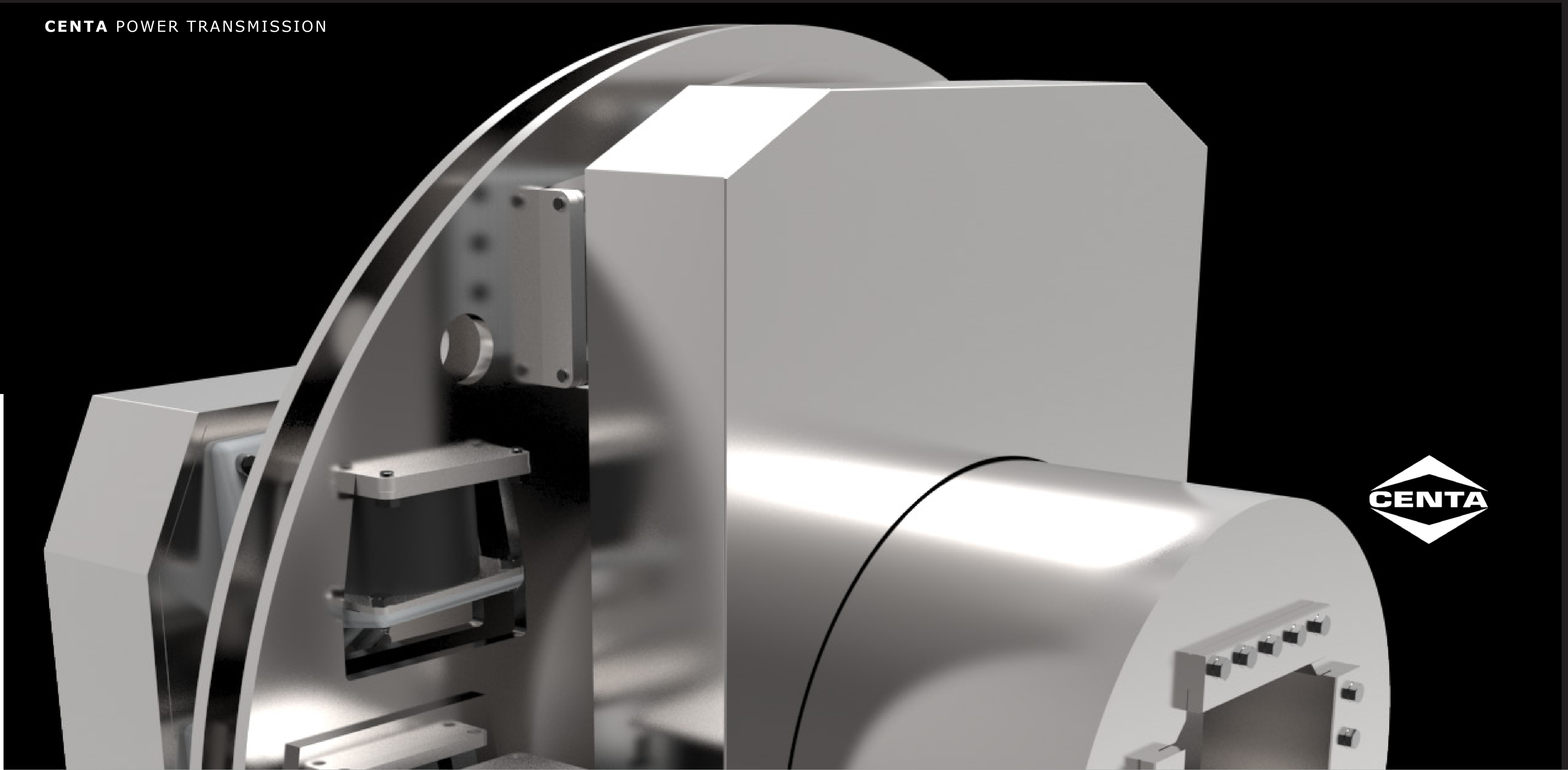


CF-FO-EN-17

CENTAFLEX-FO

SUPER ELASTIC COUPLING FOR SUGAR MILLS

ENGLISH

CENTAFLEX-FO

CENTAFLEX-FO
AT A GLANCE

CENTAFLEX-FO - a highly torsionally elastic coupling that provides an innovative, original solution and unparalleled design specifically for sugar mill applications.

CENTAFLEX-FO couplings unique patented design is permits a wide degree of radial, axial and angular misalignment, with up to 30 mm radial.

The elastic elements of the CENTAFLEX-FO permit a wide torsion angle that absorbs the vibrations and shocks that result from the continuous torque variations of the mill, thus avoids wear to the gears, hubs and shafts.

The coupling design transmits torque without backlash and eliminates wear to the driven hub and shaft.

CENTAFLEX-FO coupling allows the mill to be reversed for a short period of time in case of jamming.

Features

High flexibility in all directions

High adaptability to torsional flexibility

High design flexibility

Backlash and wear free

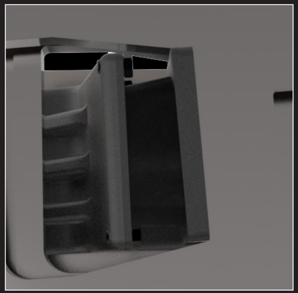
Areas of aplication

Sugar cane Mill

Torque range

1200 to 4400 kNm

LEADING BY INNOVATION



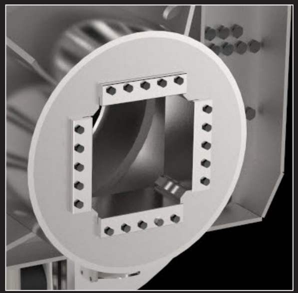
TORSIONAL FLEXIBILITY

The rubber elements for the CENTAFLEX-FO are available in different degrees of Shore hardness.
This enables the torsional flexibility of the couplings to be adapted with utmost variability to the working torque of the sugar mill. Torsional vibrations and impacts are reliably dampened.

COMPENSATION OF MISALIGNAMENT

The couplings of the CENTAFLEX-FO series compensate for significant misalignments in axial, radial and angular directions.

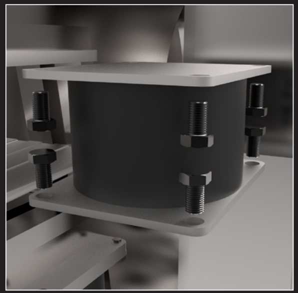
Superior high allowable radial misalignment of up to 30 mm at permanent running is the distinguish mark of this coupling.



CLAMP HUB

The coupling design transmits torque without backlash and eliminates wear to the driven hub and shaft

The unique design of the clamping hub allows the driven hub to be compressed and provides a very strong backlash free connection between the driven hub and driven shaft, avoiding wear, and results in excellent benefits over time.



MAINTENCE

Axial exchange of elastic elements reduced time expended, extremely simple, and without displacement of of equipment or use of special tools.

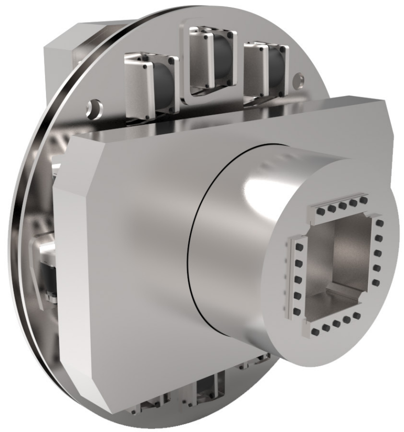
QUALITY

When the going gets tough, quality is priceless. With an exemplary Quality Management, CENTA ensures products that withstand the roughest assignments. CENTA’s coupling systems are more than the sum of their parts. CENTA entertains the vision of intelligent products that meet the highest requirements in terms of design and quality.

CENTAFLEX-FO

TECHNICAL DATA

CENTAFLEX-FO



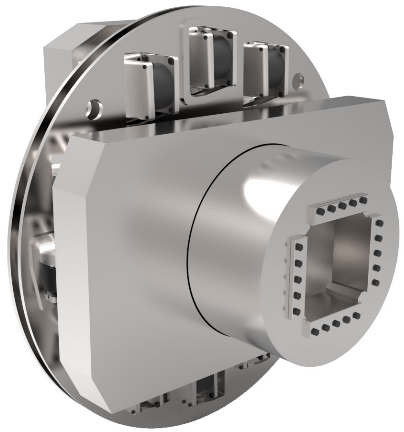
TECHNICAL DATA

↓ SIZE 19 → SIZES 22-26

1	3	4	7	9	10	12	14
Mill Size	Nominal torque T_{KN} [kNm]	Maximum torque T_{KMAX} [kNm]	Dynamic torsional stiffness C_{Tdyn} [kNm/rad]	Speed n_{max} [rpm]	Permissible Axial displacement ΔK_a [mm]	Permissible Radial displacement ΔK_r [mm]	Permissible Angular displacement ΔK_w [°]
39″x66″	1200	2400	19100	13	±30	±25	1°
39″x67″	1200	2400	19100	13	±30	±25	1°
42″x78″	1700	3400	26600	13	±30	±25	1°

*primary values

CENTAFLEX-FO

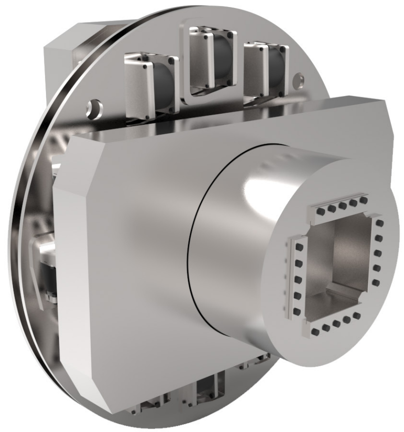


TECHNICAL DATA | ↓ SIZE 22 | → SIZES 26

1	3	4	7	9	10	12	14
Mill Size	Nominal torque T_{KN} [kNm]	Maximum torque T_{KMAX} [kNm]	Dynamic torsional stiffness C_{Tdyn} [kNm/rad]	Speed n_{max} [rpm]	Permissible Axial displacement ΔK_a [mm]	Permissible Radial displacement ΔK_r [mm]	Permissible Angular displacement ΔK_w [°]
45″x78″	1800	3600	28000	10	±30	±25	1°
46″x84″	2200	4400	34400	10	±30	±25	1°
46′x84′	2200	4400	34400	10	±30	±25	1°
46″x86″	2300	4600	39000	10	±30	±25	1°
46″x90″	2800	5600	44700	10	±30	±25	1°

*primary values

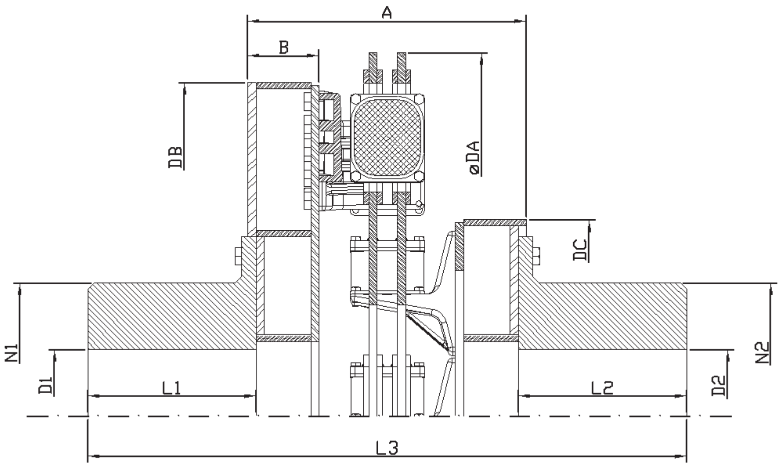
CENTAFLEX-FO



TECHNICAL DATA | ↓ SIZE 26 | ← SIZES 19-22

1	3	4	7	9	10	12	14
Mill Size	Nominal torque T_{KN} [kNm]	Maximum torque T_{KMAX} [kNm]	Dynamic torsional stiffness C_{Tdyn} [kNm/rad]	Speed n_{max} [rpm]	Permissible Axial displacement ΔK_a [mm]	Permissible Radial displacement ΔK_r [mm]	Permissible Angular displacement ΔK_w [°]
54”x90”	3200	6400	48600	8	±30	±25	1°
54”x96”	3400	6800	51600	8	±30	±25	1°
57”x100”	3900	7800	56800	8	±30	±25	1°
59”x104”	4400	8800	64000	8	±30	±25	1°

*primary values



CENTAFLEX-FO

DIMENSIONS | ↓ **SIZES 19-22-26**

Size	Dimensions										
	A	B	D_{1max}	D_{2max}	D_A	D_B	D_C	L_1	L_2	L_3	N_1	N_2
19	735	190	490	490	1900	1790	1050	*	*	*	860	860
22	870	225	600	600	2200	2110	1240	*	*	*	1000	1000
26	1155	275	700	700	2600	2570	1510	*	*	*	1200	1200

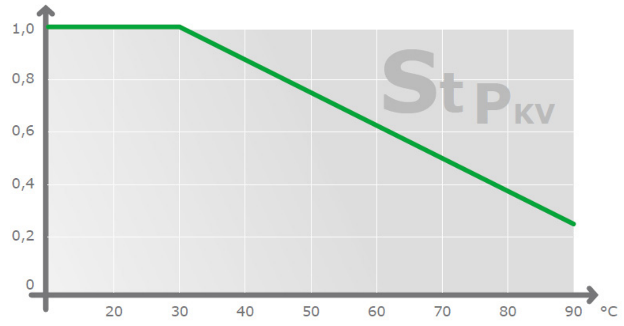
* acc. customer specification
Dimensions N_1 and N_2 may vary according final bore dimension
Mass moments of inertia and masses on request

CENTAFLEX-FO
EXPLANATION OF TCHNICAL DATA

This appendix shows all explanations of the technical data for all CENTA products.
the green marked explanations are relevant for this catalog:

CENTAFLEX-FO

EXPLANATION OF THECHNICAL DATA



1
Size

This spontaneously selected figure designates the size of the coupling.

2
Rubber quality
Shore A

This figure indicates the nominal shore hardness of the elastic element.
The nominal value and the effective value may deviate within given tolerance ranges.

3
Nominal torque
T_{KN} [kNm]

Average torque which can be transmitted continuously over the entire speed range.

4
Maximum torque
[kNm]

T_{Kmax}	This is the torque that may occur occasionally and for a short period up to 1.000 times and may not lead to a substantial temperature rise in the rubber element.

In addition the following maximum torques may occur:

ΔT_{Kmax} = 1,8xT_{KN}	Peak torque range (peak to peak) between maximum and minimum torque, e.g. switching operation.
ΔT_{Kmax1} = 1,5xT_{KN}	Temporary peak torque (e.g. passing through resonances). ΔT_{Kmax} or T_{Kmax1} may occur 50.000 times alternating or 100.000 times swelling.
ΔT_{Kmax2} = 4,5xT_{KN}	Transient torque rating for very rare, extraordinary conditions (e.g. short circuits).

5
Continuous vibratory torque
T_{KW} [kNm]

Amplitude of the continuously permissible periodic torque fluctuation with a basic load up to the value T_{KN}.
The frequency of the amplitude has no influence on the permissible continuous vibratory torque. Its main influence on the coupling temperature is taken into consideration in the calculation of the power loss.

Operating torque
T_{Bmax} [kNm]

The maximum operating torque results of T_{KN} and T_{KW}.

6
Permissible Power Loss
P_{KV} [kW]

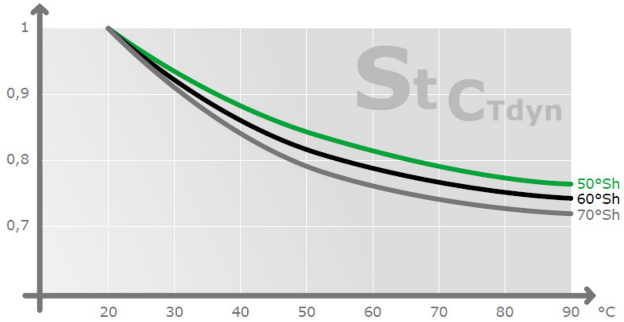
Damping of vibrations and displacement results in power loss within the rubber element.
The permissible power loss is the maximum heat (converted damping work into heat), which the rubber element can dissipate continuously to the environment (i.e. without time limit) without the maximum permissible temperature being exceeded.
The given permissible power loss refers to an ambient temperature of 30° C.
If the coupling is to be operated at a higher ambient temperature, the temperature factor $S_{t\ PKV}$ has to be taken into consideration in the calculation.
The coupling can momentarily withstand an increase of the permissible power loss for a short period under certain operation modes (e.g. misfiring).

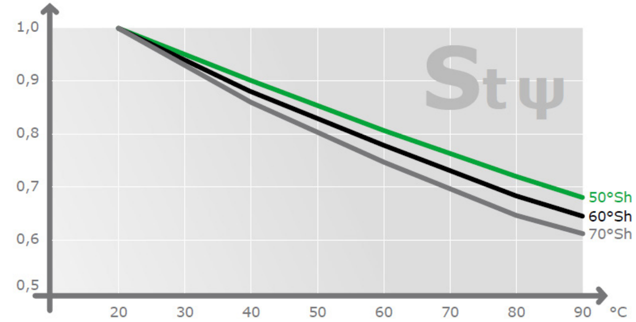
P_{KV30} [kW]

For a maximum period of 30 minutes the double power loss P_{KV30} is permissible.
CENTA keeps record of exact parameters for further operation modes.

CENTAFLEX-FO

EXPLANATION OF THECHNICAL DATA





7

Dynamic torsional stiffness

C_{Tdyn} [kNm/rad]

The dynamic torsional stiffness is the relation of the torque to the torsional angle under dynamic loading.

The torsional stiffness may be linear or progressive depending on the coupling design and material.

The value given for couplings with linear torsional stiffness considers following terms:

- Pre-load: 50% of T_{KN}
- Amplitude of vibratory torque: 25% of T_{KN}
- Ambient temperature: 20°C
- Frequency: 10 Hz

For couplings with progressive torsional stiffness only the pre-load value changes as stated.

The tolerance of the torsional stiffness is ±15% if not stated otherwise.

The following influences need to be considered if the torsional stiffness is required for other operating modes:

- Temperature
  Higher temperature reduces the dynamic torsional stiffness.
  Temperature factor $S_t\, C_{Tdyn}$ has to be taken into consideration in the calculation.
- Frequency of vibration
  Higher frequencies increase the torsional stiffness.
  By experience the dynamic torsional stiffness is 30% higher than the static stiffness.
  CENTA keeps record of exact parameters.
- Amplitude of vibratory torque
  Higher amplitudes reduce the torsional stiffness, therefore small amplitudes result in higher dynamic stiffness. CENTA keeps record of exact parameters.

8

Relative damping

ψ

The relative damping is the relationship of the damping work to the elastic deformation during a cycle of vibration.

The larger this value [ψ], the lower is the increase of the continuous vibratory torque within or close to resonance.

The tolerance of the relative damping is ±20%, if not otherwise stated.

The relative damping is reduced at higher temperatures.

Temperature factor $S_{t\,\psi}$ has to be taken into consideration in the calculation.

The vibration amplitude and frequency only have marginal effect on the relative damping.

9

Speed

[min⁻¹]

n_{max}	The maximum speed of the coupling element, which may occur occasionally and for a short period (e.g. overspeed). The characteristics of mounted parts may require a reduction of the maximum speed (e.g. outer diameter or material of brake-discs).
n_d	The maximum permissible speed of highly flexible coupling elements is normally 90% thereof.

10

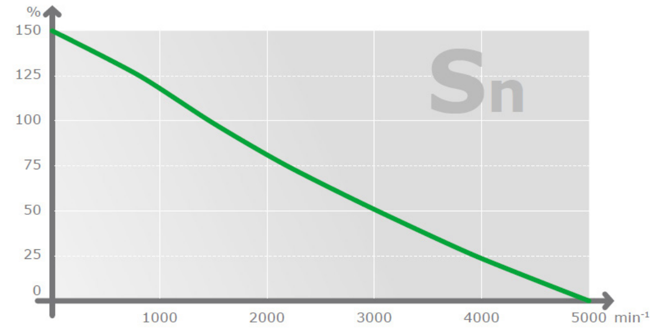
Permissible axial displacement

[mm]

ΔK_a	The continuous permissible axial displacement of the coupling. This is the sum of displacement by assembly as well as static and dynamic displacements during operation.
$\Delta K_{a\,max}$	The maximum axial displacement of the coupling, which may occur occasionally for a short period (e.g. extreme load). The concurrent occurrence of different kinds of displacements is handled in technical documents (displacement diagrams, data sheets, assembly instructions).

CENTAFLEX-FO

EXPLANATION OF THECHNICAL DATA



11 — Axial stiffness [kN/mm]

C_a	The axial stiffness determines the axial reaction force on the input and output sides upon axial displacement.
$C_{a\ dyn}$	By experience the dynamic stiffness is higher than the static one. The factor depends on the coupling series.

12 — Permissible radial displacement [mm]

ΔK_r	The continuous permissible radial displacement of the coupling. This is the sum of displacement by assembly as well as static and dynamic displacements during operation. The continuous permissible radial displacement depends on the operation speed and may require adjustment (see diagrams Sn of the coupling series).
$\Delta K_{r\ max}$	The maximum radial displacement of the coupling, which may occur occasionally and for a short period without consideration of the operation speed (e.g. extreme overload). The concurrent occurrence of different kinds of displacements is handled in technical documents (displacement diagrams, data sheets, assembly instructions).

13 — Radial stiffness [kN/mm]

C_r	The radial stiffness determines the radial reaction force on the input and output sides upon radial displacement.
C_{rdyn}	By experience the dynamic stiffness is higher than the static one. The factor depends on the coupling series.

14 — Permissible angular displacement [<°]

ΔK_w	The continuous permissible angular displacement of the coupling. This is the sum of displacement by assembly as well as static and dynamic displacements during operation. The continuous permissible angular displacement depends on the operation speed and may require adjustment (see diagrams Sn of the coupling series).
$\Delta K_{w\ max}$	The maximum angular displacement of the coupling, which may occur occasionally and for a short period without consideration of the operation speed (e.g. extreme overload). The concurrent occurrence of different kinds of displacements is handled in technical documents (displacement diagrams, data sheets, assembly instructions).

15 — Angular stiffness [kNm/°]

C_w	The angular stiffness determines the restoring bending moment on the input and output sides upon angular displacement.
C_{wdyn}	By experience the dynamic stiffness is higher than the static one. The factor depends on the coupling series.

1. This catalog supersedes previous editions.
   This catalog shows the extent of our coupling range at the time of printing. This program is still being extended with further sizes and series. Any changes due to technological progress are reserved.
   We reserve the right to amend any dimensions or detail specified or illustrated in this publication without notice and without incurring any obligation to provide such modification to such couplings previously delivered. Please ask for an application drawing and current data before making a detailed coupling selection.

2. We would like to draw your attention to the need of preventing accidents or injury. No safety guards are included in our supply.

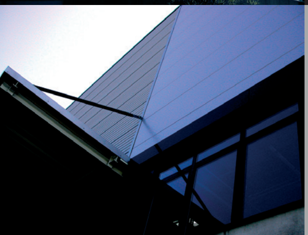
3. TRADEMARKS
   CENTA, the CENTA logo, Centacone, CENTADISC, CENTAFIT, Centaflex, CENTALINK, Centalock, Centaloc, Centamax, Centastart, CENTAX and HYFLEX are registered trademarks of CENTA Antriebe Kirschey GmbH in Germany and other countries.
   Other product and company names mentioned herein may be trademarks of their respective companies.

4. Torsional responsibility
   The responsibility for ensuring the torsional vibration compatibility of the complete drive train, rests with the final as embler. As a component supplier CENTA is not responsible for such calculations, and cannot accept any liability for gear noise/-damage or coupling damage caused by torsional vibrations.
   CENTA recommends that a torsional vibration analysis (TVA) is carried out on the complete drive train prior to start up of the machinery.
   In general torsional vibration analysis can be undertaken by engine manufacturers, consultants or classicfication societies.
   CENTA can assist with such calculations using broad experience in coupling applications and torsional vibration analysis.

5. Copyright to this technical dokument is held by CENTA Antriebe Kirschey GmbH.

6. The dimensions on the flywheel side of the couplings are based on the specifications given by the purchaser. The responsibility for ensuring dimensional compatibility rests with the assembler of the drive train. CENTA cannot accept liability for interference between the coupling and the flywheel or gearbox or for damage caused by such interference.

7. All technical data in this catalog are according to the metric SI system. All dimensions are in mm. All hub dimensions (N, N1 andN2) may vary, depending on the required finished bore. All dimensions for masses (m), inertias (J) and centres of gravity (S) referto the maximum bore diameter.



CENTA is the leading producer of flexible couplings for rail, industrial, marine and power generating applications. Worldwide.

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