SGF cord reinforced coupling systems

SGFlex-3F SERIES with Tenpu® fiber technology
FLEX COUPLING ASSEMBLY

We make drive systems comfortable and reliable.
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.

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

$T_{KN} \geq T_N$ – Max permissible nominal torque of flexible coupling

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 SGF-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.

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.

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

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 an 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 an 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
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 minimise 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 5 standardized sizes with a torque range from 200Nm – 3,200Nm.

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 un-assembled 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.

<table>
<thead>
<tr>
<th>Type</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>SGFlex-3FD-096</td>
<td></td>
</tr>
</tbody>
</table>
Süddeutsche Gelenkscheibenfabrik GmbH & Co. KG // SGFlex-3F SERIES

APPLIEDS 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, dumpers, concrete pumps, forklifts
7. **Mining Technology**: vibrating screens, hydraulic systems, conveyor belts
8. **Heat Transfer Systems**: fans, blowers
9. **Power Plant Technology**: Gen-Sets, emergency power generators, CHPs (combined heat and power units)

**APPLICATIONS WITH SGFlex-3F SERIES**

The flexible coupling specifies the capability of the flex coupling assembly series SGFlex-3F. The nominal torque helps to choose the size of the flex coupling assembly.

For each coupling size of SGFlex-3FF, there are 3 flanges available to connect to standardized flywheels acc. to SAE J620. Also this flanges are protected against corrosion by electroplated coating. Other flange sizes are available upon request.
## TECHNICAL DATA SGFlex-3F SERIES

### SGFlex-3FD

**Designed to connect two shafts**

<table>
<thead>
<tr>
<th>Size (TK)</th>
<th>Torque (Nm)</th>
<th>Ø</th>
<th>L</th>
<th>d1</th>
<th>d2</th>
<th>d</th>
<th>M</th>
<th>Weight</th>
<th>Description</th>
<th>Part number</th>
</tr>
</thead>
<tbody>
<tr>
<td>075</td>
<td>420</td>
<td>384</td>
<td>845</td>
<td>130</td>
<td>3.147</td>
<td>1.160</td>
<td>71</td>
<td>0.750</td>
<td>87</td>
<td>SGFlex-3FD-015</td>
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<td>120</td>
<td>545</td>
<td>577</td>
<td>1035</td>
<td>160</td>
<td>3.147</td>
<td>1.160</td>
<td>114</td>
<td>0.750</td>
<td>117</td>
<td>SGFlex-3FD-020</td>
</tr>
<tr>
<td>180</td>
<td>1600</td>
<td>1881</td>
<td>2524</td>
<td>200</td>
<td>3.147</td>
<td>1.160</td>
<td>172</td>
<td>0.750</td>
<td>156</td>
<td>SGFlex-3FD-025</td>
</tr>
</tbody>
</table>

*Nominal torque, for further information on technical data see SGF-3F, **maximal diameter for key way connection, ***pay attention to rotational direction acc. to SGF-TL-002.

Only the metric dimensions shall be binding.

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### SGFlex-3FS

**Designed to connect a shaft with an existing structure**

<table>
<thead>
<tr>
<th>Size (TK)</th>
<th>Torque (Nm)</th>
<th>Ø</th>
<th>L</th>
<th>d1</th>
<th>d2</th>
<th>d</th>
<th>M</th>
<th>Weight</th>
<th>Description</th>
<th>Part number</th>
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<td>130</td>
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<td>114</td>
<td>0.750</td>
<td>117</td>
<td>SGFlex-3FS-020</td>
</tr>
<tr>
<td>180</td>
<td>1600</td>
<td>1881</td>
<td>2524</td>
<td>200</td>
<td>3.147</td>
<td>1.160</td>
<td>172</td>
<td>0.750</td>
<td>156</td>
<td>SGFlex-3FS-025</td>
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</tbody>
</table>

*Nominal torque, for further information on technical data see SGF-3F, **maximal diameter for key way connection, ***pay attention to rotational direction acc. to SGF-TL-002.

Only the metric dimensions shall be binding.

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## TECHNICAL DATA SGFlex-3F SERIES

### SGFlex-3FF

**Designed to connect a flywheel with a shaft**

<table>
<thead>
<tr>
<th>Size (TK)</th>
<th>Torque (Nm)</th>
<th>Ø</th>
<th>L</th>
<th>d1</th>
<th>d2</th>
<th>d</th>
<th>M</th>
<th>Weight</th>
<th>Description</th>
<th>Part number</th>
</tr>
</thead>
<tbody>
<tr>
<td>075</td>
<td>420</td>
<td>384</td>
<td>845</td>
<td>130</td>
<td>3.147</td>
<td>1.160</td>
<td>71</td>
<td>0.750</td>
<td>87</td>
<td>SGFlex-3FF-015</td>
</tr>
<tr>
<td>120</td>
<td>545</td>
<td>577</td>
<td>1035</td>
<td>160</td>
<td>3.147</td>
<td>1.160</td>
<td>114</td>
<td>0.750</td>
<td>117</td>
<td>SGFlex-3FF-020</td>
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<tr>
<td>180</td>
<td>1600</td>
<td>1881</td>
<td>2524</td>
<td>200</td>
<td>3.147</td>
<td>1.160</td>
<td>172</td>
<td>0.750</td>
<td>156</td>
<td>SGFlex-3FF-025</td>
</tr>
</tbody>
</table>

*Nominal torque, for further information on technical data see SGF-3F, **maximal diameter for key way connection, ***pay attention to rotational direction acc. to SGF-TL-002.

Only the metric dimensions shall be binding.

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**Flywheel connection acc. to SAE J620**

<table>
<thead>
<tr>
<th>Size of Flywheel</th>
<th>W</th>
<th>G</th>
<th>I</th>
<th>N</th>
<th>Number of holes</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAE 7.5</td>
<td>241.39</td>
<td>8.75</td>
<td>9</td>
<td>0.354</td>
<td>0.215</td>
</tr>
<tr>
<td>SAE 8</td>
<td>263.52</td>
<td>10.5</td>
<td>11</td>
<td>0.433</td>
<td>0.215</td>
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<tr>
<td>SAE 10</td>
<td>294.72</td>
<td>12.9</td>
<td>15</td>
<td>0.591</td>
<td>0.215</td>
</tr>
<tr>
<td>SAE 11.5</td>
<td>325.42</td>
<td>13.9</td>
<td>17</td>
<td>0.174</td>
<td>0.472</td>
</tr>
<tr>
<td>SAE 14</td>
<td>446.72</td>
<td>19.3</td>
<td>25</td>
<td>0.415</td>
<td>0.215</td>
</tr>
<tr>
<td>SAE 16</td>
<td>517.42</td>
<td>20.4</td>
<td>26</td>
<td>0.602</td>
<td>0.472</td>
</tr>
<tr>
<td>SAE 18</td>
<td>571.96</td>
<td>22.5</td>
<td>28</td>
<td>0.750</td>
<td>0.215</td>
</tr>
</tbody>
</table>

**Boils for flywheel connection are not included!**

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*Nominal torque, for further information on technical data see SGF-TL-001, **maximal diameter for key way connection, ***pay attention to rotational direction acc. to SGF-TL-002.

Only the metric dimensions shall be binding.
For further information a technical data sheet for each flexible coupling is available upon request.

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** $\Delta K_w$

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**Performance**

<table>
<thead>
<tr>
<th>Size (TK)</th>
<th>Flexible coupling</th>
<th>$T_{max}$</th>
<th>$T_{max}$</th>
<th>$T_{max}$</th>
<th>$T_{max}$</th>
<th>Max. Speed $n_{max}$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>[kNm]</td>
<td>[kNm]</td>
<td>[kNm]</td>
<td>[kNm]</td>
<td>[rpm]</td>
</tr>
<tr>
<td>075</td>
<td>SGFlex-075.02</td>
<td>210</td>
<td>105</td>
<td>430</td>
<td>1050</td>
<td>7200</td>
</tr>
<tr>
<td>096</td>
<td>SGFlex-096.02</td>
<td>420</td>
<td>210</td>
<td>540</td>
<td>1200</td>
<td>3700</td>
</tr>
<tr>
<td>120</td>
<td>SGFlex-120.05</td>
<td>740</td>
<td>345</td>
<td>720</td>
<td>1600</td>
<td>2700</td>
</tr>
<tr>
<td>140</td>
<td>SGFlex-140.04</td>
<td>1000</td>
<td>450</td>
<td>900</td>
<td>2000</td>
<td>3000</td>
</tr>
<tr>
<td>180</td>
<td>SGFlex-180.02</td>
<td>2000</td>
<td>1000</td>
<td>1000</td>
<td>2000</td>
<td>6000</td>
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<tr>
<td>220</td>
<td>SGFlex-220.02*</td>
<td>3400</td>
<td>1300</td>
<td>1200</td>
<td>3400</td>
<td>8000</td>
</tr>
</tbody>
</table>

*For explanation of technical data see SGF-TL-001

Only the metric dimensions shall be binding

*pay attention to rotational direction acc. to SGF-TL-002

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**Examples of machined flanges**

**Ød1**

- Maximum diameter (e.g. for calculation of the 3-edge part of the flange inner clamping sets of the max diameter for shrink discs)

**Ød2**

- Maximum rotational diameter of the 3-edge part of the flange

**Key connection for bigger shafts thru unique 3-edge design**

**Key connection with threads for fixing bolts**

**Spline connection with fastening function**

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**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 $T_{KN}$

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

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 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 $T_{KMax1}$ typically occur when starting or stopping, shifting, accelerating or braking.

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 flexible coupling without destroying it. Massive damage to the flexible coupling as well as damage to the screw connections may result, so that only emergency operation of the flexible coupling may be possible following the application of the $T_{KMax2}$ load.

Permissible continuously oscillating torque $T_{KW}$

The permissible continuously 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).

Maximum permissible speed $n_{max}$

The maximum permissible speed $n_{max}$ 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.
SGF is a leading manufacturer for tension based torque transmission and has 70 years of experience in cord and bonding technology.

We offer a wide range of flexible, temperature-resistant products for torque transmission and vibration absorption.

Our main area of application is in general machine and systems engineering and in the automotive industry. We offer flexible couplings, dampers for drive shafts, exhaust hangers and absorbers as well as a variety of rubber-metal parts for the support of different aggregates.