Innovative Power Transmission

RENK Coupling Solutions for Railway Applications

Coupling Solutions for Railway Applications

Great demands are made on couplings for railway applications given that the mobility of people and goods depends on their technical reliability. RENK can revert to decades of experience in developing and producing high-quality drive units. We develop couplings that provide maximum torque transmission and compensation of wide misalignments. They represent the ideal solution even for the most difficult applications.

RENK Coupling Solutions for Railway Applications are known for:

- 30 years of experience in the development and production of couplings for railway applications
- Currently operating in diverse types of trains and locomotives
- Dependable torque transmission under all operating conditions

Curved Tooth Coupling

- Compensation of axial, parallel and angular misalignment
- Overload protection through integrated sliding hub
- Applied in metros and local trains
- Long maintenance intervals

Hyguard® Safety Coupling

- Torque limitation to protect the drive train
- Adjustable release torque
- Up to 1,000 releases
- Applied in high-speed trains

Diaphragm Coupling

- Compensation of axial and angular misalignment
- Integrated overload protection
- Applied in locomotives and motor coaches

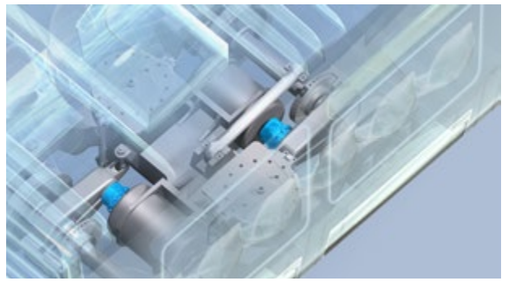
Curved Tooth Coupling

Main Features:

- Tooth tip centering enables operation without vibrations
- Highest possible misalignment capability yet compact design
- Special gearing for maximum torque transmission
- Hubs and sleeves made from high-quality materials
- Fully gas-nitrided coupling for corrosion and wear protection
- Identical coupling halves to reduce storage costs
- Wear-free metallic gap sealing
- Optional: Overload protection through integrated sliding hub
- Lubrication: either oil or grease

Typical operating data (Type SB 80)
Application: Bogie Metro

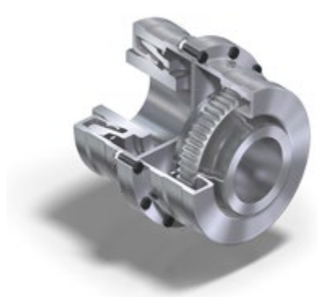
- Between motor and gearbox
- Speed: 4,000 rpm
- Torque: 450 Nm
- Shaft Ø: 90 mm
- Outer Ø: 268 mm
- Length: 245 mm
- Δ axial: ± 10 mm
- Δ parallel: 9 mm
- Δ angular: 4,5 °



Drive unit of a metro

Advantages:

- **Fewer major parts**
- **High misalignment capability**
- **Low wear and maintenance**
- **Lightweight design**



HYGUARD® Safety Coupling

Main Features:

- Precise release torque
- Adjustable release torque
- Constant release torque during operation
- Small installation space
- Quick re-commissioning after release
- Recoverability of coupling components after release
- Release within milliseconds
- Slip monitoring system on request
- Integrable into almost all existing drive elements

Typical operating data (Type HEW 140)
Application: Bogie high-speed train

- Between motor and gearbox
- Speed: 3,560 rpm
- Release torque: 10,000 Nm - 28,000 Nm
- Shaft Ø: 90 mm
- Outer Ø: 230 mm
- Length: 180 mm

Drive unit of a high-speed train

Advantages:

- **Dependable torque limitation to protect the drive train**
- **Regular train operation is assured**
- **Integrable into existing drive elements**

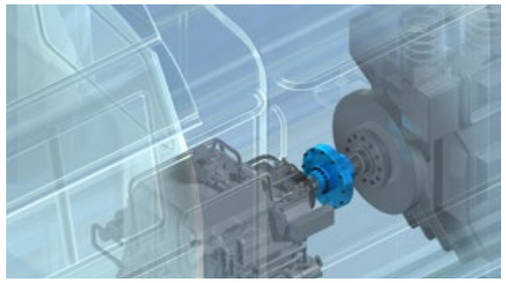
Diaphragm Coupling

Main Features:

- No need for lubrication nor maintenance
- Low restoring forces and bending moments
- Lightweight design
- Long lifetime with high reliability
- Simple construction consisting of a few major parts only
- Integrated overload protection
- Electrical insulation on request

Typical operating data (Type MD 235)
Application: Locomotive drive train

- Between motor and gearbox
- Speed: 4,500 rpm
- Torque: 23,000 Nm
- Shaft Ø (Motor): 90 mm
- Shaft Ø (Gearbox): 75 mm
- Outer Ø: 310 mm
- Length 150 mm
- Δ axial: 2.9 mm
- Δ angular: 0.33 °



RENK diaphragm couplings are applied in locomotives and motor coaches

Advantages:

- **Integrated overload protection**
- **For e-motor application electric insulation available on request**
- **100% maintenance free**

Quality Management & Testing Facilities

To verify the calculations and design of the couplings before commencing with serial production, RENK AG Rheine Works uses several test benches with which it is possible to simulate almost all static and dynamic loads as well as drive profiles during railway applications. With fatigue analysis, the specified lifetime can be reviewed in a test phase.

Operating figures static test bench:

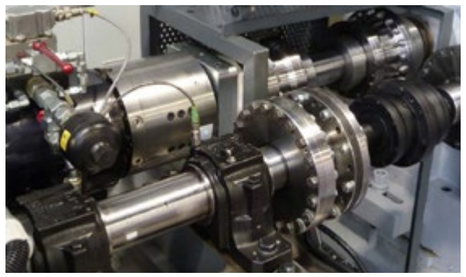
- Torque: -25 kNm up to +25 kNm
- Frequency range: up to 5 Hz
- Parallel and angular misalignments

Operating figures dynamic test bench:

- Torque: -10 kNm up to +10 kNm
- Speed: up to 6,000 rpm
- Power: 3,000 kW
- Parallel misalignments
- Axial misalignments during operation along with measurement of restoring forces
- Fully automated testing of operating states

Advantages:

- **Verification & validation of calculations**
- **Simulation of almost all static and dynamic operational and load profiles**
- **Fatigue analysis to verify and validate the specified lifetime of operation**



Test Systems

RENK: the Specialist for Railway Applications – starting from production up to integrated quality assurance

Sustained standards for traveling comfort, safety, speed and environmental protection in the railway sector imply greater complexity for research and quality assurance. Therefore state-of-the-art test system technologies together with reliable solution partners are needed.

The combination of expertise, technology and experience is the basis for meeting the demands of the growing test equipment market. RTS provides cost-effective, reliable high-tech solutions and products.

For R&D and Quality Assurance, RENK provides the following test systems:

- Wheelset test systems
- Wheelset bearing test rigs
- Bogie test systems
- Flywheel brake test rigs
- Engine test equipment
- Transmission test systems
- Test systems for torque converters
- Drive and cardan shaft test rigs
- Test rigs for couplers
- Vibration damper test rigs

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Advantages:

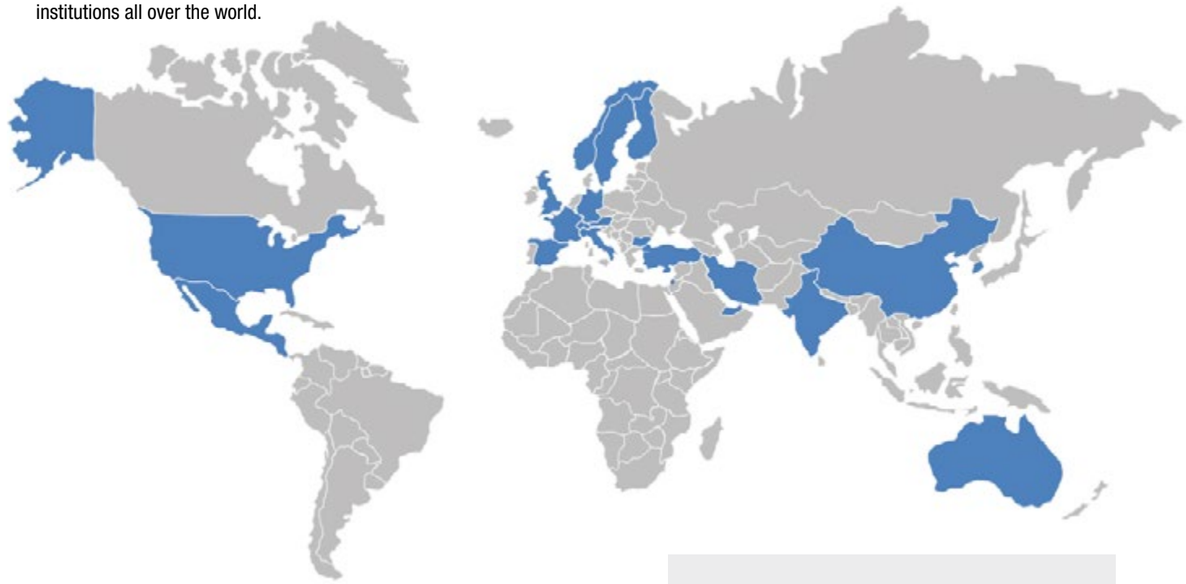
- **RENK package solution**
- **Complete range of solutions: Consulting, concept design & validation, development, production, implementation and training of operators**
- **Service & maintenance from manufacturer**

References

RENK AG - RENK Test System GmbH

Our innovative solutions for railway applications are deliverered to many parts of the world. RENK couplings are plugged in different metros of various countries. Every day they ensure the safe transport of thousands of commuters.

RENK Test Systems are applied in research facilities and institutions all over the world.



Our customers:

- **Deutsche Bahn**
- **CRRC QIShuYan (China South Railway)**
- **China Academy of Railway Science**
- **CoFren**
- **Knorr-Bremse**
- **Shandong Gold Phoenix**
- **Bremskerl**
- **Voith Turbo Scharfenberg**
- **Yujin**

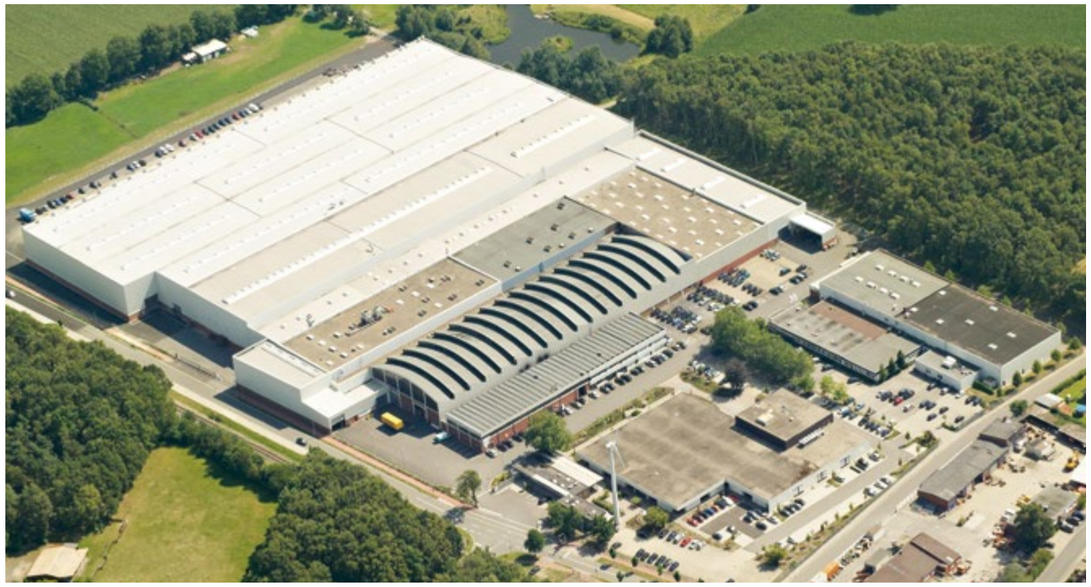
RENK Torque Transmission Technology

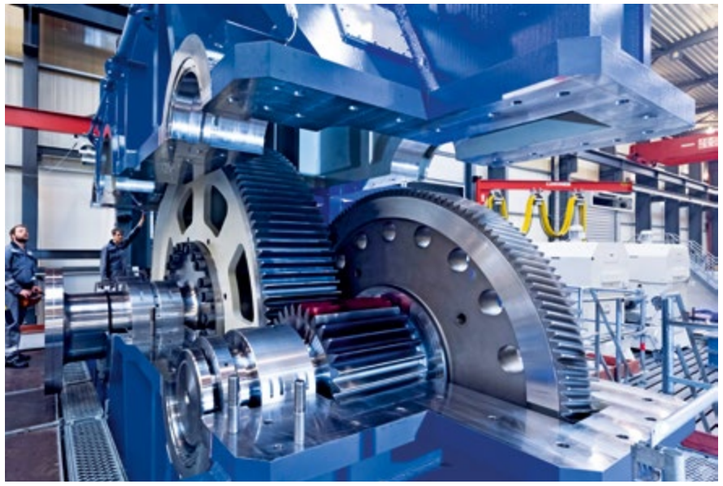
RENK: the name for torque transmission technology. RENK AG ranks among the world's foremost manufacturers of torque transmission components and test rigs. In tracked vehicle transmissions, slide bearings and especially for railway couplings RENK stands for the best quality and high performance.

This success is driven by more than 140 years of experience and development work in torque transmission technology. Furthermore, the combined capabilities of more than 2,200 employees worldwide ensure that RENK AG is able to uphold and further expand its leadership in the various markets.

The RENK plant in Rheine, Germany, specializes in the production of couplings and gear units of all kinds. Over 450 employees develop and manufacture a wide variety of all-steel couplings and clutches, a range of marine gear units for commercial marine vessels, turbo gear units for industrial plants and gear units for 5 MW offshore wind energy plants.

Outstanding quality is an inherent feature of all our products. All the components are manufactured and assembled to the same strict standards of quality.





Assembling the world's biggest planetary gear system designed for the megasized wind energy nacelle testing unit at Clemson University, USA. The picture above shows the four planetary stages.

Marriage of the two sides of the world's biggest cutter gearbox at RENK Rheine Works. The gearbox weighs 275 tons and is fitted to the biggest dredger of the Jan De Nul Group.

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