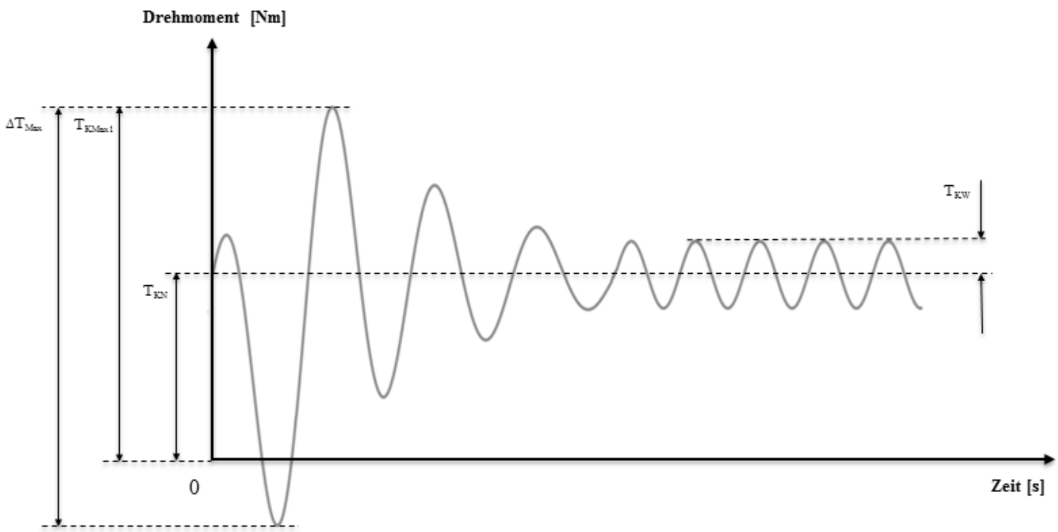
We make drive systems
comfortable and reliable.

Explanation of technical data

SGF-Industrial Application

SGF-TL-001



1. Table of contents

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2. Validity area

This document is valid for all flexible couplings, flexible flange couplings as well as link ring assemblies and link assemblies in the Industrial Application area of SGF. In the following these are always designated as elastic coupling.

3. Explanation of technical data

Please refer to the drawings and the technical data sheets for the technical data on the individual products. These values only serve to describe the product and are not to be understood as a guaranteed characteristic in legal terms. The values are partly based on calculations and may differ in reality.

3.1. Nominal torque T_{KN}

T_{KN} is the nominal torque of the elastic coupling. This torque can be permanently transferred in full by the elastic coupling, see Figure 1

3.2. Maximum torque T_{KMax1}

Torques at values of T_{KMax1} occur regularly in the normal operation of a machine or plant and can be transferred by the elastic coupling without damage as long as the load develops for a short time only and with a frequency not greater than 50,000 load cycles.

Torque peaks at the value of T_{KMax1} typically occur when starting or stopping, shifting, accelerating or braking.

3.3. Maximum torque T_{KMax2}

Torques at a value of T_{KMax2} do not occur in normal operation of a machine or plant, but can still be transferred by the elastic coupling without destroying it. Massive damage to the elastic coupling as well as damage to the screw connections may result, so that only emergency operation of the elastic coupling may be possible following the application of the T_{KMax2} load. Torques at a value of T_{KMax2} seldom occur, e.g. in cases of damage to the machine, emergency shut-down or abuse. Following the occurrence of torques at a value of T_{KMax2} we generally recommend replacing the elastic coupling or the link assembly elements (elastic elements) as well as screw-connection parts.

3.4. Permissible continously oscillating torque T_{KW}

The permissible continously oscillating torque T_{KW} is the maximum permissible torque superimposed on the nominal torque. The specification of T_{KW} is given as vibratory amplitude (peak value), see Figure 1.

3.5. Maximum torque range ΔT_{Max}

ΔT_{Max} is the maximum torque range within which the elastic coupling can operate in the case of normal transient operating conditions of a machine.

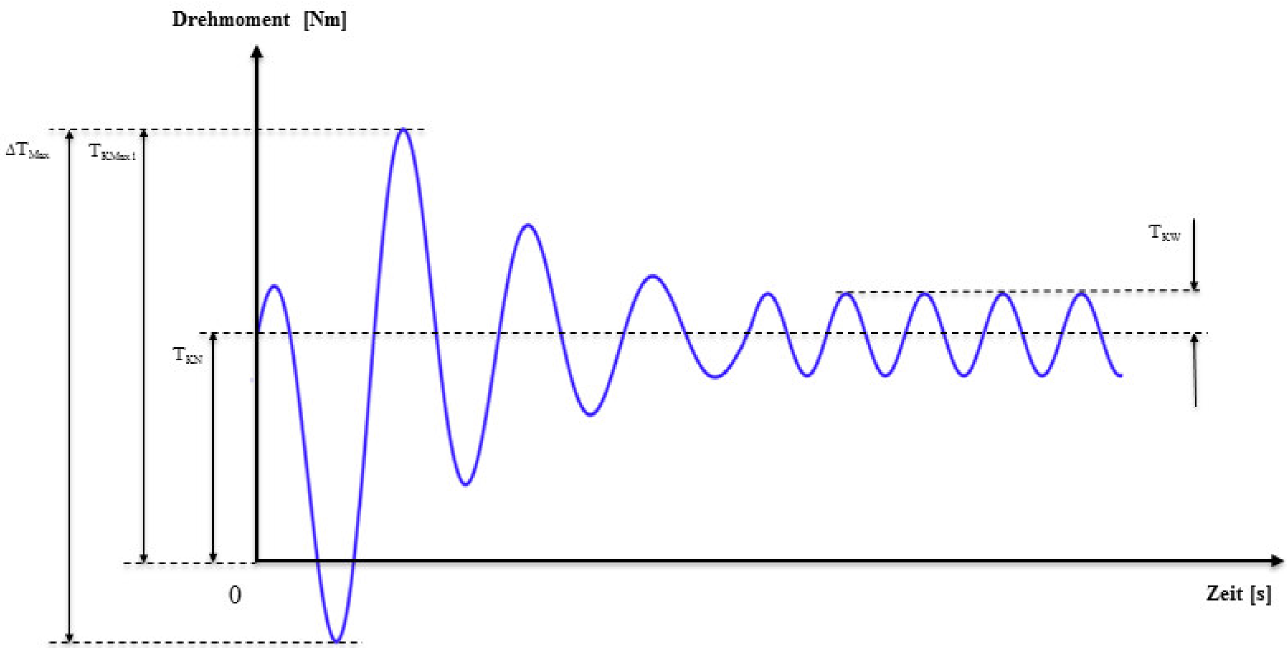

Figure 1: Illustration of T_{KN}, T_{KW}, T_{Kmax1} and ΔT_{Max} as an example of a transient process

3.6. Axial displacements

Displacements between the drive and output shaft can be compensated by elastic couplings, as described in the following. The specified maximum values apply, however, only to the specific aspect as rated for endurance strength. If different axial displacements occur simultaneously up to the maximum value, reduced durability is to be expected.

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3.6.1. Radial displacement ΔK_r

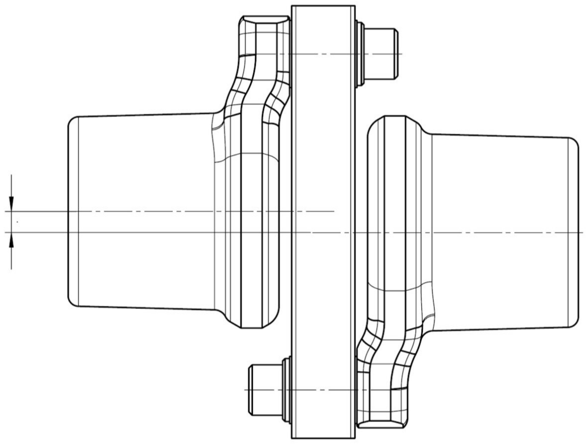

Figure 2: Radial displacement

ΔK_r is the maximum permissible radial displacement of the drive and output side which the elastic coupling can compensate (Figure 2).

The maximum permissible radial displacement at low rpm ΔK_r and the maximum permissible radial displacement at maximum permissible rpm ΔK_{rmax} are differentiated.

Since the elastic elements in the interior build are sometimes significantly different, the rpm limit for the maximum permissible radial displacement at low rpm is also different.

Compensation of greater radial displacement is fundamentally possible at low rpm, as well as displacement of lower radial displacement at higher rpm.

3.6.2. Axial displacement ΔK_a

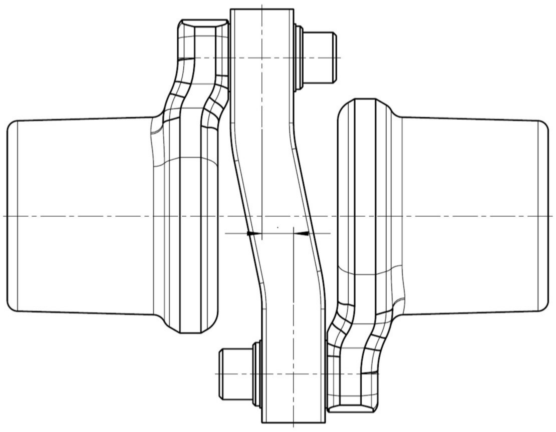

Figure 3: Axial displacement

ΔK_a is the maximum permissible axial displacement of the drive and output side which the elastic coupling can compensate, (Figure 3).

The permanent axial displacement ΔK_{aDauer} and the axial displacement for transient loads $\Delta K_{aTransient}$ are differentiated.

Transient loads may occur due to powertrain displacements during acceleration and braking and appear only for a short time.

If only one value (ΔK_a) is specified on the datasheet or the drawing, this value applies to the permanent axial displacement ΔK_{aDauer}.

In case of dynamic axial displacement (e.g. due to pulsating movement), the maximum possible radial displacement ΔK_r is to be applied.

3.6.3. Angular displacement ΔK_w

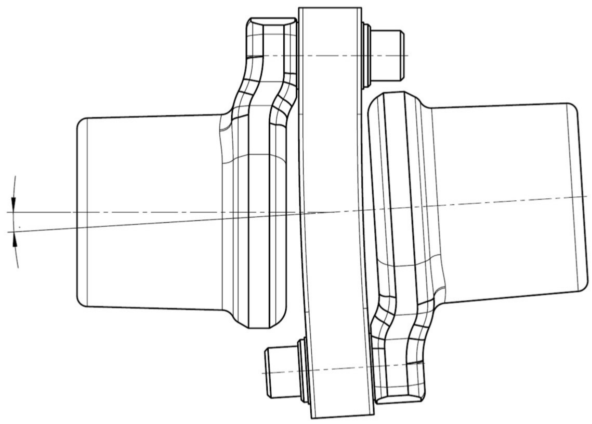

Figure 4: Angular displacement

ΔK_w is the maximum permissible radial displacement of the drive and output side which the elastic coupling can compensate (Figure 4).

The permanent angular displacement ΔK_{wDauer} and the angular displacement for transient loads $\Delta K_{wTransient}$ are also differentiated here.

Transient loads may occur due to powertrain displacements during acceleration and braking and appear only for a short time.

If only one value (ΔK_w) is specified on the datasheet or the drawing, this value applies to the permanent angular displacement ΔK_{aDauer}.

3.7. Stiffness of elasic coupling

The stiffness specified in the following for elastic couplings serve to evaluate the vibration behaviour and the bearing reactions of the drive train when using this couplings.

The values specified on the datasheet or the drawing usually relate to new parts. They are partly based on calculations and may differ in reality. A initial set may occur in the operation of the elastic coupling resulting in a change of stiffness.

3.7.1. Torsional stiffness C_t and C_{tdyn}

The torsional stiffness of the elastic coupling is specified as static and dynamic stiffness.

The static torsional stiffness C_t here applies to all static or semi-static processes and is determined by slowly twisting the elastic coupling (T=20°C).

The dynamic torsional stiffness C_{tdyn} applies to dynamic processes and is determined under the following boundary conditions:

- Preload T_{KN}
- Load cycle amplitude at a value of ± 20% of T_{KN}
- Frequency range 20 Hz to 80 Hz
- Temperature 20°C

For both values C_t and C_{tdyn} the following applies:

Since elastic couplings in general exhibit a progressive torsional load line, the specified values are determined in the range of a preload at a value of T_{KN}

Outside this operating point the actual stiffness values of the elastic coupling may significantly deviate from the specified values.

3.7.2. Radial stiffness C_r

The radial stiffness C_r serves to calculate the resetting forces acting on the shaft bearing if radial displacement (see 3.6) between the drive and output is to be compensated by the elastic coupling.

3.7.3. Axial stiffness C_a

The axial stiffness C_a also serves to calculate the resetting forces acting on the shaft bearing if axial displacement (see 3.6) between the drive and output is to be compensated by the elastic coupling.

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3.8. Damping parameters D_{rel} and ψ

Damping parameters of the elastic coupling are specified as relative damping D_{rel} and as proportional damping ψ in accordance with DIN 740.

These parameters are determined in the framework of a dynamic test with the following boundary conditions:

- Preload T_{KN}
- Load cycle amplitude at a value of ± 20% of T_{KN}
- Frequency range 20 Hz to 80 Hz
- Temperature 20°C

3.9. Maximum permissible power loss P_{KW50}

The maximum permissible power loss P_{KW50} specifies how much power the elastic coupling can permanently withstand and thermally dissipate without being damaged. The maximum permissible power loss P_{KW50} corresponds to the maximum permissible damping power.

The specified value relates to an ambient temperature of 50°C and free convection. In reality with good ventilation significantly higher values can be realised.

3.10. Maximum permissible rpm $n_{maxDauer}$ and $n_{maxKurz}$

The specified rpm values relate to 2 possible operating conditions, permanent load and short time load.

While the rpm range for permanent load up to $n_{maxDauer}$ can be completely utilized continuously, rpm up to $n_{maxKurz}$ can only be run in particular cases and for a duration up to about 15 min. Rpm beyond that point should be avoided because of a possible bursting of the elastic coupling (separation of rubber pieces).

The specified rpm values apply irrespective of the operating temperature as long as the indicated limit values for the operating temperature are complied with. Refer to the operating and assembly instructions SGF-TL-002 (flexible couplings and flex coupling assemblies) as well as SGF-TL-003 (link assemblies and link couplings) for the operating temperature limits.

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