

## G.W.P. AG – Manufacturing competencies

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### **Assembling**

- Electromechanical assembly
- Industrial / On-site-assembly
- Mechanical assembly

### **Beam welding**

- Electron-beam welding
- Laser-beam welding

### **Bending**

- Bending / folding
- Punching-Forming

### **Cast parts manufacturing**

- Continuous casting
- Gravity die casting
- Investment casting
- Low pressure die casting
- Pressure die casting

### **Combined machining - cutting/punching**

- Combined forming plasma cutting / punching

### **Cutting (thermal / abrasive)**

- Laser cutting 2D
- Plasma fusion cutting
- Water jet cutting 2D
- Water jet cutting 3D
- Water jet cutting, tube & section

### **Deep-drawing / spinning**

- Deep-drawing
- Spinning

### **Die making (cutting / forming)**

- Deep-drawing die making
- Die replacement / wearing part manufacturing
- Impact extrusion die making
- Punching and cutting tool making
- Rod extrusion die making

### **Drilling/boring**

- Deep-hole drilling
- Drilling / threading / tapping

### **Electroforming**

- Electroforming

### **Grinding**

- Belt grinding
- Coordinate jig grinding
- External cylindrical grinding
- Internal cylindrical grinding
- Surface grinding machine

### **Inscripting/engraving**

- Engraver milling

### **Machining of extruded sections**

- Machining of extruded sections

### **Measuring / testing**

- Measuring / testing

### **Metal application / metalizing**

- Chromating
- Chrome-plating
- Electroplating
- EMI-shielding (vacuum metallization of polymers with Al or Cu/NiCr)
- Galvanizing
- Nickel plating

### **Metal powder processing**

- Sintering

### **Metal removal / erosion**

- Chemical deburring
- Etching
- Spark erosion countersinking (EDM)
- Spark erosion wire cutting (EDM)

### **Milling**

- Form milling (3 D)
- HSC milling
- Rod milling
- Surface milling (2 1/2 D)

### **Non-metal application**

- Blacking
- Pad printing
- Phosphatizing
- Screen printing

### **Painting / lacquering**

- Powder-coating (epoxy powder, polyester powder, mixing powder, 2-layer)
- Spray-painting



**Plastic parts manufacturing**

- Extrusion
- Glass-reinforced plastic (GRP)
- Injection moulding
- Injection-mould around inserts
- Multi component injection moulding

**Plastic welding**

- Extrusion welding
- Hot plate / Heated tool welding

**Plastics forming**

- Thermoforming

**Positive & non-positive joining**

- Folding
- Riveting

**Precision machining**

- Abrasive blasting
- Sand blasting
- Shot blasting
- Vibratory grinding

**Pressure welding**

- Spot welding
- Stud welding
- Ultrasonic welding

**Punching / severing**

- Punching / nibbling
- Punching / pressing (Out-of-tool)
- Shearing (rectangular blank/strip)
- Shearing (round blank)

**Rapid prototyping**

- Metal laser sintering
- Rapid prototyping (general)
- Selective laser sintering
- Stereolithography (SLA)

**Sawing / abrasive cutting**

- Abrasive cutting
- Sawing

**Solid forming**

- Drop forging
- Extruding
- Open die forging
- Upsetting

**Surface refinement**

- Pickling

**Thermal processes**

- Annealing
- Annealing / tempering
- Flame-hardening
- Hardening
- Hardening and tempering
- Induction hardening
- Surface hardening (general)

**Thermochemical processes**

- Carbonitriding
- Carburizing
- Case hardening
- Nitriding processes
- Oxidizing

**Threading**

- Thread grinding
- Thread rolling

**Turning**

- Automatic turning (bar)
- Combined machining turning / drilling / milling
- Hard turning
- Swiss turning
- Turning

**Worm machining**

- Worm grinding

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**Exchangeable CAD-formats**

- IGES
- DWG
- STEP
- IGES 3D
- CATIA
- Pro/E