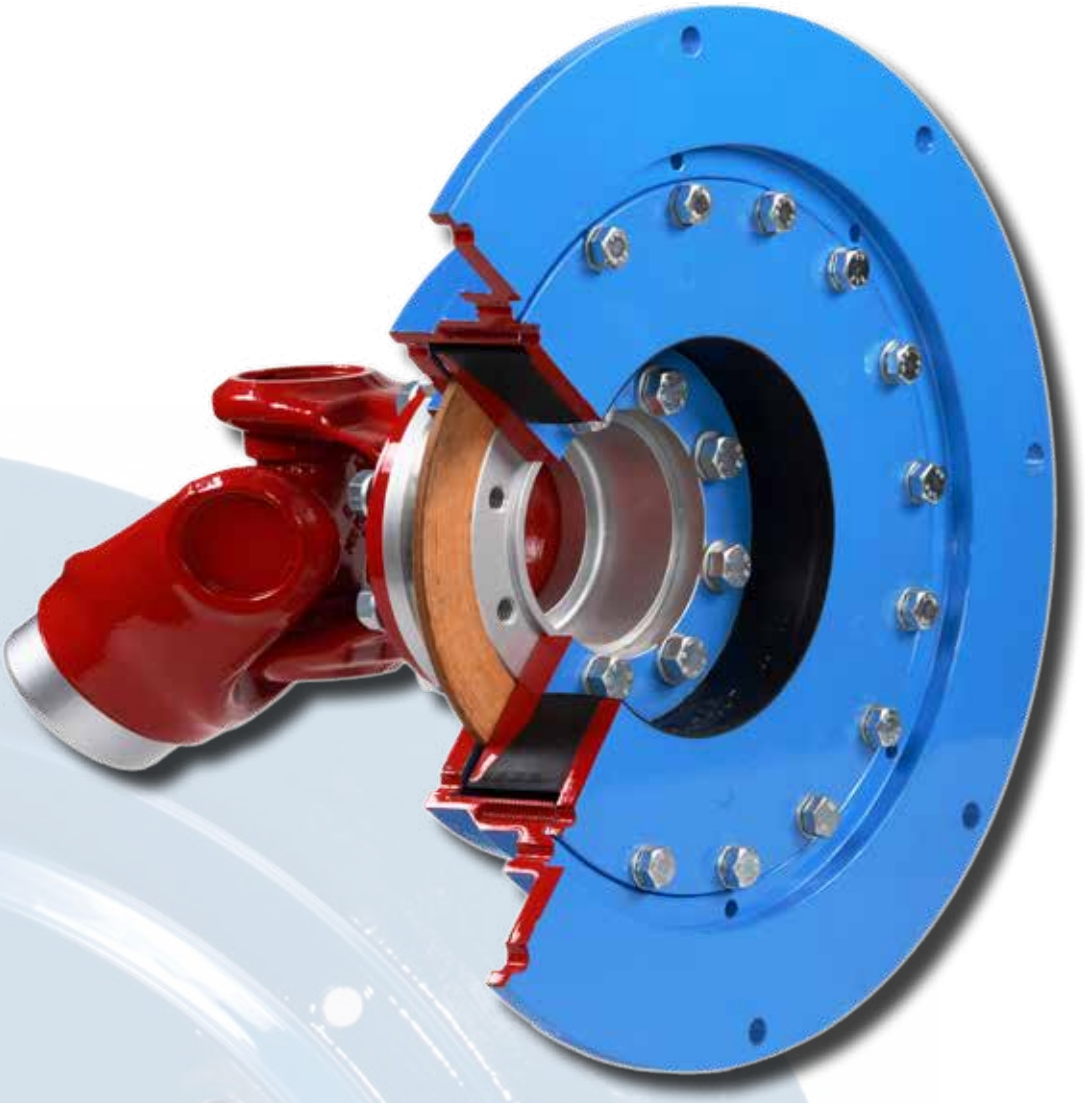
Reich Kupplungen

Dipl.-Ing. Herwarth Reich GmbH

D2C
Designed to Customer

# ARCUSAFLEX-VSK

## Highly torsionally flexible coupling for drive shafts



**Your drive is our strength. Your strength is our drive.**





# Contents



# D2C – Designed to Customer

The principle of Designed to Customer describes the recipe for success of REICH-KUPPLUNGEN: Utilizing our product knowledge, our customers are supplied with couplings which are developed and tailor-made to their specific requirements. The designs are mainly based on modular components to provide effective and efficient customer solutions. The unique form of close cooperation with our partners includes consultation, design, calculation, manufacture and integration into existing environments. Adapting our manufacturing to customer-specific production and utilizing global logistics concepts provides better after sales service - worldwide. This customer-oriented concept applies to both standard products and production in small batch sizes.

The company policy of REICH-KUPPLUNGEN embraces, first and foremost, principles such as customer satisfaction, flexibility, quality, prompt delivery and adaptability to the requirements of our customers.

REICH-KUPPLUNGEN supplies not only a coupling, but a solution: Designed to Customer.


*Edition August 2014*


*The present ARCUSAFLEX-VSK edition renders parts of the previous ARCUSAFLEX-VSK catalogues obsolete.*
*All dimensions in millimeters.*
*We reserve the right to change dimensions and / or design details without prior notice.*

# General technical description

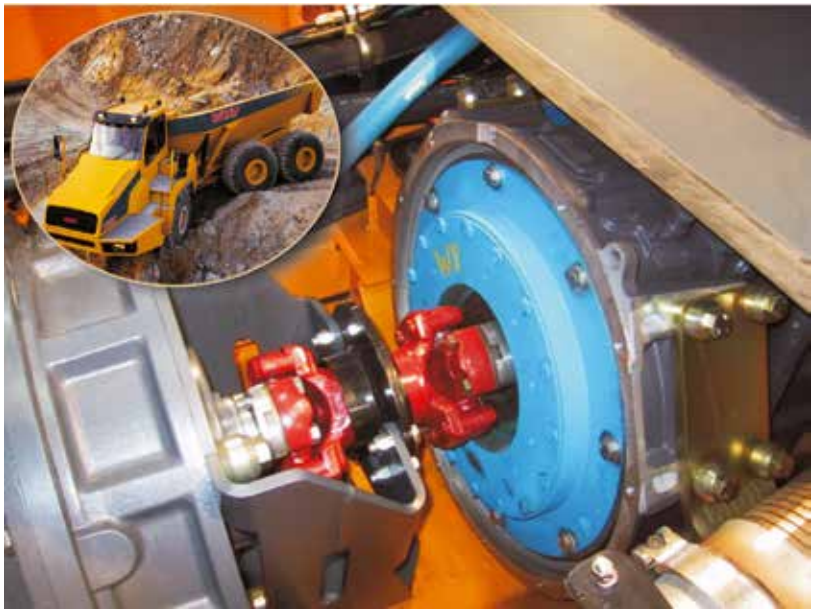
Cardan shafts are used in a drive train when a large shaft displacement or an extended distance between the drive and the driven components must be compensated. Depending on the arrangement of the drive train components, a non-uniform motion of the speed may result, and since cardan shafts exhibit some torsional flexibility, the mass of the prime mover and driven machine may induce a resonant system.

If the prime mover is an internal combustion engine, a highly flexible AC-VSK coupling is required to protect the drive train from dynamic overload. Highly flexible AC-VSK couplings are capable of shifting resonant ranges below the lowest operating speed and of reducing resonance-induced vibratory torques under reversed stresses to tolerable levels.

The highly flexible AC-VSK coupling is mounted on the engine flywheel, ahead of the drive train with drive shaft. The AC-VSK coupling contains its own axial and radial bearing to support the weight of the drive shaft and its reaction forces.

**Coupling Sizes**

The AC-VSK coupling series is available in nine standard sizes covering a torque range from 390 to 20 000 Nm. REICH-KUPPLUNGEN has an extensive programm of couplings to cover nearly every drive configuration. Customized solutions can be developed and manufactured even in small batches or as prototypes. Calculation programme are available for coupling selection and sizing. - Please challenge us!



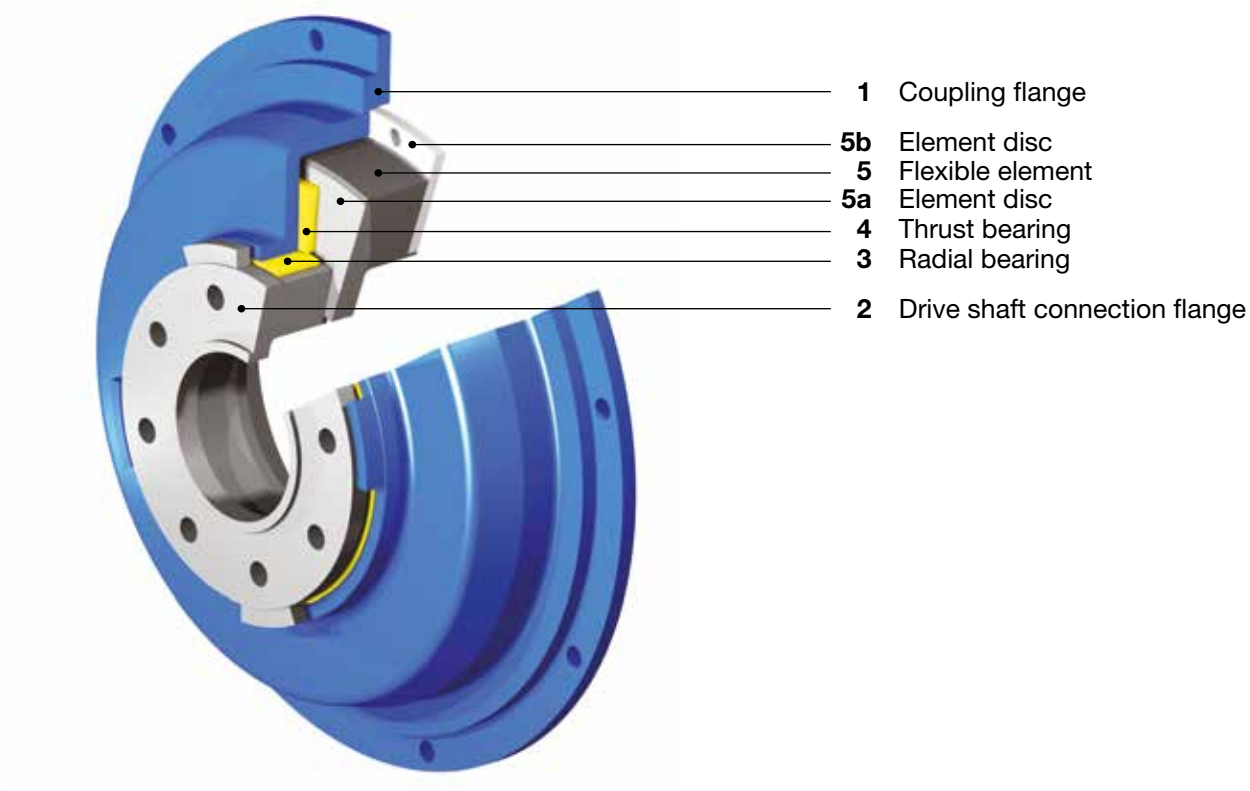
**Application of the highly flexible ARCUSAFLEX-VSK couplings**

For use with combustion engines in conjunction with drive shafts for splitter gearboxes, torque converters, ship gearboxes, control gears and pump drives, for example in drives of construction equipment, excavators, cranes, marine propulsion, locomotives, pump installations and dump trucks.

**The most important attributes and advantages of the highly flexible AC-VSK coupling are:**

- Linear torsional deflection characteristic
- Elements available in different torsional stiffnesses
- Enhanced damping capacity through frictional damping
- Maintenance-free coupling bearings
- Radial bearing close to the cardan joint
- A variety of designs for different cardan shaft configurations
- Many types with SAE connection dimensions or as specified
- Compact construction, the highly flexible element being protected by the housing
- Fail-safe device visible from the outside for ease of inspection

# AC-VSK coupling layout




Coupling shown with fail safe device

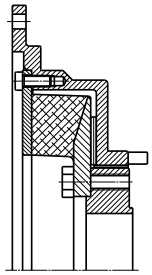
| Item | Specification | Material |
|---|---|---|
| **1** | Coupling flange | Standard design spheroidal cast iron GGG 40 |
| **2** | Drive shaft connection flange | Steel (yield strength min. 320 MPa) |
| **3** | Radial bearing | Metal or plastic (maintenance-free) |
| **4** | Thrust bearing | Composite material (maintenance-free) |
| **5** | Flexible element | Rubber according to technical details |
| **5a, 5b** | Element discs | Steel |

The highly flexible ARCUSAFLEX-VSK couplings of the type AC-VSK ... F2 are specially designed for fitting to flywheels of internal combustion engines. The coupling flanges (**1**) of the standard design therefore match engine flywheels with SAE connecting dimensions.

The highly flexible coupling element (**5**), is made of rubber bonded to steel discs and is mounted with an axial preload acting on the thrust bearing (**4**). The output flange (**2**), used to connect the cardan shaft is precisely located by means of the radial bearing (**3**) ensuring excellent concentricity.

The dynamic performance of the coupling is improved by the pre-loaded rubber element and stabilizing effect of the support bearings providing enhanced damping capacity due to additional frictional damping.

# Standard types



### Type AC-VSK....F2

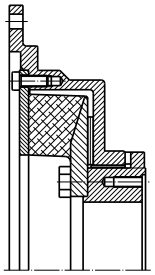
To connect an engine flywheel to a **cardan shaft with metric DIN flange**

$T_{KN}$ = 390 – 20 000 Nm

Technical data Page 7

Dimensions Page 8

Available with or without fail-safe device



### Type AC-VSK....F2

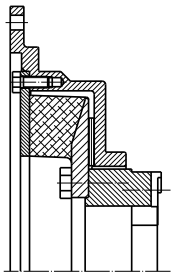
To connect an engine flywheel to a **SPICER cardan shaft**

$T_{KN}$ = 390 – 20 000 Nm

Technical data Page 7

Dimensions Page 9

Available with or without fail-safe device



### Type AC-VSK....F2

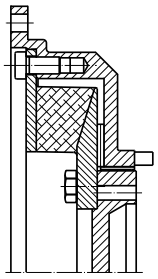
To connect an engine flywheel to a **MECHANICS cardan shaft**

$T_{KN}$ = 390 – 20 000 Nm

Technical data Page 7

Dimensions Page 10

Available with or without fail-safe device



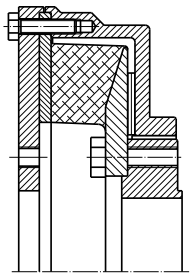
### Type AC-VSK....F2 CV

To connect an engine flywheel to a **constant velocity shaft**

$T_{KN}$ = 390 – 20 000 Nm

Technical data Page 7

Dimensions Page 11



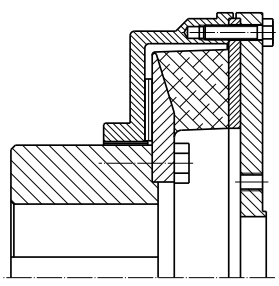
### Type AC-VSK....F1

To connect a **flange with cardan shaft connection to a cardan shaft**

$T_{KN}$ = 390 – 20 000 Nm

Technical data Page 7

Dimensions Page 12



### Type AC-VSK....F1W

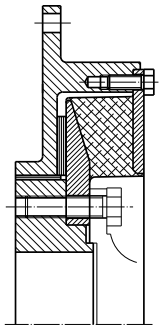
To connect a **shaft to a cardan shaft**

$T_{KN}$ = 390 – 20 000 Nm

Technical data Page 7

Dimensions Page 13

# Special types



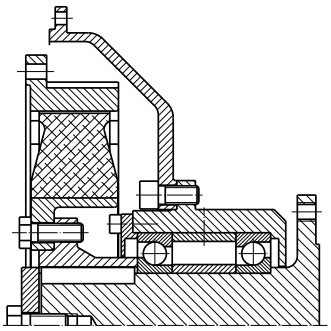
## Short type AC-VSK...F2

Narrow width to connect an engine flywheel to a cardan shaft

$T_{KN}$ = 390 - 5 000 Nm

Technical data Page 7

Dimension table available

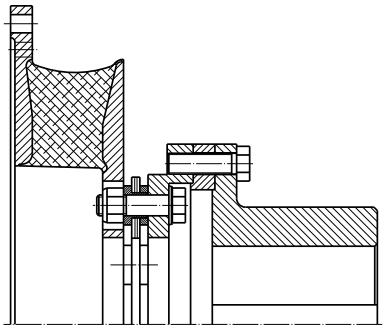


## Type AC...F2 FG-GL Flange housing

Highly flexible ARCUSAFLEX flange coupling with integral shaft support to connect a cardan shaft having a large deflection angle, also available with integrated clutch.
A separate shaft bearing support attached to the engine housing keeps the crankshaft of the engine free from the additional stresses arising from cardan shaft deflection.

$T_{KN}$ = 500 - 20 000 Nm

Technical data and dimension tables available on request

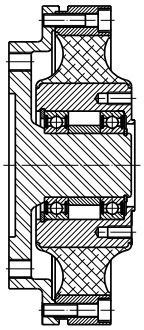


## Type FD-VSK

Highly flexible coupling element AC-VSK in combination with a FlexDur disc pack.
For compensating large radial shaft displacements (e.g. in the case of flexibly mounted internal combustion engines).
Axial compensation is ensured by the FlexDur disc pack.

For torques up to 28 000 Nm

Technical data and dimensions available on request

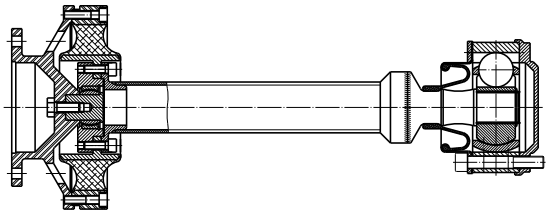


## Type TOK

Highly flexible torsionally optimized coupling used in connection with a cardan shaft, constant velocity shaft, flange or splined shaft profile

$T_{KN}$ = 100 - 43 000 Nm

Catalogue available on request



## Special type TOK for test benches

Highly flexible torsionally optimized coupling for engine test benches

Available designs:
Integrated bearing with cardan shafts
Integrated bearing with constant velocity shafts
Double element coupling with / without telescopic unit

$T_{KN}$= 100 - 30 000 Nm

$n_{max}$= 10 000 rpm

# Technical Data

| Size | Element version | Nominal torque $T_{KN}$ Nm | Maximum torque $T_{Kmax}$ Nm | Cont. vibratory torque[2] $T_{KW\ (10\ Hz)}$ Nm | Permissible power loss $P_{KV}$ (30 °C) W | Dynamic torsional stiffness $C_{Tdyn}$ Nm/rad | Relative damping[1] Ψ - | Maximum speed $n_{max}$ rpm | Maximum speed $n_{max}$ SAE |
|---|---|---|---|---|---|---|---|---|---|
| AC-VSK 15 | EN | 390 | 1170 | 140 | 120 | 2400 | 1.00 | 4500 | 8" |
| | WN | 450 | 1350 | | | 2900 | 1.25 | 4000 | 10" |
| | NN | 560 | 1680 | | | 4500 | 1.40 | | |
| AC-VSK 25 | EN | 710 | 2130 | 250 | 190 | 4500 | 1.00 | 4000 | 10" |
| | WN | 820 | 2440 | | | 5200 | 1.25 | 3500 | 11.5" |
| | NN | 1000 | 3000 | | | 8000 | 1.40 | | |
| AC-VSK 35 | EN | 1100 | 3300 | 400 | 220 | 7800 | 1.00 | 3600 | 10" |
| | WN | 1250 | 3750 | | | 9500 | 1.25 | 3500 | 11.5" |
| | NN | 1600 | 4800 | | | 14000 | 1.40 | 3000 | 14" |
| AC-VSK 45 | EN | 1400 | 4200 | 525 | 240 | 9000 | 1.00 | 3500 | 11.5" |
| | WN | 1600 | 4800 | | | 11000 | 1.25 | 3000 | 14" |
| | NN | 2100 | 6300 | | | 17000 | 1.40 | | |
| AC-VSK 50 | EN | 2000 | 6000 | 750 | 280 | 14000 | 1.00 | 3000 | 14" |
| | WN | 2300 | 6900 | | | 18000 | 1.25 | 2300 | 18" |
| | NN | 3000 | 9000 | | | 24000 | 1.40 | | |
| AC-VSK 55 | EN | 3500 | 10500 | 1250 | 335 | 24000 | 1.00 | 2600 | 14" |
| | WN | 4000 | 12000 | | | 30000 | 1.25 | 2300 | 18" |
| | NN | 5000 | 15000 | | | 45000 | 1.40 | | |
| AC-VSK 60 | EN | 4400 | 13200 | 1550 | 375 | 35000 | 1.00 | 2500 | 14" |
| | WN | 5000 | 15000 | | | 42000 | 1.25 | 2300 | 18" |
| | NN | 6200 | 18600 | | | 65000 | 1.40 | | |
| AC-VSK 70 | EN | 7000 | 21000 | 2500 | 445 | 50000 | 1.00 | 2300 | 18" |
| | WN | 8000 | 24000 | | | 62000 | 1.25 | 2100 | 21" |
| | NN | 10000 | 30000 | | | 93000 | 1.40 | | |
| AC-VSK 85 | EN | 14000 | 42000 | 5000 | 650 | 96000 | 1.00 | 2100 | 21" |
| | WN | 16000 | 48000 | | | 120000 | 1.25 | | |
| | NN | 20000 | 60000 | | | 185000 | 1.40 | | |

Shore hardness of the rubber element version: EN = 50° Shore A; WN = 55° Shore A; NN = 65° Shore A

1) The relative damping relates only to the elastomer. The frictional damping of the bearings has to be considered seperately, depending on the type of operation.

2) Continuous vibratory torque under reversing stresses $\pm T_{KW}$ at f = 10 Hz, for other frequencies $f_x$ apply $T_{KW} \cdot \sqrt{\frac{10}{f_x}}$

# Selection of the proper coupling size

The selected coupling for internal combustion engine drives should be verified by a torsional vibration analysis which we will provide on request. A preliminary selection of the coupling can, however, be made based on the continuous engine power being transmitted.

1. Calculation of the nominal drive torque $T_{AN}$
   Given a driving powe $P_{AN}$ and a coupling speed $n_{AN}$, the driving torque is calculated as follows

$$T_{AN}\,[Nm] = 9550 \frac{P_{AN}\,[kW]}{n_{AN}\,[rpm]}$$

2. The nominal torque capacity $T_{KN}$ of the coupling should be at least equal to the maximum engine torque $T_{AN}$ at any operating temperature

$$T_{KN} \geq T_{AN} \cdot S_t$$

3. The temperature factor $S_t$ allows for the decreasing load capacity of the coupling when affected by elevated ambient temperatures close to the coupling

| | 60 °C | 70 °C | 80 °C | > 80 °C |
|---|---|---|---|---|
| $S_t$ | 1.25 | 1.4 | 1.6 | on request |

4. The torsional vibration analysis to verify the coupling selection should confirm that the permissible continous vibratory torque under reversing stresses $T_{KW}$ is at least equal to the highest vibratory torque under reversing stresses $T_W$ encountered throughout the operating speed range while taking into account the temperature and frequency

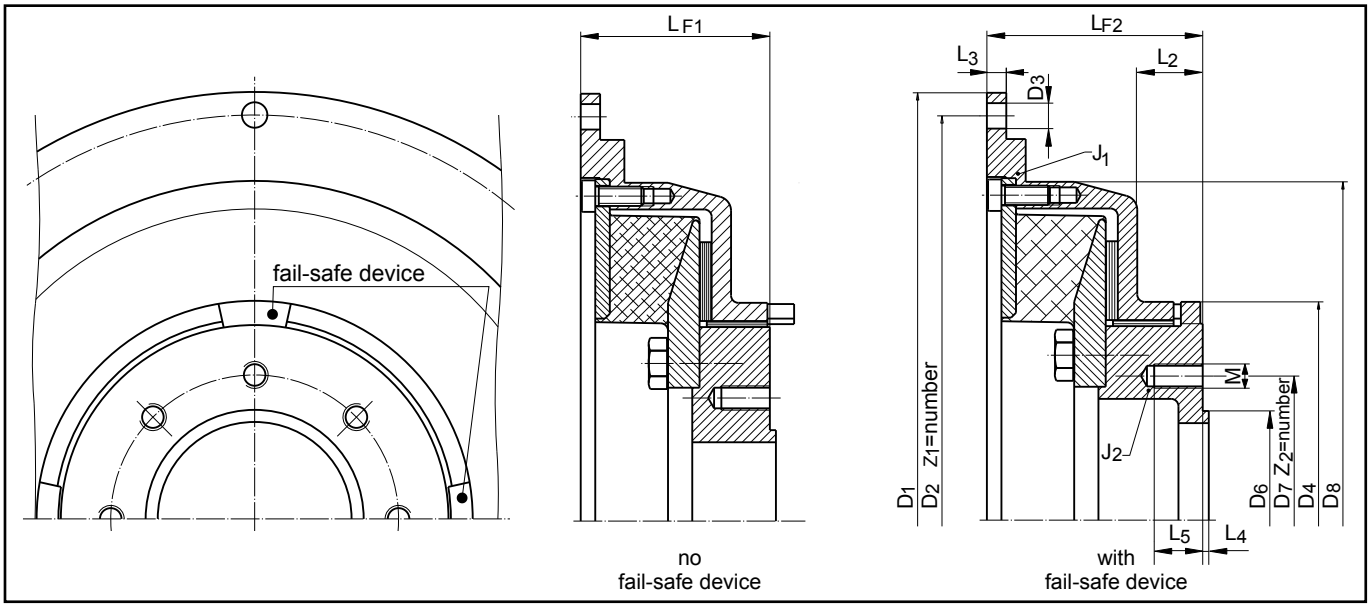
$$T_{kW\ (10\ Hz)} \geq T_W \cdot S_t \cdot S_f$$

5. The frequency factor $S_f$ allows for the frequency dependence of the permissible continuous vibratory torque under reversing stresses $T_{KW\ (10\ Hz)}$ when operating with a different frequency $f_x$

$$S_f = \sqrt{\frac{f_x}{10}}$$

# ARCUSAFLEX-VSK flange couplings

Type AC-VSK...F2 for cardan shafts with metric **DIN flange**
Engine flywheels with SAE connecting dimensions acc. to J620




| AC-VSK Coupling size | Flywheel connection dimensions SAE size | $D_1$ mm | $D_2$ mm | $D_3$ mm | $Z_1$ | $D_4$ mm | $D_8$ mm | $L_2$ mm | $L_3$ mm | $L_{F1}$ mm | $L_{F2}$ mm | Cardan shaft connecting dimensions Flange Ø | $D_6/h_6$ mm | $D_7$ mm | $Z_2$ x M[2] | $L_4$ mm | $L_5$ mm | $J_1$ kgm² | $J_2$[5] kgm² | Total[5] weight kg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| - 15.[1].F2 | 8 | 263.5 | 244.5 | 10.5 | 6 | 140 | 215 | 18 | 8 | 57 | 68 | 100 | 57 | 84.0 | 6 x M8 | 2.0 | 16 | 0.055 | 0.010 | 8.9 |
| | 10 | 314.3 | 295.3 | 10.5 | 8 | | | | | | | 120 | 75 | 101.5 | 8 x M10 | | | 0.084 | | 10.3 |
| - 25.[1].F2 | 10 | 314.3 | 295.3 | 10.5 | 8 | 144 | 260 | 22 | 10 | 74 | 85 | 120 | 75 | 101.5 | 8 x M10 | 2.0 | 20 | 0.148 | 0.023 | 15.8 |
| | 11.5 | 352.4 | 333.4 | 10.5 | | | | | | | | | | | | | | 0.188 | | 17.2 |
| - 35.[1].F2 | 10 | 314.3 | 295.3 | 10.5 | 8 | 180 | 279 | 28 | 16 | 78 | 90 | 120 | 75 | 101.5 | 8 x M10 | 2.0 | 20 | 0.144 | 0.052 | 17.0 |
| | 11.5 | 352.4 | 333.4 | 10.5 | | | | | 8 | | | 150 | 90 | 130.0 | 8 x M12 | 2,5 | | 0.177 | | 18.2 |
| | 14 | 466.7 | 438.2 | 13.0 | | | | | 8 | | | | | | | | | 0.362 | | 22.5 |
| - 45.[1].F2 | 11.5 | 352.4 | 333.4 | 10.5 | 8 | 180 | 314 | 25 | 26 | 89 | 100 | 150 | 90 | 130.0 | 8 x M12 | 2,5 | 20 | 0.281 | 0.066 | 23.9 |
| | 14 | 466.7 | 438.2 | 13.0 | | | | | 10 | | | | | | | | | 0.517 | | 29.5 |
| - 50.[1].F2 | 14 | 466.7 | 438.2 | 13.0 | 8 | 210 | 352 | 36 | 12 | 103 | 120 | 150 | 90 | 130.0 | 8 x M12 | 2,5 | 25 | 0.668 | 0.123 | 37.2 |
| | 18 | 571.5 | 542.9 | 17.0 | | | | | | | | 180 | 110 | 155.5 | 8 x M14 | 3.0 | 30 | 1.180 | | 44.7 |
| - 55.[1].F2 | 14 | 466.7 | 438.2 | 13.0 | 8 | 285 | 417 | 35 | 28 | 115 | 130 | 180 | 110 | 155.5 | 8 x M14 | 3.0 | 25 | 1.087 | 0.380 | 55.0 |
| | 18 | 571.5 | 542.9 | 17.0 | 6 | | | | | | | 225 | 140 | 196.0 | 8 x M16 | | | 1.754 | 0.378 | 64.4 |
| | | | | | | | | | | | | 250 | 140 | 218.0 | 8 x M18 | 4.0 | 30 | | | |
| - 60.[1].F2 | 14 | 466.7 | 438.2 | 13.0 | 8 | 300 | 424 | 47 | 25[3] | 122 | 137 | 225 | 140 | 196.0 | 8 x M16 | 4.0 | 45 | 1.100 | 0.464 | 60.5 |
| | 18 | 571.5 | 542.9 | 17.0 | 6 | | | | 15 | 133 | 148 | 250 | 140 | 218.0 | 8 x M18 | | | 1.878 | | 72.2 |
| - 70.[1].F2 | 18 | 571.5 | 542.9 | 17.0 | 12 | 348 | 510 | 46 | 15 | 139 | 160 | 250 | 140 | 218.0 | 8 x M18 | 4.0 | 30 | 2.681 | 1.080 | 105.6 |
| | 21 | 673.1 | 641.4 | 17.0 | 12 | | | | | | | 285 | 175 | 245.0 | 8 x M20 | 5.0 | 35 | 3.747 | 1.073 | 116.5 |
| - 85.[1].F2 | 21 | 673.1 | 641.4 | 17.0 | 12 | 440 | 610 | 66 | 35[4] | 160 | 181 | 285 | 175 | 245.0 | 8 x M20 | 5.0 | 35 | 6.857 | 2.231 | 155.2 |
| | | | | | | | | | | | | 315 | 175 | 280.0 | 8 x M22 | 5.0 | 35 | | | |

[1] For the element version see "Technical data" on page 7
[2] Alternative connection threads on request
[3] Centering depth 9 mm
[4] Centering depth 14 mm
[5] Values without fail-safe device

**Ordering example:** Coupling designation **AC-VSK 50.WN.F2.14.150.DS**

- Coupling size
- Element version acc. to „Technical data“
- SAE flywheel connection
- Cardan shaft flange Ø
- Design with fail safe device

# ARCUSAFLEX-VSK flange couplings

Type AC-VSK...F2 for **SPICER cardan shafts**
Engine flywheels with SAE connecting dimensions acc. to J620

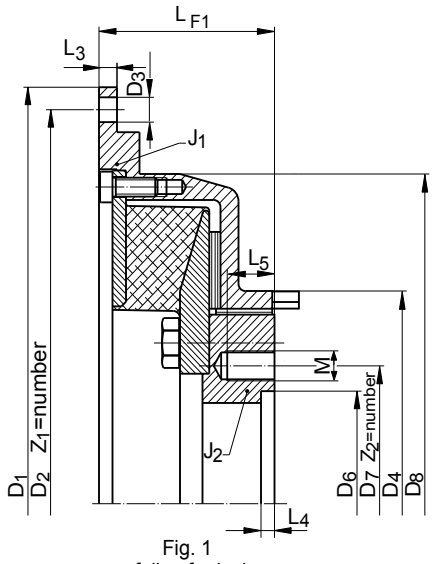



Fig. 1
no fail-safe device

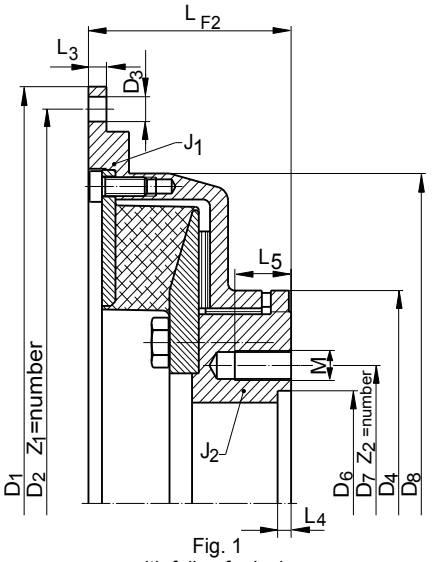



Fig. 1
with fail-safe device

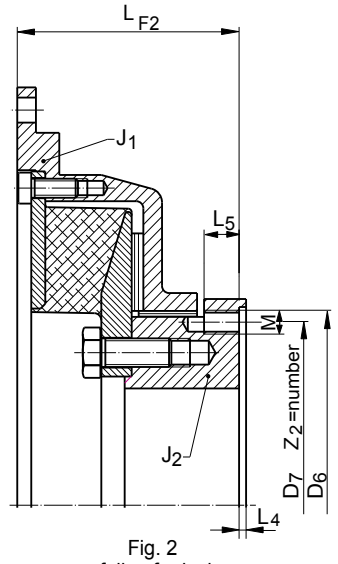



Fig. 2
no fail-safe device

| AC-VSK Coupling size | Flywheel connection dimensions SAE size | $D_1$ mm | $D_2$ mm | $D_3$ mm | $Z_1$ | $D_4$ mm | $D_8$ mm | $L_3$ mm | $L_{F1}$ mm | $L_{F2}$ mm | Spicer cardan shaft connecting dimensions size | Fig. | $D_6/H_6$ mm | $D_7$ mm | $Z_2$ x M[2] | $L_4$ mm | $L_5$ mm | $J_1$ kgm² | $J_2$[6] kgm² | Total[6] weight kg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| - 15.[1].F2 | 8 | 263.5 | 244.5 | 10.5 | 6 | 140 | 215 | 8 | 57 | 68 | 1280/1310 | 1 | 60.33 | 79.38 | 4 x $^3/_8$"- 24 | 5 | 20 | 0.055 | 0.010 | 8.9 |
| | 10 | 314.3 | 295.3 | 10.5 | 8 | | | | | | 1350/1410 | | 69.85 | 95.25 | 4 x $^7/_{16}$"- 20 | | | 0.084 | | 10.3 |
| - 25.[1].F2 | 10 | 314.3 | 295.3 | 10.5 | 8 | 144 | 260 | 10 | 74 | 85 | 1280/1310 | 1 | 60.33 | 79.38 | 4 x $^3/_8$"- 24 | 5 | 20 | 0.148 | 0.023 | 15.8 |
| | 11.5 | 352.4 | 333.4 | 10.5 | | | | | | | 1350/1410 | | 69.85 | 95.25 | 4 x $^7/_{16}$"- 20 | | | 0.188 | | 17.2 |
| - 35.[1].F2 | 10 | 314.3 | 295.3 | 10.5 | 8 | 180 | 279 | 16 | 78 | 90 | 1480/1550 | 1 | 95.25 | 120.65 | 4 x $^1/_2$"- 20 | 6 | 25 | 0.144 | 0.052 | 17.0 |
| | 11.5 | 352.4 | 333.4 | 10.5 | | | | 8 | 95 | - | 1610[3] | 2 | 168.28 | 155.58 | 8 x $^3/_8$"- 24 | 1.5 | 15 | 0.177 | 0.058 | 19.2 |
| | 14 | 466.7 | 438.2 | 13.0 | | | | | | | | | | | | | | 0.362 | | 23.5 |
| - 45.[1].F2 | 11.5 | 352.4 | 333.4 | 10.5 | 8 | 180 | 314 | 26 | 89 | 100 | 1480/1550 | 1 | 95.25 | 120.65 | 4 x $^1/_2$"- 20 | 6 | 25 | 0.281 | 0.066 | 23.9 |
| | 14 | 466.7 | 438.2 | 13.0 | | | | 10 | 105 | - | 1610[3] | 2 | 168.28 | 155.58 | 8 x $^3/_8$"- 24 | 1.5 | 15 | 0.517 | 0.072 | 30.5 |
| - 50.[1].F2 | 14 | 466.7 | 438.2 | 13.0 | 8 | 210 | 352 | 12 | 100 | 117 | 1610 | 2 | 168.28 | 155.58 | 8 x $^3/_8$"- 24 | 1.5 | 30 | 0.668 | 0.123 | 37.2 |
| | | | | | | | | | 125 | - | 1710[3] | | 196.85 | 184.15 | 8 x $^3/_8$"- 24 | | 17 | | 0.138 | 39.2 |
| | 18 | 571.5 | 542.9 | 17.0 | 6 | | | | | | 1760/1810[3] | | | | 12 x $^7/_{16}$"- 20 | | | 1.180 | | 46.7 |
| - 55.[1].F2 | 14 | 466.7 | 438.2 | 13.0 | 8 | 285 | 417 | 28 | 112 | 127 | 1710 | 2 | 196.85 | 184.15 | 8 x $^3/_8$"- 24 | 1.5 | 30 | 1.087 | 0.380 | 55.0 |
| | 18 | 571.5 | 542.9 | 17.0 | 6 | | | | | | 1760/1810 | | | | 12 x $^7/_{16}$"- 20 | | | 1.754 | | 64.4 |
| | | | | | | | | | 115 | 130 | 1880/1910 | 1 | 177.80 | 209.55 | 8 x $^5/_8$"- 18 | 7 | | | | |
| - 60.[1].F2 | 14 | 466.7 | 438.2 | 13.0 | 8 | 300 | 424 | 25[4] | 119 | 134 | 1760/1810 | 2 | 196.85 | 184.15 | 12 x $^7/_{16}$"- 20 | 1.5 | 30 | 1.100 | 0.509 | 64.9 |
| | 18 | 571.5 | 542.9 | 17.0 | 6 | | | 15 | 133 | 148 | 1880/1910 | 1 | 177.80 | 209.55 | 8 x $^5/_8$"- 18 | 7 | | 1.878 | | 76.6 |
| - 70.[1].F2 | 18 | 571.5 | 542.9 | 17.0 | 12 | 348 | 510 | 15 | 139 | 160 | 1880/1910 | 1 | 177.80 | 209.55 | 8 x $^5/_8$"- 18 | 7 | 35 | 2.681 | 1.080 | 105.6 |
| | 21 | 673.1 | 641.4 | 17.0 | 12 | | | | | | 1950 | | 209.55 | 249.30 | 12 x $^3/_4$"- 16 | | | 3.747 | 1.073 | 116.5 |
| - 85.[1].F2 | 21 | 673.1 | 641.4 | 17.0 | 12 | 440 | 610 | 35[5] | 160 | 181 | 1880/1910 | 1 | 177.80 | 209.55 | 8 x $^5/_8$"- 18 | 7 | 35 | 6.857 | 2.229 | 157.8 |
| | | | | | | | | | | | 1950 | | 209.55 | 249.30 | 12 x $^3/_4$"- 16 | | | | | |

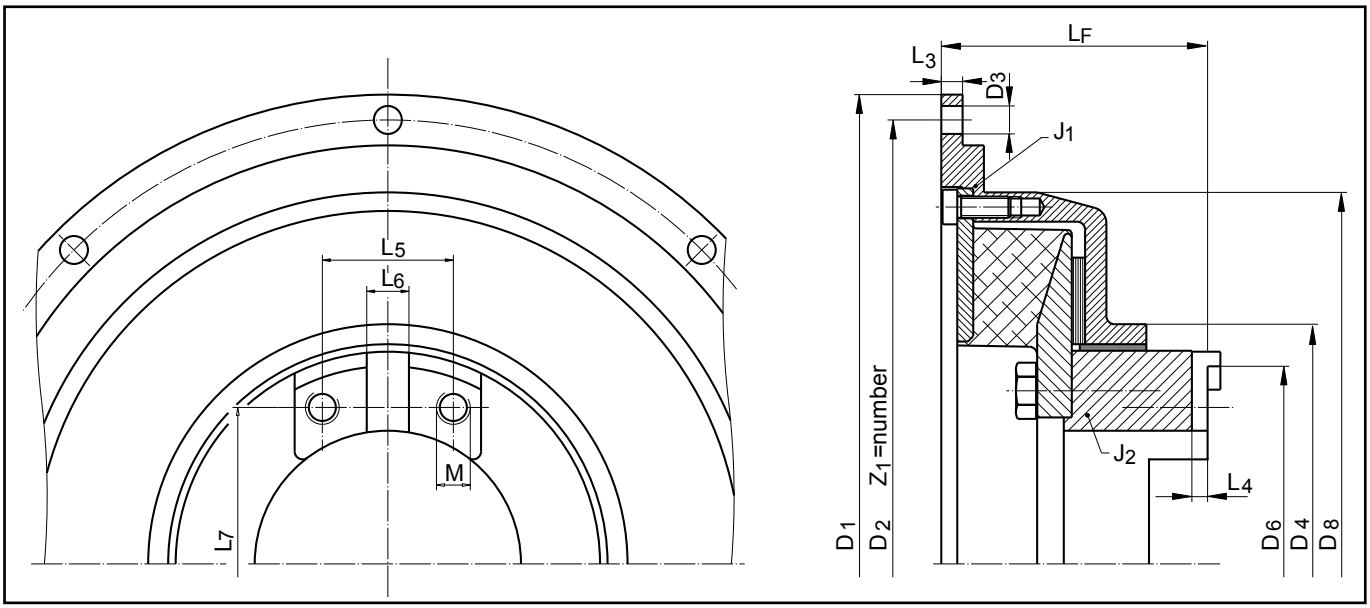
[1] For the element version see "Technical data" on page 7
[2] Alternative connection threads on request
[3] This version not available with fail-safe device
[4] Centering depth 9 mm
[5] Centering depth 14 mm
[6] Values without fail-safe device

**Ordering example:** Coupling designation **AC-VSK 50.WN.F2.14.1610.DS**

- Coupling size
- Element version acc. to „Technical data“
- SAE flywheel connection
- Spicer Cardan shaft flange
- Design with fail-safe device

# ARCUSAFLEX-VSK flange couplings

Type AC-VSK...F2 for **MECHANICS cardan shafts**
Engine flywheels with SAE connecting dimensions acc. to J620




| AC-VSK Coupling size | Flywheel connection dimensions SAE size | $D_1$ mm | $D_2$ mm | $D_3$ mm | $Z_1$ | $D_4$ mm | $D_8$ mm | $L_3$ mm | $L_F$ mm | Mechanics cardan shaft connecting dimensions size | $D_6/H_7$ mm | $L_4$ mm | $L_5$ mm | $L_6$ mm | $L_7$ mm | M | $J_1$ kgm² | $J_2$ kgm² | Total weight kg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| - 15.[1].F2 | 8 | 263.5 | 244.5 | 10.5 | 6 | 140 | 215 | 8 | 83 | 4C | 107.92 | 3.8 | 36.5 | 9.5 | 87.3 | 5/16"-24 | 0.055 | 0.010 | 8.8 |
| | 10 | 314.3 | 295.3 | 10.5 | 8 | | | | | 5C | 115.06 | 5.1 | 42.9 | 14.26 | 88.9 | 3/8"- 24 | 0.084 | | 10.2 |
| - 25.[1].F2 | 10 | 314.3 | 295.3 | 10.5 | 8 | 144 | 260 | 10 | 95 | 5C | 115.06 | 5.1 | 42.9 | 14.26 | 88.9 | 3/8"- 24 | 0.148 | 0.022 | 15.3 |
| | 11.5 | 352.4 | 333.4 | 10.5 | | | | | | | | | | | | | 0.188 | | 16.7 |
| - 35.[1].F2 | 10 | 314.3 | 295.3 | 10.5 | 8 | 180 | 279 | 16 | 100 | 5C | 115.06 | 5.1 | 42.9 | 14.26 | 88.9 | 3/8"- 24 | 0.144 | 0.048 | 16.0 |
| | 11.5 | 352.4 | 333.4 | 10.5 | | | | 8 | | 6C | 140.46 | 5.1 | 42.9 | 14.26 | 114.3 | 3/8"- 24 | 0.177 | | 17.9 |
| | 14 | 466.7 | 438.2 | 13.0 | | | | | | | | | | | | | 0.362 | | 22.2 |
| - 45.[1].F2 | 11.5 | 352.4 | 333.4 | 10.5 | 8 | 180 | 314 | 26 | 111 | 5C | 115.06 | 5.1 | 42.9 | 14.26 | 88.9 | 3/8"- 24 | 0.281 | 0.063 | 23.5 |
| | 14 | 466.7 | 438.2 | 13.0 | | | | 10 | | 6C | 140.46 | 5.1 | 42.9 | 14.26 | 114.3 | 3/8"- 24 | 0.517 | | 29.1 |
| - 50.[1].F2 | 14 | 466.7 | 438.2 | 13.0 | 8 | 210 | 352 | 12 | 130 | 6C | 140.46 | 5.1 | 42.9 | 14.26 | 114.3 | 3/8"- 24 | 0.668 | 0.115 | 36.2 |
| | | | | | | | | | | 7C | 148.39 | 6.0 | 49.2 | 15.85 | 117.5 | 1/2"- 20 | | 0.116 | 36.3 |
| | 18 | 571.5 | 542.9 | 17.0 | 6 | | | | | 8.5C | 165.08 | 6.0 | 71.4 | 15.85 | 123.8 | 1/2"- 20 | 1.180 | 0.114 | 43.1 |
| - 55.[1].F2 | 14 | 466.7 | 438.2 | 13.0 | 8 | 285 | 417 | 28 | 155 | 8C | 206.32 | 6.0 | 49.2 | 15.85 | 174.6 | 1/2"- 20 | 1.087 | 0.348 | 52.1 |
| | 18 | 571.5 | 542.9 | 17.0 | 6 | | | | | 8.5C | 165.08 | 6.0 | 71.4 | 15.85 | 123.8 | 1/2"- 20 | 1.754 | 0.353 | 63.1 |
| | | | | | | | | | | 9C | 209.52 | 6.0 | 71.4 | 15.85 | 168.3 | 1/2"- 20 | | 0.356 | 62.2 |
| - 60.[1].F2 | 14 | 466.7 | 438.2 | 13.0 | 8 | 300 | 424 | 25[2] | 148 | 8.5C | 165.08 | 6.0 | 71.4 | 15.85 | 123.8 | 1/2"- 20 | 1.100 | 0.471 | 62.1 |
| | 18 | 571.5 | 542.9 | 17.0 | 6 | | | 15 | 173 | 9C | 209.52 | 6.0 | 71.4 | 15.85 | 168.3 | 1/2"- 20 | 1.878 | | 73.8 |
| - 70.[1].F2 | 18 | 571.5 | 542.9 | 17.0 | 12 | 348 | 510 | 15 | 170 | 9C | 209.52 | 6.0 | 71.4 | 15.85 | 168.3 | 1/2"- 20 | 2.681 | 0.964 | 99.0 |
| | 21 | 673.1 | 641.4 | 17.0 | 12 | | | | | 10C | 212.70 | 9.5 | 92.1 | 25.35 | 165.1 | 5/8"- 18 | 3.747 | | 109.9 |
| - 85.[1].F2 | 21 | 673.1 | 641.4 | 17.0 | 12 | 440 | 610 | 35[3] | 200 | 12C | 289.05 | 12.5 | 92.1 | 25.35 | 241.3 | 5/8"- 18 | 6.857 | 2.305 | 157.2 |
| | | | | | | | | | | 15C | 260.00 | 12.5 | 100.0 | 31.78 | 200.0 | 3/4"- 16 | | | |
| | | | | | | | | | | 280 | 280.00 | 9.0 | 92.0 | 35.00 | 227.0 | M18 | | | |

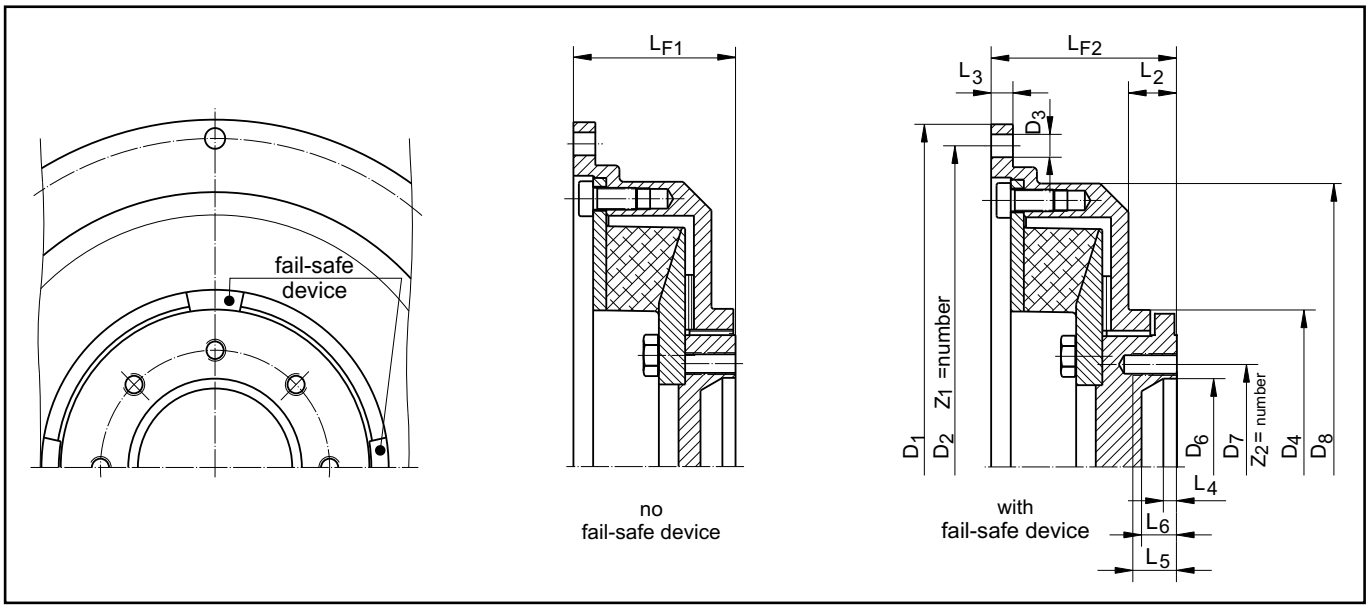
[1] For the element version see „Technical data“ on page 7
Version with fail-safe device on request
[2] Centering depth 9 mm
[3] Centering depth 14 mm

**Ordering example:** Coupling designation **AC-VSK 50.WN.F2.14.7C**

- Coupling size
- Element version acc. to „Technical data“
- SAE flywheel connection
- MECHANICS cardan shaft connection

# ARCUSAFLEX-VSK flange couplings

Type AC-VSK...F2.CV for **constant velocity shafts**
Engine flywheels with SAE connecting dimensions acc. to J620




| AC-VSK Coupling size | Flywheel connection dimensions SAE size | $D_1$ mm | $D_2$ mm | $D_3$ mm | $Z_1$ | $D_4$ mm | $D_8$ mm | $L_2$ mm | $L_3$ mm | $LF_1$ mm | $LF_2$ mm | Constant velocity shaft connections size | $D_6/H_7$ mm | $D_7$ mm | $Z_2$ x M | $L_4$ mm | $L_5$ mm | $L_6$ mm | $J_1$ kgm² | $J_2$[2] kgm² | Total[2] weight kg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| - 15.[1].F2 | 8 | 263.5 | 244.5 | 10.5 | 6 | 140 | 215 | 18 | 8 | 57 | 68 | CV 15 | 81 | 94.0 | 6 x M10 | 6 | 15 | 16 | 0.055 | 0.009 | 8.1 |
| | 10 | 314.3 | 295.3 | 10.5 | 8 | | | | | | | | | | | | | | 0.084 | | 9.5 |
| - 25.[1].F2 | 10 | 314.3 | 295.3 | 10.5 | 8 | 144 | 260 | 22 | 10 | 74 | 85 | CV 15 | 81 | 94.0 | 6 x M10 | 6 | 20 | 16 | 0.148 | 0.022 | 15.2 |
| | 11.5 | 352.4 | 333.4 | 10.5 | | | | | | | | | | | | | | | 0.188 | | 16.6 |
| - 35.[1].F2 | 10 | 314.3 | 295.3 | 10.5 | 8 | 180 | 279 | 28 | 16 | 78 | 90 | CV 21 | 90 | 108.0 | 6 x M12 | 8 | 20 | 20 | 0.144 | 0.049 | 17.0 |
| | 11.5 | 352.4 | 333.4 | 10.5 | | | | | 8 | | | CV 30 | 112 | 128.0 | 6 x M12 | 12 | 23 | 25 | 0.177 | | 17.2 |
| - 45.[1].F2 | 11.5 | 352.4 | 333.4 | 10.5 | 8 | 180 | 314 | 25 | 26 | 89 | 100 | CV 30 | 112 | 128.0 | 6 x M12 | 12 | 23 | 25 | 0.281 | 0.055 | 22.8 |
| | 14 | 466.7 | 438.2 | 13.0 | | | | | 10 | | | | | | | | | | 0.517 | | 28.4 |
| - 50.[1].F2 | 14 | 466.7 | 438.2 | 13.0 | 8 | 210 | 352 | 36 | 12 | 103 | 120 | CV 30 | 112 | 128.0 | 6 x M12 | 12 | 25 | 25 | 0.668 | 0.115 | 36.2 |
| | | | | | | | | | | | | CV 32 | 136 | 155.5 | 6 x M16 | | 30 | 26 | | | |
| - 55.[1].F2 | 14 | 466.7 | 438.2 | 13.0 | 8 | 285 | 417 | 35 | 28 | 115 | 130 | CV 42 | 144 | 165.0 | 8 x M16 | 10 | 35 | 26 | 1.087 | 0.357 | 54.7 |
| - 60.[1].F2 | 14 | 466.7 | 438.2 | 13.0 | 8 | 300 | 424 | 48 | 25[3] | 122 | 147 | CV 42 | 144 | 165.0 | 8 x M16 | 10 | 35 | 26 | 1.100 | 0.465 | 62.0 |
| | 18 | 571.5 | 542.9 | 17.0 | 6 | | | | 15 | | | | | | | | | | 1.878 | | 73.7 |
| - 70.[1].F2 | 18 | 571.5 | 542.9 | 17.0 | 12 | 348 | 510 | 46 | 15 | 134 | 155 | CV 60 | 216 | 245.0 | 8 x M20 | 5 | 35 | 25 | 2.681 | 0.929 | 95.7 |
| | 21 | 673.1 | 641.4 | 17.0 | 12 | | | | | | | | | | | | | | 3.747 | | 108.0 |

[1] For the element version see „Technical data“ on page 7
[2] Values without fail-safe device
[3] Centering depth 9 mm

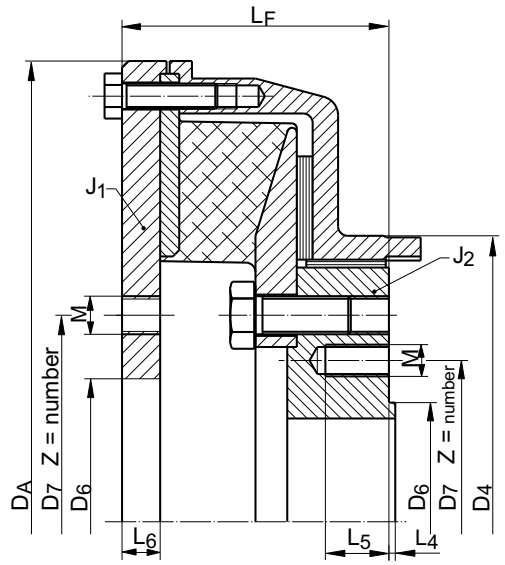
**Ordering example:** Coupling designation **AC-VSK 50.WN.F2.14.CV32.DS**

- Coupling size
- Element version acc. to „Technical data“
- SAE flywheel connection
- Size of joint
- Design with fail-safe device

# ARCUSAFLEX-VSK double flange couplings

**Type AC-VSK...F1**

For mounting between a cardan shaft and related adaptor flange. Alternative flange dimensions are available.




| AC-VSK Coupling size | $D_A$ mm | $D_4$ mm | $L_F$ mm | Flange Ø | $D_6$ $H_7/h_6$ mm | $D_7$ mm | Z x M[2)] | $L_4$ mm | $L_5$ mm | $L_6$ mm | $J_1$ kgm² | $J_2$ kgm² | Total weight kg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| -15.[1)].F1 | 222 | 140 | 60 | 100 | 57 | 84.0 | 6 x M8 | 2.0 | 16 | 10 | 0.068 | 0.0086 | 10.8 |
| | | | | 120 | 75 | 101.5 | 8 x M10 | | | | | | |
| -25.[1)].F1 | 268 | 144 | 75 | 120 | 75 | 101.5 | 8 x M10 | 2.0 | 20 | 10 | 0.164 | 0.022 | 17.5 |
| -35.[1)].F1 | 290 | 180 | 84 | 120 | 75 | 101.5 | 8 x M10 | 2.0 | 20 | 12 | 0.222 | 0.048 | 23.5 |
| | | | | 150 | 90 | 130.0 | 8 x M12 | 2.5 | 23 | | | | |
| -45.[1)].F1 | 320 | 180 | 92 | 150 | 90 | 130.0 | 8 x M12 | 2.5 | 23 | 12 | 0.408 | 0.063 | 33.3 |
| -50.[1)].F1 | 360 | 210 | 108 | 150 | 90 | 130.0 | 8 x M12 | 2.5 | 25 | 14 | 0.659 | 0.114 | 42.7 |
| | | | | 180 | 110 | 155.5 | 8 x M14 | 3.0 | 30 | | | | |
| -55.[1)].F1 | 475 | 285 | 130 | 180 | 110 | 155.5 | 8 x M14 | 3.0 | 25 | 15 | 1.711 | 0.350 | 73.0 |
| | | | | 225 | 140 | 196.0 | 8 x M16 | | | | | | |
| | | | | 250 | 140 | 218.0 | 8 x M18 | 4.0 | 30 | | | | |
| -60.[1)].F1 | 475 | 300 | 137 | 180 | 110 | 155.5 | 8 x M14 | 3.0 | 25 | 20 | 1.796 | 0.464 | 83.4 |
| | | | | 225 | 140 | 196.0 | 8 x M16 | | | | | | |
| | | | | 250 | 140 | 218.0 | 8 x M18 | 4.0 | 30 | | | | |
| -70.[1)].F1 | 580 | 348 | 154 | 250 | 140 | 218.0 | 8 x M18 | 4.0 | 30 | 20 | 3.965 | 0.945 | 127.0 |
| | | | | 285 | 175 | 245.0 | 8 x M20 | 5.0 | 35 | | | | |
| -85.[1)].F1 | 685 | 440 | 180 | 285 | 175 | 245.0 | 8 x M20 | 5.0 | 35 | 20 | 10.234 | 2.231 | 211.7 |
| | | | | 315 | 175 | 280.0 | 8 x M22 | | | | | | |

[1)] For the element version see „Technical data“ on page 7

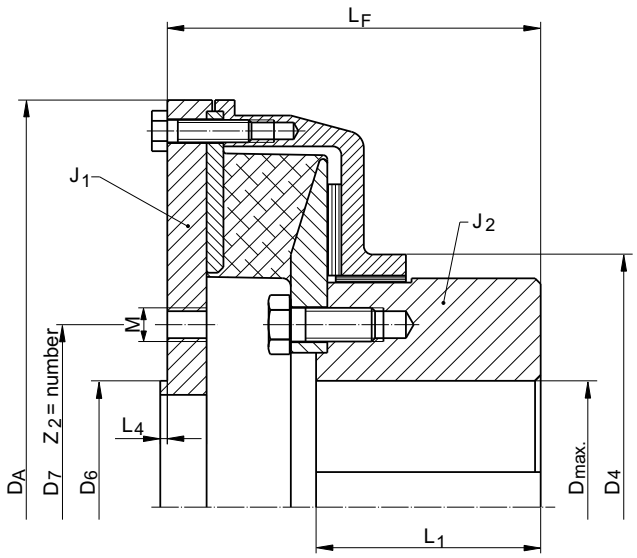
[2)] Alternative connecting dimensions and threads on request

**Ordering example:** Coupling designation **AC-VSK 50.WN.F1.150.M12.180**

- Coupling size
- Element version acc. to „Technical data“
- Cardan shaft flange Ø (part $J_2$)
- Size of the threads
- Cardan shaft flange Ø (part $J_1$)

# ARCUSAFLEX-VSK shaft couplings

**Type AC-VSK...F1W**
To connect a shaft to a cardan shaft




| AC-VSK Coupling size | $D_A$ mm | $D_4$ mm | $D_{max}$ mm | $L_1$ mm | $L_F$ mm | Cardan shaft connecting dimensions[2] Flange Ø | $D_6$ $h_6$ mm | $D_7$ mm | Z x M[2] | $L_4$ mm | $J_1$ kgm² | $J_2$ kgm² | Total weight kg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| -15.[1].F1 | 222 | 140 | 60 | 65 | 104 | 100 | 57 | 84.0 | 6 x M8 | 2.0 | 0.068 | 0.016 | 14.3 |
| | | | | | | 120 | 75 | 101.5 | 8 x M10 | | | | |
| -25.[1].F1 | 268 | 144 | 60 | 65 | 114 | 120 | 75 | 101.5 | 8 x M10 | 2.0 | 0.164 | 0.028 | 20.7 |
| -35.[1].F1 | 290 | 180 | 90 | 80 | 133 | 120 | 75 | 101.5 | 8 x M10 | 2.0 | 0.222 | 0.073 | 30.0 |
| | | | | | | 150 | 90 | 130.0 | 8 x M12 | 2.5 | | | |
| -45.[1].F1 | 320 | 180 | 90 | 80 | 139 | 150 | 90 | 130.0 | 8 x M12 | 2.5 | 0.408 | 0.088 | 39.9 |
| -50.[1].F1 | 360 | 210 | 100 | 100 | 171 | 150 | 90 | 130.0 | 8 x M12 | 2.5 | 0.659 | 0.168 | 54.0 |
| | | | | | | 180 | 110 | 155.5 | 8 x M14 | 3.0 | | | |
| -55.[1].F1 | 475 | 285 | 120 | 140 | 230 | 180 | 110 | 155.5 | 8 x M14 | 3.0 | 1.711 | 0.666 | 110.0 |
| | | | | | | 225 | 140 | 196.0 | 8 x M16 | | | | |
| | | | | | | 250 | 140 | 218.0 | 8 x M18 | 4.0 | | | |
| -60.[1].F1 | 475 | 300 | 120 | 140 | 225 | 180 | 110 | 155.5 | 8 x M14 | 3.0 | 1.796 | 0.760 | 113.0 |
| | | | | | | 225 | 140 | 196.0 | 8 x M16 | | | | |
| | | | | | | 250 | 140 | 218.0 | 8 x M18 | 4.0 | | | |
| -70.[1].F1 | 580 | 348 | 150 | 170 | 275 | 250 | 140 | 218.0 | 8 x M18 | 4.0 | 3.965 | 1.737 | 190.0 |
| | | | | | | 285 | 175 | 245.0 | 8 x M20 | 5.0 | | | |

[1] For the element version see „Technical data“ on page 7
[2] Alternative connecting dimensions and threads on request

**Ordering example:** Coupling designation **AC-VSK 50.WN.F1W.150**
coupling size
Element version acc. to „Technical data“
Cardan shaft flange Ø

# Mounting instructions

**General**

The highly flexible ARCUSAFLEX AC-VSK coupling is well suited for installation with drive shafts because of its internal support by the radial and thrust bearings. The use of appropriate bearing materials makes the AC-VSK coupling maintenance-free.

The coupling element is suitable for ambient temperatures of -40 °C to 80 °C.

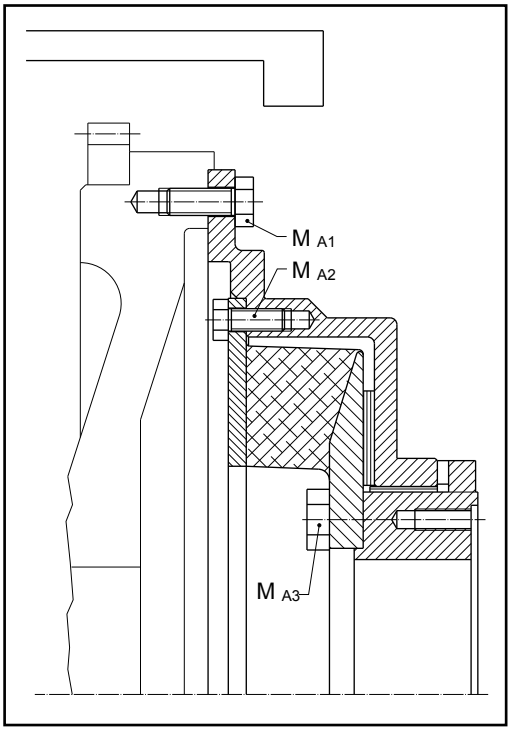
All couplings meet by default the balancing grade of G =16 for n =1500 rpm acc. to ISO 1940.

**Assembly**

Prior to the assembly, all parts of the coupling must be cleaned. All closely toleranced surfaces are protected with corrosion prevention preservative ex works. These surfaces must be cleaned with a suitable solvent prior to installation of the coupling. The solvent which is used for cleaning must not contact the rubber.

All bolted connections of the coupling should be tightened with a torque wrench and the correct bolt tightening torque must be checked. The prescribed bolt tightening torques must be precisely observed. As standard the values shown below are valid except when other values are specified. Values stated on the specific design drawing take precedence.

The coupling in its fully assembled condition is bolted to the engine flywheel and the full bolt tightening torque is applied. Then the flange of the drive shaft is bolted to the flange of the coupling.




Tightening torques for the bolted flange connection to the engine flywheel (bolt grade 8.8, lightly oiled[1])

| Flywheel SAE | $6^1/_2$ | $7^1/_2$ | 8 | 10 | $11^1/_2$ | 14 | 16 | 18 | 21 |
|---|---|---|---|---|---|---|---|---|---|
| Metric bolts | M8 | | M10 | | | M12 | | M16 | |
| $M_{A1}$ [Nm] | 25 | | 50 | | | 85 | | 210 | |
| Inch-bolts | $^5/_{16}$ - 18 | | $^3/_8$ - 16 | | | $^1/_2$ - 13 | | $^5/_8$ - 11 | |
| $M_{A1}$ [Nm] | 24 | | 42 | | | 102 | | 203 | |

Tightening torques for AC-VSK-element bolted connections (lightly oiled[1])

| AC-VSK Size | 15 | 25 | 35 | 45 | 50 | 55 | 60 | 70 | 85 |
|---|---|---|---|---|---|---|---|---|---|
| Bolt size | M8 | M10 | M8 | M10 | M10 | M12 | M12 | M12 | M16 |
| Bolt grade | 8.8 | 8.8 | 8.8 | 8.8 | 8.8 | 8.8 | 10.9 | 8.8 | 8.8 |
| $M_{A2}$ [Nm] | 25 | 50 | 25 | 50 | 50 | 85 | 120 | 85 | 210 |
| Bolt size | M10 | M10 | M12 | M12 | M16 | M16 | M16 | M20 | M20 |
| Bolt grade | 10.9 | 10.9 | 10.9 | 10.9 | 10.9 | 10.9 | 10.9 | 10.9 | 10.9 |
| $M_{A3}$ [Nm] | 69 | 69 | 120 | 120 | 295 | 295 | 295 | 580 | 580 |

[1] Values are reduced by 20% for bolts with additional lubrication.

**Disassembly**

First the drive shaft must be disconnected from the coupling. Then the coupling is unbolted from the engine flywheel and lifted out. To take the coupling apart, the bolt connections of the rubber elements must be released.

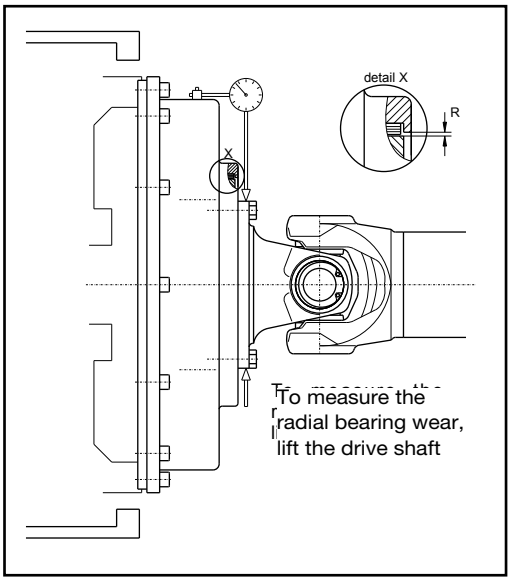
# Assembly and maintenance instructions

Within the established periodic maintenance and inspections of other parts of the installation, the coupling should regularly be visually inspected. Generally the internal bearing support in the coupling is maintenance-free. If there are any conspicuous symptoms a closer inspection is necessary.

The coupling must be disassembled according to the instructions. The visible outside and inside diameter of the rubber part of the removed coupling element has to be checked for possible cracks and separations. If there is any damage the coupling element must be replaced. At this time it is also advisable to replace the bearings as well.

The thrust bearing (friction disc) and the radial bearing (bearing bush) must be replaced if rough running is observed, or if a tilting clearance at the coupling is detectable. The thrust bearing (friction disc) must be replaced if there is a relative axial play between the drive shaft flange and the housing of the coupling. The radial bearing (bearing bush) must be replaced if the radial wear R is exceeded. For this the radial relocation of the drive shaft flange to the coupling housing can be measured (see picture). The values shown in the table below serve as a guide. The running surfaces of the bearings must not be damaged. No reworking of the precision surfaces is advisable, if damaged these particular parts must be replaced.

During maintenance the coupling must be thoroughly cleaned.




**Limits for wear of the friction disc and bearing bush**

| AC-VSK size | 15 | 25 | 35 | 45 | 50 | 55 | 60 | 70 | 85 |
|---|---|---|---|---|---|---|---|---|---|
| Thrust bearing friction disc thickness [mm] | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 6 |
| Permissible axial wear [mm] | 0.6 | 0.6 | 0.7 | 0.7 | 0.7 | 0.7 | 0.8 | 0.8 | 0.8 |
| Radial bearing bush thickness [mm] | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | 5 | 6 | 7.5 |
| Permissible radial wear R [mm]* | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.8 | 0.8 | 0.8 |

*) The wear of the bearing bush is equal to half of the measured radial wear R

During all operation phases the coupling has to run silently and vibration-free. Any deviation from this smooth behaviour during running indicates the need for closer inspection, repair or replacement.

In general a rebalancing of the coupling after replacing worn parts is not necessary. If rough running is observed after the repair, a further inspection is necessary and balancing may be required.

# Technical note

The technical data applies only to the complete coupling or the corresponding coupling elements. It is the customer's/user's responsibility to ensure there are no inadmissible loads acting on all the components. Especially existing connections, like bolt connections, have to be checked regarding the transmittable torque, if necessary other measures, e.g. additional reinforcement by pins, may be required. It is the customer's/user's responsibility to make sure the dimensioning of the shaft and keyed or other connection, e.g. shrinking or clamping connection, is correct.

REICH-KUPPLUNGEN have an extensive programme of couplings and coupling systems to cover nearly every drive configuration. Furthermore customized solutions can be developed and be manufactured also in small series or as prototypes. Calculation programmes are available for coupling selection and sizing. - Please challenge us!

# Safety precautions

**It is the customer's and user's responsibility to observe the national and international safety rules and laws. Proper safety devices must be provided for the coupling to prevent accidental contact.**

**Check all bolted connections for the correct tightening torque and fit after a short running period preferably after a test run.**

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