TURBINE TECHNOLOGY

Components for Aero Engines, Power Generation and Beyond
Our technology is embodied in our employees, who are the substance of our knowledge and experience. For generations Leistritz has been around to meet the ever-increasing need of the demanding market.

First in the field of power generating steam turbines, but then as the aviation industry evolved in the 20th century we were soon a well-trusted partner in manufacturing advanced components with cutting-edge technology.

Today, we serve our customers in four locations: Remscheid and Nuremberg (Germany), Belisce (Croatia) and Chonburi (Thailand). Approximately 800 employees work hard to produce top-quality products, which are audited regularly according to all relevant guidelines in the aviation industry.

We understand your requirements and will assist you to develop the optimum solution to your needs. What makes us so confident? Leistritz offers all relevant manufacturing technologies under one roof - an unmatched advantage for innovative ideas and performance.

More than 100 years experience in turbine technology

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FOUR MANUFACTURING FACILITIES WORLDWIDE
The Wright brothers caused a sensation in 1905: they achieved the first long-distance flights of up to 45 km with their »Flyer III«. Mankind had come closer to its dream of flying – even though intercontinental jets or expeditions into space were still utopian.

**Made in Germany**

In the same year, Paul Leistritz founded a company to manufacture turbine blades and profiles of the highest quality in Nuremberg. The utopias of that era have long since become reality. Leistritz has made its contribution to this development: modern aircraft and rocket engines utilize components from Leistritz throughout the world. Leistritz is driving the advancement in technology, meeting the market demand for component performance and economical challenge.
Ever since the first jet engines were built, Leistritz has been a partner for various aero-engine manufacturers in the development and production of engine components from difficult to machine materials such as high-temperature steels, titanium, and nickel-based alloys. This work focuses on rotating and static parts, whose aerodynamic, complicated geometries with tight tolerances and maximum material requirements are a very special challenge.

Proven expertise
Today, Leistritz is one of the largest manufacturers of various aero-engine components, blades, disks, blisks/IBRs, casings, and structural parts. The way we think and act revolves around finding optimum solutions with maximum efficiency: from the moment we start with the raw material to the delivery of the ready-to-assemble product. Millions of successful applications provided to the market are evidence of our performance.
For many years Leistritz has been a partner in development activities to adapt and further develop manufacturing techniques for a perfect match with up-coming requirements now materializing during the ramp-up of new engine programs.

**Technological lead**

Today’s eco-efficient engine designs give rise to an increasing demand for new classes of engine components such as integrally bladed rotors or blisks/IBR’s in the compressor section, high-end components such as titanium aluminide blades in the low-pressure turbine section and structural parts such as engine mounts with lightweight design. Based on our forward-looking research work we are technologically in a leading-edge position for production of this new generation of engine components.

For titanium and nickel based alloys Leistritz utilizes specific forging, mechanical machining and ECM processes.

We are mastering the challenges of gamma titanium aluminide blades machined either out of forgings or castings. Leistritz delivers ready for assembly parts by utilizing of specific isothermal forging and/or advanced metal cutting methods. Our capabilities are also applied to produce highly-stressed and safety-critical structural parts such as engine mounts out of nickel based alloys.
Power stations help satisfy mankind’s most important basic needs: power means light, warmth and security. The uninterrupted availability of power is an obvious requirement of today’s standard of living.

In order to maintain this standard, concepts are required that continuously improve the use of available resources. If we can increase the efficiency of a turbine, then we can also make an important contribution to environmental protection.

**Profound know-how**

Ever since its foundation in 1905, Leistritz has been closely associated with turbine development. We began by manufacturing blades and profiles for steam turbines, which have remained one of our main products to this day. Our technology expertise in the field of aviation ideally compliments our development and production of components for the power plant industry.
Many years of experience in the utilisation of all relevant manufacturing technologies are the foundation for the excellent reputation of Leistritz products on the global market. Our customers especially appreciate our project management expertise coupled with a fast implementation of customer requirements for developmental hardware.

Our range of products now goes far beyond blades and profiles for steam turbines, especially made of titanium. For example, we also produce blades and other components for modern gas turbines and axial compressors. The processing of high-grade nickel based parts is one of our special skills. We either produce the pre-shaped blanks ourselves or order these from reliable partners with the corresponding know-how.
The Leistritz electrochemical machining method (ECM) has proven itself through maximum precision and repeating accuracy for the production of difficult, three-dimensionally twisted airfoils. ECM can be used to machine all electrically conductive materials – irrespective of their metallurgical properties and strength.

**Economic and efficient**
For more than 40 years Leistritz is the leader in electrochemical machining by constant improvement of the technology. The airfoils and platforms of rotor blades and vanes for high-power engines and compressors are manufactured on Leistritz customized ECM systems: delivering aerodynamic profiles with complex geometries, the thinnest of edges from all conceivable alloys with a high dimensional accuracy and outstanding surface quality. This is applicable to single blades as well as airfoils on blisks or IBRs. Additionally ECM is also an economic and efficient method for machining surfaces of parts such as flanges, rings, casings and engine mounts.

**Absolute precision**
FORGING

For many years Leistritz has been a supplier to the power generation industry, providing of precision forging technology on a total cost competitive basis. Our portfolio today comprises of precision-forged, finish-machined or envelope-forged compressor and turbine airfoils for a wide range of gas and steam turbines.

Material knowledge
As a qualified and technologically advanced supplier for engine disks to the aerospace industry, our product range comprises of a wide selection of disks from the cold section to the hot section of an engine. Nickel-based and titanium alloys including the most advanced and challenging materials are part of our daily work. A most modern disk manufacturing line, advanced machining capabilities and Europe’s largest isothermal press are assets for the markets of today and tomorrow.

We are continuously improving the technological competence and process efficiency. State-of-the-art processes produce a finished gas path with ongoing efforts to keep subsequent machining operations to the economical minimum.
State-of-the-art technologies for machining are used at Leistritz to manufacture turbine components from bar stock material, forgings and investment cast blanks. Leistritz strives to always have the optimum solution – be this for turning disks and blisks or milling and grinding structural parts and blades. The latest generation of multi-axis machining centers as well as custom-developed special machines are used to satisfy the highest customer demands on product geometries. Computer-assisted simulation makes an important contribution to stable process development. For the finishing of the surface after milling, we apply special processes such as vibro-polishing to achieve the best surface finish.

Challenging designs – our passion
Reliable power supplies and safe mobility are the services provided by our customers – and in the end we all trust in these. The perfect performance of our products is what our customers must rely on. This establishes the guidelines for our quality management.

We define and organize our quality assurance measures in close cooperation with our customers, the manufacturers of landbased and aero engines. This way we can guarantee that our products will perform perfectly – to the benefit of everyone.

Quality assurance begins with the planning of production methods and defining stable processes. Constant monitoring of all manufacturing processes and the documentation of the necessary tests are critical for us. When we deliver our products they have already passed the most stringent of tests – for a long life.
The constant further development of our technological competence was and still is the basis for the more than 100-year-old success story of Leistritz Turbinentechnik as a partner to the turbine and aircraft engine industry. In order to provide optimised process chains for new products that are in line with the components and the market requirements, we develop today the processes our customers will need tomorrow. With this claim, our R&D teams in the Leistritz core fields of forging, ECM and mechanical machining work on product-oriented and innovative solutions for new component designs and materials. We cooperate closely with our customers’ experts and also with renowned universities and research institutions in R&D projects. Numerical simulation methods are becoming increasingly important in this connection and we are using these more and more to derive optimised process parameters so that we can achieve faster and safer success.

"With our R&D activities on future materials and manufacturing techniques we are supporting the ambitious goals of the A.CARE Flightpath 2015 of the European aviation community focusing on substantial reduction of CO2, NOx and noise emissions."

The special thing about Leistritz: It was founded in 1905 as a family enterprise. We are still an owner-operated company today, in which dynamic further development and innovative solutions count and values such as reliability and partnership are embodied.

With turbine blades for the aviation and aerospace industry, screw pumps for sectors such as oil and gas, the chemical industry and shipbuilding, twin screw extruders for the plastics and pharmaceuticals industry, as well as tools/machine tools for the automotive industry and mechanical engineering, we offer an extremely wide range of solutions. The high level of expertise in products and technology has always been the basis of our success. We employ approx. 1,900 staff in the various locations worldwide.
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