

Equipment

Technical equipment

- Strip rolling mill Duo/Quarto EW 105 x 100
- Servo-screw press Type ES1-S4-80/30
- Roll forming line PK-50
- Laboratory furnace Type LM 512
- CNC-machine KOSY2-MCS
- Induction generators:
 - HFG 50, MFG 10, SDF 225, SINUS 10
- Welding power source:
 - Invertig Pro 280 digital AC/DC
 - HighPULSE 450DW
 - EWM Phoenix 330 ColdArc
 - TransPuls Synergic 5000 CMT

Measuring and testing technique

- Universal testing machine inspekt 150 kN
- Surface roughness tester T1000
- Universal hardness testing machine M1C 010
- Keyence VHX-600 Digital Microscope - 3D topography
- Reflected-light microscope Axio Vert.A1 MAT
- Optical measuring systems:
 - GOM ATOS for Education
 - GOM ARAMIS

Sample preparation

- Precision cut-off machine - Delta AbrasiMet
- Fully automatic mounting press - SimpliMet 3000
- Semi-automatic grinding and polishing machine - Phoenix 4000V/1



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Devision

Forming and Joining



...we get it in shape and join it

Our teaching and research activities focus on the versatile spectrum of forming and joining technology. We cover fundamental research topics as well as the development and implementation of solutions for industrial purposes.

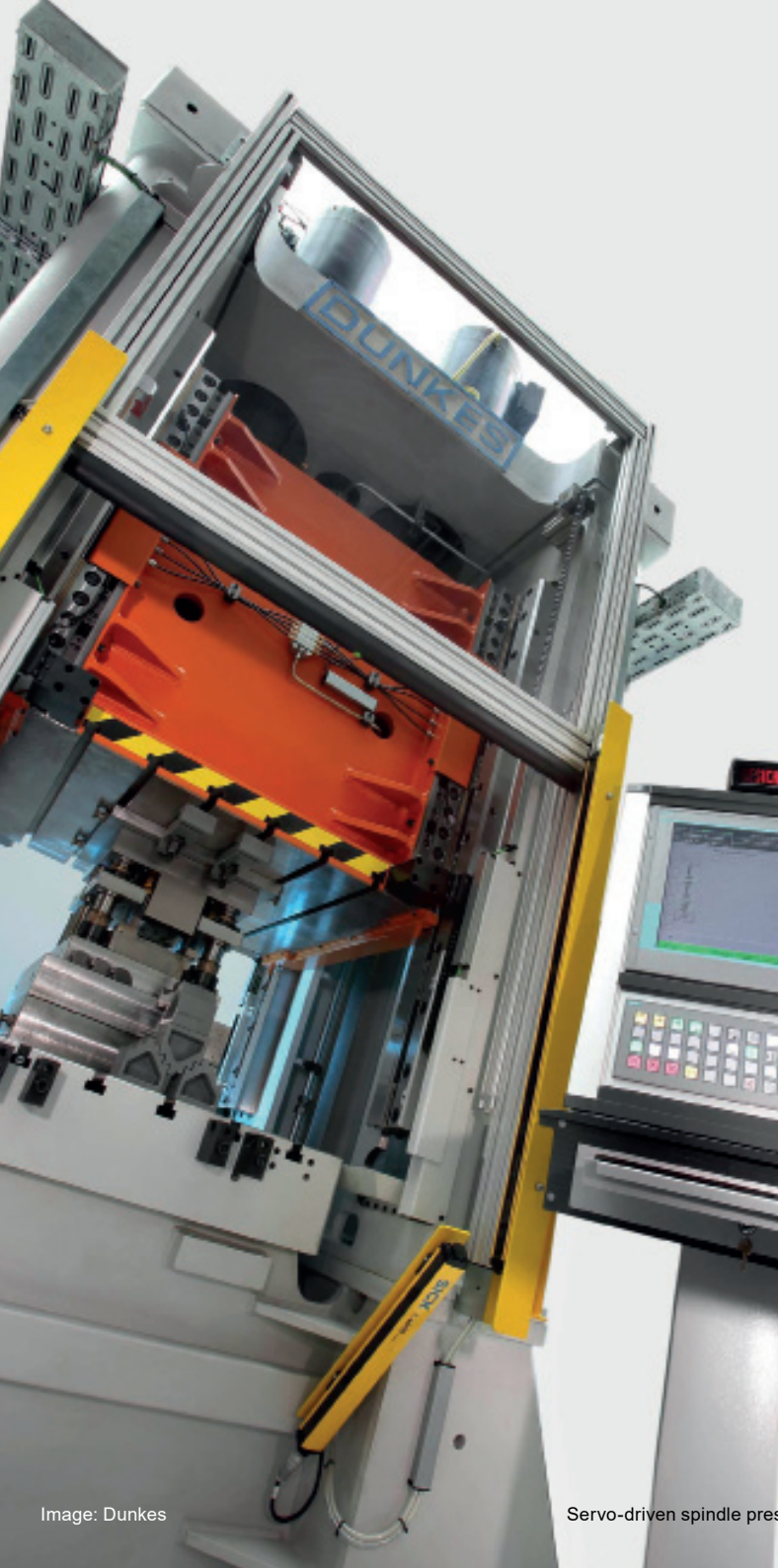
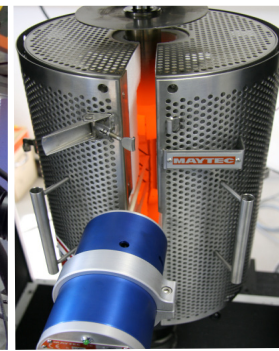
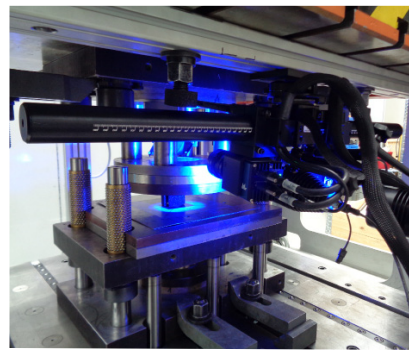


Image: Dunkes

Servo-driven spindle press



FLC test rig and temperature-controlled tensile test

Forming division

Expertise

- Designing energy- and resource-efficient production processes for both sheet metal and bulk forming
- Material characterization and forming of lightweight materials (non-ferrous metals, composites high-strength and ultra-high-strength sheet metal materials)
- Design of forming tools for cold and hot forming (sheet metal and bulk forming)

Range of service

- Basic investigations in sheet metal and bulk forming
 - Materials testing (determination of mechanical - technological properties, metallographic examinations)
 - Sheet metal testing methods (deep-drawing, stretch-drawing and bending tests at room and high temperatures)
 - Feasibility studies on selected topics of sheet metal and bulk forming as well as cutting
 - Application of incremental forming processes for sheets and profiles (ISMF, rolling, roll forming)
 - Simulation of forming processes for method planning and stress analysis
- Design of forming tools and testing on the servo spindle press
- Transfer of research services into practice and production of prototypes

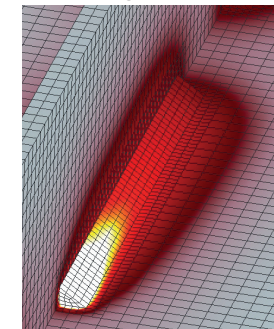
Joining division

Expertise

- Development, simulation, analysis, monitoring and optimization of welding, heat treatment and additive processes, especially in the areas of:
 - Induction and electrical process technology
 - Laser and arc processes
 - Mechanical joining processes
- Materials:
 - High-strength and corrosion-resistant steels
 - Composites, plastics, ceramic materials
- Fields of application:
 - Metal processing, e.g. tube and profile production
 - Microsystems technology and thin-film technology, e.g. wafer and chip assembly, foil welding
 - Automotive engineering, e.g. car body and powertrain

Range of service

- FE numerical simulations and design of welding and heat treatment processes
- Conducting of experimental research
- Realisation of test stands and demonstrators from concept to implementation
- Design and manufacturing of inductors
- Feasibility studies for weldability of materials and material combinations
- Testing of materials and joints



Simulation and experiment regarding GMA welding with inductive preheating