THE SILENT EVOLUTION

CENTAX-LFSM
SHAFT COUPLING WITH INTEGRATED THRUST BEARING – CENTAX-SEC DESIGN

ENGLISH

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CENTAX-LFSM

THE SILENT EVOLUTION
CENTA offers a modular CENTAX-SEC coupling system, which allows a constructive maximum of flexibility.

The components of the series are perfectly matched: multiple combinations allow for various features, and easy control of any torsional situation. Ensuring reliable compensation of axial misalignments three optional components are available (membranes, bolts, links), emphasizing CENTA as the supplier with the most multifaceted portfolio in the market.

For efficient and fast customized solutions.
Multiple combinations of the CENTAX-LFSM coupling components are available. This modularity allows for an adequate design for any application. For efficient and fast customized solutions.

The CENTAX-LFSM coupling program offers many functions to protect your drive from harmful torsional vibrations, to compensate misalignment and to dampen vibrations and noise. Reliable power transmission for your applications with an optimum of features.

The CENTAX-LFSM rubber elements are torsionally and radially highly flexible. Combined with three optional components (membranes, links or bolts) each application gets the necessary flexibility in axial and angular direction.

The torsional elasticity of each application is variably tuned by the components applied. Shocks and vibrations are damped, resonances shifted to subcritical ranges and a very low noise level for more comfort on board is achieved.

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.
# CENTAX-LFSM

**CENTAX-SEC WITH INTEGRATED THRUST BEARING**

## ONE RING ELEMENT AND LINK COUPLING

### TECHNICAL DATA

<table>
<thead>
<tr>
<th>Size</th>
<th>Rubber quality [Shore A]</th>
<th>Nominal torque $T_{IN}$ [kNm]</th>
<th>Maximum torque $T_{MAX}$ [kNm]</th>
<th>Continuous vibratory torque $T_{V}$ [kNm]</th>
<th>Permissible power loss $P_{PV}$ [kW]</th>
<th>Dynamic torsional stiffness $C_{DYN}$ [kNm/rad]</th>
<th>Relative damping $\psi$</th>
<th>Speed $n_{MAX}$ [min⁻¹]</th>
<th>Permissible axial displacement $\Delta K_a$ [mm]</th>
<th>Axial stiffness $C_a$ [kN/mm]</th>
<th>Permissible radial displacement $\Delta K_r$ [mm]</th>
<th>Radial stiffness $C_r$ [kN/mm]</th>
<th>Permissible angular displacement $\Delta K_w$ [°]</th>
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### THRUST BEARING SUPPORT LAYOUT

- **CENTA TB6**
  - Max Thrust: 80 kN
- **CENTA TB7**
  - Max Thrust: 150 kN

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**CENTA PRODUCT DOCUMENTATION**

*CF-LFSM-EN-01-16 | PAGE 5 | PUBLISHED 19. FEBRUARY 2019 | → CHECK FOR UPDATES*
This appendix shows all explanations of the technical data for all CENTA products.

**the green marked explanations are relevant for this catalog:**

- 1. Size (Page APP-2)
- 2. Rubber quality (Page APP-2)
- 3. Nominal torque (Page APP-2)
- 4. Maximum torque (Page APP-2)
- 5. Continuous vibratory torque (Page APP-2)
- 6. Permissible power loss (Page APP-2)
- 7. Dynamic torsional stiffness (Page APP-3)
- 8. Relative damping (Page APP-3)
- 9. Speed (Page APP-3)
- 10. Permissible axial displacement (Page APP-3)
- 11. Axial stiffness (Page APP-4)
- 12. Permissible radial displacement (Page APP-4)
- 13. Radial stiffness (Page APP-4)
- 14. Permissible angular displacement (Page APP-4)
- 15. Angular stiffness (Page APP-4)

Are these technical explanations up to date? Click here for an update check!
# CENTAX-LFSM

## EXPLANATION OF THE TECHNICAL DATA

<table>
<thead>
<tr>
<th>1</th>
<th>Size</th>
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<tbody>
<tr>
<td>This spontaneously selected figure designates the size of the coupling.</td>
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<table>
<thead>
<tr>
<th>2</th>
<th>Rubber quality Shore A</th>
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<tbody>
<tr>
<td>This figure indicates the nominal shore hardness of the elastic element. The nominal value and the effective value may deviate within given tolerance ranges.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3</th>
<th>Nominal torque ( T_{\text{nom}} ) [kNm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average torque which can be transmitted continuously over the entire speed range.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>4</th>
<th>Maximum torque ( T_{\text{max}} ) [kNm]</th>
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</thead>
<tbody>
<tr>
<td>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.</td>
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</table>

<table>
<thead>
<tr>
<th>5</th>
<th>Continuous vibratory torque ( T_{\text{vib}} ) [kNm]</th>
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</thead>
<tbody>
<tr>
<td>Amplitude of the continuously permissible periodic torque fluctuation with a basic load up to the value ( T_{\text{vib}} ). 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.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>6</th>
<th>Permissible Power Loss ( P_{\text{PKV}} ) [kW] or [W]</th>
</tr>
</thead>
<tbody>
<tr>
<td>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_{\text{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).</td>
<td></td>
</tr>
</tbody>
</table>

| \( \Delta T_{\text{PKV}} \) = 1,8 \* \( T_{\text{vib}} \) | Peak torque range (peak to peak) between maximum and minimum torque, e.g. switching operation. |
| \( T_{\text{nom}} \) = 1,5 \* \( T_{\text{vib}} \) | Temporary peak torque (e.g. passing through resonances). \( \Delta T_{\text{vib}} \) or \( T_{\text{nom}} \) may occur 50,000 times alternating or 100,000 times swelling. |
| \( T_{\text{nom}} \) = 4,5 \* \( T_{\text{vib}} \) | Transient torque rating for very rare, extraordinary conditions (e.g. short circuits). |

Permissible power loss: \( P_{\text{PKV}} \) [kW] or [W]

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 \( S_{\text{PKV}} \) 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). Values on request.
EXPLANATION OF THE TECHNICAL DATA

### Dynamic Torsional Stiffness

**CTdyn [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 the following terms:
- Pre-load: 50% of TKN
- Amplitude of vibratory torque: 25% of TKN
- 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 St CTdyn 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.

### 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 St ψ has to be taken into consideration in the calculation.

### Speed

**nmax [min⁻¹]**

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).

### Permissible Axial Displacement

**ΔKa max [mm]**

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.

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).
EXPLANATION OF THE TECHNICAL 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.
- \( \Delta K_a \): By experience the dynamic stiffness is higher than the static one. The factor depends on the coupling series.

### 12 Permissible radial displacement [mm]
- \( \Delta K_r \): 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.
- \( \Delta K_{r,\text{max}} \): 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 [°]
- \( \Delta K_w \): 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.
- \( \Delta K_{w,\text{max}} \): 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 assembler. 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 classification societies. CENTA can assist with such calculations using broad experience in coupling applications and torsional vibration analysis.

5. Copyright to this technical document 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 and N₂) may vary, depending on the required finished bore. All dimensions for masses (m), inertias (J) and centres of gravity (S) refer to the maximum bore diameter.
CENTA Power Transmission is now part of Rexnord. As a global leader in premium couplings, Rexnord provides the same high quality customer solutions and service you’ve come to expect from CENTA since 1970.