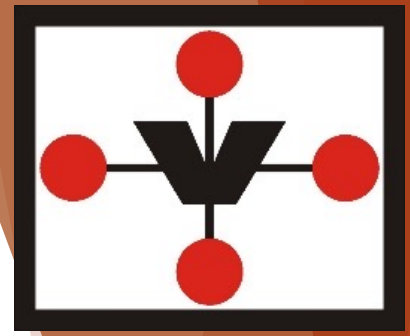


Vorbach

Tool and mould making from a single source



Our promise:

- ❖ **From the idea to the finished series part**

Development and manufacture of sophisticated and high-precision injection moulds for the automotive, electrical, leisure and packaging industries.

- ❖ **Reliability**

IN-House Development and Construction

- ❖ **Excellent quality**

Flexibility and precision thanks to state-of-the-art machine equipment and specialised personnel

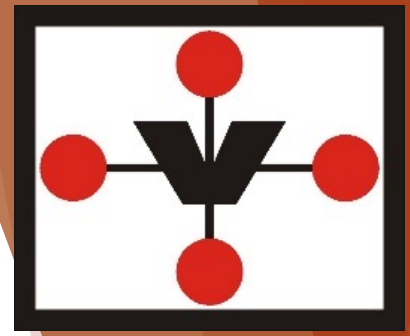
- ❖ **Punctuality**

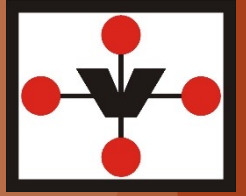
Vorbach

Expertise at the Kaufbeuren site / GERMANY

Our standards:

- ❖ Experienced in the electronics industry
- ❖ Experienced in multi-component injection moulds up to 3-K
- ❖ Fully networked CNC structure
- ❖ Running time: 24 hours on 7 days possible





Vorbach - expertise

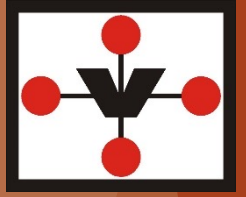
Handling System Room+Kreim Chameleon 4

Machines integrated into automation:

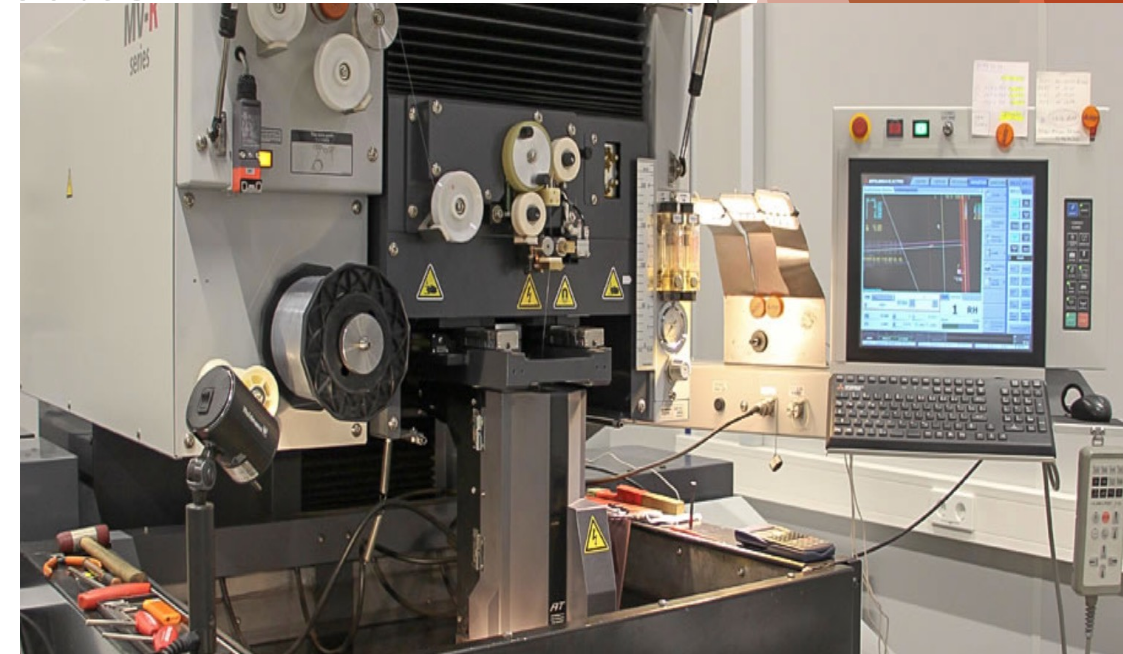
- ❖ Sinker ZK700 (350 x 400 x 350 mm travel)
- ❖ Sinker ZK1000 (500 x 700 x 500)
- ❖ Röders HSC 5-axis RXP600DSH (500 x 680 x 400)
- ❖ Röders HSC 5-axis RXP500DS (450 x 455 x 240)
- ❖ Measuring machine Zeiss Vista (400 x 500 x 350)



Vorbach - expertise

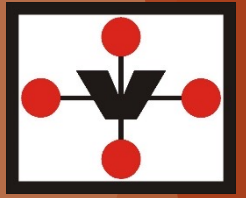
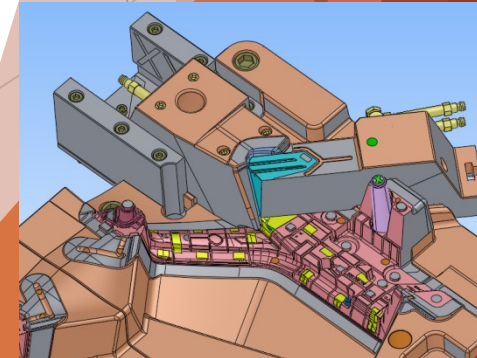
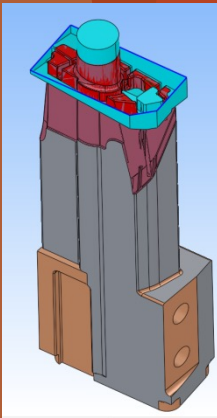
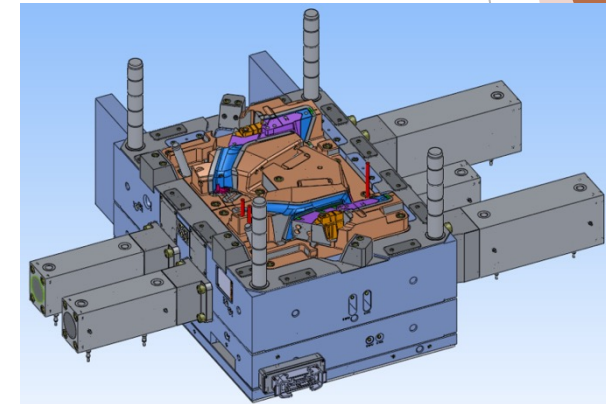
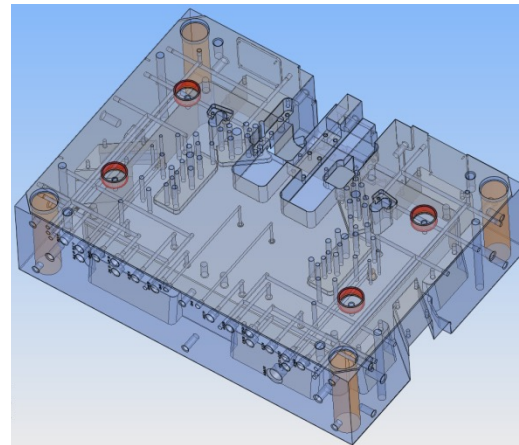
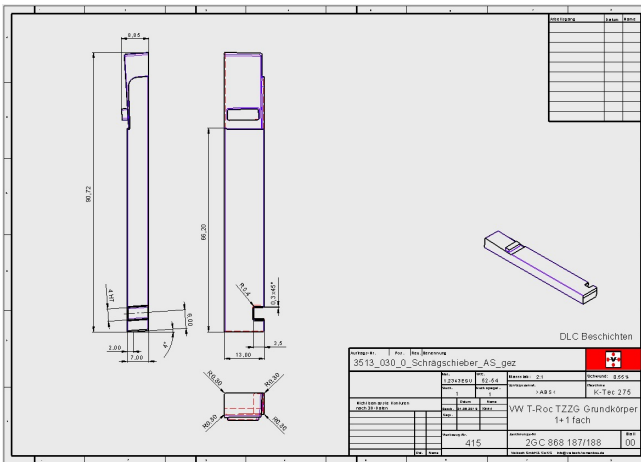


- ❖ Injection mould construction
 - 3K / 2K - Tools
 - Rotary Table Tools
 - Hybrid tools
 - Tools for belt spraying
- ❖ Repair service / conversion of injection moulds
- ❖ Alu deep drawing tools
- ❖ Device construction
- ❖ Precise single-part and batch production
- ❖

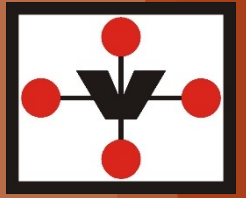


Vorbach - expertise

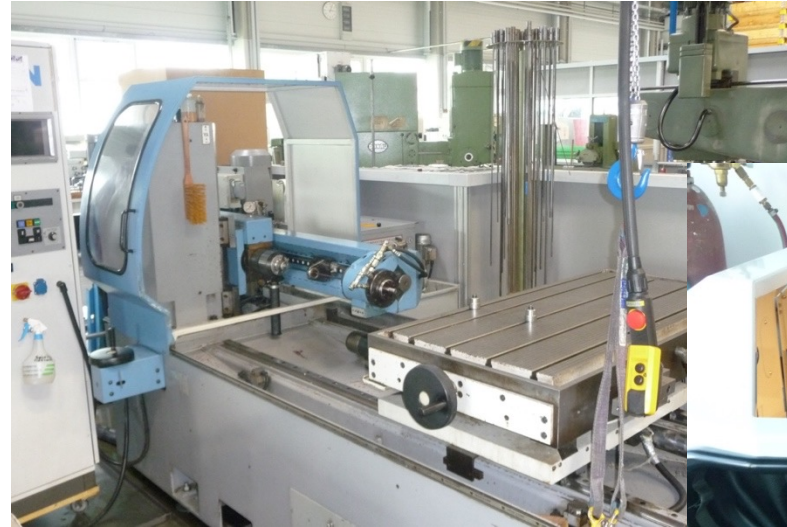
- ❖ CAD construction
- ❖ 3D-CAD-System (CimatronE)
- ❖ CAM programming (Work NC/ PowerMill)
- ❖ Laser engraving
- ❖



Vorbach - Manufacturing areas



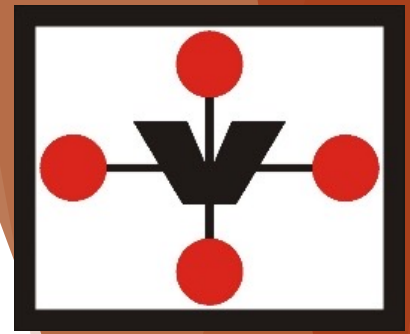
- ❖ Milling 3- /5-axis
- ❖ Rotating
- ❖ Wire eroding
- ❖ Deep hole drilling
- ❖ Grinding
- ❖ Laser welding
- ❖ Single and small parts manufacturing



Vorbach

Tool and mould making from a single source

Vorbach GmbH & Co. KG - Leo-Lutz-Str. 4 - 87600 Kaufbeuren



owner: Christian Vorbach

Dipl.-Ing. (FH), Dipl. Wirtschafts-Ing. (FH)

E-Mail: vorbach@vorbach-formenbau.de

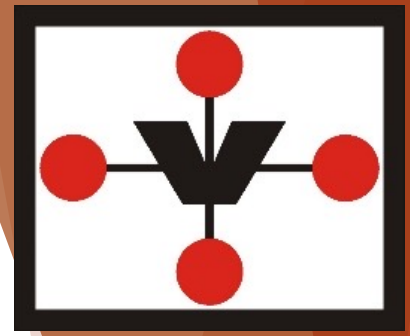
Tel.: 0 83 41 - 96 67 88 - 0

Mobil: 0172 - 83 50 503



Vorbach

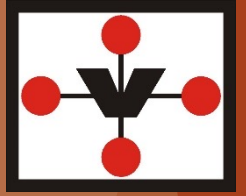
Expertise at the Kaufbeuren site / GERMANY



❖ Our product examples

- ❖ From the mould making sector
- ❖ Request to the item
- ❖ Presenting the implementation
- ❖ Illustration of the finished product

Product Examples - Mould Making



Requirements Article:

- Tool Weight: 9.7t
- Absolutely burr-free closure - high-quality surface (later galvanizing)
- Powder steel inserts, hardened, highly polished

2K tool in turntable technology "seat clamp"

Customer: KTB

Material VS: Lexan LS 1

Material FS: Xantar C CP 200 LT

Guaranteed output: 1 million rounds

Dimensions shape structure: 1496 x 896 x 1022 mm

Weight: 9.7t !!!

2+2-fold / 2 falling parts

Sprue VS: 3 HK nozzles with NV / direct connection

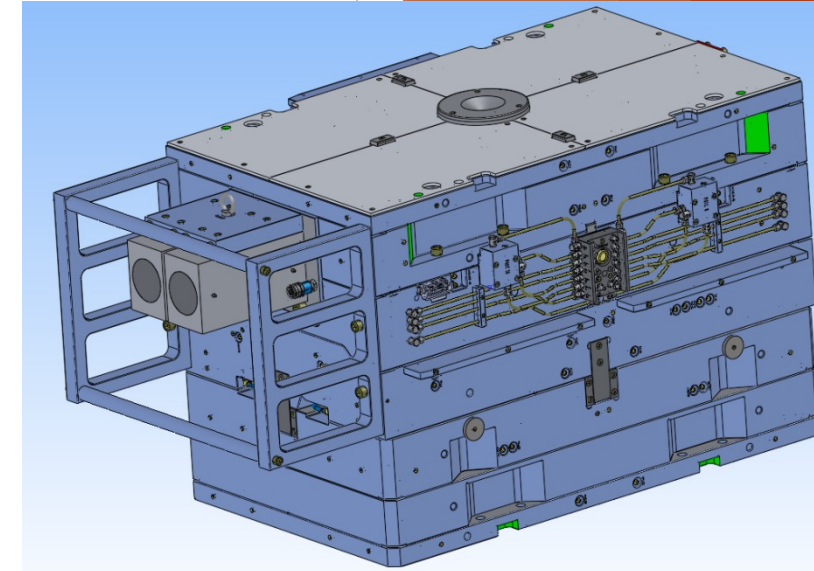
Spsps FS: 3 HK nozzles with NV / direct connection per FN

5 mechanically operated sliders

3 mechanically operated sliders FS



1. component (VS)



Product Examples - Mould Making

Requirements Article:

- absolutely burr-free - high-quality surface (later electroplating)
- Powder steel inserts, hardened, highly polished

2K tool in turntable technology "tilt lever"

Customer: KTB

Material VS: Makrolon PC 2407 SW

Material FS: Novodur P2 MC

Guaranteed output: 1 million rounds

Dimensions of shape structure: 796 x 526 x 617 mm

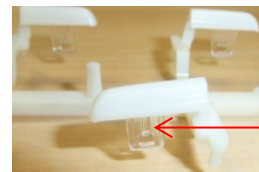
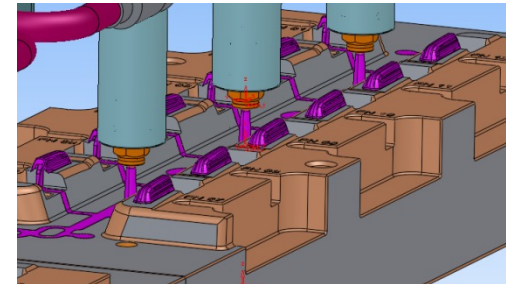
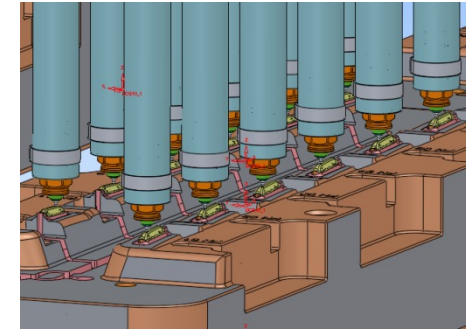
24 falling parts (2 x 12 pcs.)

Sprue VS: 24-speed HD system with NV / direct connection

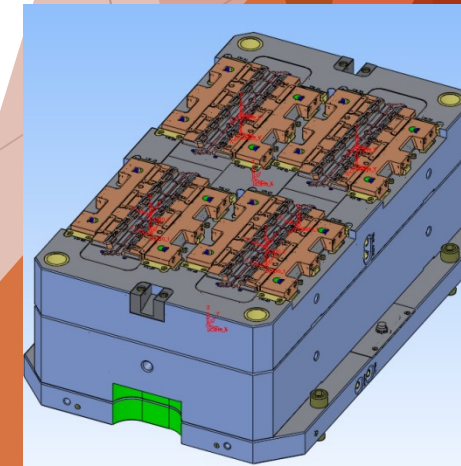
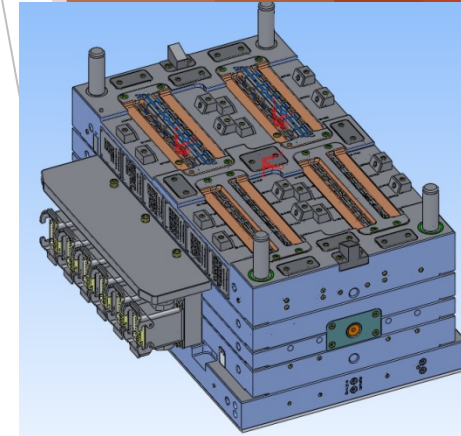
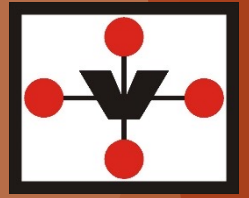
Spsps FS: 6-speed HD system with torpedo nozzle / Directly on cold channel

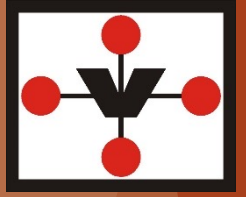
8 mechanically operated sliders

48 mechanically operated inclined valves



← 1. component (VS)





Product Examples - Mould Making

Requirements Article:

- high quality surface, 3rd component (FS)
- Inserts made of SPM 450V, hardened to approx. 60 HRC - high gloss polished

3K tool in turntable technology "Blende Supersport"

Customer: KTB

Material pre-spraying: PC APEC 1695 black

Material intermediate spraying: Alcom PC 740/4 transparent

Material pre-filled spraying: Novodur Ultra

Guaranteed output: 1 million rounds

Dimensions of shape structure: 896 x 796 x 674 mm

2+2-fold falling

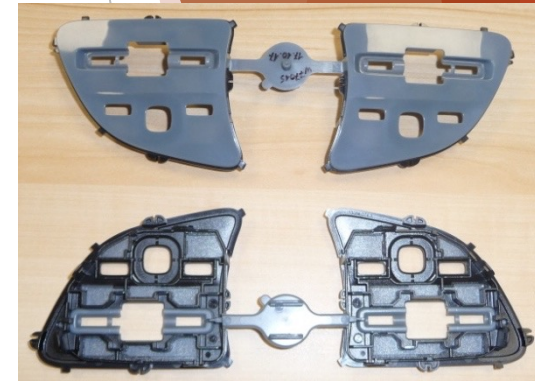
4 mechanically operated underfloor valves per FN (AS)

Spmps VS: 2 HK nozzles with NV / direct connection

Sprue ZS: 2 HK nozzles with NV / direct connection

Sprue FS: 2 HK nozzles with NV for all 4 FN / directly on cold channel

3. component (FS)



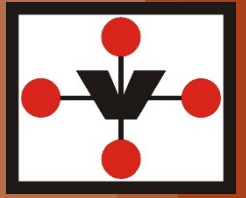
1. component (VS)

2. Component (ZS)
(Light guide)



Galvanized article

Product Examples - Mould Making



Requirements Article:

- complex building geometry to be demoulded

GID tool "TZZG base VW T-Roc"

Customer: Engel

Material: ABS

Cycle time: 55 s

Service life WZ: 750,000 cycles

Dimensions of shape structure: 846 x 626 x 700 mm

1 + 1 -fold (right and left version)

2-fold HK-system open nozzle on cold channel distributor

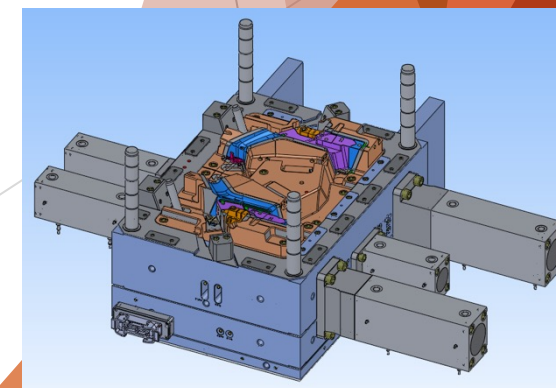
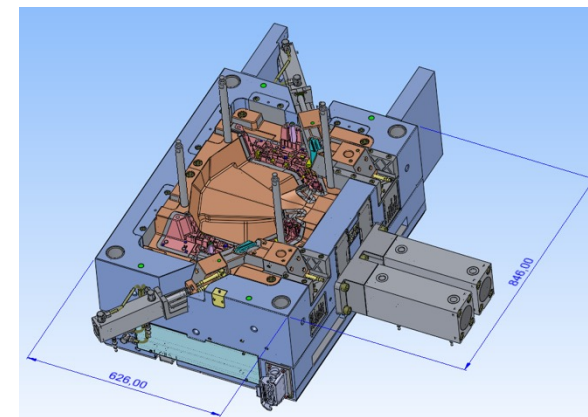
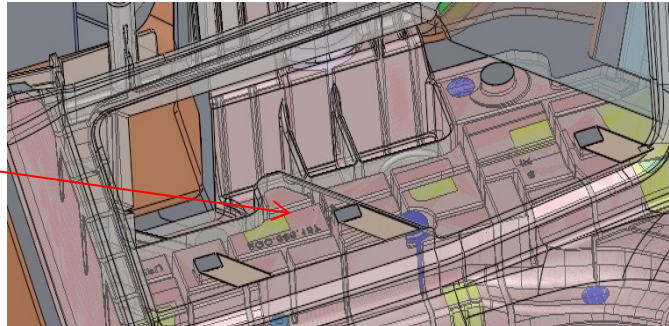
Connection with tunnel, gas internal pressure technology

Per cavity 2 hydraulically operated sliders, 1 hydr. actuated

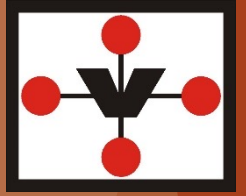
Inclined slider, 3 hydr. operated underfloor sliders,

1 mech. operated slider, several mech. operated slanted sliders.

Gas
needle



Product Examples - Mould Making



Requirements Article:

- 3 hydraulic circuits per half of the mould
- Mapping complex functionality

Round table tool (2x AS, 1x DS) "MMP enclosure"

Customer: Hardener

Material: PBT GF 30

Cycle time: 48 s

Service life WZ: 1.5 million rounds

Dimensions of shape structure: 446 x 796 x 674 mm

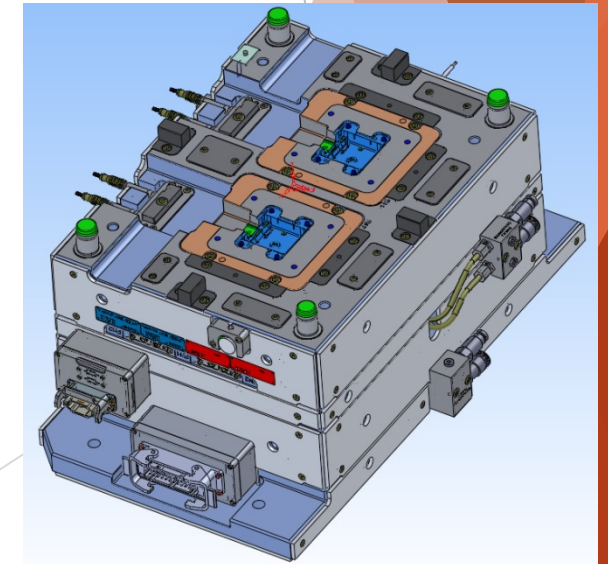
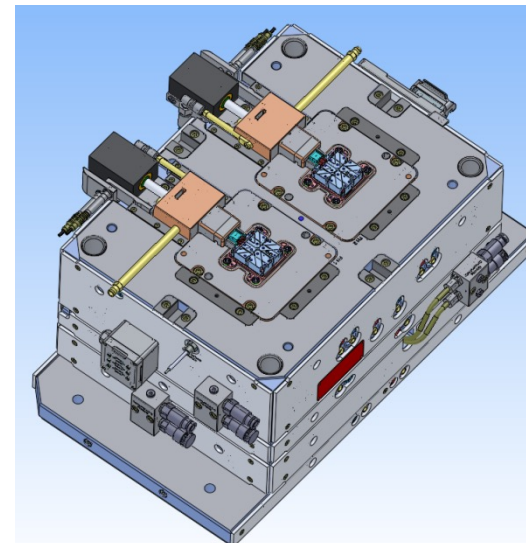
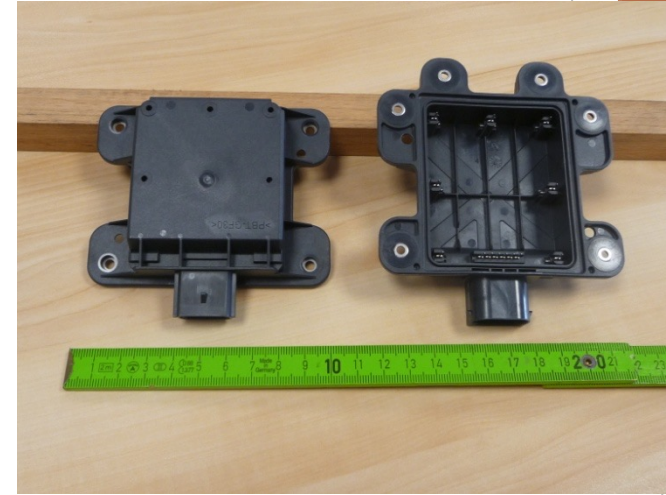
2-fold falling

Insert: Punched parts (insert parts)

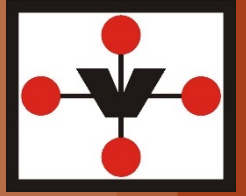
1 hydraulically operated slider per FN

3 hydraulically operated core pulls per half of the mould AS + DS

Direct injection via hot runner system with 2x hydr. NV nozzles



Product Examples - Mould Making



Requirements Article:

- Optimization of the previous Tool construction
- Revision of tool inserts

Round table tool set (each 2x AS, 1x DS) "Sensors dance grid"

Customer: Hardener

Material: PA 66 MH 14-110 GF35

Cycle time: 25 s

Guaranteed output: 1.5 million rounds

1. WZ pre-injection

Dimensions of shape structure: 346 x 446 x 414 mm

2-fold falling

Insert: Punching part

1 hydraulically operated slider per FN

Direct injection via hot runner system with 4x hydr. NV nozzles and 6x open nozzles

2. WZ main spraying

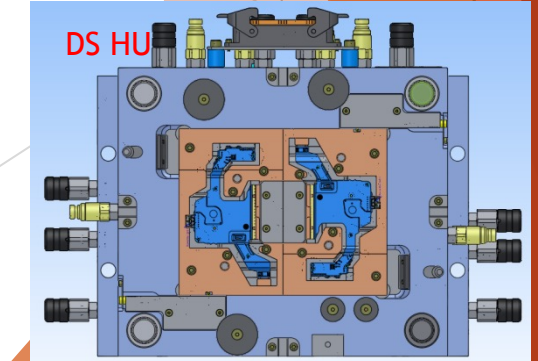
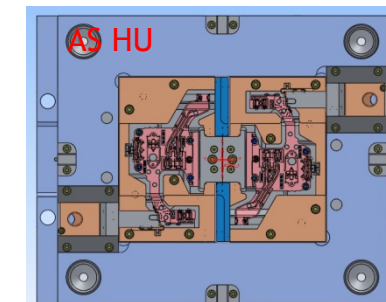
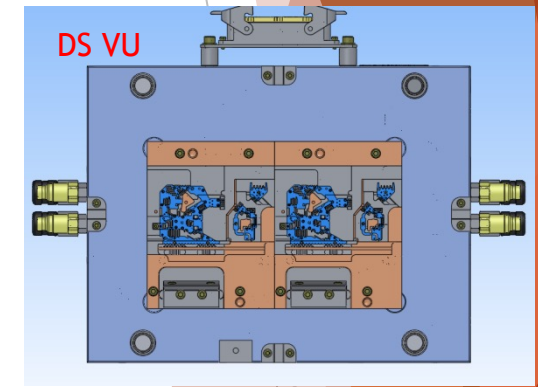
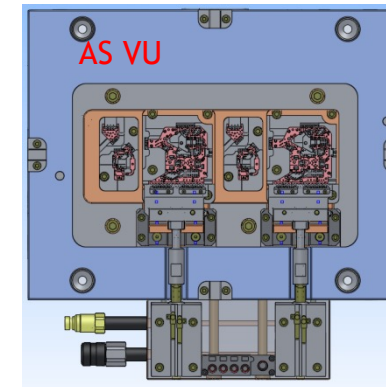
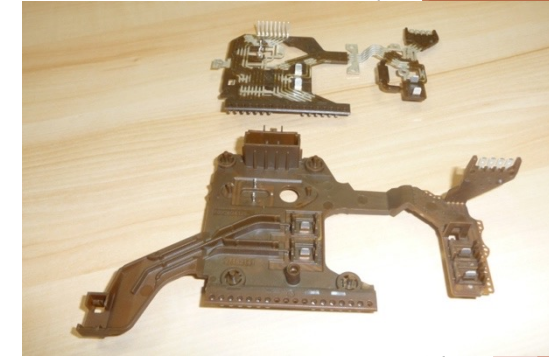
Dimensions of shape structure: 346 x 446 x 425 mm

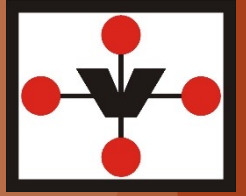
2-fold falling

Insert: pre-injected component

1 mechanically actuated slider per FN

Direct injection via hot runner system with 10 hydr. NV nozzles





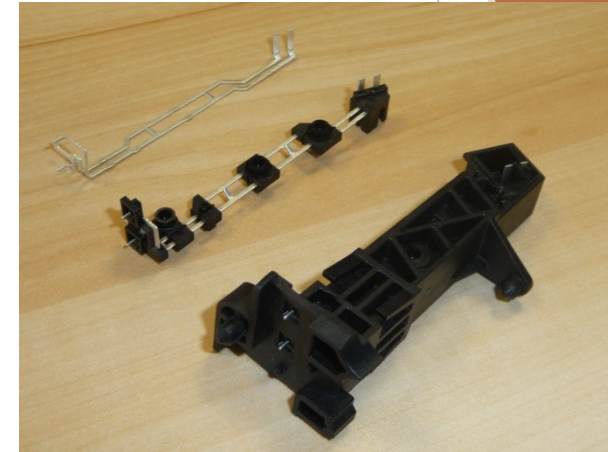
Product Examples - Mould Making

Requirements Article:

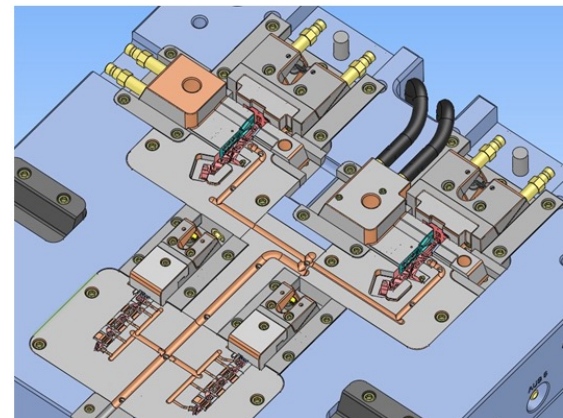
- 2 pre-injections each with simultaneous Pre-filled spraying

Round table tool (2x AS, 1x DS) "Sensordome"
Customer: Swoboda
Material: PA66 GF35

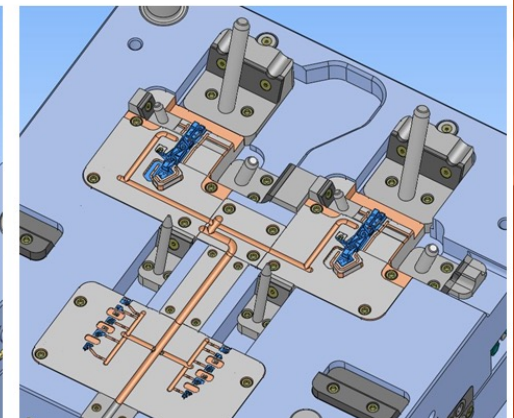
Dimensions of shape structure: 434 x 546 x 413 mm
2x VU + 2x HU per AS (2-fold falling HU)
Insert: VU: Punched part / HU: Pre-spray
Punching function via block cylinder
1 mechanically operated slider per FN VU
2 mechanically operated sliders per FN HU
Connection: Tunnel anguss



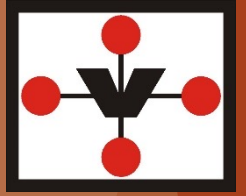
AS



DS

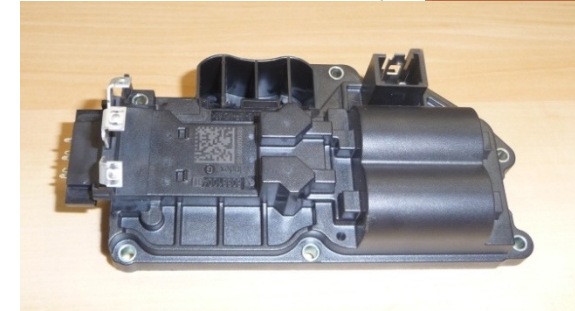


Product Examples - Mould Making



Requirements Article:

- High-temperature tool
- Production at 140 degrees tool temperature



Round table tool (2x AS, 1x DS)

"Electronic enclosure EBM-Pope"

Customer: Hardener

Material: PPS-(GF+MD)60

Cycle time: 60 s

Service life WZ: 1.5 million rounds

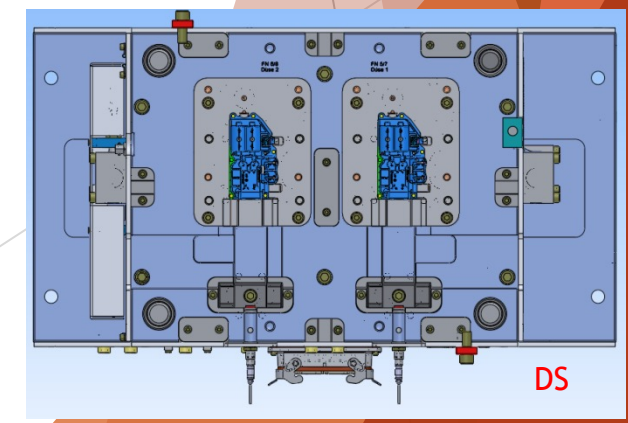
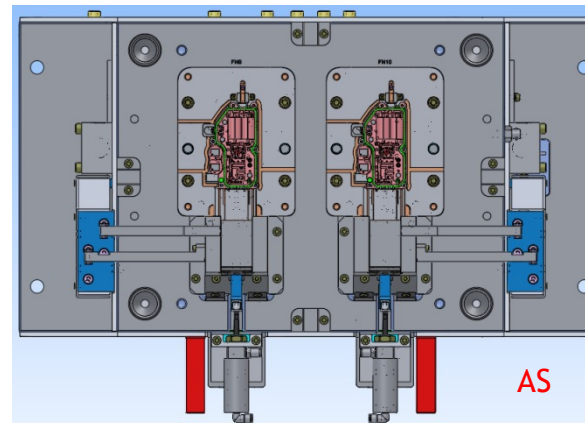
Dimensions of shape structure: 396 x 746 x 580 mm

2-fold falling

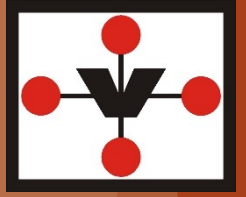
Insert: several sockets, spring plates, punching contacts

Pro FN: 1 hydraulically operated slider with pneum. operated backpack slider

Connection via 2-fold HK system on KK, tunnel sprue



Product Examples - Mould Making 2K Special Tools



2K-WZ "Rotary-Knob"
4+4-fold (4-fold falling)
Customer: KTB
Material: ABS+PC / PC
Shape structure: 446 x 496 x 505 mm
4 sliders per FN AS
4 cushioned inclined sliders DS



2K-WZ "TZZG-Grundkörper"
2+2-fold (1+1 fold falling)
Customer: Utescheny
Material: ABS+PC / TPU
Shape structure: 596 x 896 x 640 mm
Gas internal pressure technology



2K-WZ "Chrome Frame"
1+1-fold (1 pc falling)
Customer: KTB
Material: ABS+PC / PC
Shape structure: 396 x 546 x 497 mm



2K-WZ "Divinder Bar"
4+4-fold (4 pcs falling)
Customer: KTB
Material: ABS+PC / PC
Shape structure: 496 x 596 x 465 mm
3 underfloor sliders per FN AS

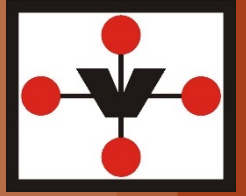


2K-WZ "Mirror-Knob"
4+4-fold (4 pcs falling)
Customer: KTB
Material: ABS+PC / PC
Shape structure: 396 x 396 x 317 mm
automaton. Transfer VU to HU



2K WZ "Bentley Frame"
1+1-fold (1 pc falling)
Customer: KTB
Material: ABS+PC / PC
Shape structure: 496 x 596 x 470 mm

Product Examples - Mold Making Hybrid Tools Electronics



Round table WZ "Connector ASM", 4-fold
Customer: Doduco
Material: PET
Shape structure: 366 x 396 x 450 mm
Injection via 4 open HD nozzles
Pneumatically operated holder DS



Round table WZ "AGR motor housing", 2+2-fold
Customer: Swoboda
Material: PPS GF40
Shape structure: 496 x 696 x 615 mm
2FN VU + 2FN HU (each AS)
with integrated VU
Punching process in the WZ



WZ "valve plate", 1-fold
Customer: Swoboda
Material: PPS GF40
Shape structure: 446 x 496 x 477 mm
1 hydraulically operated slider
2 hydraulically operated underfloor
valves
2 x jack pull

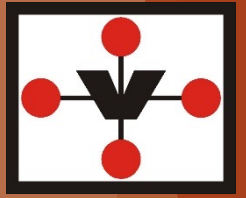


WZ "Airmax Enclosure", 2-fold
Customer: Hardener
Material: PA66 GF30
Shape structure: 446 x 546 x 547 mm
2 hydraulically operated NV nozzles
1 hydraulically operated slider



WZ "HFM7 enclosure", 4-fold
Customer: Hardener
Material: PBT GF30
Shape structure: 446 x 546 x 572 mm
Direct injection 4x hydr. NV nozzles
1 hydraulically operated slider per FN DS
Hydraulically operated slide lock AS

Product Examples - Mould Making



WZ "Aperture Luxury", 1-fold
Customer: KTB
Material: ABS
Shape structure: 496 x 596 x 606 mm
7 Slanted slider



WZ "door opening lever", 2+2-fold
Customer: Utescheny
Material: PA6 MV40
Shape structure: 496 x 596 x 622 mm
Burr-free separation
4+4 mech. pusher



WZ "pressure button", 8-fold
Customer: TRW (ZF)
Material: POM
Shape structure: 512 x 546 x 490 mm
Direct injection with open nozzles
8 mech. pusher
8 replaceable shield sliders
8 interchangeable inclined sliders

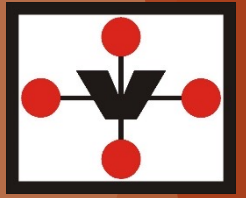


WZ "Chromring", 4-fold
Customer: KTB
Material: ABS
Shape structure: 446 x 396 x 320 mm
Direct injection with open nozzles
8 sliders per FN for outer contour

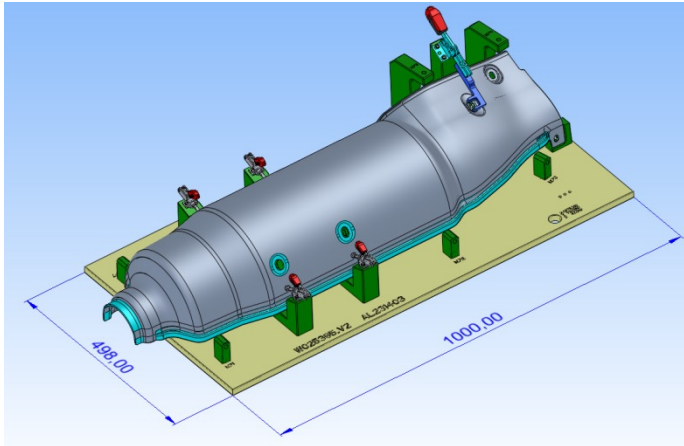


WZ "shaft frame element", 2-fold
Customer: Langmatz
Material: PC GF 6% (TSG foam)
Item weight: 8.5 kg per part
Shape structure: 1420 x 746 x 910 mm
Direct injection with 6 hydr. NV nozzles
Weight Shape: 4.7t

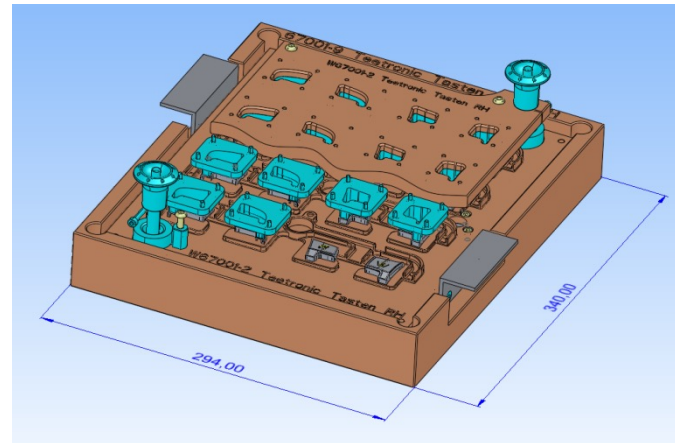
Product examples - Device construction



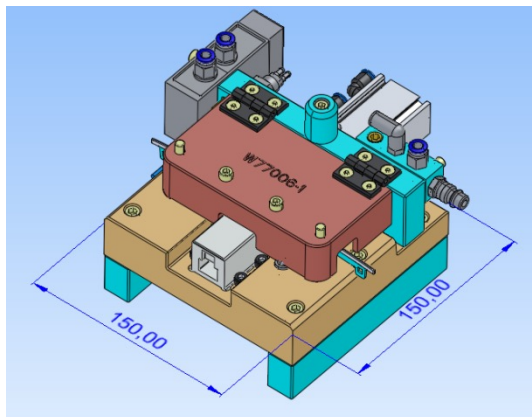
Tester



Laser recording



Pneumat. Punching_{device}



Embossing device

