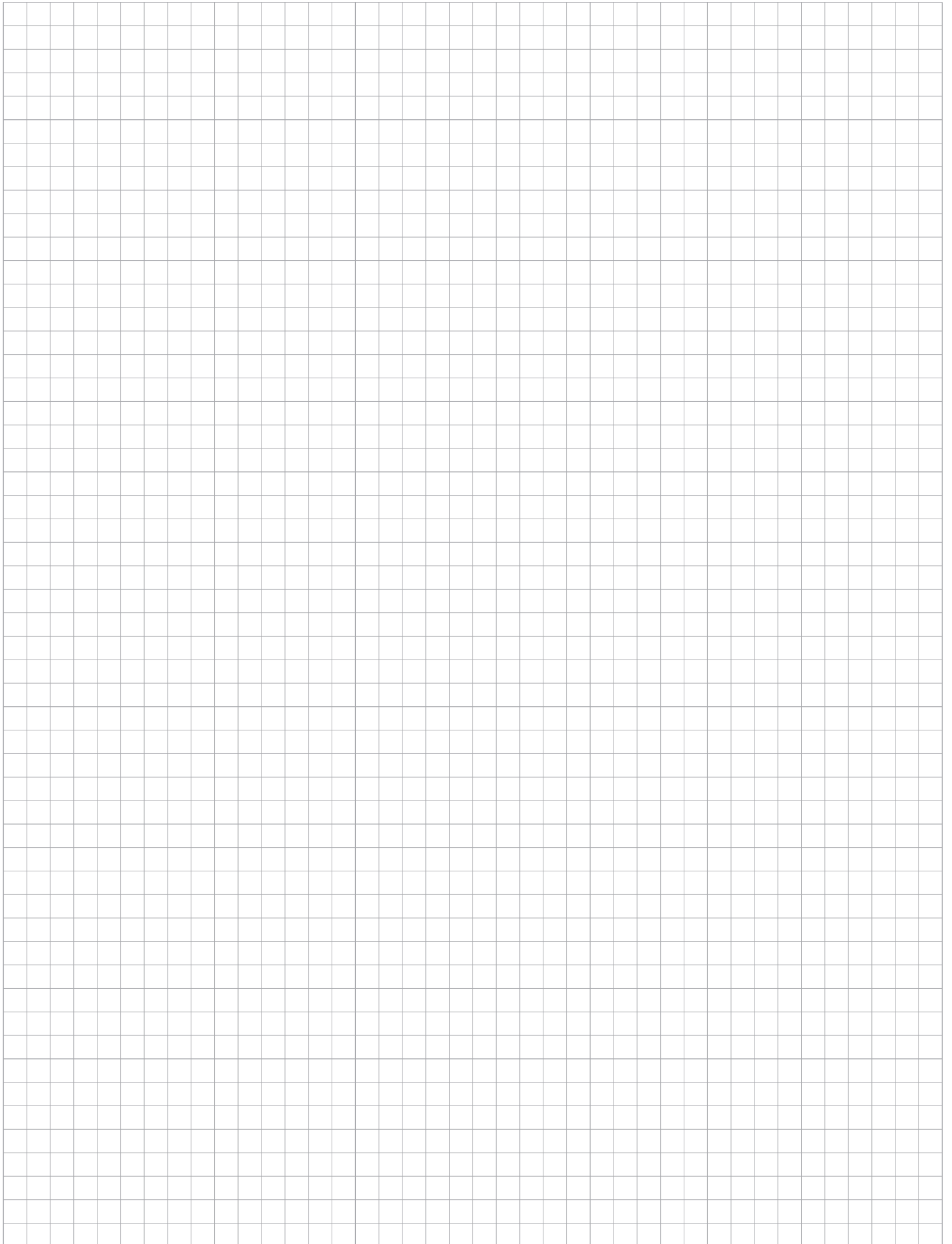


**Ingeneering production**

**I 1**

# Notes

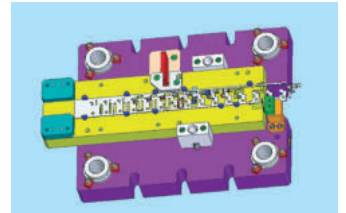


## PRIMARY PRODUCTION AND TOOL SHOP

Basic information related to production possibilities of the tool shop:

Tools for plane forming:

- Simple, progressive, composed, combined, block
- Tools for plane forming made of tool steel and high-speed steel as well as of hard metals
- Tools for all types of eccentric presses (even in case of imported ones), TPO presses, TALO presses and BIHLER, SCHULER, BRUDERER companies
- Tools aimed at processing of material from 0,1 up to 8 mm



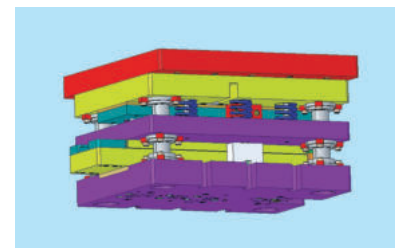
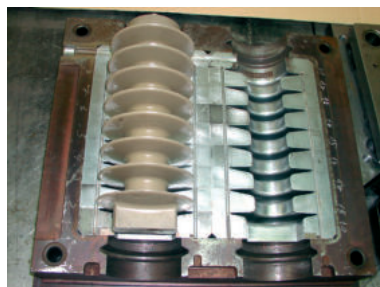
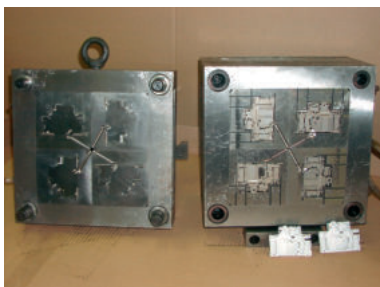
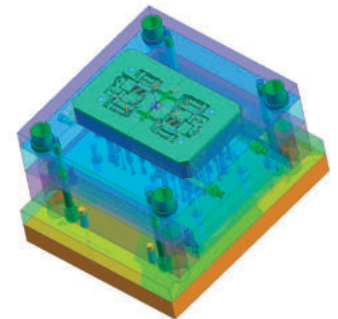
### Molds:

- For pressing of plastic materials, sets, pressure casting of Al, rubber
- For all types of presses

### Jigs:

- Boring, drilling, threading, clamping, welding

Normal components for tools and molds + equipment for grinding of municipal tools



Except for conventional machining equipment with manual control we dispose of the following technological equipment:

- Spark erosion deepening machine from CHARMILLES – of the ROBOFORM 200 type, from AGIE – of the 3U type, AGIE – of the 1U type
- Spark erosion wire cutter of national production, of the EIR 002A type, imported machine supplied by AGIE of the AGIECUT 100, AGIE SPRINT 20 types and by CHARMILLES of the Robofil 440 type
- Precision grinding machine for surface and forms of the FS 640 Z SD type
- Jig-grinding machine supplied by HAUSER of the S3-CNC 314 type
- Profile milling machine supplied by DECKEL of the KF – 25 type
- Machine tool 3 axis center HEDELIUS C60 – dimension of the bench
- FNG 40 milling machine - 3D machining – NC rotary table with the Heidenhein 427 control system, FNG 32 milling machine and Heidenhein 150 control system

#### Software of structures and tool technologies:

**AUTODESK INVENTOR**

**AUTOCAD**

**MECHANICAL DESKTOP**

**UNIGRAPHICS** : extensions **Mold wizard** – extension for designing forms and electrodes

**Manufacturing** – NC programming

**SOLID EDGE**

**PEPS ( CAD / CAM system )**

Precision of manufacturing process depends on used technical equipment up to 0,003 mm. Tool, molds and jigs are manufactured in small and medium sizes with the dimension of machined parts of actuated parts max. 350x500 mm.

With respect to the manufacturing of the above mentioned tool we can provide complete drawings including software for machining equipment.

Comprehensive controlling and technical equipment aimed at measuring performed with precision of 0,001 mm – 3D measuring devices.

The primary production performs surface treatments by galvanizing and painting on part surfaces. It deals even with welding of sheet vessels and other structures. The mechanical engineering plant is able in cooperation with other supporting department of the joint stock company to provide manufacturing of any parts in accordance with supplied drawings. Another alternative of cooperation is represented by manufacturing of parts after having received finished jigs.

#### Manufacturing of surface formed parts

These are manufactured by means of simple, progressive, composes and combined tools when processing sheets and strip of Fe, Cu, Ms and Al of the thickness 0,1 up to 8 mm. The shop disposes of up-to-date BRUDERER BSTA 41 and BSTA 50 high-speed automates, TALO 25 and TPO 25 A machining equipment and conventional eccentric presses aimed at manufacturing of large series parts up to the 2,5 mm of the sheet thickness and of small series parts up to the 2 – 8 mm and exceptionally 15 mm of the sheet thickness having the forming force from 10 t up to 16 t (LEN 10A, LEN 25C, A, LEN 63C, LEPA 100VA, LEK 160, VSS 160). Our maximal possibilities of forming are represented by the crank eccentric press having the force of 400 t situated in separate premises having the possibility of cutting, punching, bending, surface forming or any combination of these operations. The use of this press is especially suitable for manufacturing of metallic parts for automotive industry.

#### Arc welding – manufacturing of sheet vessels by welding

Welding of vessels and other structures is performed on the WTU 315 welding rectifiers, MAG semi-automatic welding machines.

Low carbon steel is welded by rods with acid and alkaline coating without preheating, in CO<sub>2</sub> atmosphere. Low carbon steel may be welded even by means of flame welding.



## Manufacturing of parts cutting machining

Parts are manufactured according to volume and complexity of parts. A conventional technology is applied on centre lathes, revolver lathes and finishing lathes, milling machines, drilling machines, grinding machines and threading machines. Large scale manufacturing is performed on one spindle revolver automates (A20, A20B, A40C) automates with long revolving run (AWA 4M, AWA 7, ADA 6, AWA 10, AWA 16, AWA 25) as well as multi spindle high performance lathe automates (TORNOS SAS 16 DC).

Manufacturing of tube rivets is performed on JUS. Continuous grinding is performed on 3M 182, BB 10 center less grinding machines. Precisely formed parts having the nature of large scale production are manufactured on chucking and revolver NS lathes (SPL 25 NCA, SPRY 40 NC). In addition to the machining operation we can provide a productive technology of thread and worm manufacturing on rolling machines by necking down and partially by a continuous method (UPW 12,5.1, UPW 31,5.100).

## Resistance spot welding – manufacturing of subassemblies by spot welding

For these operations 40 kVA and 80 kVA pneumatic spot welding machines and 4 kVA and 10kVA pneumatic micro-spot welding machines are used.

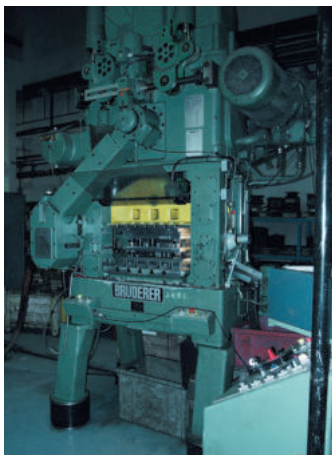
We dispose of all equipment needed for welding of Fe, Cu, Ms, Br, bimetals and their combinations.

## Surface treatment performed by galvanizing

This kind of surface treatment is ensured by mass and stationary galvanizing with chromium plating (yellow or eventually blue), mass and stationary silver plating and nickel plating, mass tinning and copper plating.

## Surface treatment performed by painting

This kind of surface treatment is ensured by spraying application of various coating materials such as synthetic, nitrocellulose based and baking coating materials.



# Notes

