

GATES EUROGRIP™ FLEXIBLE COUPLINGS

THE DESIGNER'S CHOICE



Electronic speed controls are increasingly being used in industry. In response to this requirement, Gates has developed a flexible coupling range covering standard motor sizes. Gates EuroGrip™ flexible couplings consist of a rubber sleeve and two metal end pieces. The design of Gates EuroGrip™ flexible couplings is unique, with its OGEE lines⁽¹⁾ allowing the coupling to act as a torque/life indicator for the drive.

Gates EuroGrip™ flexible couplings are available in sizes 19, 28, 42, 48 and 60 and are bored to a suit taper bush or a plain bore and keyway.

Gates EuroGrip™ flexible couplings have high

vibration damping capacity, which makes them especially suitable for direct drive applications in pumps and compressors. Their high compliance is especially appreciated by designers of speed control systems, where resonance can be a problem. The zero backlash characteristics result in high positioning accuracy and repeatability, allowing a wide range of applications in the linear actuator market.

FEATURES

- Unique OGEE lines⁽¹⁾ on the sleeve are an indicator of torque and product life.
- Sleeves are made of a high-performance elastomeric compound. The sleeve design allows the coupling to act as a predictable fuse in the system.
- End pieces are made of a high-grade aluminum to reduce weight and inertia. The aluminum end pieces are anodised to increase wear resistance and strength. Available either with finished bore and keyway or to suit a taper bush.
- Temperatures range from -25°C to +100°C.

BENEFITS

- High vibration damping. Damping increases with load, which will prevent resonance.
- Low noise levels and quiet in operation.
- Zero backlash and, consequently, high positioning accuracy.
- Easy to install and to replace. Can be inspected without stopping the drive.
- Built-in safety measure: the driven machine will stop when the coupling fails.
- High tolerance of combinations of radial and angular misalignment.
- Durable.
- Low inertia.
- Compact design.
- Light weight.

⁽¹⁾ Patent applied for

EUROGRIP™ COUPLINGS FEATURES & BENEFITS

AT A GLANCE

Gates EuroGrip™ flexible coupling was tested by the Institut für Maschinenelemente der RWTH-Aachen. The following table highlights the features and design opportunities of Gates EuroGrip™ flexible couplings. The technical evaluation is from the Institut für Maschinenelemente der RWTH-Aachen.

Table 1

Gates EuroGrip™		
Torque	Good	Up to 850 Nm peak torque
Durability	Good	Conforms to DIN 740 Part 2
Torsional Flexibility	Very good	Approx. 7° twist at peak torque
Damping	Very good	Typical damping factor of 1.7
Misalignment sensitivity	Very good	Up to 5°
Temperature resistance	Moderate	-25°C to +100°C
Installation	Very good	Generally “by eye”
Positioning	Good	Zero backlash
Shear pin effect	Good	Failure protects the driven machine

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EUROGRIP™ COUPLINGS FEATURES & BENEFITS

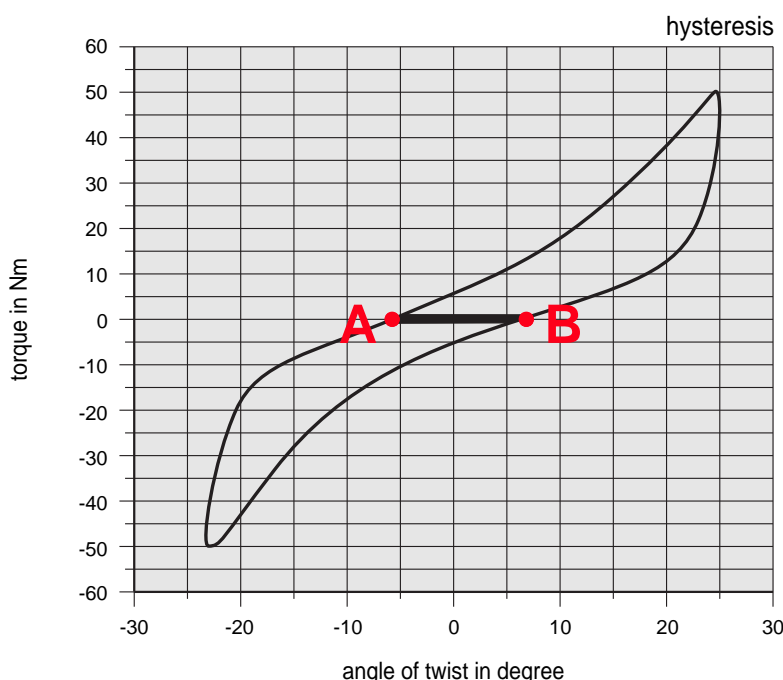
ZERO BACKLASH

Backlash is defined as the free movement or “play” occurring between two connected elements when subjected to a reversing movement. Backlash is different from the angular displacement that occurs with change of load i.e. elastic deformation.

Gates EuroGrip™ flexible coupling is classed as a zero backlash coupling, this is to say that though it will deform elastically whilst turning, on reversing it will return to the starting point. This feature is particularly required for positioning drives, actuators etc where the final position is critical.

The effect of zero backlash can be clearly seen in the hysteresis curve (see Fig. 1). As the displacement moves through the zero condition, there is a positive distance between the two boundary lines (points A & B). In a backlash situation, the two boundary lines would coincide becoming a single line along the displacement axis, the length of this line indicating the amount of backlash in the connection.

Figure 1



HIGH VIBRATION DAMPING

The damping coefficients are given in table 7 on page 8.

This value is the amount of vibrational energy the coupling will absorb and is calculated in accordance with DIN 740 part 2.

The value is calculated from the hysteresis curves and is the ratio between the absorbed energy over a complete load cycle and the elastic strain energy over a quarter period. Hence a factor of 2 would indicate that 50% of the vibrational energy is absorbed.

The chart at the right compares the damping coefficient of Gates new EuroGrip™ flexible couplings with typical flexible couplings.

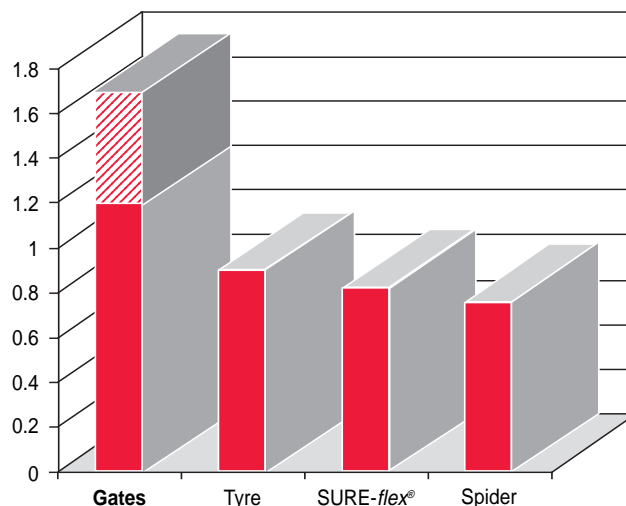
Source: Tyre coupling (Fenner catalogue 300-89, page 4), SURE-flex® coupling (BROOK Hansen catalogue 9703, page S9) and Spider coupling (KTR Rotex® catalogue 11/96, page 4).

SURE-flex® is a registered trademark of T.B. Wood's Company Chambersburg, P.A. (USA).

Rotex® is a registered trademark of K.T.R. Kupplungstechnik GmbH, Rodder Damm, Germany.

Figure 2

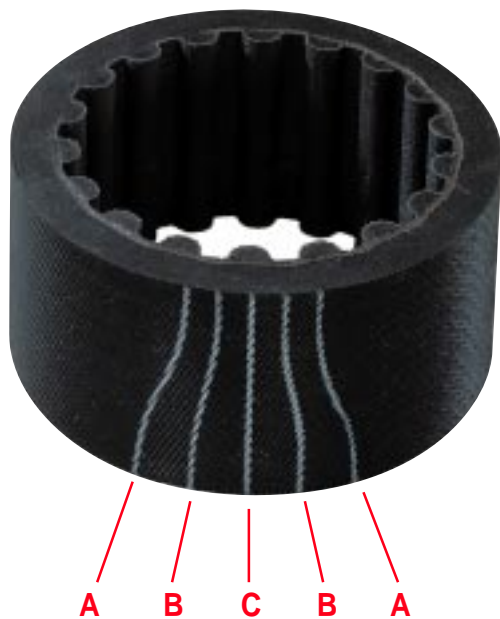
Damping factor



EUROGRIP™ COUPLINGS FEATURES & BENEFITS

OGEE LINES⁽¹⁾

Figure 3



The curved OGEE⁽¹⁾ lines printed on the outer surface of the coupling sleeve are intended to be used as a simple torque indicator.

The curves have been designed to become straight lines under given torque conditions. Hence, by viewing the coupling whilst running, with the aid of a stroboscope, a load estimate can be made.

The lines have been nominally set at zero (C), nominal (B) and overload torque (A) for both directions of twist:

Table 2

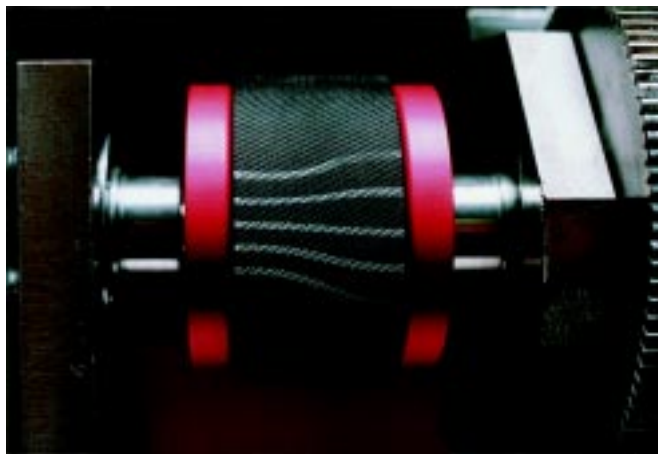
Coupling Size code	Design torques (Nm)		
	C	B	A
19	0	18	30
28	0	70	110
42	0	150	250
48	0	300	500
60	0	500	850

As the sleeve nears the end of its design life, under normal ambient conditions, the torsional characteristics will change. One will see line straightening at lower torque values than those previously observed. This change can be used as an indication that the sleeve should be replaced.

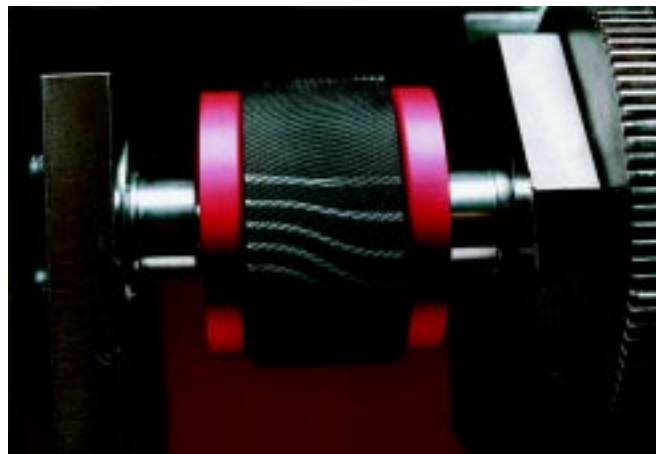
Note: When viewing the coupling, normal safety procedures must be followed and the use of a transparent guard is recommended.

The following pictures illustrate how the OGEE lines are seen under different torque conditions.

OGEE lines under no load.



OGEE lines at overload torque.



⁽¹⁾ Patent applied for