



Renewable Energy

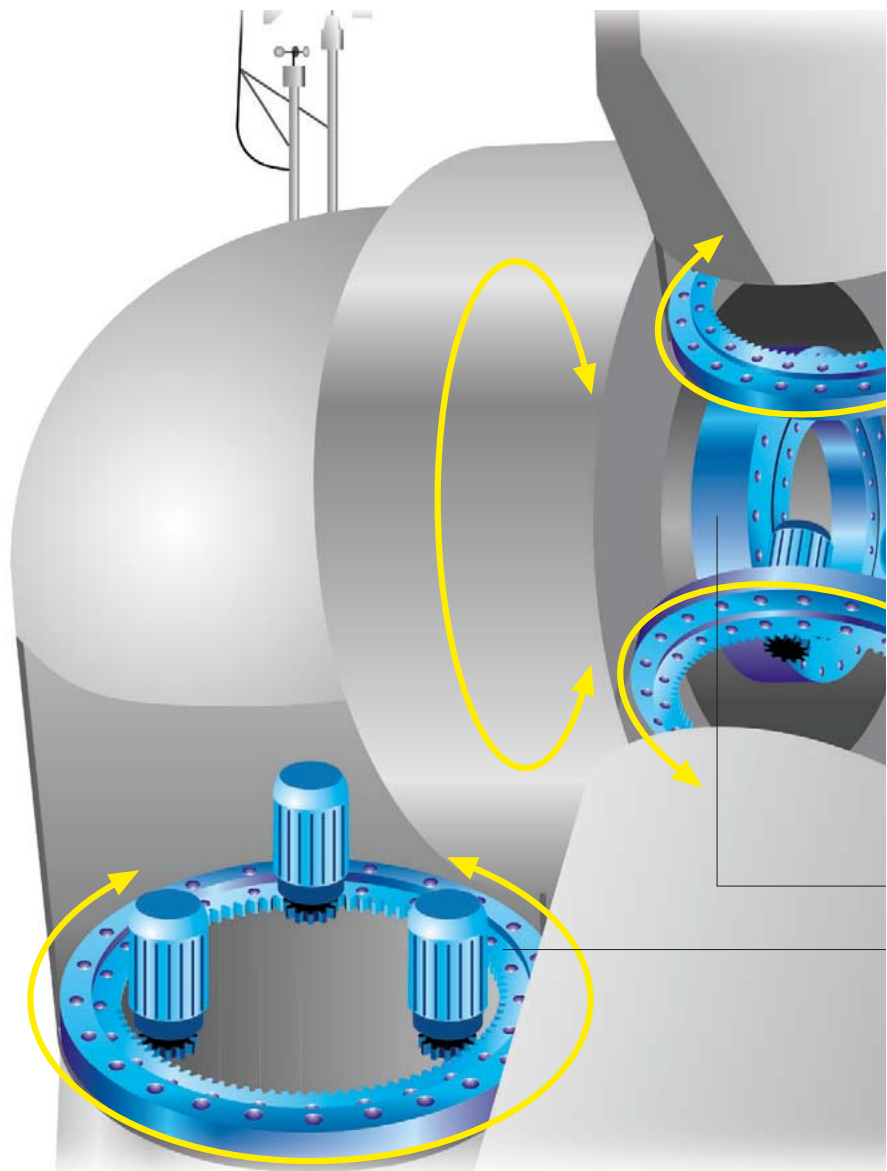
Blade, Yaw and Single Main Bearings



Wind Energy Onshore



The innovative and expanding IMO Group, with headquarters in Gremsdorf in the region of Nuremberg, Germany, has been designing, manufacturing and supplying large diameter slewing rings for a wide range of applications. IMO supplied the first yaw bearing already in 1988 and started series production of blade bearings in 1996. IMO is certified according to the standards ISO 9001:2000, ISO 14001:2005 and OHSAS 18001.



From our modern facilities, we manufacture and deliver state-of-the-art ball and roller slewing rings with diameters up to 5,200 mm (205 in).

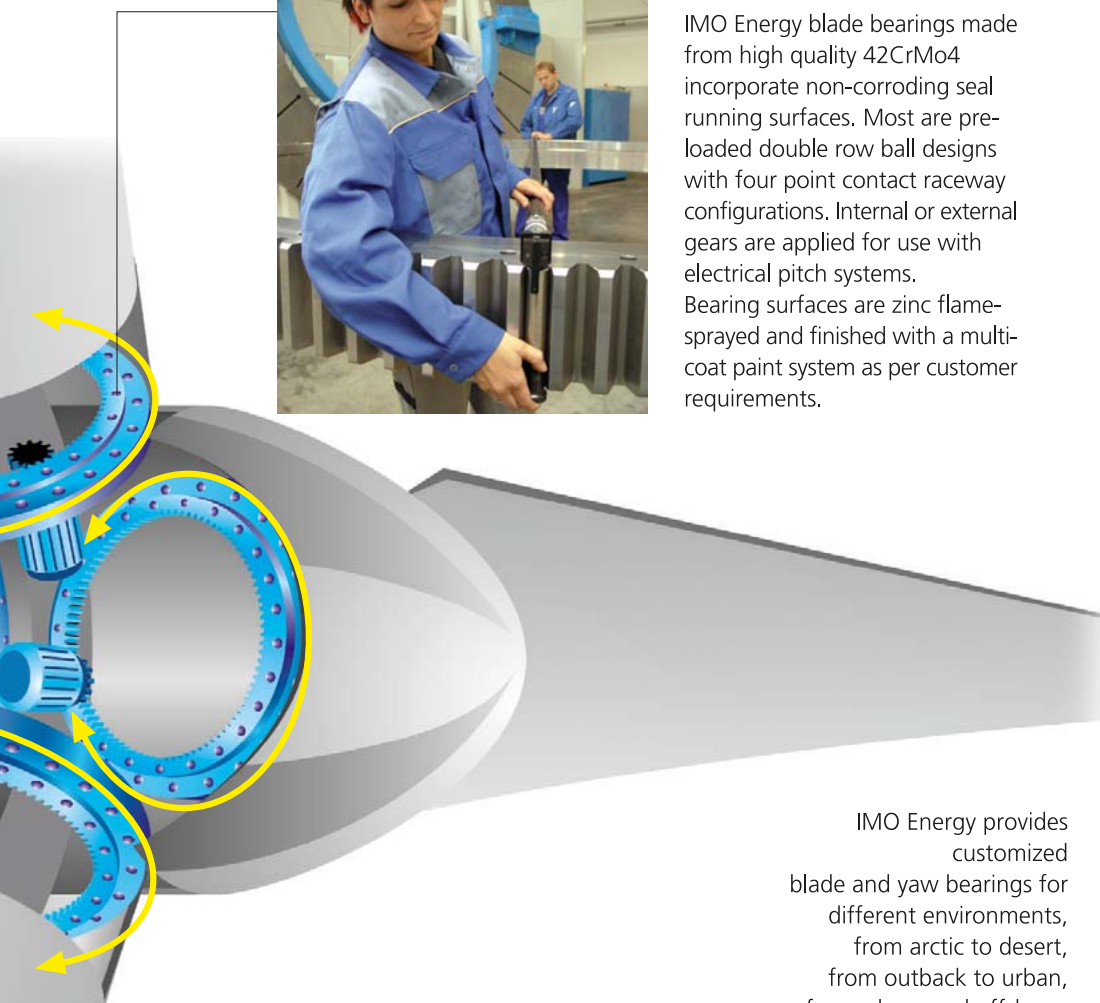
We are one of the leading suppliers on the market for renewable energy. Blade, yaw and single main bearings manufactured by IMO Energy are used by the world market leaders.

Applying German engineering expertise, IMO Energy designs slewing rings for wind energy installations in accordance with well-established procedures. IMO Energy follows the technical rules set by Germanischer Lloyd and other leading certifying authorities when calculating the slewing rings' performance capabilities.



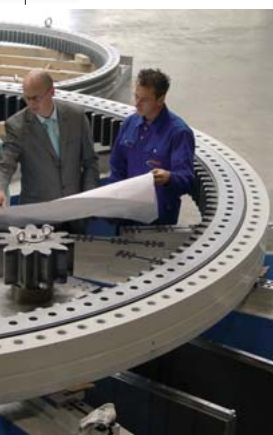


IMO Energy blade bearings made from high quality 42CrMo4 incorporate non-corroding seal running surfaces. Most are pre-loaded double row ball designs with four point contact raceway configurations. Internal or external gears are applied for use with electrical pitch systems. Bearing surfaces are zinc flame-sprayed and finished with a multi-coat paint system as per customer requirements.

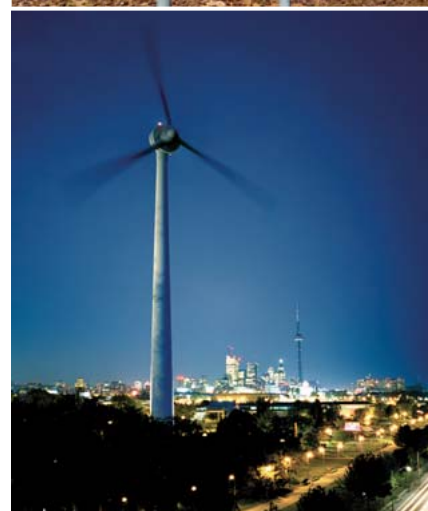


IMO Energy provides customized blade and yaw bearings for different environments, from arctic to desert, from outback to urban, for onshore and offshore, for wind turbines ranging from 10 kW to 5+ MW, and bearing diameters from 200 mm (8 in) up to 5.200 mm (204 in).

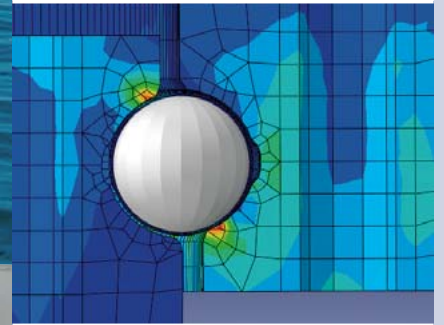
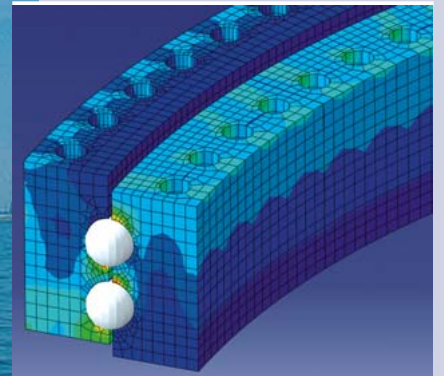
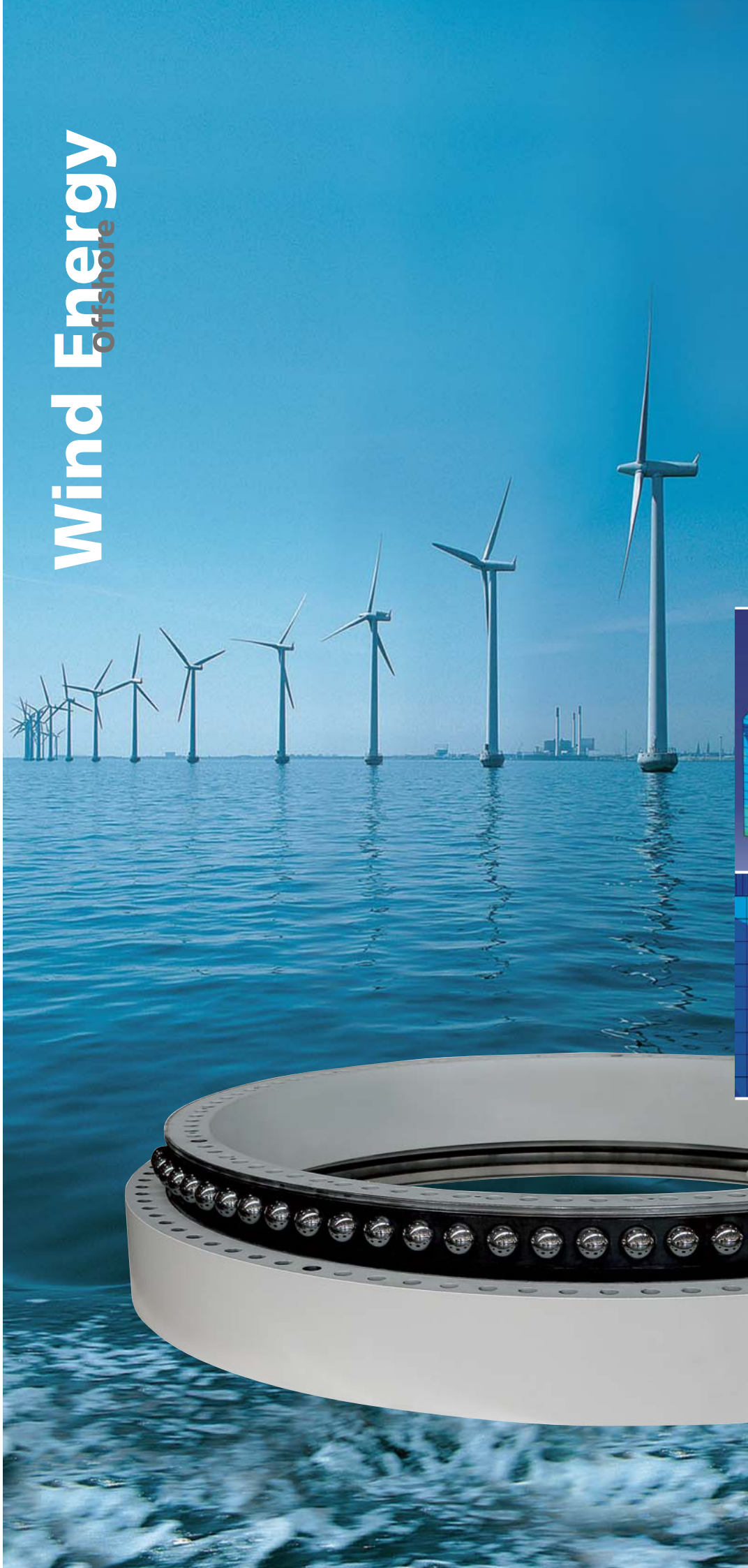
IMO Energy yaw bearings are single or double row ball bearing designs including internal or external hardened gears. The photograph below shows a 5 m (200 in) wide yaw bearing for a 5 MW offshore wind turbine.

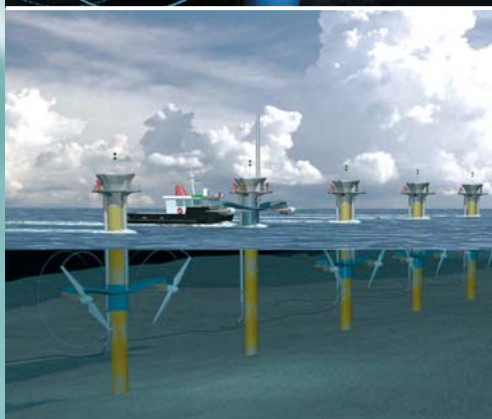


Single main bearings designed by IMO Energy for shaft- and gearless direct drive wind turbines are based on 3-row roller bearing slewing rings which provide high efficiency, stiffness and load capacity. Solid cages made from non-ferrous metals, special lubricants and high performance seals ensure low levels of wear and long service life.



Wind Energy Offshore





Marine current turbines represent a novel method for generating electricity from a huge energy resource available from the sea – as predictable as the tides that drive it. The radically new technology under development consists of twin axial flow rotors of 16 m (52.5 ft) in diameter, each driving a generator via a gearbox much like submerged windmills, but driven by flowing water rather than air.

IMO Energy was chosen to pioneer the design, test and manufacture of blade adjustment 3-row roller bearing slewing rings for the world's first large-scale tidal stream generator.

Basic requirements include a peak velocity exceeding 2.5 m/s (5 knots) with a depth of water of 20 to 30 m (66 to 98 ft). Left hand photograph shows the 16 m (52.5 ft) axial flow rotors and the complete cross-arm with its twin 600 kW power units each mounted on wing-like extensions either side of a tubular steel monopile which is set into a hole drilled into the seabed.

Since the blade bearings are fully exposed to water pressures of up to 3 bar (44 PSI), aggressive salt water and abrasive sediment, the bearing seal system comprises a redundant combination of special high performance seals. Thanks to the innovative IMO Energy design approach, the seal system is separated from the raceway system, thus it can easily be replaced if required. Bearing surfaces have a multilayer coating including a zinc layer. The blade bearing is driven by internal gears.

IMO Group of Companies



Plant I



Plant II



Blade, yaw and single main bearings for renewable energy

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