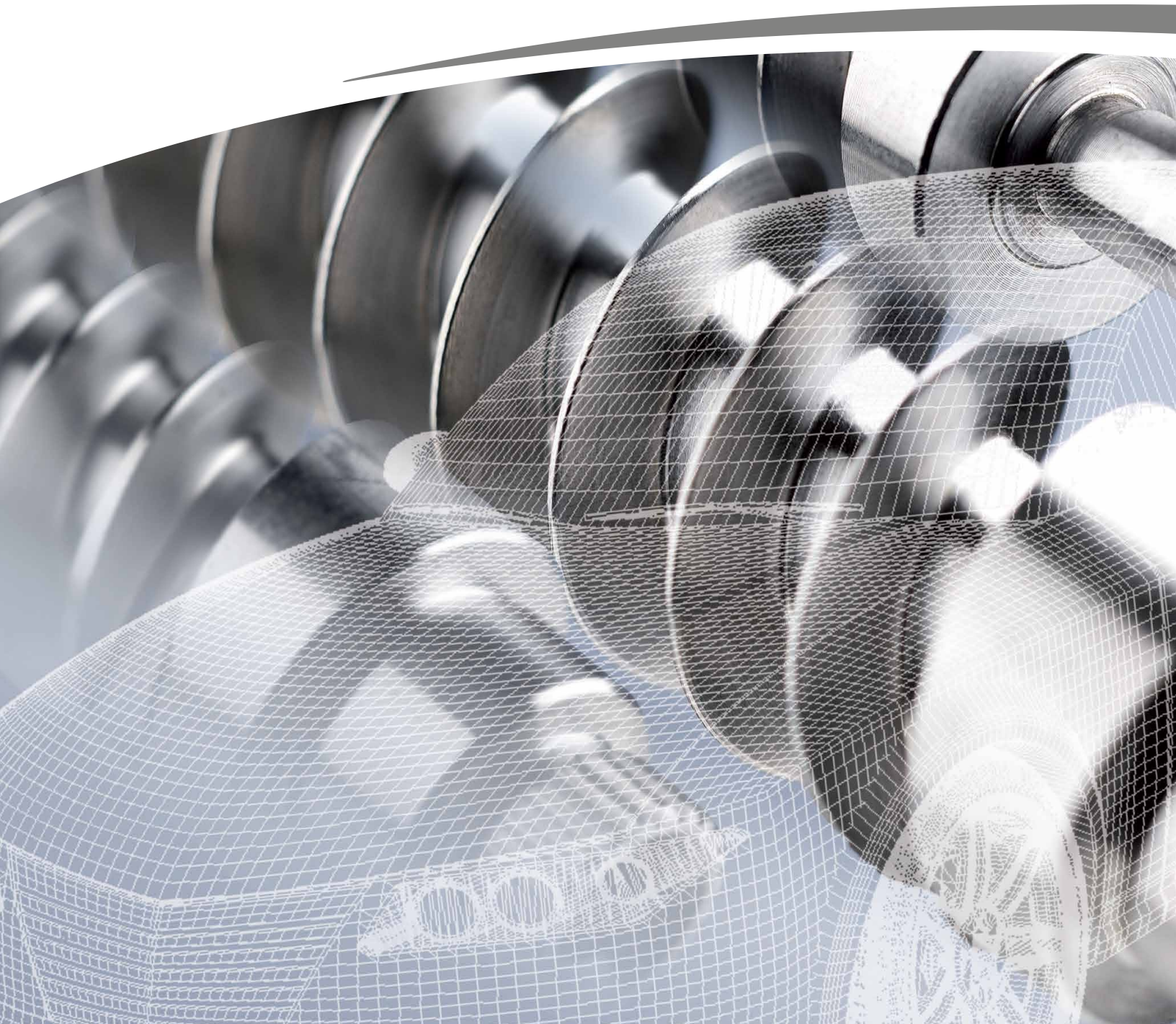


AUTOMOTIVE INDUSTRY

Machine tools



AUTOMOTIVE APPLICATIONS

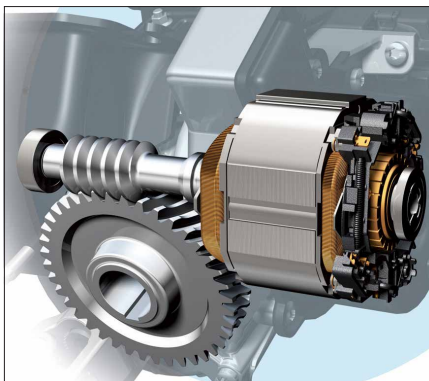
Innovative machine tools for more efficiency and accuracy

Leistritz supplies machine tools for high precision wet, dry and hard-machining. In a perpetual dialog with our customers we build trendsetting machines with innovative tools and technologies. Our aim is to continuously improve accuracy, availability, safety and the overall economic efficiency of our machines. This is the only way we can meet the high demands of the automotive industry, provide an outstanding product quality and enhance our customers' competitiveness.

We have been doing that with great passion - for over 30 years. And this is what defines us!

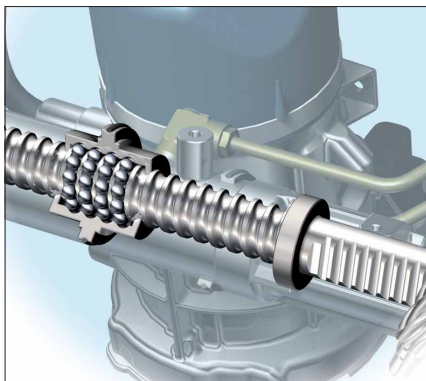
We supply machine tools and processes for the economic production of the following automotive parts:

➤ e.g. EPS worms for steering



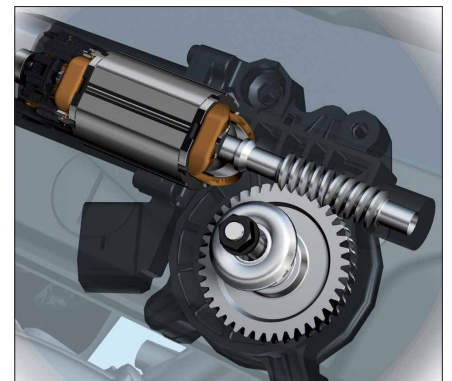
process:
external whirling and burnishing

➤ e.g. rack-and-pinion for steering

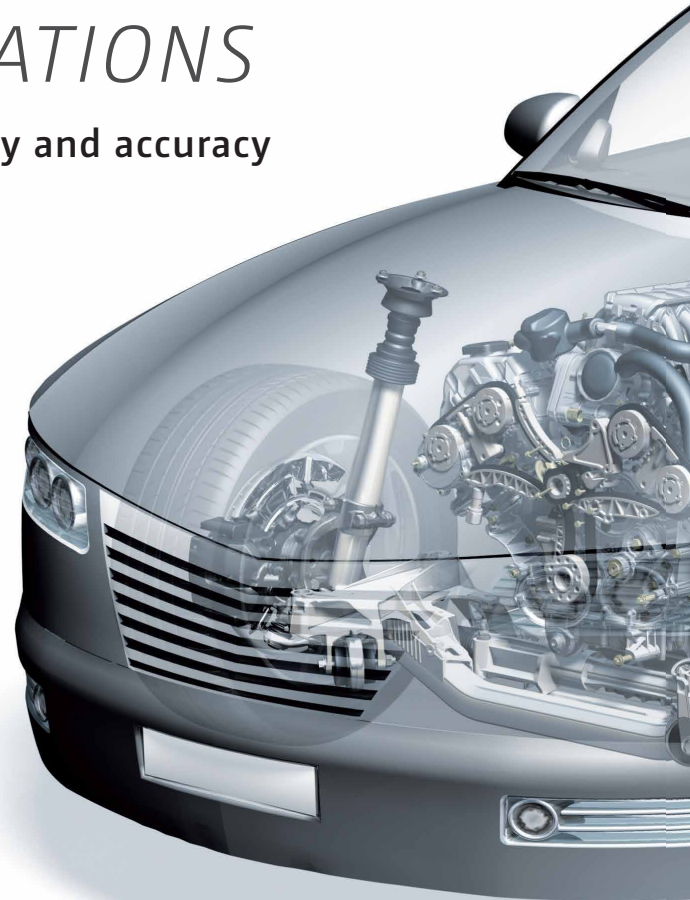


process:
hard whirling

➤ worms with different pitch directions, e.g. for windshield wipers or wing mirrors



process:
external whirling



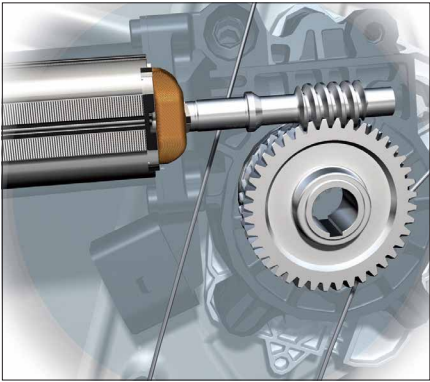
» *Leistritz has been a strong partner to the*



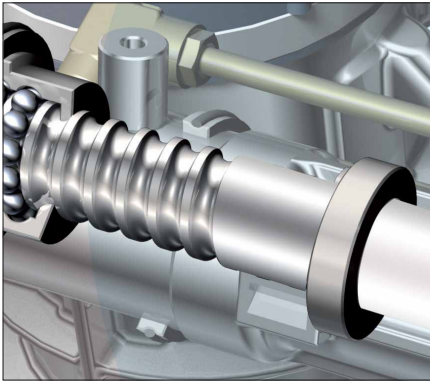
➤ small gear worms, e.g. for power windows

➤ steering pinion for hydraulic steering control and valve

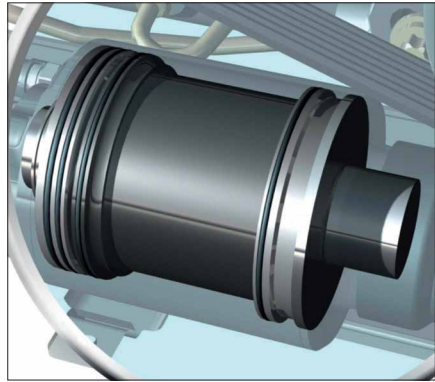
➤ spindle housing and spindle for active roll



process:
external whirling and burnishing



process:
external and internal whirling



process:
hard, external and internal whirling

automotive industry for years. «

EXTERNAL WHIRLING

Highest demands on profile precision and quality

With the whirling process, helical profiles can be processed very efficiently. In this process, an eccentrically positioned whirling ring rotates around the slowly rotating work piece - in most cases without the use of a coolant. This has the advantage that because of the specific way of cutting the majority of the cutting heat is discarded with the chips rather than heating up the work piece.

The production of components like e.g. small actuator screws or C-EPS worms impose highest demands on profile precision and the quality of the finish in order to meet the great need of efficiency and smooth running. The Leistritz whirling machines are an efficient solution for this mass production. The modular design allows solutions to be perfectly adapted to customers' specific requirements.

Machine examples:



LWN 65

**Application areas in the automotive industry:
manufacture of worms with different pitches
and small gear worms**

The LWN 65 external whirling machine has been specially designed for the production of work pieces in large quantities. Long tool life, short tool-changing times and short manufacturing times ensure maximum productivity. This machine may be equipped with an integrated, workpiece-specific automated loading and unloading system.

LWN 90

Application area in the automotive industry: manufacture of steering pinions

The LWN 90 external whirling machine is built for the high production volumes of the automotive industry. The machine convinces with process capability and a high availability. An integrated work-piece-specific automatic loading and unloading system may also be considered to complement the production solution in accordance with customer requirements.



LWN 120 EPS

Application areas in the automotive industry: manufacture of EPS worms, spindles

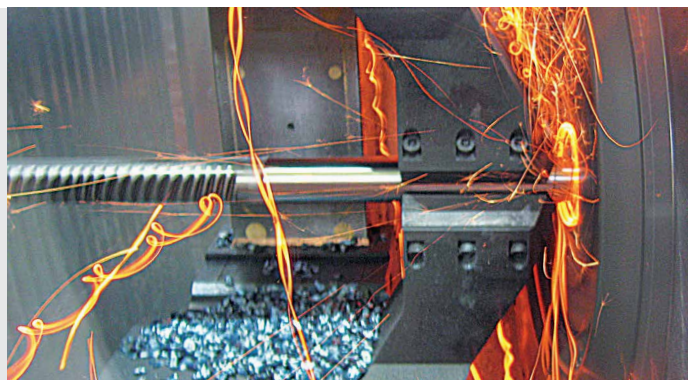
The LWN 120 external whirling machine with its high profile and pitch accuracy allows work pieces to be finish-machined. High-quality surfaces are achieved with this machine and its patented tool system. The torque motor facilitates high-speed cutting at speeds of up to 4,500 rpm. This, in conjunction with the fact that the machine is very stiff, creates the optimum precondition for economic use also in hard-machining. The large swiveling angle ($\pm 50^\circ$) allows almost any kind of thread profile or screw to be realized.



HARD WHIRLING:

Effective material working

Automotive manufacturers apply hard part machining for manufacturing steering worms or Rack-EPS. Those products can be machined to finished dimensions and tolerance without further machining. The hard whirling process on a Leistriz LWN 120 is saving machining time and additional process steps.



INTERNAL WHIRLING

Innovative technology and intelligent automation

A variety of parts, including ball screw nuts, require an equally intricate internal thread and are therefore predestinated for whirling. During internal whirling, both the work piece and single-point whirling tool rotate in the same C-axis direction, though not at the same speed. During this choreographed rotation, the tooling is continually moving back and forth along the Z-axis. This W-axis oscillation allows the tool's cutting insert to remain normal to the thread helix angle to achieve profile accuracy.

The Leistriz internal profile technology allows the two stages of “soft pre-machining” and “finishing hardened material” to be replaced with a single process. This innovation has been made possible by a new drive concept that creates a superimposed rotational and oscillation movement while nearly completely balancing the masses involved and a new flexible tooling system. An intelligent automation concept complements the machine thus enabling it to meet the demands made on process-reliable mass production.

Machine example:

LWN 120 IW

Application areas in the automotive industry: manufacture of steering nuts, spindle housing

The LWN 120 IW internal whirling machine is able to completely machine internal profiles. The use of corresponding tools means that both hard- and soft-machining is possible. The machine's stiffness results in highest levels of accuracy.



BURNISHING PROCESS

Material and time effective

The production process of burnishing serves to improve the strength of the surface while increasing surface quality at the same time. This way, the operating, sealing and joining properties of the workpiece are optimized. Leistritz burnishing machines ensure quick machining by achieving long tool life.

By combining the whirling and burnishing operation the customer is getting the advantage out of both processes by one supplier. Leistritz offers the turn-key solution out of one hand for whirling and burnishing the workpiece.

Machine example:

LWN 120 RR

**Application areas in the automotive industry:
burnishing of small gear screws and C-EPS screws**

The economic LWN 120 RR burnishing machine stands for high outputs. The patented power frame-work guarantees highest precision and performance. The PLC is equipped with a comfortable user interface. An automation system specially adapted for all applications guarantees that the machines deliver high outputs.



PRODUCTION TECHNOLOGY

Available for you all over the world

UNITED STATES

Leistritz Advanced Technologies Corp.,
Allendale, NJ

GERMANY

Leistritz Produktionstechnik GmbH,
Pleystein

CHINA

Leistritz Machinery (Taicang) Co., Ltd.,
Taicang



Leistritz Advanced Technologies Corp.

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