SGF cord reinforced coupling systems

SGFlex-3F SERIES with Tenpu® fiber technology
FLEX COUPLING ASSEMBLY
The new SGFlex-3F Series coupling system incorporates industry proven SGFlex couplings with solid steel flanges or flywheel combinations to provide an integrated solution to our customers.

SGFlex couplings are highly durable, reinforced flexible couplings made of high-quality elastomer and strong cord reinforcement for safe and effective torque transfer no matter what the application.

SGFlex couplings compensate for axial, radial and angular misalignment and are able to operate in extreme application conditions. They provide effective dampening for torque peaks and shock loads.

Some common applications include Pump systems, Hydraulic drives and Conveyor drivelines.

The high power density ratio and outstanding durability and performance of the SGFlex coupling makes it the perfect coupling system for all kinds of special machinery such as wood cutting machines, shredder applications and rock crushers to name a few.

The forged steel flanges are made of high quality steel and its versatile design can support all common as well as custom sizes of shaft/hub connection requirements. The flange hubs can be machined to specific keyway/slot or multi spline connection requirement depending on individual requirements. Very large shaft diameters can be connected due to the unique 3-edged design of the flanges.

The flanges are protected against corrosion by electroplated coating which ensures outstanding storing characteristics and protects the steel parts against aggressive media and environmental impacts. Applications in corn harvesting machines, inside biogas fermenters and in the salty area of the marine industry prove the excellent resistance against unfriendly environment.

SGFlex flanges and couplings are built together by a simple screw connection, using high quality bolts (grade 10.9) and high quality washers (300 HV hardness). The screw connection is easy to install, as the bolts are bolted directly into the flange material. Due to this, the SGFlex coupling can be replaced without disassembling the metal parts, just by loosen the bolts and replacing the flexible disc element in radial direction.

In order to choose the right coupling size for your application, calculate the nominal torque $T_N$ of your system.

$$T_N = \frac{9550 \times P [\text{kW}]}{n [\text{rpm}]}$$

$T_{NH} \geq T_N$

Further take following points into account:

- Due to the constructive composition of SGF flexible couplings, normally it is not necessary to correct $T_N$ for machine types or thermal influences.
- In addition to considering static loads when selecting a flexible coupling, we always recommend a calculation of the vibratory behaviour of the drive train to avoid undesired resonance phenomena.
- Under unfavourable conditions, running the drive train in resonance mode can lead to destruction of individual components within minutes and should be avoided on principle.
- The data needed for the calculation is given in the technical datasheet according to the SGFlex coupling and explained in the technical data explanation SCF-TL-001 (available upon request).
- At high load frequencies, take heed that the maximum permissible power loss of the individual flexible coupling is not exceeded.
- If an SGF coupling is used as a replacement solution in an existing system, bearings loads may increase due to altered rigidities.
THE SGF TENSION-FORCE-PRINCIPLE

Torque is transmitted almost exclusively via the vulcanised-in cord inlays (Tenpu® fiber technology) by the unique SGF tension-force-principle.

Properties
» Compensation of radial, axial and angular misalignment
» Damping of torque peaks in the drivetrain
» Electrically insulating upon request

Benefits
» High power density due to unique power transmission via Tenpu® technology
» Resistant to shock loads

Common Applications
» For connecting combustion engines and generators, including any related drive equipment in power plants and power stations or connecting combustion engines and generators in combined heating and power plants and power stations
» As a flexible coupling in drivetrains such as vibrating screens and test benches
» Movement compensation and vibration absorption between engines and hydraulic pumps in forklifts, cement trucks or other similar equipment
» As a flexible connecting element in mixers, pumps and agricultural machinery
» For connecting the transmission and drive shaft in road, rail, mining, military or marine (ship) applications

The cord inlays serve to damp torque peaks and to absorb start-up impacts. The rubber takes on a supporting and protective function for the cord packets and serves to isolate noises due to the interruption of the structure-borne noise path.
SGF flexible couplings are torsional flexible, non-shiftable couplings. They are used to compensate radial, axial or angular displacements of rotating components (e.g. shafts), to dampen vibrations in the drive train and to minimize torque peaks.

The flex coupling assembly SGFlex-3F Series is an assembly consisting of a SGFlex flexible coupling, a drive flange and a driven/output flange.

The SGFlex-3F Series offers 3 types of couplings each 6 standardized sizes with a torque range from 200Nm – 3200Nm.

E.g. **SGFlex-3FD-096**

All forged 3-arm flanges come with a pilot hole to adjust the bore to the specific needs. The max. possible bore diameter for key connection acc. to DIN6885-1 or ASME B17.1 is given in the tables on the next pages. Bore processing and special designs are available upon request.

SGFlex-3F coupling and flange kits will be delivered unassembled but shipped with the required attaching hardware (bolts and washers) in the kit.

For the assembly of SGFlex-3F couplings refer to our “SGF-TL-002” instruction document. For coupling size 220 please pay attention to the rotational direction when installing.

**SGFlex-3F SERIES**

This coupling is designed to connect two devices with shafts, for example an electric motor with a hydraulic pump. The flanges can be machined to fit an almost any shaft design. The coupling is easy to install, either fully assembled or separately in the mounting space. For maintenance, the flexible coupling can be replaced without moving neither the devices or the flanges.

The flex coupling assembly SGFlex-3FD provides the installation versatility and operational reliability and is the complete solution for your application.

This coupling is designed to connect an existing structure with a device with shaft for example a pulley with an electric generator. The existing structure has to be adjusted to fit to the connection of the flexible coupling, however it allows the reduction of parts and subsequent costs.

The flex coupling assembly SGFlex-3FS is a smart solution for applications with a suitable existing structure combined with the advantages of the SGFlex-3FD.

This coupling is designed to connect an engine flywheel with a device with shaft, for example a gear box or an electric generator. The flanges for the flywheel connection are standardized acc. to SAE J629J. The flanges for the shaft connection can be machined to fit to the specific needs.

The flex coupling assembly SGFlex-3FF brings together the advantage of a finished flange for the flywheel connection and the flexibility to assemble it on any kind of shaft.

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e.g. **SGFlex-3FD-096**

All forged 3-arm flanges come with a pilot hole to adjust the bore to the specific needs. The max. possible bore diameter for key connection acc. to DIN6885-1 or ASME B17.1 is given in the tables on the next pages. Bore processing and special designs are available upon request.

SGFlex-3F coupling and flange kits will be delivered unassembled but shipped with the required attaching hardware (bolts and washers) in the kit.

For the assembly of SGFlex-3F couplings refer to our “SGF-TL-002” instruction document. For coupling size 220 please pay attention to the rotational direction when installing.
APPLIED WITH SGFlex-3F SERIES

1. Railway Vehicles: fully or partly suspended drive-trains, hydraulic systems, auxiliary power generation
2. Machinery and Equipment Technology: conveyor belts, pumps, compressors, augers, mixers, fans, blowers, test-benches
3. Agriculture Technology: harvesters, corn and grain headers, PTOs, disc mowers, cable winches
4. Wind Power Systems: drive trains, hydraulic systems
5. Marine Technology: propulsion, auxiliary power generation
6. Construction Machinery: excavators, dumper, concrete pumps, forklifts
7. Mining Technology: vibrating screens, hydraulic systems, conveyor belts
9. Power Plant Technology: Gen-Set, emergency power generators, CHPs (combined heat and power units)
### TECHNICAL DATA SGFlex-3F SERIES

**SGFlex-3FD**
- Designed to connect two shafts

<table>
<thead>
<tr>
<th>Size (TK)</th>
<th>Torque (IN/SCF)</th>
<th>D</th>
<th>E</th>
<th>L</th>
<th>d1</th>
<th>d2</th>
<th>Weight</th>
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<td>24</td>
<td>40</td>
<td>50</td>
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</table>

**SGFlex-3FS**
- Designed to connect a shaft with an existing structure

<table>
<thead>
<tr>
<th>Size (TK)</th>
<th>Torque (IN/SCF)</th>
<th>D</th>
<th>E</th>
<th>L</th>
<th>d1</th>
<th>d2</th>
<th>Weight</th>
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### TECHNICAL DATA SGFlex-3F SERIES

**SGFlex-3FF**
- Designed to connect a flywheel with a shaft

<table>
<thead>
<tr>
<th>Size of Flywheel</th>
<th>Torque (IN/SCF)</th>
<th>D</th>
<th>E</th>
<th>L</th>
<th>d1</th>
<th>d2</th>
<th>Weight</th>
</tr>
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<td>40</td>
<td>50</td>
<td>66</td>
</tr>
</tbody>
</table>

**Notes:**
- Torque values are given for standard metric dimensions. For other dimensions, consult the manufacturer for specific values.
- Bolt tightening torques and weights are provided for reference.
- Flywheel connection acc. to SAE J620
- Bolts for flywheel connections are not included!
## TECHNICAL DATA FLEXIBLE COUPLINGS

### Performance

<table>
<thead>
<tr>
<th>Size (TK)</th>
<th>Flexible coupling</th>
<th>part number</th>
<th>( T_{\text{max}} )</th>
<th>( \Delta K )</th>
<th>( \Delta K_a )</th>
<th>( \Delta K_w )</th>
<th>( n_{\text{max}} )</th>
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<tr>
<td>075</td>
<td>SGFlex-075.02</td>
<td>GA000-024</td>
<td>210</td>
<td>0.3</td>
<td>0.015</td>
<td>0.024</td>
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<td>GA000-028</td>
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<td>0.084</td>
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<td>SGFlex-120.05</td>
<td>GA000-015</td>
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<td>0.7</td>
<td>0.039</td>
<td>0.086</td>
<td>760</td>
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<td>140</td>
<td>SGFlex-140.04</td>
<td>GA000-021</td>
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<td>0.8</td>
<td>0.049</td>
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<td>0.158</td>
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<td>1.4</td>
<td>0.085</td>
<td>0.206</td>
<td>10000</td>
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*For explanation of technical data see SGF-TL-001

### 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.

Max. radial displacement: \( \Delta K_r \)

Max. axial displacement: \( \Delta K_a \)

Max. angular displacement: \( \Delta K_w \)

For further information a technical data sheet for each flexible coupling is available upon request.

### SGF FORGED STEEL FLANGES

- **\( \varnothing d_1 \):** Maximum diameter (e.g. for calculation of the 3-edge part of the flange inner clamping sets of the max diameter for shrink discs)
- **\( \varnothing d_2 \):** Maximum rotational diameter of the 3-edge part of the flange

### Examples of machined flanges

- Key connection for bigger shafts thru unique 3-edge design
- Key connection with threads for fixing bolts
- Frictional connection thru a clamping set
- Frictional connection thru shrink disc
- Spline connection with fastening function

### Additional Information

- 3D models of SGFlex-3F Series are available online:
  - [http://sgf.partcommunity.com](http://sgf.partcommunity.com)

Further applicable documents:
- SGF-TL-001 Explanation of technical data
- SGF-TL-002 Operating and assembly instructions flexible couplings and flex coupling assemblies
- Technical data sheets of flexible couplings
Nominal torque $T_{\text{KN}}$

$T_{\text{KN}}$ is the nominal torque of the flexible coupling. This torque can be permanently transferred in full by the flexible coupling.

Maximum torque $T_{\text{Kmax1}}$

Torques at values of $T_{\text{Kmax1}}$ occur regularly in the normal operation of a machine or plant and can be transferred by the flexible 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 $T_{\text{Kmax1}}$ typically occur when starting or stopping, shifting, accelerating or braking.

Maximum torque $T_{\text{Kmax2}}$

Torques at a value of $T_{\text{Kmax2}}$ do not occur in normal operation of a machine or plant, but can still be transferred by the flexible coupling without destroying it. Massive damage to the flexible coupling as well as to the screw connections may result, so that only emergency operation of the flexible coupling may be possible following the application of the $T_{\text{Kmax2}}$ load.

Permissible continuously oscillating torque $T_{\text{KW}}$

The permissible continuously oscillating torque $T_{\text{KW}}$ is the maximum permissible torque superimposed on the nominal torque. The specification of $T_{\text{KW}}$ is given as vibratory amplitude (peak value).

Maximum permissible speed $n_{\text{max}}$

The maximum permissible speed $n_{\text{max}}$ can be completely utilized continuously. The specified rpm value applies 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) for the operating temperature limits.

Torque at a value of $T_{\text{Kmax2}}$ 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 $T_{\text{Kmax2}}$ we generally recommend replacing the flexible coupling as well as screw connection parts.

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Contact

For additional information about the product range and special designs or services (vibratory behaviour of a total system, calculations for screw connections, etc.), please contact industry@sgf.com.