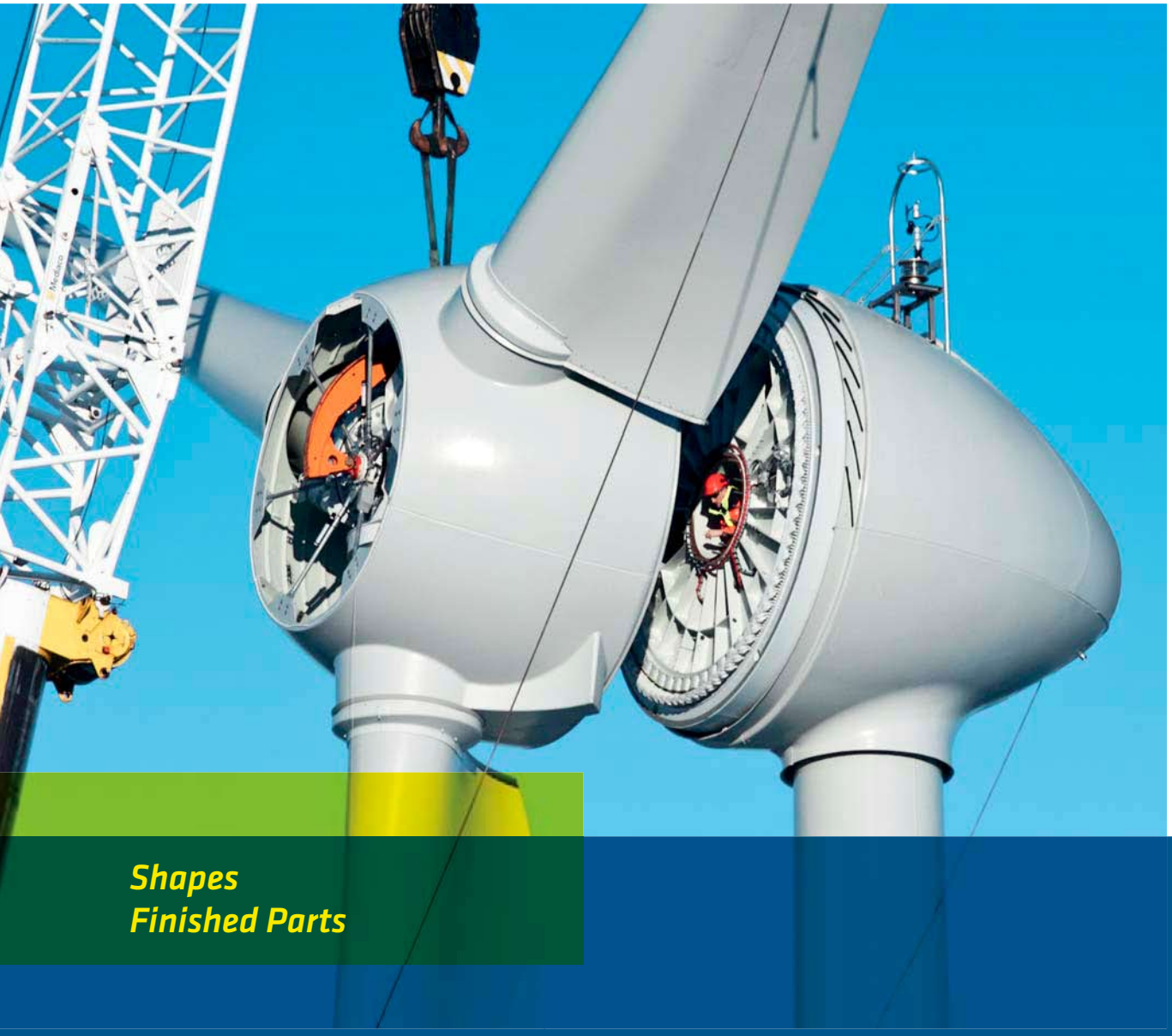
Ensinger



Shapes
Finished Parts

High-performance plastics
for renewables

Benefits of technical plastics

Reliability, low maintenance and performance – the same stringent standards are expected today of systems used for power, heat and fuel production using renewable energy sources.

Nowadays, technical plastics have a major contribution to make towards improving existing solutions because modern materials offer a wide range of benefits:

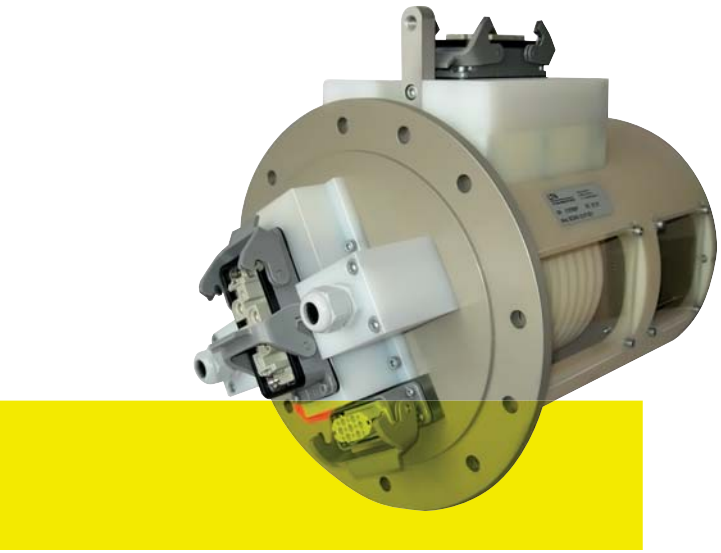
→ Weight reduction
→ Freedom from corrosion
→ Minimized noise emissions
→ Thermal decoupling
→ Emergency running properties

The systems used to harvest renewable energy sources are undergoing an ongoing process of development. Enhanced performance helps increase system efficiency. The reliability of these systems has improved decisively, short maintenance intervals are a thing of the past. The progress made in this field is due in large part to the use of modern materials.

Renewables

The demand for energy is increasing dramatically the world over, and can scarcely be met by conventional fossil fuels. In addition, their combustion is responsible for producing climate damaging emissions. This means that alternatives are urgently needed.

Wind, water, sun and bioenergy are all available in practically limitless supply. Unlike conventional energy sources such as crude oil, coal and natural gas, the use of renewable energy sources does not harm the environment, is safe and helps to save natural resources. Fuel cells which allow power to be generated from (regeneratively produced) hydrogen can also play a major role in the new era of alternative energy sources.



Wind power

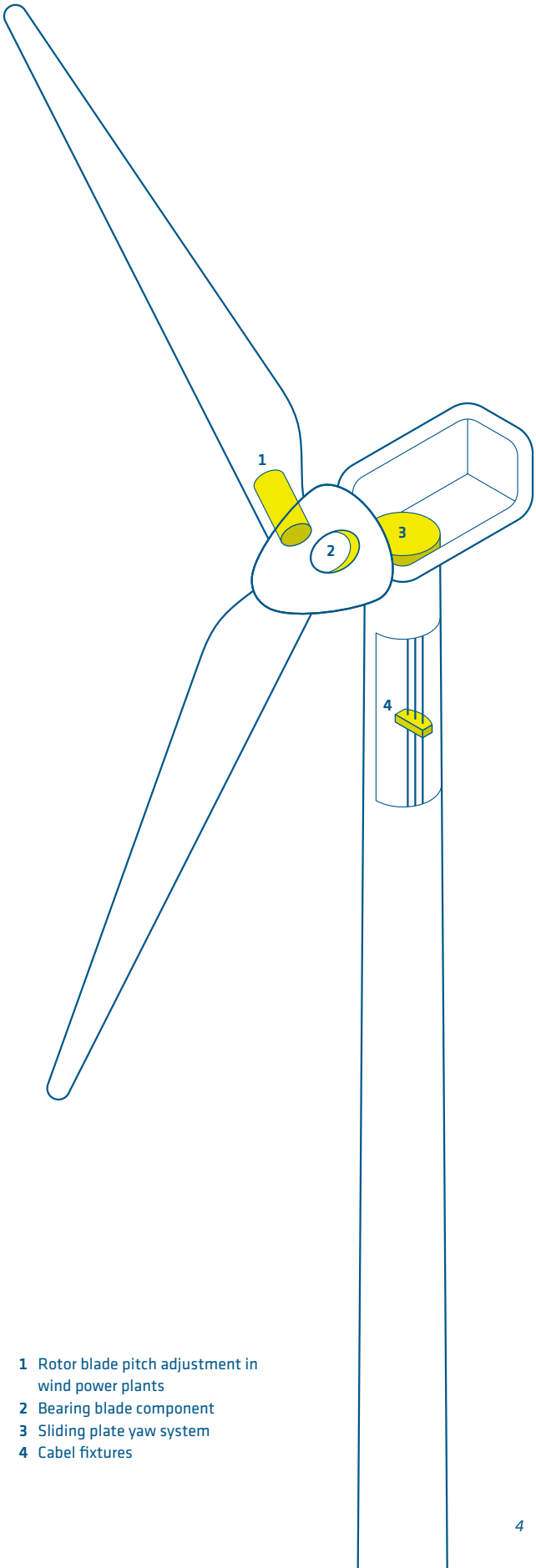
The potential offered by wind power is far from being exhausted. The perspectives for further expansion here are highly positive, primarily through repowering - exchanging obsolete equipment for modern, more efficient systems - and utilizing offshore wind power.

Technical developments are highly advanced in this area. However, the drive to improve efficiency and the extreme conditions occurring in offshore wind farms are making ever more stringent demands on the materials used. Depending on the field of application, high-performance materials have to address the following demands:

→ High abrasion resistance
→ High thermal stability
→ Dimensional stability
→ Low friction
→ Minimal weight
→ Self-lubricating properties
→ Antistatic properties

Main fields of application:

→ Slide plates / slide rings
→ Bearing shells / radial guides
→ Bushings, blades
→ Coupling components
→ Gearbox components
→ Central lubrication elements



1 Rotor blade pitch adjustment in wind power plants
2 Bearing blade component
3 Sliding plate yaw system
4 Cabel fixtures

Photovoltaics and solar heat

The manufacture of solar plants for the generation of heat or electrical energy is a complex process. The fundamental process involved here is the manufacture of silicon wafers. There are a whole range of applications relating to this process which rely on high-performance plastics.

These impose a wide range of demands on the materials used:

→ High thermal and mechanical load capacity
→ Good electrical insulation / defined conductivity
→ Minimal thermal expansion
→ High abrasion resistance
→ Good chemical resistance
→ High plasma resistance
→ Low outgassing in a vacuum
→ Minimal proportion of extraneous ions

Predominant fields of application:

→ Grippers
→ Wafers
→ Wafer handling
→ Sliding elements
→ Bushings

Hydropower

The generation of energy from hydropower is a comparatively old and technically matured technology. The kinetic and potential energy inherent in a water current is converted into mechanical rotational energy by means of a turbine wheel. More recent ideas such as tidal and wave power plants are increasingly attracting interest within the industry.
Technical plastics can also make an essential contribution towards efficient, low-maintenance operation, with properties such as:

→ High abrasion resistance
→ Corrosion resistance
→ Dimensional stability
→ Low friction
→ Minimal weight
→ Self-lubricating properties
→ Antistatic properties

Predominant fields of application:

→ Bearing shells
→ Bearing elements
→ Pneumatic and hydraulic components
→ Sealing rings

Bioenergy

Biomass is the most important and most versatile renewable energy source used in Germany. Renewable raw materials are used in solid, fluid and gaseous form for the generation of electrical power and heat, and also for the manufacture of biofuels. Technical plastics enjoy widespread different uses in this field, in particular where higher temperatures occur and where extreme mechanical or tribological loading capacities are called for.

Applications:
→ Sealing elements
→ Elements exposed to high thermal loads

Fuel cells

Fuel cells are developing into an essential cornerstone of future energy generation, largely due to their flexible scope for application, their efficiency and their environmentally friendly credentials. Already today, fuel cells have become an established feature of many applications.Their performance and efficiency can be increased particularly for mobile applications by reducing their weight. Here, high-performance plastics can play a fundamental role.

Central requirements here include:
→ Excellent rigidity and strength
→ High thermal stability
→ High dimensional stability
→ Very high strength at high temperatures

Application:
→ End panels

New, improved materials play an important pacemaking role for technological development. Our portfolio includes engineering and high-temperature plastics with property profiles to suit a wide-range of different applications.Due to their low weight, optimized sliding properties, high abrasion resistance, dimensional stability and chemical resistance, they are superior to conventional materials even at high application temperatures.

From a range of over 100 different materials, ENSINGER offers semi-finished products, precision profiles and finished parts through to complete assemblies. In addition, almost 500 different plastic modifications can also be implemented.

High-temperature plastics

High-temperature plastics are plastics capable of being exposed to long-term service temperatures of over 150 °C. Special reinforcing materials such as glass fibres, glass beads, carbon fibres or matrix fabrics are used to enhance thermal dimensional stability and rigidity. Additives such as PTFE, graphite and aramid fibres considerably improve the sliding friction characteristics, while the addition of metal fibres and carbon black provide improved electrical conductivity.

The most important areas of application for high-temperature plastics: Sliding friction-stressed mechanical components (sliding bearings, rollers, pressure discs, piston rings, seals), semi-conductor and electrical engineering industry

TECASINT (PI)

For components exposed to high levels of thermal and mechanical stress. Good wear resistance up to 300 °C in continuous operation. Dimensionally stable, electrically isolating, high purity, low outgassing. Inherently flame resistent.

TECAPEEK (PEEK)

Balanced characteristic profile; Low creep tendency, high modulus of elasticity. Excellent abrasion resistance. Inherently flame resistant.

TECAFLON PTFE (PTFE)

Extremely good chemical resistance, long-term service temperature of 260 °C. Excellent sliding properties and extremely good electrical properties. High level of toughness even at low temperatures. Inherently flame resistant.

Engineering plastics

Thermoplastic engineering plastics can be used permanently at temperatures between 100° C and 150 °C. The materials demonstrate good mechanical properties, high dimensional stability and good chemical resistance.

TECAMID 6 (PA6)

Good damping properties; Good impact strength and high toughness even at low temperatures; good abrasion resistance, particularly against sliding partners with rough surface.

TECAST T (PA6 G)

Cast polyamide with properties similar to TECAMID 6, production of high-volume parts with high wall thicknesses possible.

TECAPET (PET)

Low tendency to wear; High dimensional stability due to minimal thermal expansion; minimal moisture absorption; good dielectric properties; good chemical resistance.

TECAFORM AH (POM-C)

Minimal moisture absorption; good reverse bending strength, dimensional stability and rigidity, parts with tight tolerances, good sliding friction properties.

TECAFORM AD (POM-H)

Slightly higher mechanical values compared to TECAFORM AH, very good resilience and high level of surface hardness, very good sliding friction properties.

Ensinger at a glance

Whether in the form of compounds, stock shapes, profiles or finished parts: Our products contribute towards making customer applications more efficient and consequently more competitive. ENSINGER solutions are in operation in practically every important industrial sector, including mechanical and apparatus engineering, medical technology, the automotive industry as well as construction.

Employing a total workforce of 1,800 in 25 locations, the family firm ENSINGER is represented in all the important industrial regions of the world with its own production plants or sales branches.

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Renewables are indispensable to climate protection. Wind power, solar power, bioenergy, hydropower and also fuel cell technology: all of these play an essential role in the energy mix of the future. In what is predominantly still a young field of industry, many applications can only be realized using new materials. A decisive role is played here by high-performance plastics, which are enjoying ever more widespread use.

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