1134 | 128.0 | 1134 | 128.0 |
| L/AL110 | 1.625 | 42 | 792.0 | 89.5 | 1188 | 134.0 | 2268 | 256.0 | 2268 | 256.0 |
| L150 | 1.875 | 48 | 1240.0 | 140.0 | 1660 | 210.0 | 3708 | 419.0 | 3706 | 419.0 |
| AL150 | 1.875 | 48 | 1450.0 | 163.8 | N/A | N/A | N/A | N/A | N/A | N/A |
| L190 | 2.125 | 55 | 1726.0 | 195.0 | 2592 | 293.0 | 4680 | 529.0 | 4680 | 529.0 |
| L225 | 2.625 | 65 | 2340.0 | 264.0 | 3510 | 397.0 | 6228 | 704.0 | 6228 | 704.0 |
| L276 | 2.875 | 73 | 4716.0 | 533.0 | N/A | N/A | N/A | N/A | N/A | N/A |
| C226 | 2.500 | 64 | 2988.0 | 338.0 | N/A | N/A | 5940 | 671.0 | 5940 | 671.0 |
| C276 | 2.875 | 73 | 4716.0 | 533.0 | N/A | N/A | 9432 | 1066.0 | N/A | N/A |
| C280 | 3.000 | 76 | 7560.0 | 854.0 | N/A | N/A | 13866 | 1567.0 | N/A | N/A |
| C285 | 4.000 | 102 | 9182.0 | 1038.0 | N/A | N/A | 16680 | 1882.0 | N/A | N/A |
| C295 | 3.500 | 89 | 11340.0 | 1281.0 | N/A | N/A | 22680 | 2563.0 | 22680 | 2563.0 |
| C2955 | 4.000 | 102 | 18900.0 | 2136.0 | N/A | N/A | 37800 | 4271.0 | 37800 | 4271.0 |

**NOTE:** Bronze has a maximum RPM capability of 250 RPM. N/A indicates not available.

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