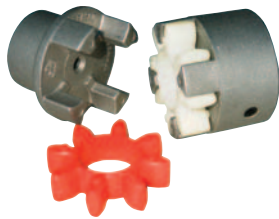


SHAFT COUPLINGS | How to select your flexible shaft couplings

The optimum choice of flexible coupling for any application is the result of a compromise between many factors. Care should be taken to select a coupling which meets the performance criteria at the minimum cost.

1. Decide if the coupling should be torsionally soft or rigid. Torsionally soft types are generally less expensive.
2. Consider whether a small amount of backlash is tolerable; a backlash-free coupling is usually more expensive.

3. Calculate the required torque by multiplying the running power and speed by the service factors shown in the table below.
4. Make a provisional selection.
5. Check maximum speed and coupling dimensions meet requirements.
6. Contact us to confirm price and delivery. Please give the type number where possible. Our couplings specialists are able to give advice where needed and can offer other models.



Torsionally soft with backlash



Torsionally soft, backlash free



Torsionally rigid, backlash free

With backlash or backlash free?

Couplings that have a one-piece construction or have bolted joints are backlash free. These are useful for precise positioning and to avoid wear on reversing drives. Couplings with backlash tend to have lower cost and are easier to install.

Torsionally soft or torsionally rigid?

As a guide, couplings with rubber or plastic elements can be considered as torsionally soft. Most metal couplings are rigid, but some such as Simplaflex have quite low stiffness. A soft coupling may wind up 5° or more at rated torque whilst a rigid one would twist as little as 0.1°. Soft couplings are generally lower in cost.

Types of misalignment

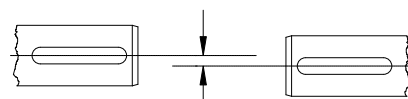
Angular

This is usually present to some extent on all applications, typical values 0.5° – 2°. Sometimes higher values are necessary.



Radial

Also known as parallel misalignment, this is also nearly always present. A well aligned installation might have values below 0.20mm.



Axial

This can be considered as end float. It is sometimes caused by thermal expansion or is a result of machine design.



Often a combination of all three types of misalignment is present. Coupling maximum limits should not be used simultaneously.

SHAFT COUPLING

Selection guide

Coupling type	Nominal torque range Nm	Speed capacity	Range of bores mm	Torsionally soft	Torsionally rigid	Backlash free	
Universal joints	10 to 580	Low to medium	6 to 50	✗	✓	✓	
Oldham	0.2 to 42	Medium	3 to 30	✓ moderate	✗	✓	
Curved jaw	11 to 1465	High	10 to 90	✓	✗	✗	
Clamp hub curved jaw	0.65 to 187	High	4 to 45	✓	✗	✓	
High torque curved jaw*	7 to 450	High	10 to 42	✓	✗	✓	
Lovejoy Straight sided jaw	0.4 to 660	High	4 to 67	✓	✗	✗	
Barrel gear	10 to 700	High	7 to 80	✓ Moderate	✗	✗	
Hexaflex Reinforced rubber disc	100 to 2250	Medium	14 to 100	✓	✗	✓	
Hexaflex BlueLine* Marine couplings	100 to 2000	Medium	20 to 70	✓	✗	✓	
Beam	0.4 to 5	High	3 to 12	✗	✓ Moderate	✓	
Simplaflex spring Couplings	2.5 to 900	High	3 to 75	✓ Moderate	✗	✓	
Bellows	2.5 to 45	High	3 to 25	✗	✓	✓	
Mini metal disc Servoflex 328	1 to 25	High	4 to 24	✗	✓	✓	
Metal disc couplings Servoflex 318	35 to 500	High	12 to 55	✗	✓	✓	
Arcoflex metal disc couplings	800-23000	High	25 to 150	✗	✓	✓	

*details on request

	Typical misalignment values			Ambient temperatures °C	Spacer models	Comments
	Angular degrees	Radial mm	Axial mm			
	45 per joint	High values with double joints	High values with telescopic models	to 100°C	Telescopic only for static adjustment	Not true flexible couplings, Double & telescopic version available
	0.5	0.2	0.15	-25 to +60°C		Compact design clamping hubs standard
	1.5	0.12	1.4	-30 to +80°C	on request	General purpose & economic
	1	0.12	1.4	-40 to +120°C	on request	Eliminates keyways
	1	0.12	1.4	-40 to +120°C	on request	Compact with high torque
	1	0.4	1.4	-51 to +120°C		General purpose, variable stiffness by changing element
	1	0.4	±1	-25 to +90°C		Suits blind assembly, electrically insulating
	3	0.6	3	-30 to +80°C	built from stock	General purpose coupling, rugged.
	3	0.6	3	-30 to +80°C	On request	Flange to shaft connection with optimal damping for marine diesels
	3	0.2 to 0.38	0.1 to 0.25	-40 to +170°C	On request	Set screw or clamp hub. Special materials available
	3-6	0.5 (3.6 max)	+1	-30 to +100°C (300°C on request)		Strong all steel coupling, 3 lengths available
	1.5	0.15	0.4	-45 to +90°C		Lowest inertia, clamping hubs standard
	2	0.2	±0.5	-30 to +150°C		Clamping hubs standard
	2	0.3	2	-40 to +270°C	to 3m or more	Clamping hubs and aluminum construction optional
	1	2.2	2	-40 to +270°C	to 5m or more	Adaptable metal disc couplings. Clamp hubs available

Size calculation

The required torque is determined using the following equation:

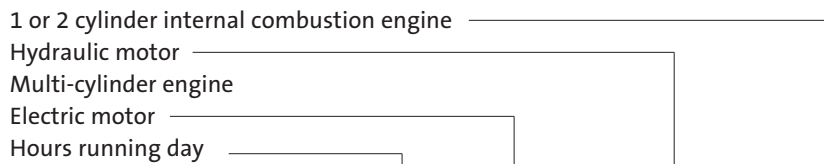
$$\text{Torque required} = 9550 \times \frac{\text{kW}}{\text{N}} \times k \times S, \text{ Nm}$$

or in imperial units

$$\text{Torque required} = 7124 \times \frac{\text{hp}}{\text{N}} \times k \times S, \text{ Nm}$$

- N = revolutions per minute
- k = service factor depending on operating conditions
- S = starting frequency factor

Service factor k



Type of machine

Light, even load Small generators, centrifugal pumps, turbo-compressors, belt conveyors	4	0.8	1.0	1.25
	8	1.0	1.25	1.5
	24	1.25	1.5	1.75
Irregular shock-free load – few drive reversals Screw conveyors, agitators, woodworking machines, machine tools	4	1.0	1.25	1.5
	8	1.25	1.5	1.75
	24	1.5	1.75	2.0
Irregular shock load – few drive reversals Piston-type pumps and compressors textile machines, agitators, centrifuges	4	1.25	1.5	1.75
	8	1.5	1.75	2.0
	24	1.75	2.0	2.25
Arduous driving conditions – frequent drive reversals Piston type compressors (without flywheel) vibrators, rolling mills	4	1.5	1.75	2.0
	8	1.75	2.0	2.25
	24	2.0	2.25	2.5

Starting frequency, factor S

Maximum number of starts per hour	up to 30	up to 60	up to 120	up to 180
Starting frequency, factor	1	1.2	1.5	2.0