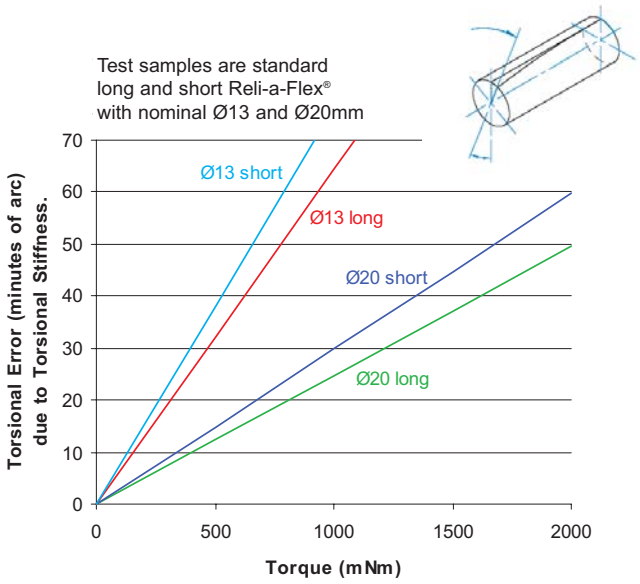
INSTALLATION

Couplings are available with either clamp or set screw mounting. Clamp fastening, both Reli-a-Grip™ and traditional, allows repeated repositioning of the coupling on the shaft leaving the shaft unmarked. The effectiveness of the clamp is dependent on the diameter being a 'close' fit in the coupling bore. Use of Reliance components will ensure that the clamp works correctly.

Set screws provide an effective but non-adjustable means of connecting couplings and shafts. Ideally the shafts should have a small flat in the area of the screw which allows the set screw to seat below the surface of the shaft.

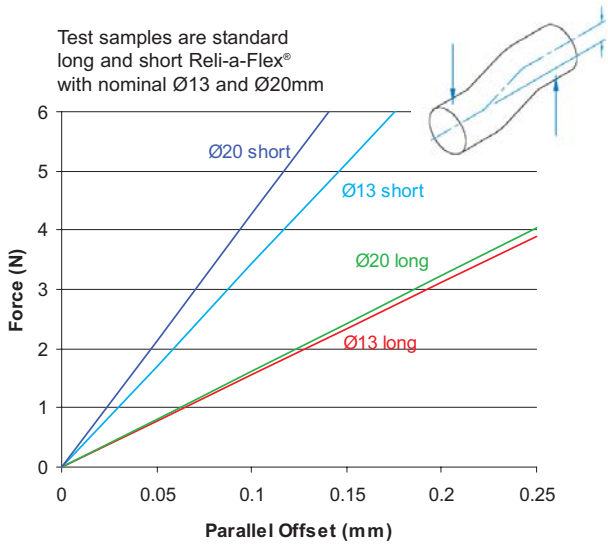
TORSIONAL STIFFNESS

This is the characteristic that describes the angular deflection when a torque is applied. High torsional stiffness contributes to increased accuracy and system response. It is essential for accurate feedback applications. Applications that are subject to shock loads may require a less stiff coupling to reduce the peak torques and avoid premature failure or slipping clamps.



RADIAL COMPLIANCE

This is the characteristic that describes the force the coupling applies on the support bearings when the shafts are misaligned. High radial compliance is essential to provide low bearing loads.



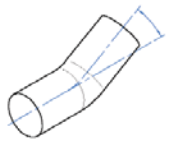
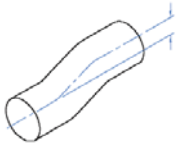
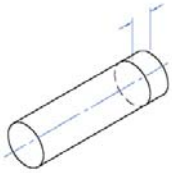
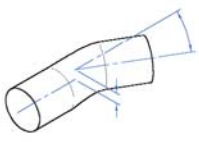
TORQUE CAPACITY

In general, the rated torque figures are based on >10^6 torque reversals and the peak torque should not be applied for more than 1% of the duty cycle.

Standard Product Sales : +44 (0)1484 601060 +44 (0)1484 601061
www.reliaflex.co.uk sales@rpmechatronics.co.uk

SHAFT MISALIGNMENT

The most common type of misalignment is a combination of angular, parallel and axial misalignment and occurs due to the build-up of tolerances as associated parts are assembled together. As these accumulate randomly, worst-case misalignment should be calculated and used to select the correct coupling to avoid premature failure.

Angular	Parallel	Axial	Combined
			

TRANSMISSION ERROR

Often referred to as kinematic error, this is the total error in the driven shaft position with respect to the driving shaft position. In a system the following factors must be individually considered to determine their overall effect.

a. Backlash ..... internal clearance related
b. Torsional wind up ..... torsional stiffness related
c. Velocity error ..... coupling design related

a. Backlash
Is the amount of free rotational movement inherent in the coupling under zero or near zero torsional loads. Reli-a-Flex® flexible shaft couplings have zero backlash.

b. Torsional wind up
In applications where the resistance is frictional, the driven shaft will experience a position lag, which will double with direction reversal, proportional to the torsional stiffness.

During operating mode, the inertia and the torque will cause a momentary lag but this will not be seen at standstill.

c. Velocity error
In general, because Reli-a-Flex® couplings have double flexing elements they will introduce negligible velocity errors.

LUBRICATION

This is not required on any of the couplings in this brochure.

TORSIONAL RESONANCE

The torsional natural frequencies of a system are dependent on the mass/elastic characteristics of the various inertias and connecting shafts. Torsional resonance can occur under certain conditions when the natural frequency of the system is close to the excitation frequency of the driving system. It is most likely to occur when the load is predominantly inertial and can occur in closed loop position or velocity control systems, leading to torsional vibrations which, in severe circumstances, can destroy the coupling.

Choosing a coupling that operates well above or well below the operating frequencies can help to avoid premature failure.

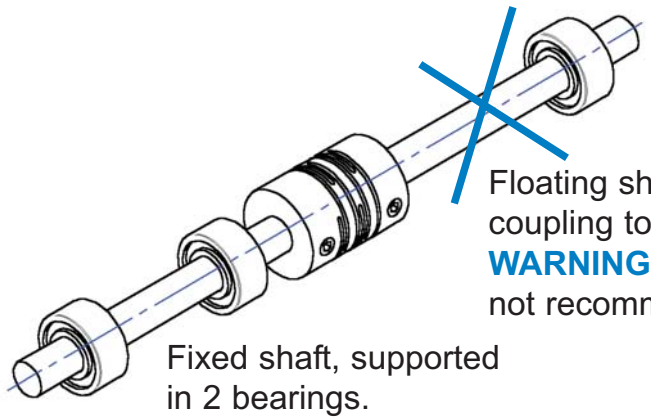
The resonant frequency of a system can be calculated from the following:

$$F_R = 1/2\pi \times \sqrt{(1/J_M + 1/J_L) \times 10.8/\pi \times C_T}$$

where
F_R = Resonant frequency (Hz)
J_M = Motor inertia (Kgm^2)
J_L = Load inertia (Kgm^2)
C_T = Coupling torsional stiffness (mNm/min)

FLOATING SHAFTS

We do not recommend the use of couplings in this brochure for floating shafts, where one or both ends of a shaft are supported by a coupling.



Floating shaft, relies on the coupling to support one end.
WARNING: This arrangement is not recommended.

Fixed shaft, supported in 2 bearings.

Standard Product Sales : +44 (0)1484 601060 +44 (0)1484 601061
www.reliaflex.co.uk sales@rpmechatronics.co.uk