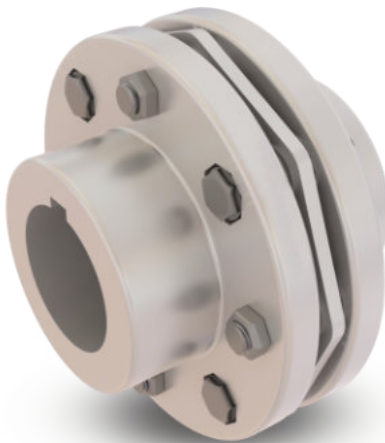




**UK** Flowtechnik

# Coupling Selection



# Coupling Selection

## How to Select

### Standard Selection

The Standard Selection may be used for engine driven, motor, or turbine applications. The following information is required:

- Application or equipment type (motor to pump, reducer to conveyor, etc.)
- Shaft diameters (mm)
- Gaps between shafts (mm)
- Speed (RPM)
- Horsepower or torque (Nm)

**1. Rating :** Determine system torque. Torque is calculated as follows :

$$\text{I. Torque (Nm)} = \frac{\text{kW} \times 9,550}{\text{RPM}} \quad \text{II. Torque (Kg.m)} = \frac{\text{kW} \times 974}{\text{RPM}}$$

**2. Service Factor :** Determine appropriate service factor from pages 3–4

**3. Minimum Coupling Rating :** Determine the required minimum coupling rating as follows :

$$\text{Minimum Coupling Rating} = \text{Service Factor} \times \text{Torque (Nm)}$$

**4. Type :** Select the appropriate coupling type

**5. Size :** Trace the Torque column to find the value that is equal or greater than value from Step 3.

**6. Check :** Check speed (RPM), bore, gap and dimensions.

### Formula Selection

The Standard Selection should be used for most coupling selections.

The Formula Selection procedure below should be used for:

- High Peak Loads
- Brake Applications (Brake disc or brake wheel is an integral part of coupling)

Using the Formula Selection and providing system peak torque and frequency, duty cycle, and brake torque rating will allow for a more refined selection.

**1. High Peak Loads:** Use formula A or B for applications which involve motors with higher than normal torque characteristics. Applications should also be those with intermittent operations, including shock loading, inertia effects due to stop/start and repetitive system-induced high peak torques. System Peak Torque is the maximum torque that can exist in the system. Select a coupling with a Torque Rating equal or greater than the Selection Torque calculated below:

A. Non-Reversing High Peak Torque : Selection torque (Nm) = System Peak Torque or

$$\text{System Torque (Nm)} = \frac{\text{System peak kW} \times 9549}{\text{RPM}}$$

B. Reversing High Peak Torque : Selection Torque (Nm) = 2 x System Peak Torque or

$$\text{System Torque (Nm)} = \frac{2 \times \text{System peak kW} \times 9549}{\text{RPM}}$$

**2. Brake Applications :** If the torque rating of the brake exceeds the motor torque, use brake rating as below :

$$\text{Selection Torque (Nm)} = \text{Brake Torque Rating} \times \text{Service Factor}$$

# Service Factors

## Operation of Drive System

Application	Service Factor
<b>AERATOR</b>	2.0
<b>AGITATORS</b>	
Vertical and Horizontal Screw, Propeller, Paddle	1.0
<b>BARGE HAUL PULLER</b>	1.5
<b>BLOWERS</b>	
Centrifugal	1.0
Lobe or Vane	1.25
<b>CAR DUMPERS</b>	2.5
<b>CAR PULLERS</b>	1.5
<b>CLARIFIER or CLASSIFIER</b>	1.0
<b>COMPRESSORS</b>	
Centrifugal	1.0
Rotary, Lobe or Vane	1.25
Rotary, Screw	1.0
With Flywheel and Gear between Compressor and Prime Mover	
1 Cylinder, single acting	3.0
1 Cylinder, double acting	3.0
2 Cylinders, single acting	3.0
2 Cylinders, double acting	3.0
3 Cylinders, single acting	3.0
3 Cylinders, double acting	2.0
4 or more cylinders, single acting	1.75
4 or more cylinders, double acting	1.75
<b>CONVEYORS</b>	
Apron, Assembly, Belt, Chain, Flight, Screw	1.0
Bucket	1.25
Live Roll, Shaker and Reciprocating	3.0
<b>CRANES and HOIST</b>	
Main Hoist	1.75
Skip Hoist	1.75
Slope	1.5
Bridge, Travel or Trolley	1.75
<b>DYNAMOMETER</b>	1.0
<b>ELEVATORS</b>	
Bucket, Centrifugal Discharge	1.25
Gravity Discharge	1.25
<b>EXCITER, GENERATOR</b>	1.0
<b>EXTRUDER, PLASTIC</b>	1.5
<b>FANS</b>	
Centrifugal	1.0
Cooling Tower	2.0
Forced Draft–Across the Line start	1.5
Forced Draft Motor driven thru fluid or electric slip clutch	1.0
Gas Recirculating	1.5
Induced Draft with damper control or blade cleaner	1.25
Induced Draft without controls	2.0
<b>FEEDERS</b>	
Apron, Belt, Disc, Screw	1.0
Reciprocating	2.5
<b>GENERATORS</b>	
Even Load	1.0
Hoist or Railway Service	1.5
Welder Load	2.0

Application	Service Factor
<b>HAMMERMILL</b>	1.75
<b>LAUNDRY WASHER or TUMBLER</b>	2.0
<b>LINE SHAFTS</b>	
Any Processing Machinery	1.5
<b>MACHINE TOOLS</b>	
Auxiliary and Traverse Drive	1.0
Bending Roll, Notching Press, Punch Press, Planer, Plate Reversing	1.75
Main Drive	1.5
<b>METAL FORMING MACHINES</b>	
Continuous Caster	1.75
Draw Bench Carriage and Main Drive	2.0
Extruder	2.0
Farming Machine and Forming Mills	2.0
Slitters	1.0
Wire Drawing or Flattening	1.75
Wire Winder	1.5
Coilers and Uncoilers	1.5
<b>MIXERS</b>	
Concrete	1.75
Muller	1.5
<b>PRESS, PRINTING</b>	1.5
<b>PUG MILL</b>	1.75
<b>PULVERISERS</b>	
Hammermill and Hog	1.75
Roller	1.5
<b>PUMPS</b>	
Boiler Feed	1.5
Centrifugal–Constant Speed	1.0
Frequent Speed Changes under Load	1.25
Descaling with accumulators	1.25
Gear, Rotary, or Vane	1.25
Reciprocating, Plunger Piston	
1 Cylinder, single or double acting	3.0
2 Cylinders, single acting	2.0
2 Cylinders, double acting	1.75
3 or more cylinders	1.5
Screw Pump, Progressing Cavity	1.25
Vacuum Pump	1.25
<b>SCREENS</b>	
Air Washing	1.0
Grizzly	2.0
Rotary Coal or Sand	1.5
Vibrating	2.5
Water	1.0
<b>STEERING GEAR</b>	1.0
<b>STOKER</b>	1.0
<b>TIRE SHREDDER</b>	1.5
<b>TUMBLING BARREL</b>	1.75
<b>WINCH, MANOEUVRING</b>	
Dredge, Marine	1.5
<b>WINDLASS</b>	1.5
<b>WOODWORKING MACHINERY</b>	1.0

# Service Factors

## Operation of Drive System

Industry	Service Factor
<b>AGGREGATE PROCESSING, CEMENT, MINING KILNS; TUBE, ROD and MILLS</b>	
Direct or on L.S. shaft of Reducer, with final drive Machined Spur Gears	2.0
Single Helical or Herringbone Gears	1.75
Crushers, Ore or Stone	2.5
Dryer, Rotary	1.75
Grizzly	2.0
Hammermill or Hog	1.75
Tumbling Mill or Barrel	1.75
<b>BREWING and DISTILLING</b>	
Bottle and Can Filling Machines	1.0
Brew Kettle	1.0
Cookers, Continuous Duty	1.25
Lauter Tun	1.5
Mash Tun	1.25
Scale Hopper, Frequent Peaks	1.75
<b>CLAY WORKING INDUSTRY</b>	
Brick Press, Briquette Machine, Clay Working Machine, Pug Mill	1.75
<b>DREDGES</b>	
Cable Reel	1.75
Conveyors	1.25
Cutter head, Jig Drive	2.0
Maneuvering Winch	1.5
Pumps (Uniform load)	1.5
Screen Drive, Stacker	1.75
Utility Winch	1.5
<b>FOOD INDUSTRY</b>	
Beet Slicer	1.75
Bottling, Can Filling Machine	1.0
Cereal Cooker	1.25
Dough Mixer, Meat Grinder	1.75
<b>LUMBER</b>	
Band Resaw	1.5
Circular Resaw, Cut-off	1.75
Edger, Head Rig, Hog	2.0
Log Haul	2.0
Planer	1.75
Rolls, Non-Reversing	1.25
Rolls, Reversing	2.0
Sawdust Conveyor	1.25
Slab Conveyor	1.75
Sorting Table	1.5
Trimmer	1.75
<b>METAL ROLLING MILLS</b>	
Coilers (Up or Down) Cold Mills only	1.5
Coilers (Up or Down) Hot Mills only	2.0
Coke Plants	
Pusher Ram Drive	2.5
Door Opener	2.0
Pusher or Larry Car Traction Drive	3.0
Continuous Caster	1.75
Colling Beds	1.5
Drawbench	2.0
Feed Rolls-Blooming Mills	3.0
Furnace Pushers	2.0
Hot and Cold Saws	2.0
Ingot Cars	2.0
Manipulators	3.0
Mill Tables	
Roughing Breakdown Mills	3.0
Hot Bed or Transfer, non-reversing	1.5
Runout, reversing	3.0
Runout, non-reversing, non-plugging	2.0
Reel Drives	1.75
Screwdown	2.0
Seamless Tube Mills	
Piercer	3.0
Thrust Block	2.0
Tube Conveyor Rolls	2.0
Reeler	2.0
Kick Out	2.0
Sideguards	3.0

Industry	Service Factor
Slitters, Steel Mill only	1.75
Lift	1.0
Travel	2.0
Straighteners	2.0
Unscramblers (Billet Bundle Busters)	2.0
Wire Drawing Machinery	1.75
<b>OIL INDUSTRY</b>	
Chiller	1.25
Oilwell Pumping (not over 150% peak torque)	2.0
Paraffin Filter Press	1.5
Rotary Kiln	2.0
<b>PAPER MILLS</b>	
Barker Auxiliary, Hydraulic	2.0
Barker, Mechanical	2.0
Barking Drum	
L.S. shaft of reducer with final drive-Helical or Herringbone Gear	2.0
Machined Spur Gear	2.5
Cast Tooth Spur Gear	3.0
Beater & Pulper	1.75
Bleachers, Coaters	1.0
Calender & Super Calender	1.75
Chipper	2.5
Converting Machine	1.25
Couch	1.75
Cutter, Felt Whipper	2.0
Dryer	1.75
Cylinder	1.75
Felt Stretcher	1.25
Fourdrinier	1.75
Jordan	2.0
Log Haul	2.0
Line Shaft	1.5
Press	1.75
Pulp Grinder	1.75
Reel, Rewinder, Winder	1.5
Stock Chest, Washer, Thickener	1.5
Stock Pumps, Centrifugal	
Constant Speed	1.0
Frequent Speed Changes Under load	1.25
Suction Roll	1.75
Vacuum Pumps	1.25
<b>RUBBER INDUSTRY</b>	
Calender	2.0
Cracker, Plasticator	2.5
Extruder	1.75
Intensive or Banbury Mixer	2.5
Mixing Mill, Refiner or Sheeter	
One or two in line	2.5
Three or four in line	2.0
Five or more in line	1.75
Tire Building Machine	2.5
Tire & Tube Press Opener (Peak Torque)	1.0
Tuber, Strainer, Pelletiser	1.75
Warming Mill	
One or two Mills in line	2.0
Three or more Mills in line	1.75
Washer	2.5
<b>SEWAGE DISPOSAL EQUIPMENT</b>	
Bar Screen, Chemical feeders, Collectors, Dewatering Screen, Grit Collector	1.0
<b>SUGAR INDUSTRY</b>	
Cane Carrier & Leveller	1.75
Cane Knife & Crusher	2.0
Mill Stands, Turbine Driver with all Helical or Herringbone, or Spur Gears with any Prime Mover	1.75
<b>TEXTILE INDUSTRY</b>	
Batcher	1.25
Calender, Card Machine	1.5
Cloth Finishing Machine	1.5
Dry Can, Loom	1.5
Dyeing Machinery	1.25
Mangle, Napper, Soaper	1.25
Spinner, Tenter Frame, Winder	1.5

# Service Factors







## Standard Selection

Service Factors for engine drives are required for applications where good flywheel regulation prevents torque fluctuations greater than 20%. For drives where torque fluctuations are greater or where the operation is near a serious critical or torsional vibration, a mass elastic study is necessary.

Number of Cylinders	4 or 5					6 or more				
Service Factor	1.5	1.75	2	2.25	2.5	1.5	1.75	2	2.25	2.5
Engine Service Factor	2.5	2.75	3	3.25	3.5	2.5	2.75	3	3.25	3.5

To use Engine Drive Service Factors, first determine application Service Factor from pages 3–4. When Service Factor is greater than 2.0, or where 1, 2 or 3 cylinder engines are involved, refer complete application details to UK Flowtechnik for engineering review.

Service Factors are a guide, based on experience, of the ratio between coupling catalogue rating and system characteristics. The system characteristics are best measured with a torque meter.

Torque Demands Driven Machine	Typical applications for Driven Equipment	Typical Service Factor
	Constant torque such as Centrifugal Pumps, Blowers and Compressors.	1.0
	Continuous duty with some torque variations including Plastic Extruders, Forced Draft Fans.	1.5
	Light shock loads such as Metal Extruders, Cooling Towers, Cane Knife, Log Haul.	2.0
	Moderate shock loading as expected from a Car Dumper, Stone Crusher, Vibrating Screen.	2.5
	Heavy shock load with some negative torques namely from Roughing Mills, Reciprocating Pumps, Compressors, Reversing Runout Tables.	3.0
	Applications like Reciprocating Compressors with frequent torque reversals, which do not necessarily cause reverse rotations.	Refer to UK Flowtechnik