The reliability and security which come from being a global group enables thyssenkrupp rothe erde to provide you with fast and flexible decisions. With production sites in 10 countries and associated ring roller mills, thyssenkrupp rothe erde and its subsidiaries represent a global company with a local presence.

As part of a global group, we are a strong, reliable partner offering you stability and planning certainty for your projects. Our extensive knowledge base in a wide range of applications has made us a global leader.

You can find us where we are needed.

Our global brands rothe erde® slewing bearings, rothe erde® rings and psl® rolling bearings form the basis of long-standing customer relationships through our wide range of slewing bearings, rings and rolling bearings and our individualized customer solutions.

The depth of production we can offer is impressive. All national and international plants are bound, without exception, by the quality concept. Experienced and highly specialized employees with proven know-how work for constant innovation and adhere to the highest quality standards in the world.

Our outstanding position enables us to tackle projects by interdisciplinary approach and to import technology from other sectors. Our company has been a reliable partner to all the manufacturers of wind energy equipment since wind energy was first used.
The carbon dioxide (CO$_2$)-free energy gained through wind power is now ever more important. Germany is not just the leader in this technology, but also uses wind as the top alternative source of energy. The company’s commitment to renewable energies has made it a reliable partner to all the important wind power plant manufacturers since the sector came into being.

Wind energy plants – onshore and offshore.

Along with innovative solutions for pitch and yaw bearings, the main focus lies on developing main bearings. thyssenkrupp rothe erde has been crucially involved in its role as the global market leader for slewing bearings. Intensive research and development has resulted in the successful deployment of thyssenkrupp rothe erde products in wind energy plants (both onshore and offshore) throughout the world.

The driving force.

Finite resources and rising energy prices constitute a global challenge. At thyssenkrupp rothe erde we are taking on this challenge through our development of pioneering solutions.

With the aim of achieving advances in providing environmentally friendly energy, we are installing increasingly efficient wind energy plants throughout the world, which are now able to compete against fossil energy resources. We at thyssenkrupp rothe erde are a strong, progressive partner in the field of onshore and offshore systems. Our constant search for innovative breakthroughs enables our customers not just to be part of the new energy era but to advance it, and to make crucial contribution to securing a more environmentally friendly future.
The demands placed on the various bearings and rings in wind turbines necessitate custom designs. In addition to the rings which provide the secure connecting element for the tower, we can supply you with suitable products – individually to fit your requirements – wherever you need them for diameters of up to 6500 mm for main bearings and 9600 mm for yaw and pitch bearings.

Many years of experience and skill in dimensioning ball and roller slewing connections enable us to provide optimal designs for the specified loads and operating conditions.
rothe erde® slewing bearings meet the most stringent requirements.

[1] The Main Bearing
thyssenkrupp rothe erde uses patented production technology to manufacture induction-hardened raceways without soft spots on main bearings. The process is suitable for double-row taper roller bearings and three-row cylindrical roller bearings with diameters up to 6500 mm.

The yaw (azimuth) bearing is used primarily for positional adjustment, keeping the nacelle properly oriented in the wind. Single and double-row four-point contact ball bearings are ideally suited for these applications. Three-row roller bearings are used on MMW scale turbines.

rothe erde® pitch bearings are given a preload with defined torque resistance values during production as a means to prevent unwanted false brinelling. Special UV and ozone resistant double-lip-seals provide optimal protection for the raceway system.

Rotor pitch must be adjustable to produce maximum output from the generator. Pitch bearings in particular have to withstand the continuous load changes. Single and double-row four-point contact ball bearing and three-row roller bearings are ideally suited for these applications.
The main bearing – the central link.

The object of the main bearing is to enable the transmission of the torques from aeromechanical energy conversion to the current-producing generator – with the least loss possible – and simultaneously to brace against the forces and moments which arise. The main bearing is therefore the central element of any drive train concept.

Whether one-row or multiple-row construction, clamped or bolted installation, case hardened or slip-free induction-hardened raceways – we design these in close consultation with you and manufacture the appropriate solutions for diameters of up to 6500 mm.
Specialized applications demand individual solutions. Our slewing bearings are developed and constructed exactly to your requirements. In close consultation with you, we find unique solutions for the construction, material composition and performance.

To cater for this we have different forms of construction, hardening processes and configurations available – all of which are practical and have been proven throughout the world.

We believe that solutions should be designed to fit the customer’s requirements from planning to manufacture and beyond. As a global group with 11 companies and 16 manufacturing plants in 15 countries, we are able to maintain close contact with our customers by virtue of our local presence. Through decades of expertise gained in the wind energy sector, we are capable of finding efficient and innovative solutions in partnership with you.

thyssenkrupp rothe erde relies on APQP4Wind to minimize risks. APQP4Wind is an initiative of the Danish Wind Industry Association and leading wind turbine manufacturers for the transparent implementation of customer requirements within the development, planning, and production processes.

The aim is to reliably meet customer requirements even before the product enters into series production. APQP (Advanced Product Quality Planning) originated in the automotive industry, where it was established as a standard. With APQP4Wind, this standard is adapted to the special requirements of the wind industry and significantly lower volumes. thyssenkrupp rothe erde has been one of APQP4Wind’s first component suppliers since its inception in 2017 and has been working to establish the standard ever since. Requirements of APQP4Wind were successively implemented and the employees were fully trained.
With us, you choose a partner capable of covering the entire production chain. From raw materials to the finished product, all the main components of the slewing bearings are manufactured in-house.

For the manufacture of our slewing bearings we only use steels whose suitability for the respective application has been proven beyond a doubt. Inspections are made throughout the entire production chain. The steel used is of the highest purity with minimal oxygen and sulphur content in order to prevent long-term material fatigue. In the case of large-dimension bearings and rings this secures the optimal combination of hardness and fracture strength. Once we have selected and manufactured the correct material, our rolling mills manufacture the rings. These rings form the basis for further production stages of machining through to finishing and assembly.

In addition to rings we manufacture all the other components, such as balls, rollers and cages at our plants. This guarantees very strict quality control and traceability throughout the entire production process. In addition, the great vertical production range enables lead times to be shortened considerably with the accompanying improvement in planning ability. Knowledge of the materials and components, their properties and composition guarantees innovative results which can be achieved in close collaboration with the customer. This ensures that you will receive complete solutions from a single source, with all requirements catered for, right down to the smallest detail.

Only individuals who are able to view the entire production chain in detail are capable of providing you with effective advice to satisfy your requirements. With this knowledge we are able to assist and advise our customers through all project phases from initial advice on planning the system to its construction and installation. Our services continue after shipment has taken place. Trained and experienced service inspectors are available to assist you with all questions.
Our plants offer a full range of thermo-chemical and inductive processes to achieve the desired results. Targeted carburization and austempering lead to optimal material characteristics from the required hardness to the correct toughness. Cooling processes then achieve an obvious reduction in the retained austenite and eliminate possible weaknesses throughout the entire raceway geometry.

Specific sections of certain workpieces can even be provided with different, and hence exactly suitable, hardening profiles using non-slip induction hardening, and this can be done on diameters of up to 6500 mm.

Using specially developed hardening processes, our engineers provide the slewing bearings not just with a long service life, but also very high surface hardness and the ability to withstand extreme loads by virtue of the depth of hardening. This is how we create optimal conditions for all given applications.

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Using renewable sources of energy.
Commitment to quality - we meet customer requirements.

While the growth of wind energy plant size has brought the established processes and technologies close to their limits, thyssenkrupp rothe erde has steadily continued developing its bearing concepts. For example, both the inner and outer rings of a main bearing can be bolted to the adjoining sections. While this permits easier installation of the main bearings than when shrinking them on, it also eliminates relative movements of the bearing against the driveshaft.

Prior to shipping, our slewing bearings are thoroughly tested in every possible aspect. The latest testing methods and efficient forms of analysis offer valuable clues to stability, service life, performance and load limits. The tests are performed in the full-size plant under realistic conditions, with thorough inspection of the individual components.

Environmental factors such as temperature and air humidity are included in the tests. We are able to examine the slewing bearings on a scale of 1:1 under conditions approximating reality using a number of in-house pitch and main bearing test benches. To include new developments for systems in the multi-megawatt class, thyssenkrupp rothe erde was careful to increase its production capacity at an early stage. With the current equipment it is possible to manufacture main bearings with an external diameter of up to 6500mm. Today, our production capability is well in excess of the current market average of approximately 4000 mm for a 6-megawatt main bearing.

In order to test our products as realistically as possible and thus minimize the risk for our customers, we rely on tests with real companion structures on a scale of 1:1. In addition to several rotor bearing test benches, a new pitch bearing test bench considerably expands our possibilities. There, we receive the possibility to test the next generation of pitch bearings by using an original hub and an original blade of an offshore wind turbine. This includes all designs as well as the challenges for systems >10 MW. It is possible to simulate the required service life within months. With these opportunities, thyssenkrupp rothe erde has developed a test center that is unique worldwide.

Additionally, we investigate and improve the structural behavior and lubricant compatibility of our products on site, thus providing you the bearings of the next generation.
Full service – a strong partner from A to Z.

Full implementation includes not just the production, but also the extensive know-how offered by our global company network for application in your wind energy project. This allows us to assist you from start to finish and in any situation.

It starts with a good plan.

The Finite Element Method (FEM) is an efficient method of developing the optimal slewing bearings solution for any wind energy system together with you. An analysis is made based on the rigidity of the adjoining structures and a subsequent full calculation of the entire system. The results provide information on the safety and lifetime of the bearings, but also indicate options for optimizing the adjoining structures. FEM enables potential weaknesses to be identified and eliminated at an early stage of the planning.

Reliable support after assembly is complete.

Our work does not end with the shipment of the main bearing. You can also benefit from our know-how and expertise during normal operation. Make use of our advisory and training service, for example, when carrying out servicing and maintenance with your own team. Benefit globally from the know-how of our engineers who will work for you on-site. In short: keep your turbine turning!
Using renewable sources of energy.

Focusing the power of the sun and the tides.

Corrosion protection is especially important in hydroelectric and tidal power stations to prevent damage caused by seawater. thyssenkrupp rothe erde uses special sealing systems with mating surfaces made of stainless steel, which have an extensive track record in the offshore industry.

rothe erde® slewing bearings absorb all radial and axial forces and the resultant tilting moments in a single self-retaining, ready-to-install bearing unit with an excellent weight/performance ratio. Compact design, an excellent weight/performance ratio, an open center and integrated gearing make rothe erde® slewing bearings the ideal choice for tidal power stations.

rothe erde® slewing bearings are supplied as yaw, pitch or rotor bearings, depending on the application. Integrated sealing systems can be provided as well.

Efforts continue to make better use of existing potential of solar power systems, and thyssenkrupp rothe erde is a major contributor.

On PV systems, rothe erde® slewing bearings and worm drives ensure optimal solar tracking performance. Slewing bearings and worm drives also position the mirrors which focus the sun’s rays at solar thermal stations, producing heat which is converted to electricity in a conventional power station.

Slewing bearings featuring proven designs and compact worm drives, which are supplied ready-to-install deliver absolute precision to maximize system efficiency. The worm drive offers the advantages of a slewing bearing and a worm drive gear in a single unit.

It withstands high axial and radial forces, and tilting moments. The rothe erde® worm drive eliminates the need for a brake, and due to the geometry of the gearing the drive is selflocking. rothe erde® slewing bearings and worm drives deliver dependable operation without the need for extensive maintenance. rothe erde® worm drives are not complicated to install, and the rugged design ensures many years of low-maintenance operation.