



Global benchmark for power transmission technology

The RENK Group – Driving the world market.

It's always been our ambition for RENK products to set standards in terms of performance, innovative technologies and quality, and thus meet tomorrow's needs today. This philosophy has made us a global leader in power transmission technology for heavy-duty equipment. Behind this success story are over 140 years of experience, ongoing development efforts and the concerted skills of more than 2,200 employees worldwide. Over the years ahead we will continue to serve our customers by supplying pioneering solutions for efficient power transmission.

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Florian Hofbauer Executive Board Spokesman

C. fannel

Christian Hammel Executive Board Member

"We're the only ones who can do that. And so we're doing it."

Franz Tiecher, Head of Assembly, Augsburg Plant

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15,000,000 NEWTON METERS

At home under extreme conditions.

With the aid of the world's biggest and most powerful planetary gear unit, Clemson University, South Carolina, USA, is testing the performance of wind power plants under extreme conditions. The unit's maximum torque of 15,000,000 newton meters is equivalent to the wheel torque of well over 50,000 midsize cars.

In engineering the test rig's gear unit which weighs over 300 tons or as much as four power cars of an ICE train, we were able to draw on our inhouse expertise. For over 70 years we've been building customized test rigs for the automotive, aviation, rail vehicle, wind energy and defense sectors. These all-in, turnkey systems come with perfectly coordinated and matching hardware and software topped with comprehensive engineering and service support.





140 MEGAWATTS

Maximum efficiency – minimum loss.

Throughout the world, RENK power plant gear units are synonymous with efficient handling of precious natural resources: gas, steam, water or wind for energy production.

As early as 1997, we manufactured the world's then most powerful high-speed gear unit rated at 100 megawatts. Only two years later, we raised the world record to 140 megawatts. These high-speed gear units are therefore transmitting the aggregate power of more than 17 high-speed trains. Even now a record, but we're still pushing ahead. Simultaneously, energy losses were significantly lowered and the dependability of the gear units was enhanced. The benefits for our customers: throughout their service life RENK gear units deliver significant cost savings.



107.6 KILOMETERS PER HOUR

Fast ferry.

On the service between Montevideo und Buenos Aires, the Francisco ferry carries up to 1,000 passengers and 150 vehicles at a record speed of 58.1 knots (107.6 km/h). RENK expertise makes sure that the power developed by the 42,000-kilowatt LNG turbines is dependably transmitted into efficient motion.

Ferries, naval or merchant vessels, cruise liners, frigates, corvettes, fast boats or megayachts – you'll find RENK wherever dependable marine power transmission is called for. Besides the gear units with the latest control and monitoring systems, we supply clutch couplings and thrust bearings for complex drive trains. And we have special experience in the manufacture of low-noise power transmission systems of the kind we've been developing for the world's navies ever since the 1950s. Nowadays these quiet marine gear units are making cruise liners and ferries even more comfortable to sail on.









MORE THAN **2,000** EXPERTS

Concerted capabilities for premium products.

Teamwork is the essence of our continuing success. It is the only way in which the creativity, commitment and personal dedication of each individual coalesce to bring about an outstanding product.

Virtually each and every product is unique and of unparalleled quality. In implementing our customers' wishes as faithfully as possible we draw on the vast experience of our experts. It is only through the interplay of engineering expertise and manual skills that we can supply gear units that, despite their outstanding complexity, are impressive for their efficiency, dependability, and durability. And this is why inhouse training is so important for RENK. Our expert teams in the offices and the production shops are the assurance that we will continue to provide you with premium power transmission technology.





100% CONSISTENT

Uncompromising quality.

The consistently high quality of our products is founded on the principle of zero compromise. The most modern production equipment, ongoing monitoring, and our highly skilled experts are the basis for your satisfaction.

Heat treatment in one of Europe's finest hardening shops or precision-ground gearwheel flanks, the exceptional quality of our products is attributable to longstanding inhouse expertise. And this applies not only to production. RENK's quality philosophy is demonstrably everywhere: from the initial drawing board discussions via product development, production, inspection, assembly, commissioning and start-up through to workshop training courses and after-sales service.

300 Tons axial load

World leader in slide bearings.

Installed in electric motors, generators, pumps, water turbines, roll stand drives or marine applications – RENK slide bearings always deliver dependable and efficient performance.

Shaft mounting is critical to the performance, noise level and smoothness of a drive system. The experts at our Hannover plant are well aware of this. The bearings currently manufactured there will safely transmit propeller thrusts of over 300 tons. These products are preferred wherever efficiency and dependability are required under extreme conditions. Besides premium standard products, we can supply slide bearings perfectly adapted to one-off customer specifications and applications. This capability is valued by our customers and has made RENK a world leader in the market for slide bearings.







100 times PROVEN

Enhancing the efficiency of the biggest LNG carriers.

For their LNG carriers, too, the world's foremost shipyards prefer RENK gear units. The products from our Rheine plant ensure utmost efficiency and dependability both in singleand double-propeller tankers.

The biggest and most modern LNG tankers are fitted with RENK single and double marine gear units developed and assembled at our Rheine plant. At present, over 100 LNG carriers are fitted with RENK gear technology. And most new dual-fuel/diesel-electric (DFDE) tankers come with RENK single and double marine gear units. Moreover, on numerous LNG tankers with two independent propulsion systems, RENK single gear units ensure dependable transmission of electric motor power.







The world market leader in power transmission technology.

Wherever extreme forces need to be transmitted dependably and safely, RENK is in its element. The formula behind this success: the integration of 140 years of experience, concerted capabilities, state-of-the-art engineering, and ultimate quality.

Our top-caliber standards have made us world market leaders in fully automatic transmissions for heavy-duty tracked vehicles, horizontal slide bearings and gear units for naval vessels. And in the markets for customized gear units used in special-purpose vehicles, industrial plant, ships as well as for drive system components and test rigs, we're likewise up among the leaders. By refining our products and skills on an ongoing basis we ensure that we will come up with the best possible solutions for the manifold requirements of our customers.



At home on the world's oceans.

Quiet, smooth, powerful, and extremely efficient: these are the typical virtues of RENK propulsion systems appreciated by the world's navies and builders of modern cruise liners or fast megayachts.

Tooth geometries perfectly adjusted to ensure quiet gear mesh, double-walled gear housings that eliminate resonance vibrations, advanced-engineered bearings for ideal power transmission or elastic mounting on the ship's base for much reduced noise levels – ever since the 1950s our power transmission systems have synchronized utmost efficiency with minimum-noise operation. What set out as a development for the naval sector is nowadays, thanks to RENK, contributing to a more comfortable sail on cruise liners, ferries and megayachts.



Smooth, quiet running and dependability: just two reasons why so many navies are opting for RENK bearings when fitting out their submarines.

Ships



CODELAG

Gear systems from RENK such as CODELAG (COmbined Diesel ELectric And Gasturbine) rank among the most popular for frigates worldwide. Such technology which we have largely developed, enables Italy's FREMM frigates to travel at speeds of up to 29 knots (53 km/h).



length/width/height 11.05 m/5.3 m/3.15 m



RENK AED[©] – the ultimate propulsion system for quiet ships.

Electric motors represent a technically mature and viable marine propulsion option and play an important role in our new RENK AED[®] Advanced Electric Drive which is being used on naval craft, megayachts, and research vessels.

RENK's AED[©] is founded on the experience which we have accumulated since the 1950s in the design and manufacture of marine gear units. Electric drive and gearing share an elastically mounted raft. This arrangement is compact, lightweight, easy to install and incomparably smooth and quiet in operation.



Noise level on a par with submarines: RENK's AED[®] readily interfaces with the onboard electric system and, due to its very quiet and smooth operation, can do the job of a conventional direct-drive electric propulsion unit.

Variable, powerful, dependable.

RENK power transmission systems ensure variable and dependable marine propulsion using several diesel engines, electric motors, and gas turbines.

These drive systems provide the best preconditions for minimized fuel consumption and even at high speeds develop very little noise and vibration. They enhance the cost effectiveness of a ship – an advantage that is appreciated around the globe. Over 40 navies trust in RENK power transmission technology. Owners of modern megayachts also rely on our quiet, smooth, dependable and fuel-efficient marine propulsion systems.



Our high standards make our gear units also popular with owners of countless megayachts such as this 180-meter ship.





CODAG

Gas turbine gear unit for the CODAG propulsion system of a frigate.



length/width/height 4.1 m/3.6 m/4.2 m

CODAG

The gas turbine gear unit of a four line CODAG (COmbined Diesel And Gas turbine) propulsion on a megayacht transmits 26,000 kilowatts at 3,600 rpm. Depending on requirements, RENK's minimum-noise yacht gear units are manufactured from lightweight aluminum, with a specially engineered elastic mounting.



length/width/height 3.7 m/3.1 m/3.3 m

Safe and secure under extreme loads.

For more than 65 years, RENK has been developing and building customized transmissions for tracked vehicles. Developed back in 1965, our pioneering hydrostatichydromechanical shift-reverse-steer units were and still are state-of-the-art for armored vehicles.

Continuously refining proven products while exploring new terrain – this is the underlying objective of our engineering design efforts. Our automatic powershift transmissions on today's tracked vehicles ensure reliable power transmission even under continuous and extreme loads. We can also supply other drive train components such as closed- or open-loop PTOs and final or intermediate drives. Such combined expertise has made RENK world leader in this field.



In the engineering of our transmissions we work closely with leading vehicle and engine manufacturers as in the case of the MBT Leopard 2 transmission. (Photo: Krauss-Maffei Wegmann)



HSWL 256B

This ultramodern, high-performance transmission exemplifies our newest developments for this class of vehicles. For the first time, digital control is an integral part of the transmission both on the HSWL 256 and HSWL 256B, with no need for a separate box. The transmission is being installed in the British Army's new AJAX family.





length/width/height 0.9 m/1.5 m/0.9 m

HSWL 354

The hydromechanical HSWL 354 ranks among the most proven and reliable tracked vehicle transmissions and is featured on all members of the Leopard 2 family.





length/width/height 1.1 m/1.7 m/0.8 m

References that speak for themselves.

In appreciation of our know-how and excellent product quality, many national defense organizations trust in RENK technology.

Our transmissions are perfectly tailored to the vehicle's engine and hence deliver optimum propulsion performance even under extreme conditions. Before leaving the plant, each transmission undergoes the most rigorous stress tests, and only when these have been passed to our full satisfaction is it shipped out. The stringent standards applied to the dependability and performance of our products are why RENK transmissions can be found in the world's finest military vehicles, including the Pizarro, Ulan and Puma infantry fighting vehicles, the Leopard 2 and Leclerc main battle tanks, the Roland surface-to-air missile tank, the Keiler mine-clearing vehicle, the Büffel armored recovery vehicle, and the Self-Propelled Howitzer 2000.



The AJAX, the British Army's new tracked vehicle.



More output, more efficiency.

For years now our innovative high-speed gear units have been improving the efficiency of energy production processes.

Gear units for high-speed plants represent a special challenge since they are required to transmit very high power and high speeds while having dimensions that are as compact as possible. Our products will transmit up to 140 megawatts – outstanding in the industry. What's more, over the past 20 years RENK innovations have been able to halve the losses from high-speed gear units and thus largely enabled customers to much enhance the cost effectiveness of their power plants.



At the world's most modern and efficient test bay for boiler feed pumps, a TUA-800 RENK gear unit ensures reliable power transmission.

TA..XI

With power ratings extending to 140 megawatts, TA..XI high-speed gear units are used in the oil and gas industry as well as energy production. These gear units are among the most powerful on the high-speed gear market.



length/width/height 3 m/3.2 m/2.5 m

etaX®

The high-efficiency etaX[®] gear units have been developed from the TA..XI series. They run in a vacuum environment which ensures lowestpossible friction losses and are engineered for a maximum of 170 megawatts.



length/width/height 3 m/3.2 m/2.5 m (version TA73) (Size will depend on rating and type)

More output at less cost.

Our etaX[®] gear units have set new benchmarks in power production efficiency.

The less energy is lost in power production, the more efficient the operation of the plant. Hence, curbing such losses was the overriding consideration in the development of the etaX[®]. The outcome: the etaX[®] will save almost 700 kilowatts in the production of 100 megawatts. For power plant operators, this RENK technology spells cost benefits of over €250,000 annually. What's more, the etaX[®] units run more reliably, are less punishing on lubricants and thus improve the ecological footprint of the entire plant.



Innovations for competitive advantages.

More and more efficient gear units and couplings help our customers improve their competitiveness.

RENK's innovative power transmission technology not only enables the wind and hydro-energy sectors to operate more efficiently, it is also easier on precious resources. Further components for enhanced dependability and efficiency are the wear- and maintenance-free couplings. This know-how benefits numerous industries. Our Rheine plant manufactures a wide range of standard and special couplings for nearly any application.



Borkum wind park project: 40 plants generate 750 gigawatts electricity annually on an area of 56 square kilometers. (Photo: Trianel GmbH/Jan Oelker)





Multidisk steel couplings

RENK's flexible disk couplings for wind energy applications are torsionally stiff though flexible enough to compensate for any misalignment; they are also maintenance- and wear-free. The specially shaped steel disks allow the couplings to absorb any axial, radial or angular displacement of the connecting rod without causing any major backlash. Calculations and analyses of test data permit the couplings to be custom-designed to the given operating conditions.



length/width/height 1.5 m/1.5 m/1.5 m

AeroGear® WPPO-6M

This gear unit with oil system and coupling has been specially engineered for wind energy plants. It has a gear ratio of 1:40 and is coaxially connected to the generator. Weighing less than 70 tons, the gear unit is doing a reliable and highly efficient job at its workplace in Japan by transmitting a nominal torque of around 5,200 kilonewton meters.



length/width/height 4.1 m/4 m/3 m

Compact flexibility.

The extended integration of renewable energies in the electricity network poses new challenges for plant operators. Synchronous clutches from RENK-MAAG deliver added flexibility and efficiency at ratings between 0.5 and well over 200 megawatts.

Apart from the possibility to start-up and shut-down single-shaft CCPP faster, the clutches also allow profitable operation in the "condensing mode" by disconnecting gas turbine and generator.

On ships, RENK-MAAG couplings ensure simple and efficient (dis)connection of various energy sources (PTI, PTO or PTH). This is especially the case with combined drive trains where different drive units such as diesel engines and/or gas turbines power one or more propellers.







MS synchronous clutch coupling

Various versions of automatic MS synchronous clutch couplings are used in rotary drives, starter generators or as the main coupling between turbines and generators. They facilitate efficient operation and synchronized (dis)connection of plant components such as in power generation or in marine propulsion systems with combined diesel and/or gas turbines (CODOG or CODAG).



width/diameter 0.24 m/0.27 m (Size will depend on rating and type)

HS synchronous clutch coupling

Hydraulically assisted HS synchronous clutch couplings serve as the main coupling between turbines and generators. They permit highly efficient operation and additional functionality on new and existing plants. They thus meet all the requirements of a deregulated electricity market with a high share of renewable energies.



width/diameter 0.74 m/0.97 m (Size will depend on rating and type)



Benchmark and pioneer.

For decades now, RENK gear units for the raw materials industry have set standards in engineering and efficiency. We were the first to use planetary gear units for cement and coal mills and we established three-stage gear units in the market.

These latter have proliferated to form a complete family of vertical and horizontal mill drive systems. Besides their extreme reliability, it is the short delivery periods and ready supply of replacement parts that boost the efficiency of the entire plant. RENK's extruder gear units for the plastics sector are likewise industry benchmarks and our superimposed SUPREX gear units transmit the world's highest torque ratings for this category of plant.



SUPREX gear unit for plastic extruders.

Milestone for more efficiency.

Our COPE gear units represent another milestone in the development of vertical mills. Their innovative concept is the perfect answer to customer needs for more operating efficiency.

With its compact footprint, the COPE system, which we developed together with LOESCHE, one of the foremost suppliers of vertical mills, also integrates readily with existing plants. Versions with up to eight motors permit mill capacity to be optimally adapted to various requirements. Another benefit: costly downtime can be eliminated, for the plant will continue to run even in the event of failure of one or several motors.



Assembly of a KPBV cement mill gear unit.

COPE

With customers demanding more and more productivity, today's cement mills are growing bigger and bigger. COmpact Planetary Electric Drive (COPE) is an advanced gear unit that is powerful, robust, easy to service and fully complies with customer requirements in terms of dependability and handling. COPE is the first cement mill drive for ratings of up to 13 megawatts.





diameter/height 4.5 m/3 m

KPBV

Manufactured from proven components and modules, KPBV vertical roller mill gear units assure the utmost reliability. Other impressive features are their compact footprint, ease of installation, and the relatively low weight of the high-precision intermeshing parts.





length/width/height 4 m/3.8 m/3 m (Actual size will depend on capacity and configuration)

Extended availability, enhanced performance.

Our team of electronic engineers is continuously devising intelligent gear monitoring systems that allow operators to keep an eye on the relevant propulsion, coupling and gear unit data at all times.

RENK's VIB-Monitor checks and displays on the equipment itself or, thanks to communication via satellite anywhere in the world, all the parameters that are essential to optimum operation. This allows a swift response to any irregularities. RENK's VIB-Monitor also supports efficient maintenance planning and optimum parts management. Plant availability is increased, life-cycle costs are lowered.

Tracked vehicles are another environment where RENK's digital electronics enhance reliability and optimize powerpack performance by, for example, timing the gear shifts to match drive situation and completely monitoring all the mechanical brake and steer systems while providing extensive reports that can be transmitted to a notebook for analysis and evaluation.



Electronic components boost the performance of our ultramodern transmissions while optimizing their reliability as on the HSWL 256.





Expertise in standard and special solutions.

RENK slide bearings are used in a wide variety of industries. In fact, the many different options mean that we have the perfect product for even the toughest applications – the outcome of our longstanding expertise.

Our hydrodynamic, lubricated slide bearings for absorbing extreme loads contribute to improved efficiency and smoother operation in countless electric motors, generators, pumps, fans, water turbines, drive systems for rolling stands, and marine and offshore applications. The development of tailored solutions adapted to customer applications assumes an ever larger share of our portfolio strategy.



For safe and friction-free operation, RENK slide bearings boost efficiency in all areas of industry – such as power plants.

EGXLA 45

EGXLA 45 slide bearings are engineered specifically for the loads encountered in hydropower plants.





length/width/height 1.3 m/0.5 m/1 m

LABRZ 60-600 thrust bearings

High-performance LABRZ 60-600 marine thrust bearings are suitable for heavy-duty ice-breaking ships DNV Polar Class 3 and RMRS Artic 7. These bearings are able to absorb a continuous load of 210 tons and a maximum (shock) load of over 1,000 tons. A compact design is achieved through the integration of hydrostatic and lube oil supply unit. RMRS = Russian Maritime Register of Shipping





length/width/height 2.8 m/2.1 m/1.7 m

Turnkey and custom-tailored.

Much shorter development times, much superior product quality and much lower costs – some of the benefits gained from our tailor-made test rigs designed to help accelerate time-to-market and give innovators a sharper competitive edge.

Ever since 1986, RENK has been manufacturing tailor-made, turnkey test rigs popular in a variety of sectors: the automotive and its suppliers, aviation, rail vehicle, wind-energy, and military. This independent unit within the RENK Group aggregates our longstanding experience in power transmission, instrumentation and electronics. Each and every test rig is the outcome of hardware and software systems perfectly geared to customer requirements and enhanced with expert engineering and other support services.



The testing of functions and performance is becoming increasingly complex. Our end-of-the-line roller dynamometers assist in making sure that the commercial vehicles are always in line with or even exceed current quality benchmarks.









A philosophy of dependability.

Whatever our product, each is normally exposed to extreme and uninterrupted loads and so dependability is a core element of our corporate philosophy.

Ongoing measurements verify and document the quality of each individual production step, and only products that have passed our thorough and uncompromising final inspection under load conditions are released for shipment.

After the products have been commissioned we're still at your side. During in-depth courses we show you how to make sure the products are working to the utmost of their ability and how to best service and maintain them. Our all-in service packages make sure that our customers receive the expert support they require.



Measuring tooth profile and lead: only the combination of maximum manufacturing quality and ongoing quality assurance continuously results in optimum, low-noise gears.

The best possible protection for your investments.

24 hours a day, 7 days a week, available around the globe: our service is at your service when and where needed. After all, we're well aware just how costly downtime can be.

Our objective is for maintenance, repair and upgrade time to be kept as short as possible throughout the lifetime of the equipment and, moreover, to respond flexibly to your needs. To this end, our service engineers apply all their knowledge and experience and make sure that the right parts are always available at the right time.

Our customized service packages also help lengthen the life-cycle of your plant and equipment. Detailed maintenance strategies enhance the efficiency of your systems by extending their maintenance intervals. In this way and right from the drawing board stage you're getting from us the protection you value for your investment.



We're repeatedly refining our service systems in order to provide perfect support for our customers at all times.







A success story with a **future**.

Each of our products embodies all the experience and expertise accumulated over 140 years. Again and again, RENK has succeeded in shaping the industry with new, benchmark-setting products. And this is a tradition we will continue.



Johann Julius Renk (January 4, 1848 – November 3, 1896) laid the foundation stone for today's RENK AG in 1873.

1873

Company founded by Johann Julius Renk in Augsburg, Germany

1926

The very first gearwheels with ground flanks

1943

Development of the principle of hydrostatic superimposed steering for tracked vehicles

1998

Bevel planetary gear unit for one of the biggest vertical raw meal grinders with a rating of 4,800 kilowatts

1997

Launch of the world's most powerful high-speed gear units with a gas turbine rating of 100 megawatts

1992

Construction of the most powerful planetary gear unit (20,600 kilowatts) for a ship propulsion system with counter-rotating propellers

1999

Premiere of the world's most powerful high-speed gear unit with a gas turbine rating of 140 megawatts

2000

Presentation of the newly developed etaX[®] gear unit for higher efficiencies

2001

The world's first CODAG system for the main propulsion of a frigate (38 megawatts total rating)

1956

The first high-speed gear units with a pitch circle velocity of 185 m/sec

1961

The world's first electronic controls for automatic vehicle transmissions

1965

Development of the hydrostatic/ hydrodynamic steering drive for tracked vehicles

1989

At 75,000 kilowatts, RENK develops a high-speed gear unit with the highest-ever power transmitted in one gear mesh

1976

RENK is the first to harden and grind gearwheels with a diameter of over 3,000 mm

1971

First-ever brake system with friction and hydrodynamic brakes integrated in a vehicle transmission system

2002

Development of a 5-megawatt AeroGear[®] for wind-energy plants

2004

The first heavy-duty naval gear unit in COGAG arrangement (6,300 kilowatt total rating) featuring the lowest specific weight in its class anywhere

2013

Manufacture of the world's biggest planetary gear system designed for a wind energy nacelle testing unit with a torque of 15,000,000 newton meters

2015

The world's most powerful cement grinder gear unit COPE, with eight motors and a rating of 10 megawatts

The first electric drive module AED[®] for quiet marine propulsion systems

Around the world.

The small mechanical workshop for making gearwheels of all kinds has evolved into a global supplier of premium power transmission technology and test rigs – the success story of RENK AG.

RENK AG Augsburg Plant, Germany, corporate headquarters



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