



Zakład Kół Zębatych s.c.

54-212 Wrocław ul. Małopanewska 29
56-400 Oleśnica ul Moniuszki 19 /19c
tel: +48 71 3981214
e mail: biuro@zkz.net.pl www.zkz.net.pl

GEARS-we do it best

Family company – Zakład Kół Zębatych s.c.
co-own: Czesław Borkowski, Anna Borkowska,
Andrzej Olszacki, Monika Olszacka.

Start-up year 1983

The production area of 2000 m²

50 + employees





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We provide precision gears to our customers in the highest classes , prototypes for research and development departments with all topographic and heat treatment measurements.

Helical gears grind from module 0.5 to module 16 / outer diameter 10 mm to 800 mm / also grind internal helical teeth from diameter 80 mm to 800 mm ,and Hirth type clutches.

We can also grind teeth in a solid material with any profile imported from CAD (motor sports, Formula 1, aerospace, defense industry and, above all prototypes)

We also have heat treatment controlled by computer- hardening, carburizing, carbon nitriding, induction hardening cnc.

Processes: CNC turning, CNC machining centers, CNC grinding, broaching splines , firing with wire, sandblasting, phosphating and a few more...

Quality control - measuring machine for 4-axis gears(certified annually) ,

3-axis measuring machine , studying the structure-hardening

depth of materials and the residue austenite

Quality management systems ISO 9001;14001:2110-AQAP(NATO) ,CSR

R & D / Constr. Dep.





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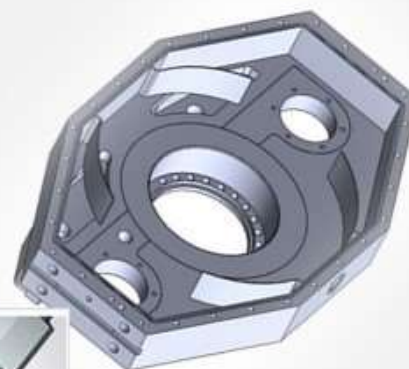
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First, KNOW HOW

We know and support this knowledge of our customer
 With us, even documentation will be checked and optimized before starting production



CAM DESIGN



Enterprise Resource Planning





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KX 300 P gear centre generating and profile grinding of gears

machine concept

Based on a modular system in combination with the application possibilities of different tool and process technologies, user-specific, optimal production solutions can be configured.

The following methods are possible:

- continuous generating grinding
- discontinuous profile
- Grinding combination of both methods
- header spindle (dia 30)



KAPP NILES ZE 800 Profile gear grinding machine

smallest footprint and optimal access; electrical direct drive and hydrostatic as option; external / internal gears and special profiles; highest flexibility – from drive technology .



Renishaw - integrated measurement systems



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PRINCIPLES GEAR GRINDING Mod. 0,5 / 17 Metric & Imperial

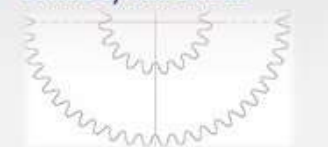
Inter. Spur Gears & Helical
 Dia 80- 800 mm



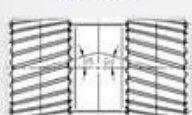
Spur Gears & Helical
 Dia 10 – 800 mm



Whels Synchronous



Double Helical
 „APEX”



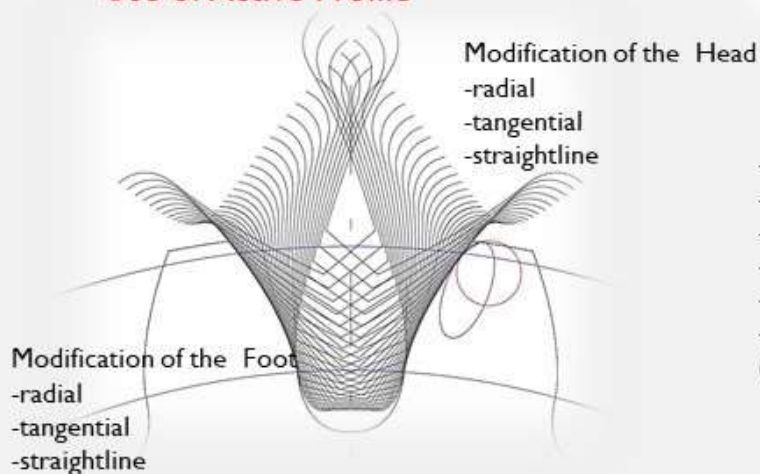
Hirth coupling



Undefined Helical Profiles
 (CAD)



Use of Active Profile



METHOD OF GRINDING

PROFILE



GENERATING



POSSIBLE MODIFICATIONS

-TOOTH LINE (BARREL)
 -TOOTH PROFIL
 -HEAD CORRECTION
 -FOOT CORRECTION
 -PRESSURE ANGLE
 -PROFILES UNDEFINED-
 (from CAD import)

-TOOTH LINE (BARREL)
 -URGENT PROFILE
 RESULTING FROM
 DIAMOND DISK



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Liebherr LC 800 Gear hobbing machine

•A 6-axis, numerically controlled vertical machine for producing all possible cylindrical profiles on a cylindrical workpiece. Milling of cylindrical and conical gears and profiles with a special circular tool,
 Technical parameters:

- minimal. Center distance: 55 mm
- Max. Center distance: 560 mm
- Max. Radial speed: 4000 mm / min
- Max. Workpiece diameter: 800 mm
- Max. Swing angle with FK 3.2: +/- 35 °
- Max. Swing speed: 0.5 ° / s
- Max. Hobbing module: 20 mm
- Max. Module profile milling: 24 mm



Richardon R200 CNC Gear Hobbing maschine

A 6-axis, numerically controlled vertical machine for producing all possible cylindrical profiles on a cylindrical workpiece. Milling of cylindrical, conical gears and profiles with a special circular tool, a barrel.

Technical parameters:

- The outer diameter of the workpiece min. 10-300 mm
- 42CrMo 4 max.5 mm steel modules
- Axial distance Radial min. – max. 20 – 210 mm
- Vertical path max. 500 mm





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Wenzel WGT 400 CNC machine for measuring gears

Diameter of parts min./max. 5 – 400 mm
 Inner diameter of the wheel min. > 12 mm
 Range of modules From 0.5 mm
 Wheel width max. 500 mm
 Inclination angle max. <90 °
 Accuracy of control of gears according to VDI / VDE 2612/13, Group I



Wenzel LH 108 3D measuring machine

additional measurements of gears up to 800 mm diameter



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Carburizing

Carbonitriding

Hardening

Tempering

FULL CONTROL PROCESS



Micro hardness testing CHD/ EHT



- Measurements of gear in a tooth cross-section
- Vickers-DIN EN ISO 6507, ASTM E-384, ASTM E92
- KnoopDIN EN ISO 4545, ASTM E-384, ASTM E92
- BrinellDIN EN ISO 6506, ASTM E-10

CNC Induction hardening



FULL CONTROL PROCESS



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MAZAK QTS350M

The QUICK TURN SMART 350 offers machining diameters of 420 mm and machining up to a diameter of 102 mm. The new MAZATROL SMART control system – a dialogue programming system with unrivaled efficiency. Heavy turning – increased rigidity and speed of machining due to the use of roller guides.

- Maximum machining diameter 420 mm
- Maximum machining diameter from the bar 102 mm



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ZKZ MAZAK VTC 800/20HD Matrix Nexus 2

CNC machining center for the production of bodies and other elements of gears

Work space

Table height from the posture-870 mm

Table working surface (transverse) -2.500 mm

Working surface table (longitudinal) -820 mm

Cross slide (longitudinal) of the X-2,000 mm axle

Column (transversal) of the Y-800 mm axis

Spindle head (vertical feed) of the Z-720 mm axis

Maximum spindle speed (standard) 18,000 min⁻¹

Fast travel (X axis) 50 m / min

Fast travel (Y axis) 50 m / min

Fast travel (Z axis) 50 m / min

The size of the T-slot (rotary table) 18mm +0.018 -0.000

Table length 2,500 mm

Table width 820 mm

Automatic tool changer

Tool magazine capacity (standard)



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Okamoto IGM 15 NC III

IGM 15 NC III

•CNC grinder for
two-spindle holes
Range: Ø 6 to Ø 150
grinding: gears –
holes and foreheads
from one mounting



Robbi Omicron CNC 3210

Precision CNC roller grinder with active MARPOS measurement

- The CNC versions were developed in response to needs for medium-high production volumes.
- Equipped with the latest-generation of SIEMENS 840D sl control system.
- The work cycle can be optimised in-process with geometrical and working parameters.
- The machine can be equipped with automatic measurement devices to process complex components.
- The CNC version allows the operator to profile the grind wheel in relation to geometries specifically created for the type of production required.
- High precision crowning operations can be performed by equipping the machines with a third interpolated axis and a bespoke software for this processes.



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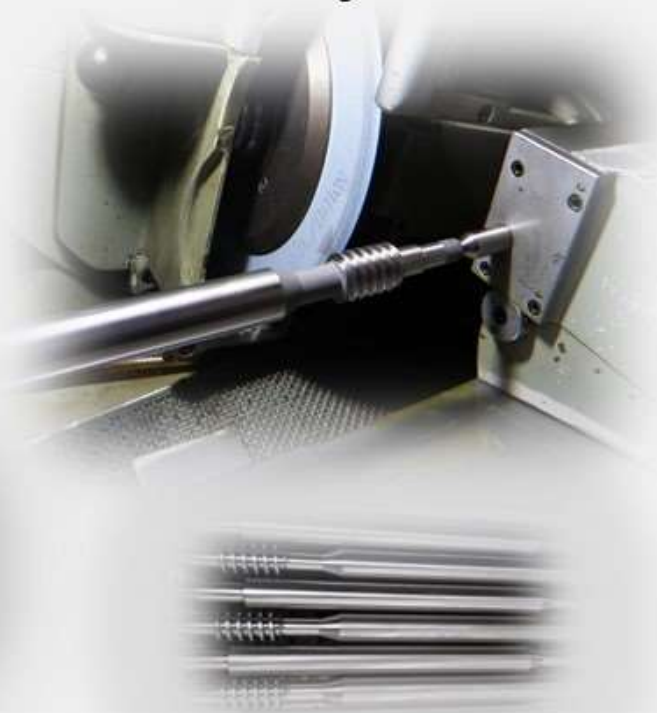
Production of Wormwheels and multi-worm snails



Richardon R200 CNC Thred –snails milling



Reishauer NRK Thread Grinding Maschine





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Ultrasound washing, phosphorating



Fellows

Performing splines

Slotting of involute teeth

Rounding of teeth

Impact marking

Threading

Sandblasting,
glassblasting





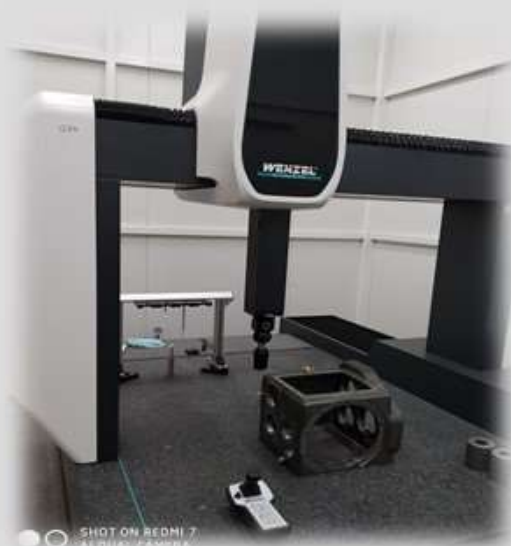
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Assembly of gear boxes





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We support Technical Schools



Warsaw University of Technology

Assembled on the best mechanical parts, of course ours:



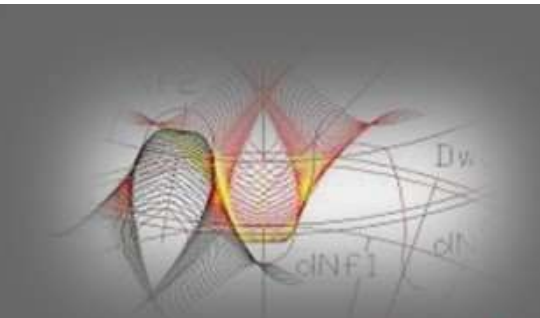
The Mark R17

Wroclaw University of Technology



ROBOCIK





AQAP
2110

PN-EN
ISO
9001

PN-EN
ISO
14001


PCC



ZKZ
SINCE 1983

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