

# 3D-Metal Printing

The mechanical properties can vary, depending on the X, Y and Z-position of the objects and the exposure parameters. The information is based on our current knowledge. It does not guarantee any certain product properties or suitability of any specific operation purpose.

Maximum construction range is:  
 Steel 250x250x325mm  
 Aluminum: 500x280x325mm

| Properties and Unit  | Tool Steel       | Stainless steel              | Aluminum                    |
|--|------------------|------------------------------|-----------------------------|
| Material number  | 1.2709; MS1      | 17-4PH; 1.4543               | AlSi10Mg, 239               |
| Slice thickness, $\mu\text{m}$                               | 20:40            | 20:40                        | 30:50                       |
| Achievable part accuracy, %                                  | $\pm 0,2$        | $\pm 0,2$                    | $\pm 0,2$                   |
| Surface roughness after blasting, $\mu\text{m}$              | Ra4-6,5, Rz20-50 | Ra2,5-4,5, Rz15-40           | Ra4-5,5, Rz25-35            |
| Surface roughness after polishing, $\mu\text{m}$             | Rz up to <0,5    | Rz up to <0,5                | Rz up to <2,0               |
| Relative density by standard parameters, %                   | ca.100           | ca.100                       | ca.100                      |
| Material density, $\text{g}/\text{cm}^3$                     | 8-8,1            | 7,8                          | 2,7                         |
| Young's modulus E, GPa                                       | 180 $\pm$ 20     | 170 $\pm$ 20                 | 75 $\pm$ 15                 |
| Young's modulus E after tempering 650°C/1h, GPa              | -                | ca.195                       | -                           |
| Tensile strength XY (Z), MPa                                 | -                | 1050 $\pm$ 50 (980 $\pm$ 50) | 315 $\pm$ 35 (280 $\pm$ 35) |
| Tensile strength after build process, MPa                    | 1100 $\pm$ 100   | -                            | -                           |
| Tensile strength after hardening Yield strength (Rp0,2), MPa | 1950 $\pm$ 100   | -                            | -                           |
| Yield strength (Rp0,2) XY (Z)                                | -                | 540 $\pm$ 50 (500 $\pm$ 50)  | -                           |
| Yield strength (Rp0,2) after build process, MPa              | 1000 $\pm$ 100   | -                            | -                           |
| Yield strength (Rp0,2) after hardening                       | 1900 $\pm$ 100   | -                            | -                           |