

Technological capabilities



35 years
of experience



30 000 m²



900+
over 900 employees



350+
over 350 machines



7000+
over 7000 products



100 000
sent packages





CERTIFICATES



ISO 9001:2015

Issued by: TÜV SÜD Polska



PN-EN 15085-2:2021

Certification level **CL1**

Issued by: TÜV SÜD Polska



PN-EN ISO 3834-2:2021

Issued by: TÜV SÜD Polska



ENVIRONMENTAL PROTECTION



RENEWABLE SOURCES OF THE ENERGY

- developing the photovoltaic technology
- recovering heat from the production processes



MINIMAL POLLUTION

- oils and coolant filtration
- water dilutable cleaning preparations
- upgrading the powder coating technology



LED LIGHTING

- energy-efficient lightening in the company



RECYCLING

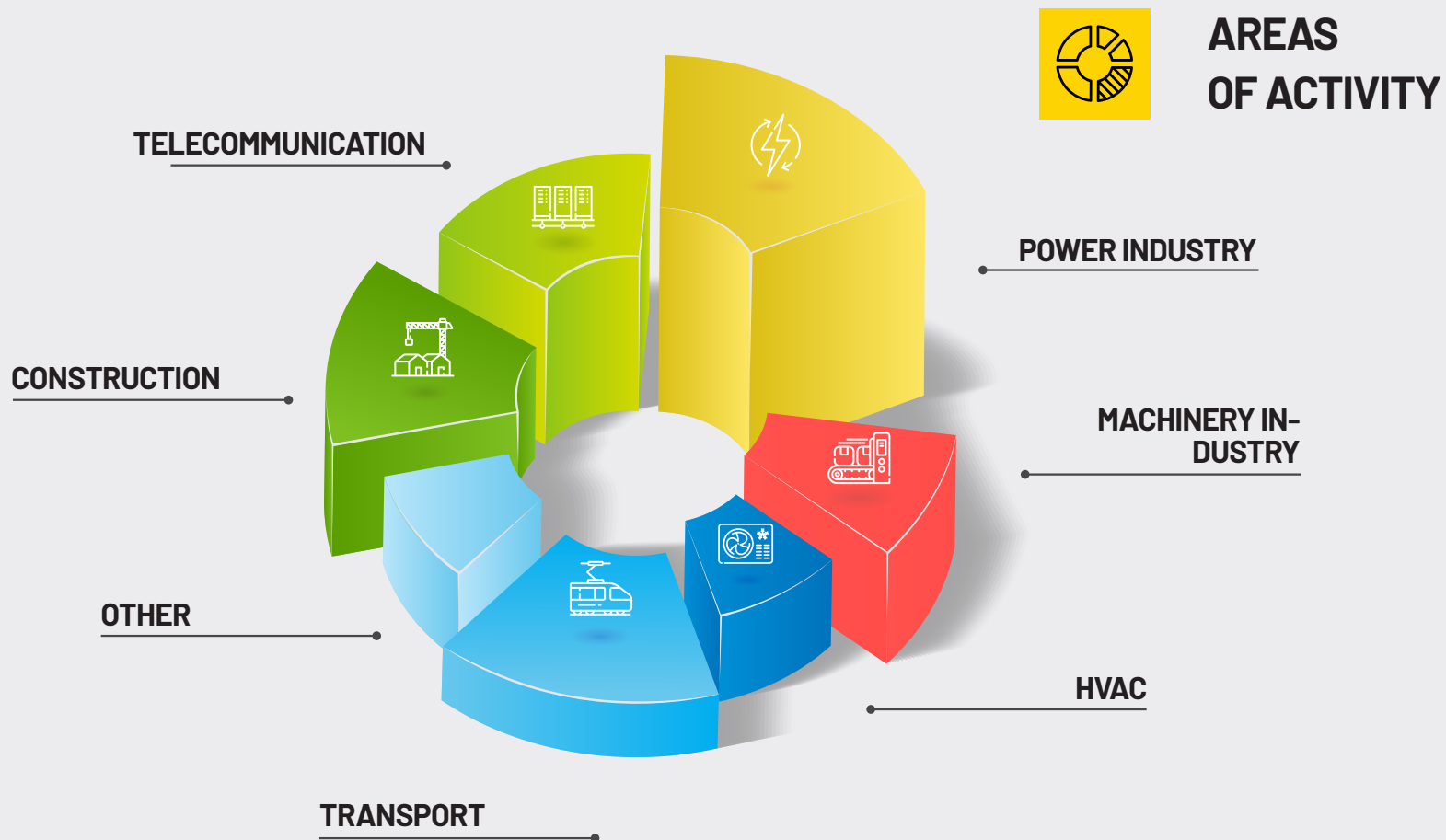
- re-use of raw material
- waste sorting



REACH
COMPLIANT



RoHS
COMPLIANT



ENERGETICS



TELECOMMUNICATION



TRANSPORT



RAILWAY



HVAC



MACHINERY INDUSTRY



CONSTRUCTION



CONSTRUCTION & TECHNOLOGY DEPARTMENT

- Over **40 engineers**
- Design and preparation of technical documentation
- **Technical support** of implemented projects
- Consultancy and creation of individual tools
- **Optimisation of product** design
- **Prototyping 3D in PolyJet** print technology
- Simulation of casting process **FLOW 3D CAST** during construction of tools eliminating potential casting defects
- Resistance and metallographic tests
- **Professional engineering services** (outsourcing)



Software CAD/CAM/CAE



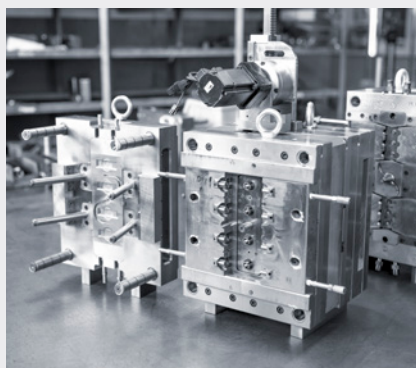
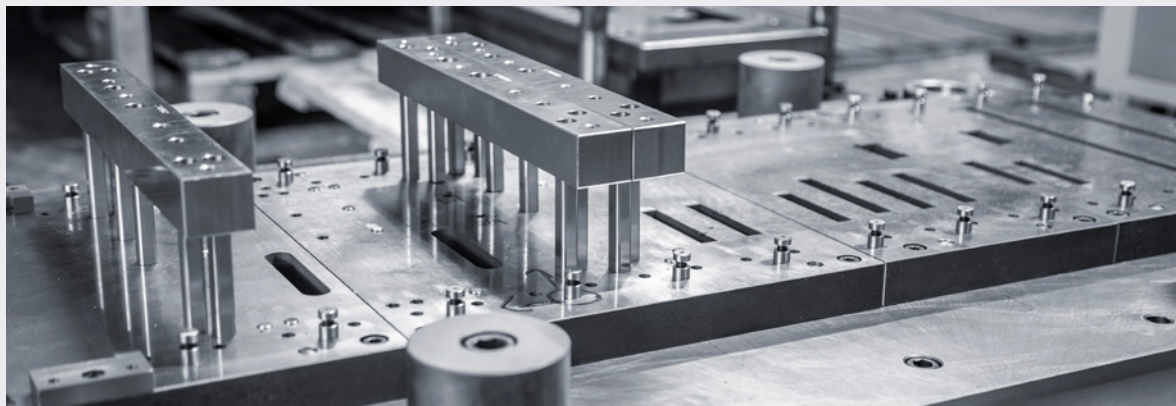
40+

Over 40 engineers

30+

Over 30
solidworks
stations

- **SolidWorks, SolidCam, AutoCad**
30 workstations
- **MES SolidWorks Simulation**
simulation software
- **MOLDEX 3D**
simulation software for plastic injection
- **FLOW 3D Cast**
simulation software for zamak injection
- **Solidworks PDM** - Documents management system



TOOL ROOM

- Injection molds for zinc alloys
- Injection molds for plastics
- Punching dies
- Stamping dies
- Sheet metal processing
- Other specialized instruments

TECHNICAL DATA

Cutting machines

type AGIE CHARMILLES, ACCUTEX

- **Axis travel**
X-350 to X-500 mm
Y-220 to Y-300 mm
Z-220 to Z-300 mm
U45 to U100
V45mm to V100mm
max angle +/-10,25o/80mm to +/-30o/100mm
cutting class 0,18µm to 0,25µm

Die sinking machines

type ROBOFORM 350, FORM 200

- **Axis travel**
X-350, Y-250, Z-300 mm
max element weight: 500kg
table dimensions: 500 x 400mm

Drilling machines type DRILL 11

Grinding machines

- max range of work 400 x 800 mm

Milling Machines

type MIKRON

- **Axis travel**
X-500 to X-1020 mm
Y-450 to Y-560 mm
Z-360 to Z-600 mm

for graphite

- **Max spindle speed**
42 000 obr/min
- **Axis travel**
X-500, Y-450, Z-360 mm

Vacuum furnace AMP

- useful area 250 x 250 x 400 mm (60 kg)

10

erosive centers

12

CNC milling
machines
3 & 5-axis

14

grinding
machines

450

tools in 2023



CNC MILLING

5-axis CNC Milling Machines

HAAS UMC-750



TECHNICAL DATA

Trunnion table

■ Table diameter	500 mm
■ T-slot size	16 mm x 3
■ Table load capacity	300 kg
■ Rotary range of C-axis	360°

Axis travel

■ X-axis travel	762 mm
■ Y-axis travel	508 mm
■ Z-axis travel	508 mm

Distance from spindle nose to table top	102-610 mm
---	------------

27

milling machines
3-axis

6

milling machines
4-axis

7

milling machines
5-axis

24

conventional
milling machines

1

horizontal
machining center



3-axis CNC Milling Machines

DMG M1 / DMG CMX600 / Haas VF3 YT /
Haas VF3 / Doosan / MAZAK VTC 820/30



TECHNICAL DATA

Table

■ Table diameter	820 x 3500 mm
■ Table load capacity	2500 kg

Axis travel

■ X-axis travel	3000 mm
■ Y-axis travel	820 mm
■ Z-axis travel	720 mm

Distance from the table area	140 - 860 mm
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CNC TURNING



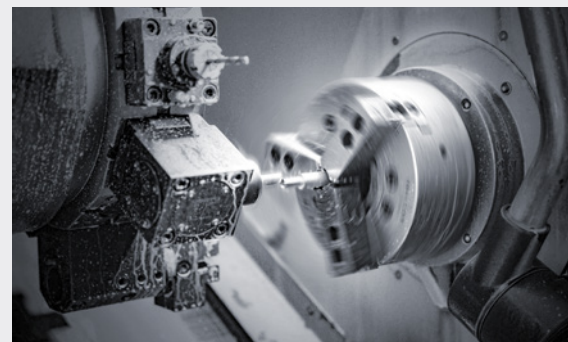
TECHNICAL DATA

Lathe spindle:

- Turning diameter recommended 210 mm
- Max. turning diameter 406 mm
- Max. diameter of the spindle rod 65 mm
- Max. turning length 520 mm

Longitudinal automats

- Max. diameter of the spindle rod 38 mm
- Minimal diameter of turning 2 mm
- Max. turning length 320 mm



HAAS | DOOSAN | TSUGAMI | STAR | DMG | NAMURA | MANURHINTORNOS | OSA100 | VENUS | KNUTH | ESCOMATIC

17

CNC
turret lathes

15

conventional
lathes

18

longitudinal
CNC automats

5

escomatic lathes



LASER CUT TECHNOLOGY



TECHNICAL DATA

Maximum sheet dimensions

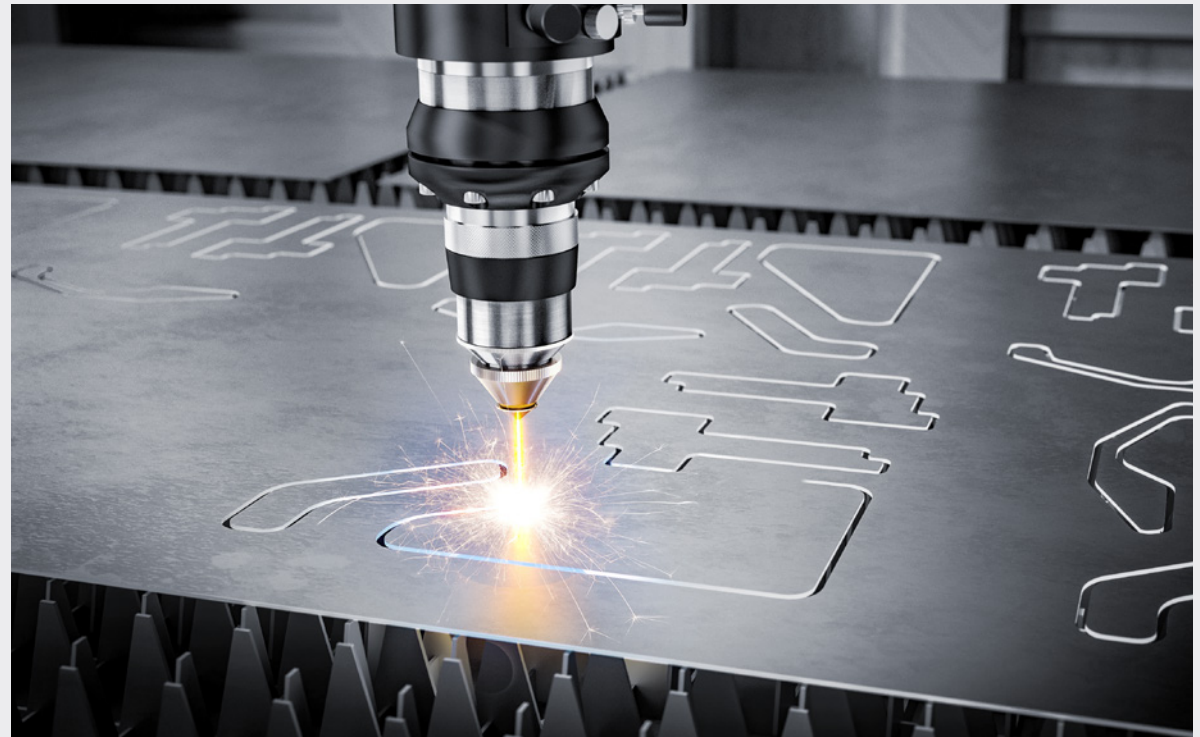
- 3000 x 1500 mm

Maximum thickness of cutting material

- Structural steel **to 25 mm**
- Stainless Steel **to 30 mm**
- Aluminium **to 30 mm**
- Cooper **to 12 mm**
- Brass **to 15 mm**

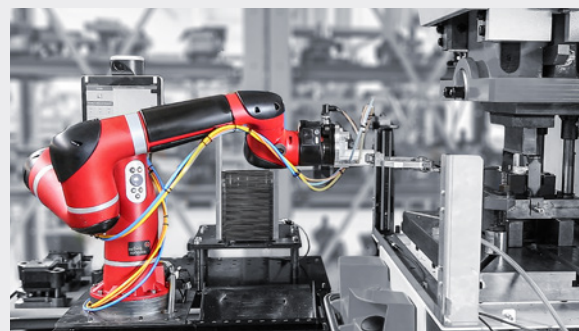
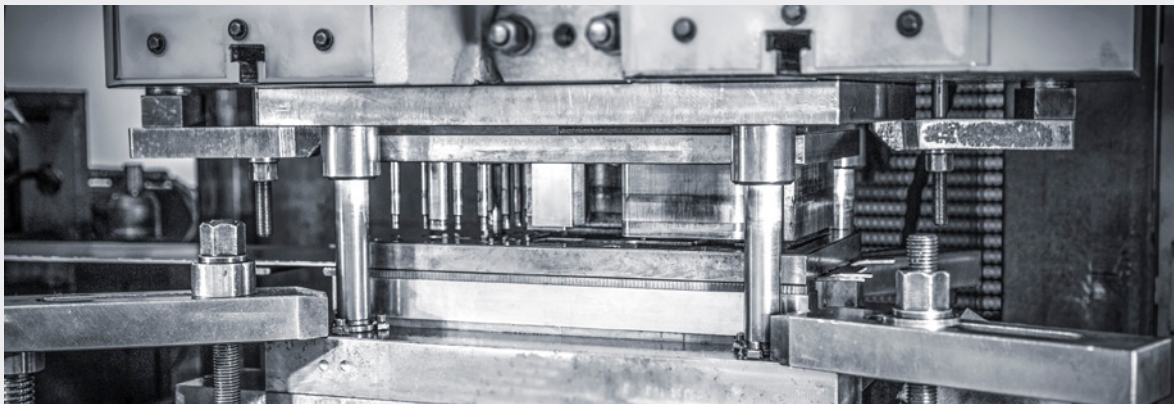
Industrial gases

- oxygen O₂
- nitrogen N₂

**7**

lasers

30 mmmax
cutting thickness**3000x1500**max
sheet dimensions



METAL SHEETS FORMING

- Cutting
- Punching
- Sheet metal bending
- Pressing
- Rolling



TECHNICAL DATA

- Eccentric presses: max pressure up to **300 T**
- Toggle presses max pressure up to **320 T**
- Brake presses max pressure up to **70 T**
- Hydraulic presses max pressure up to **225 T** max bending length **3000 mm**
- **Logopress** software for simulating and assisting in the design of punches and progressive dies to help eliminate potential errors during construction.

100

presses

1030

blanking dies

520

stamping dies

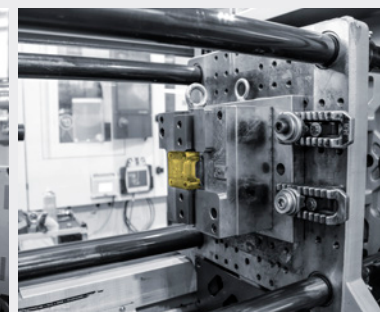
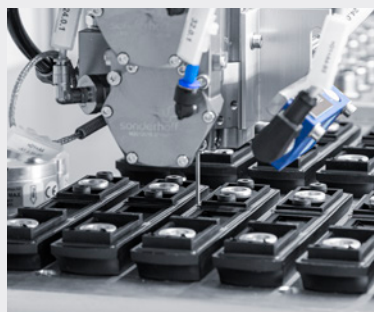


PLASTIC INJECTION MOLDING



TECHNICAL DATA

- Machines clamping force: **35 - 160 T**
- Max Injection **357 g**
- Injectors equipped with manipulators to collect moulded parts
- Vertical injection moulding machine Engel with rotary table
- Possibility to make short prototype series of inserts to injection moulds due to 3d print technology poly jet
- Two component injector to PUR type sealing
- Ultrasonic welding machine



KRAUS MAFFEI | BOY | ARBURG | ENGEL | WITTMANN | PIOVAN | SONDERHOFF

9

injection
machines

4

robotic systems

35-160T

clamping force
from 35 to 160 T

357g

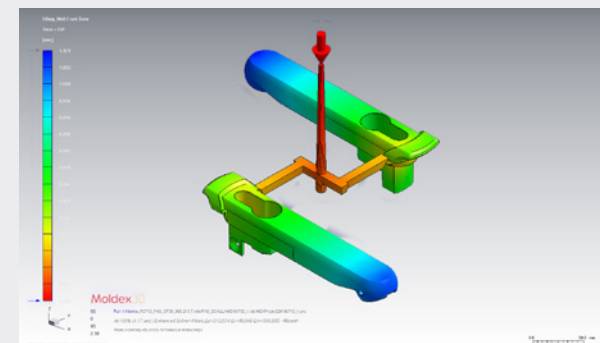
max Injection

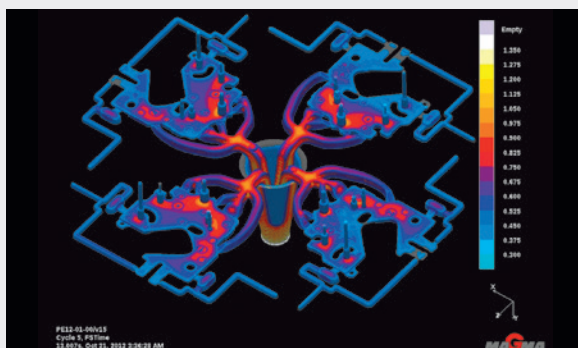
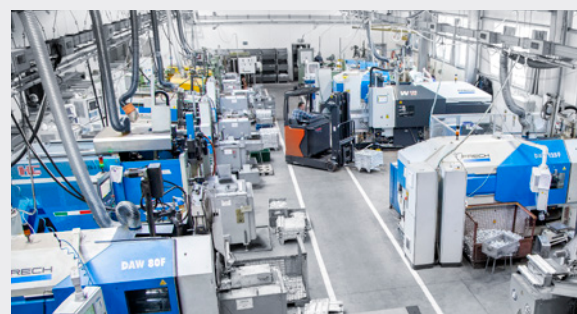
MATERIALS

PA6	PA6 GF	PA66	POM	PC
ABS	PS	PP	PE	TPE

INJECTION SIMULATION

Moldex3D





ZINC DIE CASTING PROCESS TECHNOLOGY

The potential of our foundry is mainly **FRECH** hot chamber machines supported by six-axis collecting **robots KUKA KR 16F**



TECHNICAL DATA

- **15 casting machines**
- Clamping force from: **20 to 200T**
- Max Injection **2200 g**
- **3 automated foundry objectives** / stations equipped with KUKA robots enabling the receipt of details and assembly of inserts in the form
- **FLOW 3D Cast** casting process simulation program
- supporting the construction of the tool, eliminating potential casting defects

FRECH | AGRATI

**SIMULATION
INJECTION**
**FLOW-3D[®]
CAST**

ZINC ALLOY

Z410

Z430

15

Hot Chamber
Injection Machines

3

automated
foundry objectives

200T

max clamping
force 200 T

2200g

Max Injection
2200 g

500x500

clearance
between columns



PRECISE WELDING

Welding TIG/MIG/MAG

Spot welding

Laser welding

MATERIALS (ISO TR 15608)

- Steel: Non-alloy steel, alloys steel, stainless steel
- **group 1.2** - group 1.2 steel of yield point to 375 MPa (example S355JR, S235JR etc.)
- **group 2.2** - finely grained steel thermo-mechanical machined with yield point over 475 MPa (example DOMEX500MC)
- **group 8.1** - Austenitic steel (example X5CrNi18-10)



Welding center with robot KUKA KR C4

CERTIFICATES



PN-EN 15085-2:2021
Certification level CL1

Railway -welding rail vehicles and its parts



PN-EN ISO 3834-2:2021

Quality requirements regarding welding of steel materials.
 -full quality requirement

10

manual stations

5

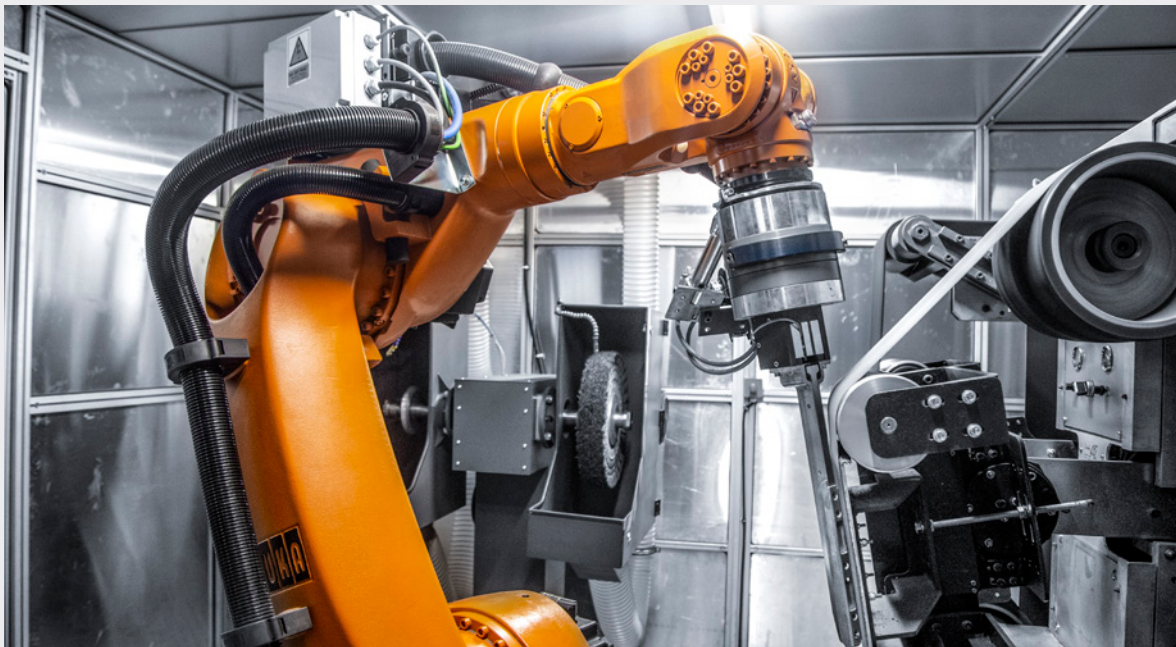
automatic stations

1

robotic station

1

laser welding station



SURFACE FINISH

- Vibro-abrasive machining
- Grinding
- Deburring of sheet metal (including aluminum) on wide belt sanders
- Shotblasting
- Powder painting
- Galvanic treatment
- Laser marking
- Pad printing



13

grinders

1

robotic station

7

electrovibrators

2

shotblasting machines



POWDER COATING

- Chemical preparation in a 4-stage spray washer (Degreasing with phosphatising, 2 x water rinsing, rinsing with demineralised water)
- Electrostatic powder paint application
- Powder paints from the RAL and NCS palette
- Paint polymerisation furnace with dimensions: 1900 × 1500 × 1900 mm (L × W × H)
- Paint polymerisation furnace (for prototypes): 1300 × 700 × 1500 mm (L × W × H)

**2**

paint
polymerisation
furnaces

1

automatic 4-zone
washer

1

dryer





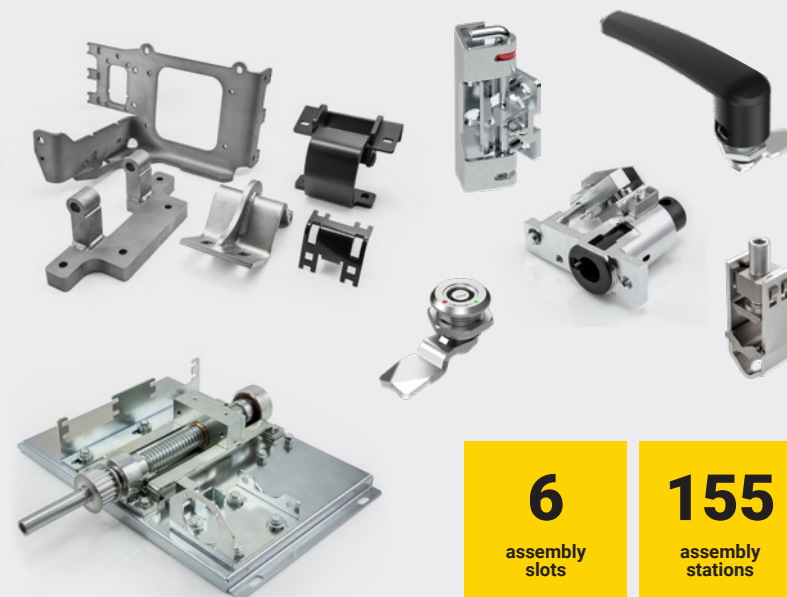
ASSEMBLY

Assembly of catalogue production:

- Locking systems
- Locks, hinges
- Electronic locks (EPA zone)
- Screw clamps

Assembly of custom products:

- Customised designs
- Customisation of catalogue products to meet market and customer needs



6

assembly
slots

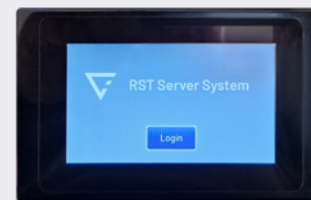
155

assembly
stations



ELECTRONIC EQUIP- MENT ASSEMBLY - EPA AREA

- 12 ESD workstations
- 2 ionisers
- ESD wristband and shoe tester
- Resistance meter
- Electrostatic field meter



12

ESD
workstations

2

ionisers



MATERIALS PROPERTIES RESEARCHES



Salt spray chamber **ASCOTT CC450iP i Q-FOG CCT/1100**

PN-EN ISO 9227, DIN50021, ASTM B117, ASTM G85

Working conditions:
salt spray | humidity condensation | drying | humidity check

Chamber capacity: **450 l**
Inside dimensions: **1010 x 640 x 1140 mm**



Stand for electrochemical corrosion testing **ATLAS 1131**

- assessment of corrosion rate for metal alloys,
- verification of the influence of various factors on the rate of corrosion and on the mechanical properties of materials,
- determination of the properties of protective coatings,
- checking how different groups of materials react with each other.



QUV The QUV weathering **Q-Sun Xe-3**

- rapid weathering test
- light resistance, colour stability, photostability

Sliding trace (dimensions **451 x 718 mm**)

Climatic chamber **Weiss C180/40**

- temperature and humidity impact for the characteristics, function and lifetime of the material

Temperature work range **-40 to 180 °C**,
Humidity regulation range **10% to 98 %**



Water-tightness test according to **PN-EN 60529 standard**

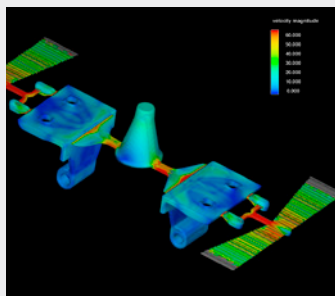
Waterproof class IPX:

- IPX 5
- IPX 6



R&D CENTER

PROTOTYPE LABORATORY



Inject simulation

ProCAST - for zinc alloy cast simulation
Moldex 3D - for synthetic materials injection simulation

- optimisation of injection molds construction
- Supervision of the molded part filling process



Prototype prints **3D printer Objet30 Prime**

- 3D technology poly jet
- precise of the surface and difficult shape geometry

Chamber: **294 x 192 x 148,6 mm**
Growth thickness: **16 µm, 28 µm, 36 µm**
Print accuracy: **0,1 mm**



Hinges sustainability check **PN-EN 1935**

Strength test:

- static load
- shearing
- sustainability
- carrying capacity



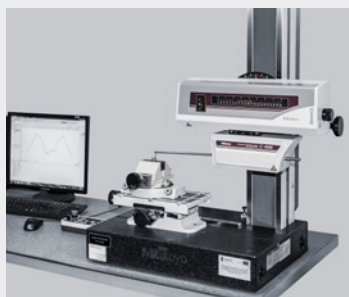
METEOROLOGICAL LABORATORIES

NON-DESTRUCTIVE RESEARCHES



Multisensory Coordinate Measuring Machine **Axiom too HS**

- CCD camera with a telecentric lens
- possibility of non-contact measurements



Contracer contourograph **CV-4500**

- high precision semi-automatic contour measuring device

Measurement ranges:

X up to 120 mm, max rise of the Z profile up to **50 mm**
 Distance of measuring points (in X) **1,0 µm to 8,0 µm**



Digital measurement projector **KEYENCE IM-7000**

- high precision measurement
- measurement of a large number of products simultaneously
- simultaneous height and depth measurement
- automatic data storage
- measuring range 200 x 200 mm



Magnetic defectoscopy **MT2**

The Defectoscope MINIEM type CEM 1500/300 FWDC-3F

Detection of discontinuities:

- of surfaces
- subsurface (to a depth of approx. 3 mm) in ferritic materials
- **MT2** Magnetic powder tests



Penetration testing line

- detection of surface defects with the use of color and fluorescent penetrants
- Penetrant Testing **PT 2**

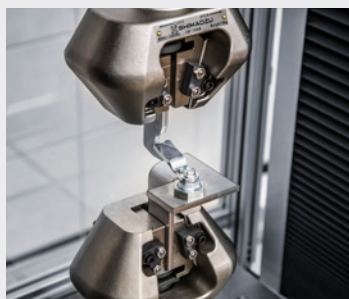


Visual tests

- detection of open surface discontinuities in materials and finished products
- **VT2** visual testing

MATERIALS PROPERTIES RESEARCHES

MATERIALS PROPERTIES RESEARCHES



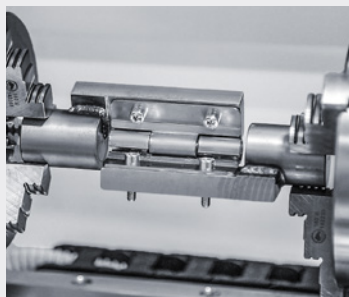
Endurance machine Autograph serii AG-X

- tearing, compression, bending, tensile and shear testing

Force measurement: **1/1000 ± 0,5%**

Range: **from 10 N to 100 kN**

Working space: **1250 x 600 mm**



Torque moment testing machine

- torque determination with torque force recording
- test of resistance to torsion

Range **1 to 100 Nm** (resolution 0.003 Nm).

Max. Sample size: **150 mm in diameter and 250 mm in length**



Universal hardness tester Verzus 750 CCD

EN/IS, ASTM, JIS

Methods:

Brinell, Vickers, Rockwell, Superficial Rockwell, HVT, HBT, H (ISO 2039/1)

Load range: **from 1 to 250 kg**



Shore's hardness tester scale A and D

DIN 53505 (DIN ISO 7619), ASTM D 2240, JIS K7215

Measurement of the hardness of plastics,

- for soft materials - **scale A**
- for hard materials - **scale D**

Accuracy: **± 0.5 units**



SPECTROTEST spectrometer

- analysis of the chemical composition in the spark and arc mode for the following bases: **Fe, Al, Cu, Zn i Ni**
- material grade control
- analysis of intermediates



Spectro-Guide Gloss 45/0 spectrophotometer

Color measurement acc. to **ASTM - D2244, E308, E1164, DIN-5033, 5036, 6174, 11664, 55988, ISO - 7724**

Gloss measurement acc. to **ASTM - D523, D2457, DIN - 67530, ISO - 2814, 7668.**

Measurement range: **400 – 700 nm**
Spectral resolution: **10 nm**

MATERIALS PROPERTIES RESEARCHES



Workstation designated for researching the painting covers

- **Thickness measurements** of the covers on the surface;
F-type - magnetic (iron/steel)
NF-type - non-magnetic (stainless steel)
- **Hardness check** Buchholz method
 BS 3900-E9, DIN 53153, ISO 2815, NF T30-052
- **Checking the bending resistance**,
 grip, flexibility AS/NZS 1580.402.1, ASTM D 522-B,
 ASTM D 1737, ISO 1519-2, JIS K 5600-5-1
- **Impact strength** check, extension, cracking, shelling
 ISO 6272, NF T 30-017, ASTM 2794, ECCA 5
- **Pressurisation check** on the steel surface
 BS 3900 E4, DIN 5315 6, DIN 53232, ECCA T6, EN 13523-6,
 ISO 1520, JIS K 5600-5-2, NBN T22-104, NF T30-019



METALLOGRAPHIC RESEARCHES



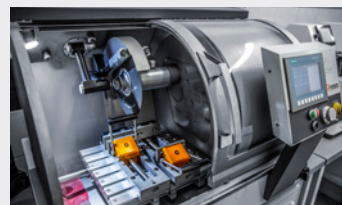
Mikroskop **OLYMPUS BX53M** with camera **OLYMPUS SC180**

zoom-in 50x do 1000x - watching microstructure metals, ceramics and composites.

- microstructure and material phase analysis
- grains size
- cover thickness check

Microscope stereoscopic **OLYMPUS SZX16**

- digital system of image archiving

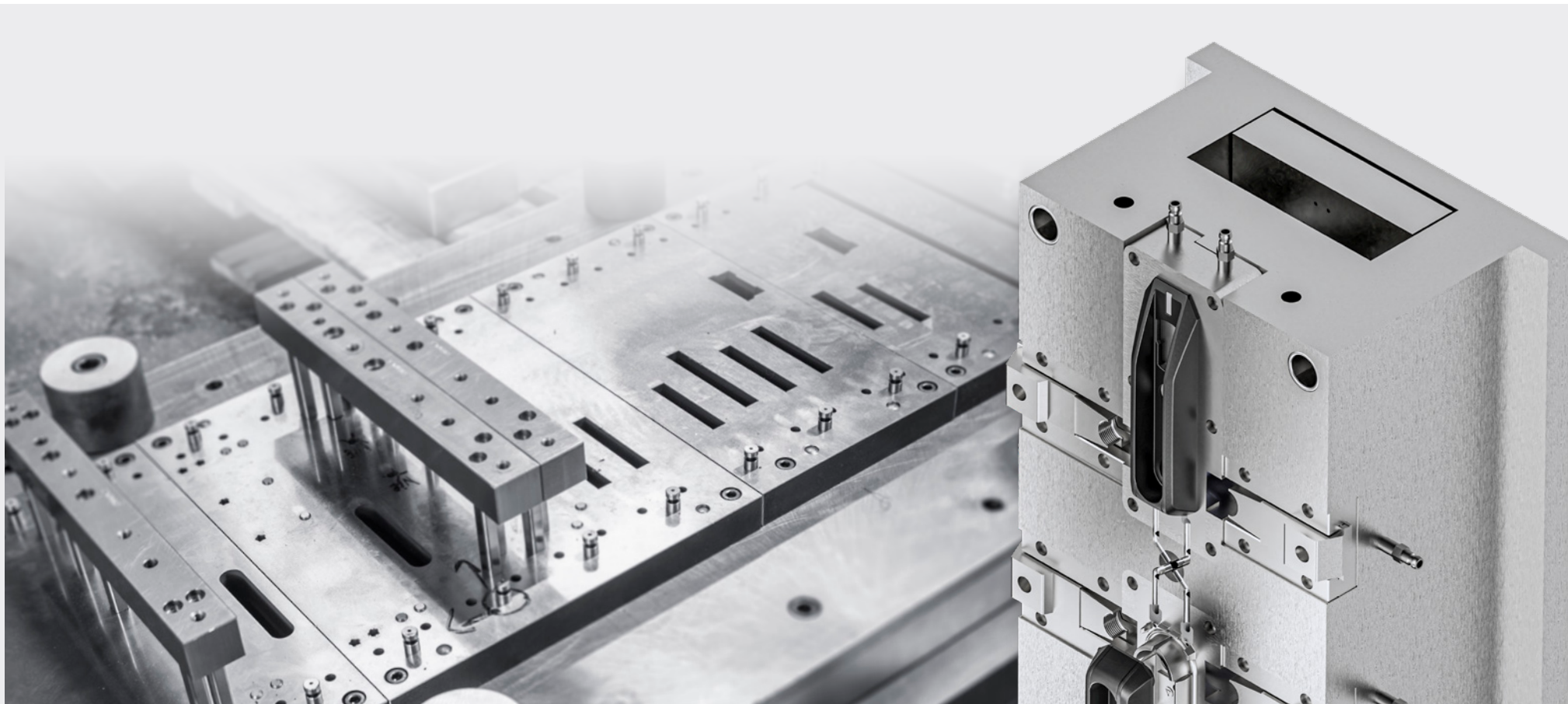


Precision cutter **QCAT 1100A**



Automatic press to mounting **PRESSLAM 1.1 Lam Plan**

Automatic tegrin **MASTERLAM 3.0 Lam Plan**



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worldwide

3500
clients

28
28 distributors
worldwide

15 mln
15 million of products
sold in 2022

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