

## Gantry Platform



Length X Axis 5500 mm

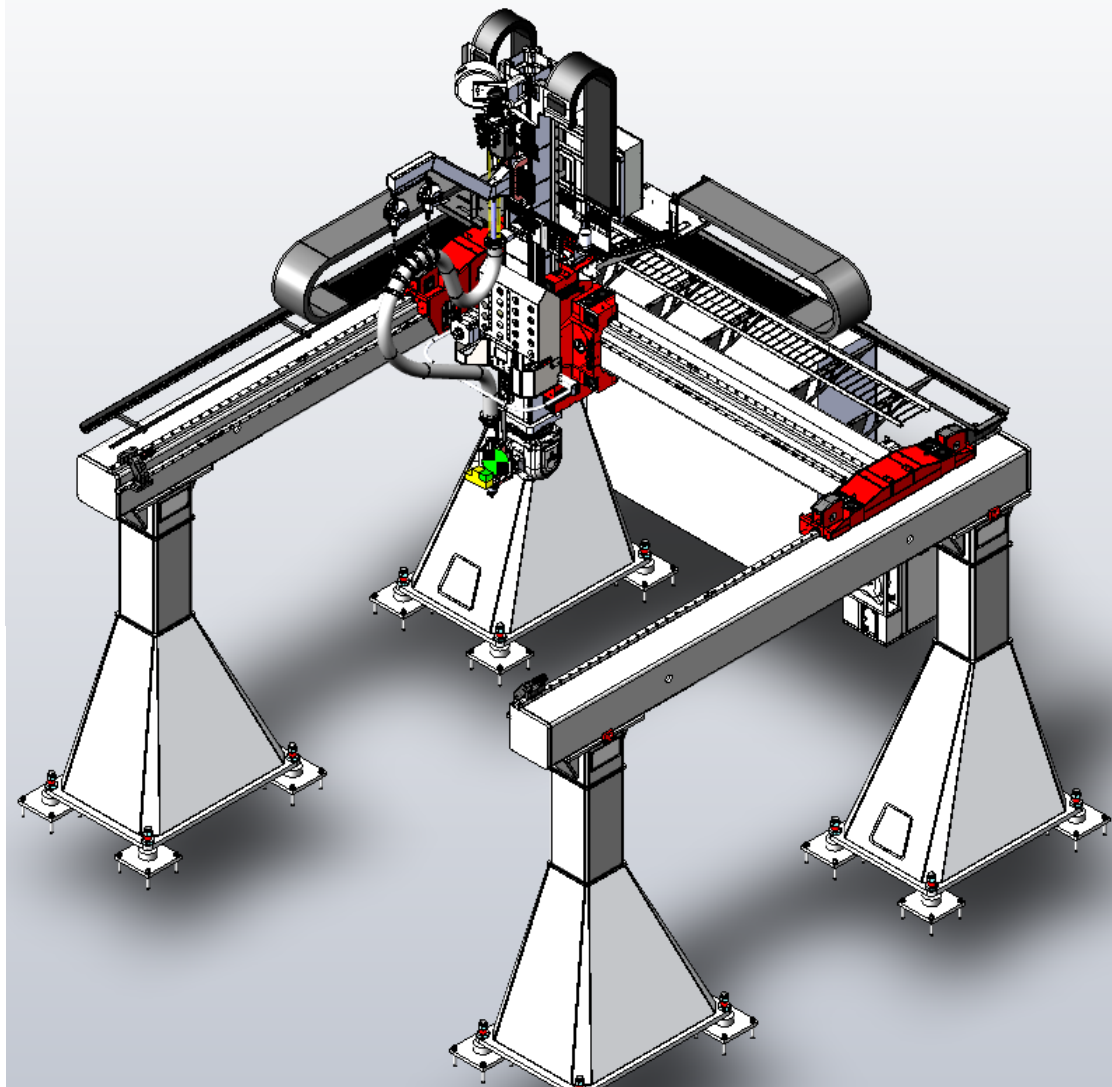
Stroke X Axis 2749 mm

Length Y Axis 4475 mm

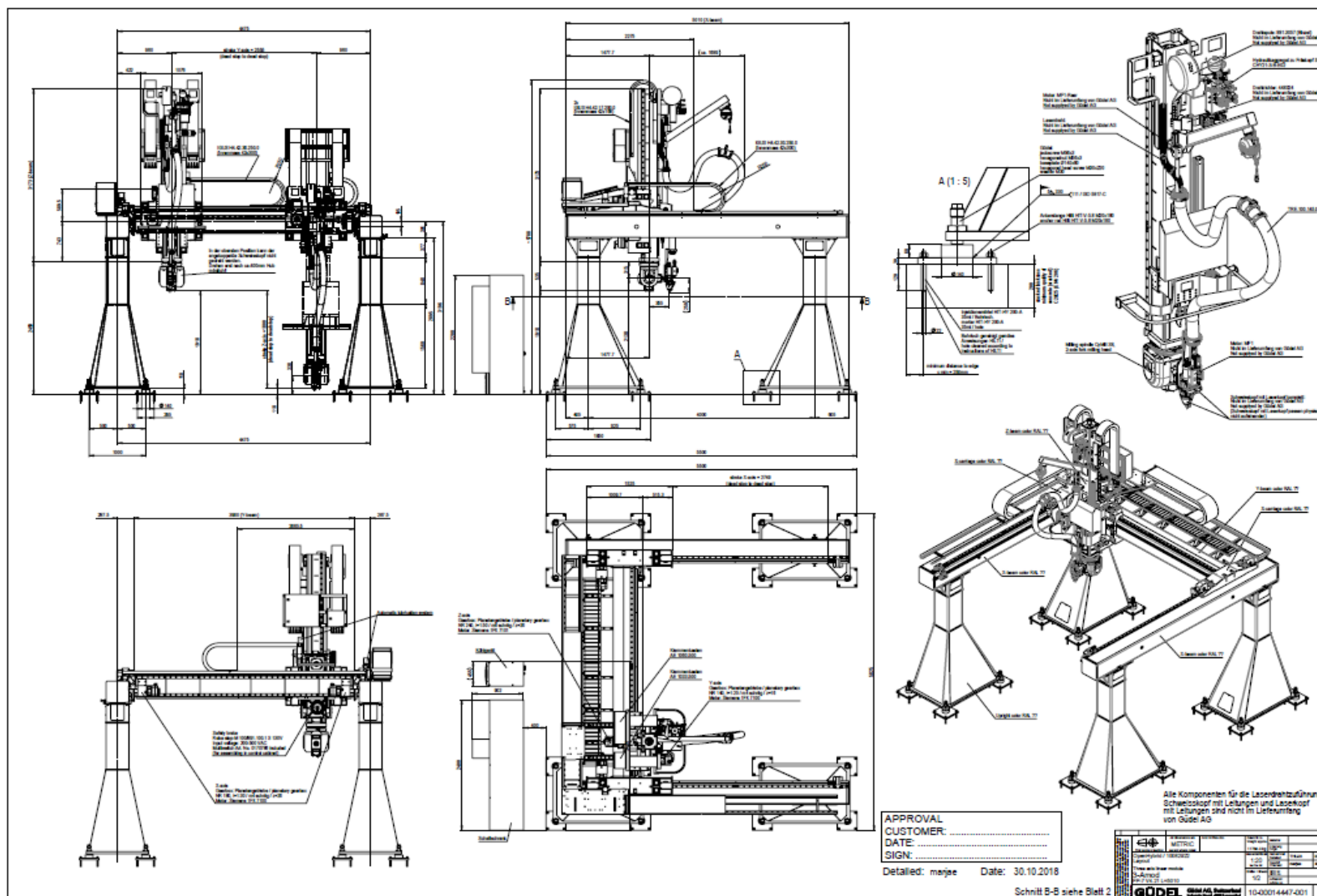
Stroke Y Axis 2555 mm

Length Z Axis 5788 mm

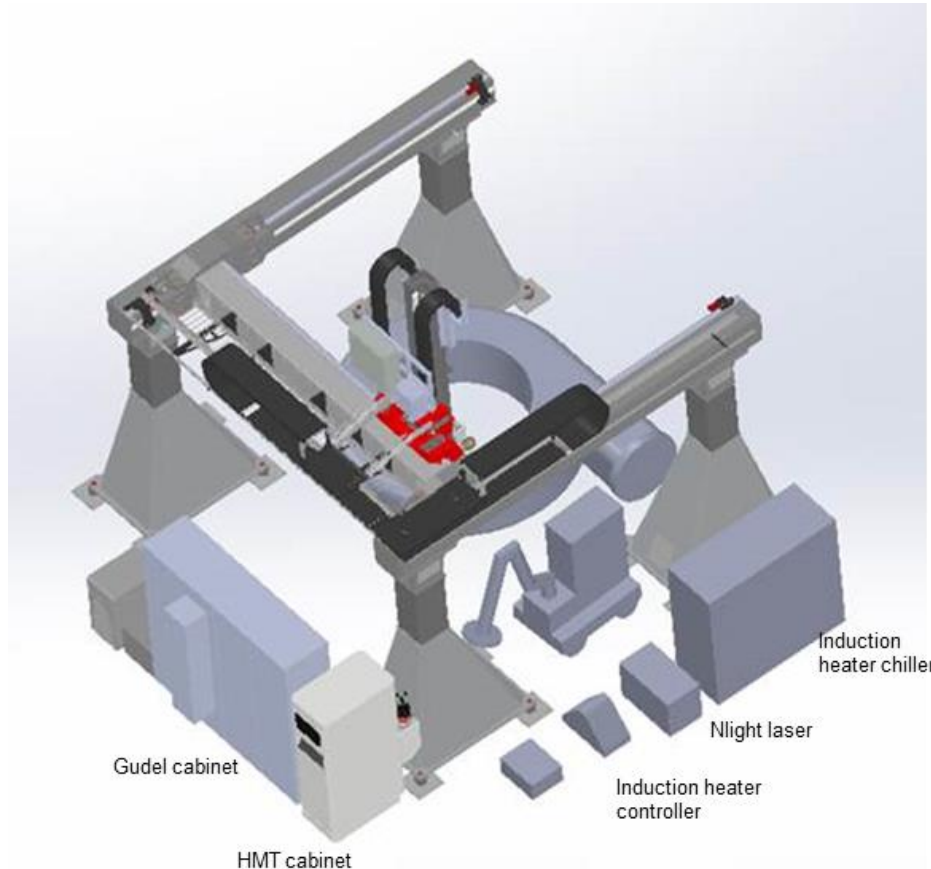
Stroke Z Axis 1800 mm



# Gantry specification

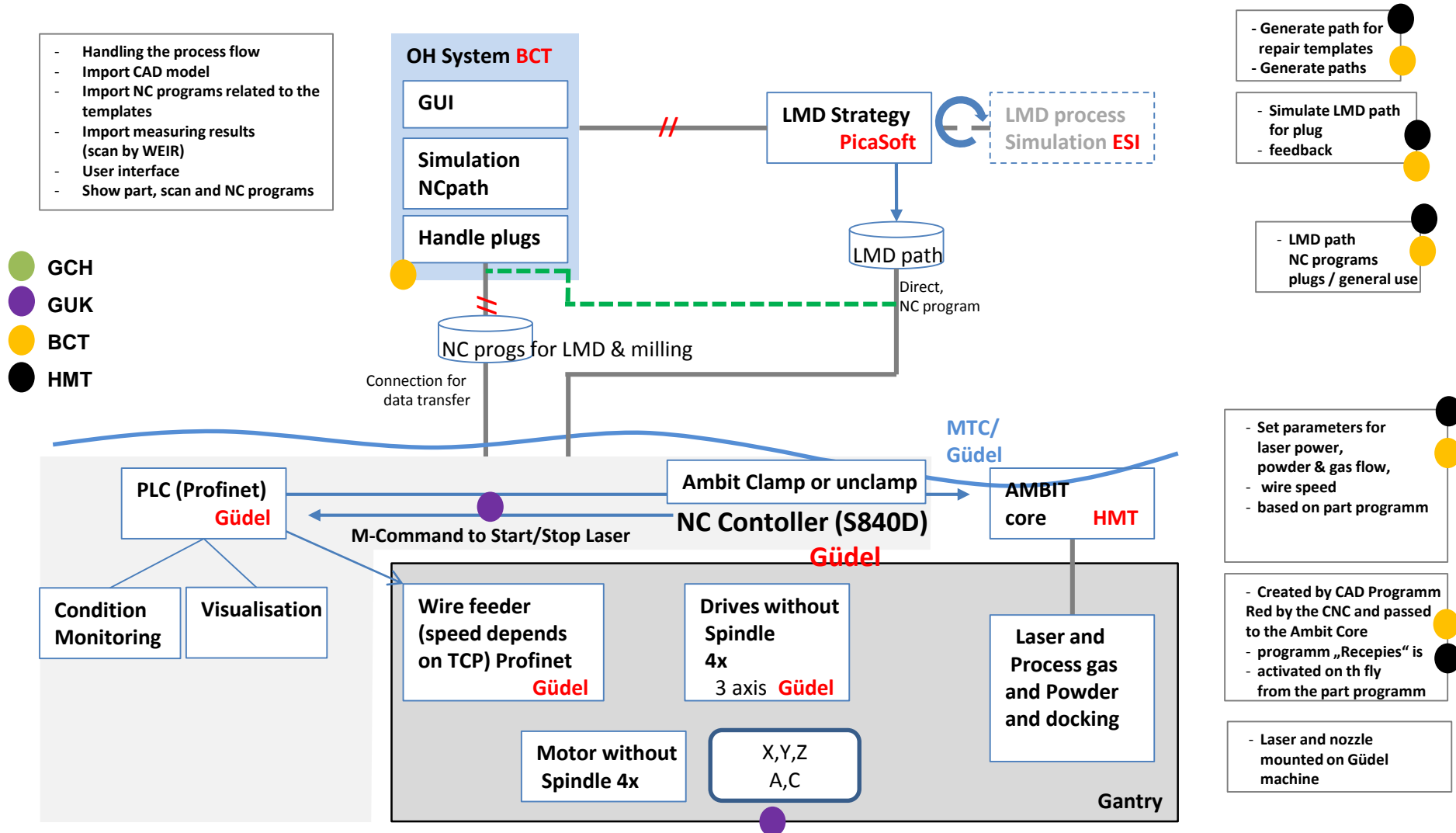


## Components of the integrated hybrid system



- Induction heater chiller
- Induction heater controller
- Induction heater temperature controller
- Laser chiller
- Fume extraction unit
- Laser
- Coolant pump
- Compact wire cladding head + feed arm
- Control Interface (Interface lasersystem-wirefeeder-Simens 840D)
- Wire feed system
- grinding/machining head and spindle

# Gantry system Control architecture



## Spindle characteristics

### Wire feed rate specifications:

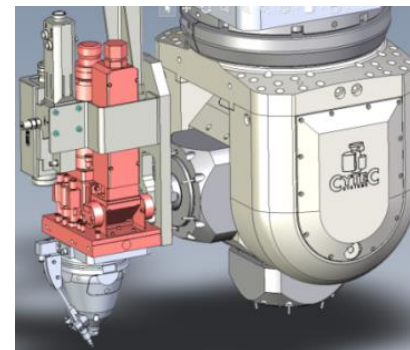
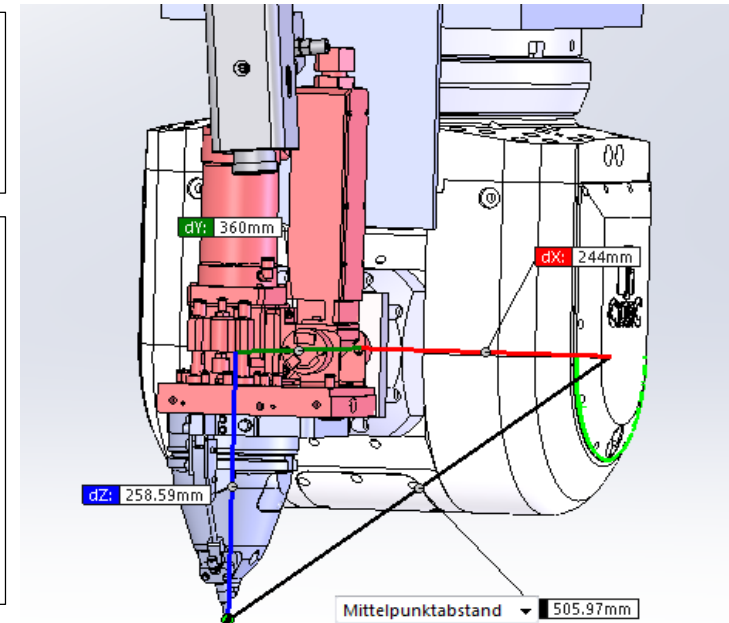
min = 500 mm/min  
max = 2500 mm/min

### Spindle speed and forces:

Conventional milling: 200mm/min, 150N force, 1'000 rpm

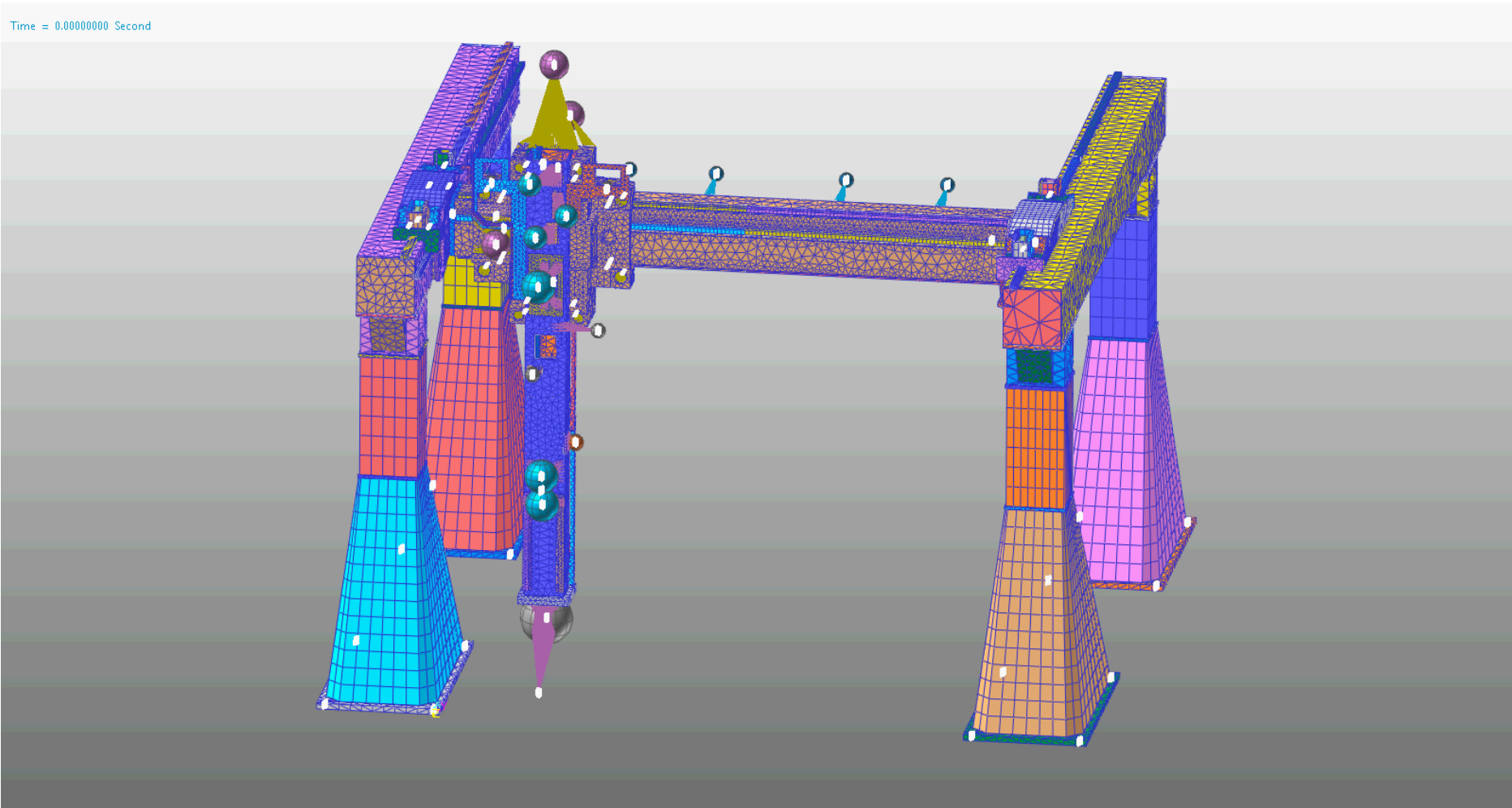
High speed milling: 5 m/min, <50 N force, 10'000 rpm

Grinding: max. 1 m/min, 45 (-200) N force, 18'000 rpm

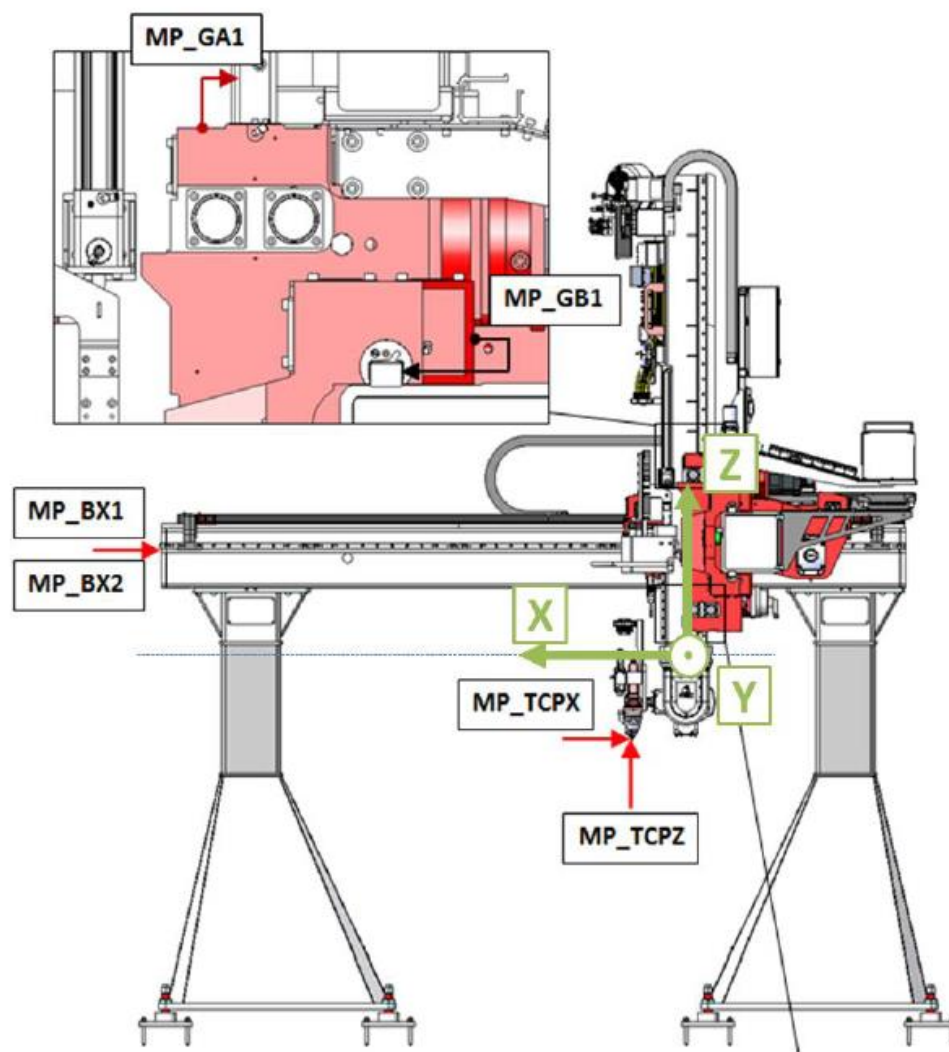




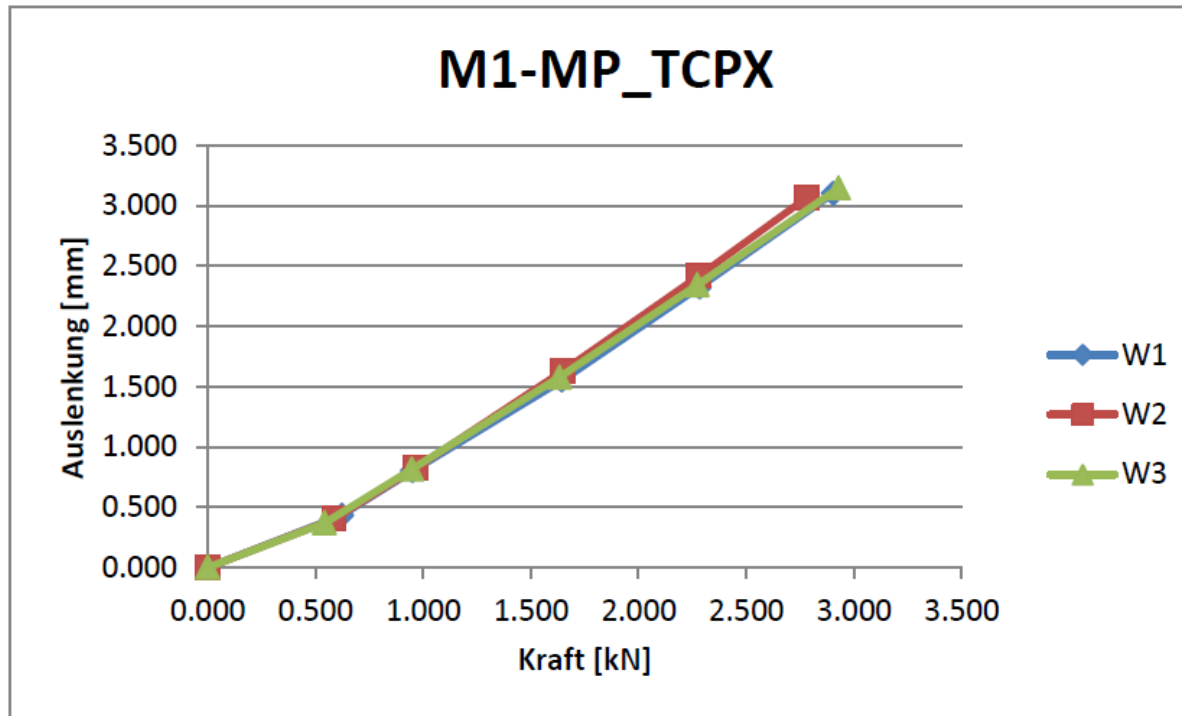
## Gantry stiffness



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**Spindle deflection:**  
Approx. 1 mm/kN  
⇒ Accuracy

0.02 mm  
⇒ Repeatability

Conventional milling:

200mm/min, 150N force, 1'000 rpm

High speed milling:

5 m/min, <50 N force, 10'000 rpm

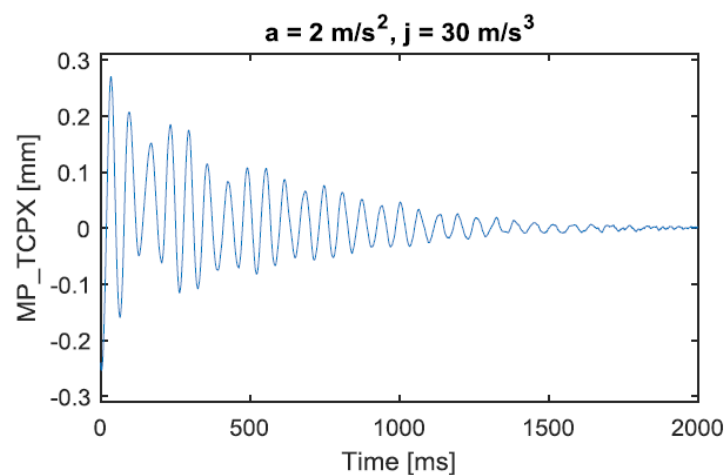
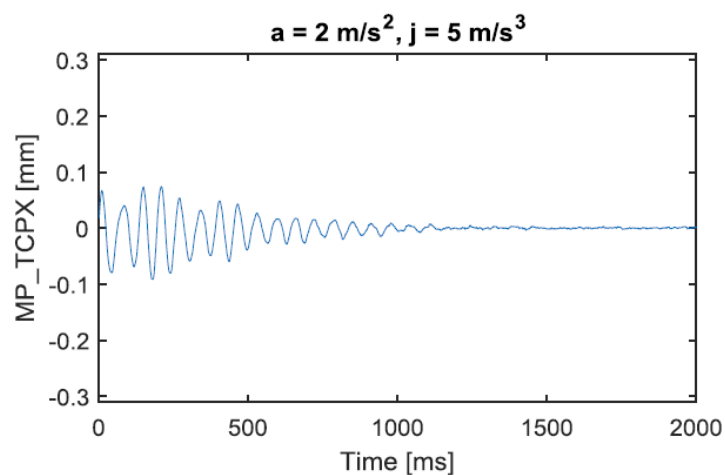
Grinding:

max. 1 m/min, 45 (-200) N force, 18'000 rpm



## Gantry damping ratio, closed loop

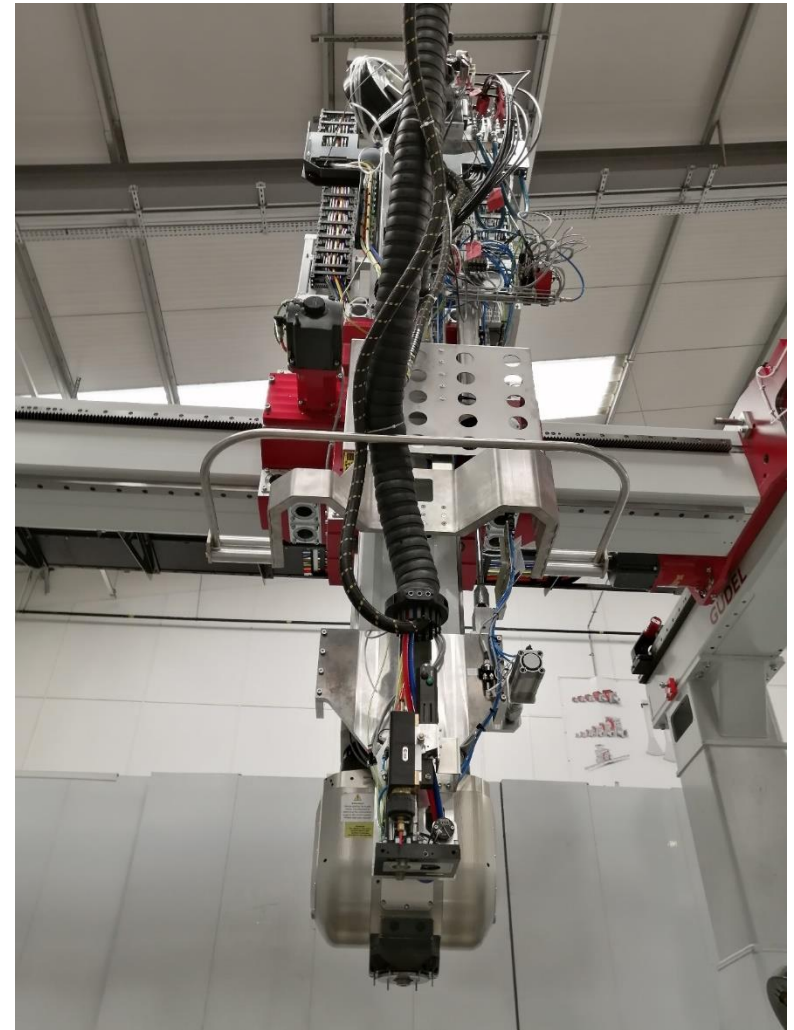
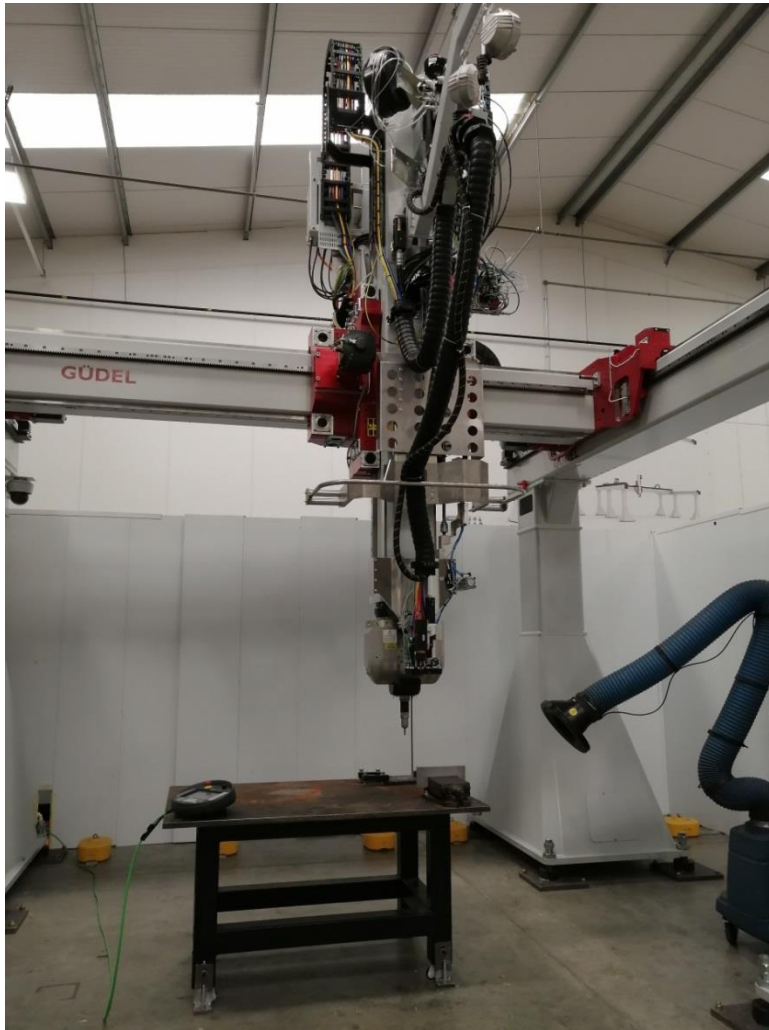
X Movement - MP\_TCPX - X: Mid, Y: Mid, Z: Down



## Gantry prototype



## Gantry prototype



## Machining Trials



Status: Currently completing machining and cladding characterisation trials

# Questions ?