

- ⌋ **Rapid Prototyping**
- ⌋ **Rapid Tooling**
- ⌋ **Reverse Engineering**

## TECHNOLOGIES

- DMLS EOSINT M270**  
Fast production of tooling, molds and functional metal parts
- 3D Printer Dimension SST 1200**  
Fast production of plastic prototypes from the ABS material
- 3D scanner GOM ATOS I**  
Digitalization of the parts, Reverse Engineering, validation
- CAE COSMOSWorks Advanced Professional**  
Analysis, optimization, simulation
- CAD Catia V5, Solidworks Design**



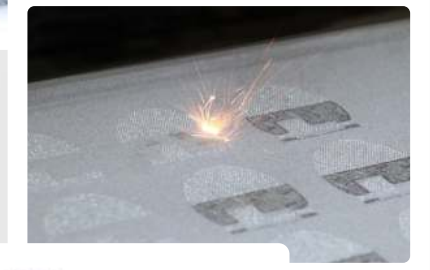
**EOSINT M270**

top- end system for all DMLS materials in best quality  
 build volume 250x250x215mm  
 building layer: 0,02mm or 0,04mm  
 solid state laser, 200W  
 dual focus  
 first machine in the Czech Republic

### DIRECT METAL LASER SINTERING – TECHNOLOGY DESCRIPTION

DMLS is an 'additive' technology that works by sintering very fine layers of metal powders layer-by layer from the bottom up until the build is complete.

- production of homogenous metal components in density of up to 100% using powder based materials
- fully functional metal parts
- released metal powders: - bronze, Stainless Steel, Maraging Steel



### MATERIALS – APPLICATIONS:

	Bronze DM20	Stainless Steel GP1 1.4542	Maraging Steel MS1 1.2709
Min. wall thickness	0.6 mm	0.4 mm	0.4 mm
Ultimate tensile strenght (MPIF 10)	400 MPa	900 MPa	1100 MPa (1950 MPa)
Yeild strengt (Rp 0,2%)	200 MPa	500 MPa	1000 MPa (1900 MPa)
Young's Modulus	80 GPa	190 GPa	180 GPa
Surface hardness	120 HV	23-33 HRC	36-39 HRC (50-54 HRC)
Application	Prototype injection molding tooling, functional prototypes	Functional prototypes & series parts (engineering, medicine)	Serial injection molding tooling, engineering parts

Values in parenthesis MS1 - after age hardening

### DMLS – SUMARIZATION & ADVANTAGES

- Cost and production **time reduction**
- Building time** depends on part volume **not on its complexity**
- Construction of DMLS part is **different from construction for CNC machining**
- Some geometric components, which are not manufacturable by conventional way, **could be produced by DMLS technology** (e.g. complex shape cooling channels)
- Geometrical flexibility** (complicated surfaces, deep slots, sharp internal corners ...), Fully unmanned operation EOSINT M270
- Low material consumption** (not-melted powder is possible to use again)
- Compatibility with other processes** (DMLS parts is possible to mill, bore, grind, polish, weld ...)



# DIRECT METAL LASER SINTERING (DMLS)

## DMLS - APPLICATIONS

SHAPE MOLD INSERTS



PROTOTYPE SHEET METAL



PROTOTYPE AND SERIAL MOLDS FOR INJECTION OF PLASTICS



TOOL INSERTS AND MOLDS WITH CONFORMAL COOLING CHANNELS



## 3D Scanner GOM – ATOS I



- Reverse Engineering – stl. files, surfaces
- inspection – comparison of CAD model and measured geometry
- high accuracy (+- 0,05mm)
- fast measuring

## 3D Printer Dimension SST1200 (FDM process)

- fast way how to gain plastics prototypes
- non-toxic material ABS
- stable dimensions of prototypes
- prototypes based on CAD models (production directly from CAD)
- build volume 254x254x305mm, colours: (white, blue, yellow, black, green, metal grey)

