

# LASER SPEEDER

**A machine for cladding, hardening, measuring operations for highly automated systems devoted to large moulds machining.**

**BMW integrates a Jobs' machine equipped with an innovative laser head into an automated pallet handling system of the plant in Munich.**

## Automation

The car industry BMW has chosen Jobs to equip its factory in Munich with a GrandSpeeder HQ with laser head, named Laser Speeder. The plant will be integrated into an FMS, capable of automatically serve also the operator stations (for moulds loading/unloading on/from pallets) and the other milling machines (including a Jobs eVer7), which are part of this automated system. The pallets, on which moulds to be machined actually are, have dimensions of 5.000x2.500x250 mm and are capable of handling moulds of weight up to 30.000 kg. The plant will be operated without direct supervision of operators, whose function is to manage the periphery of the systems and not to supervise the production processes.

## Laser System

The system has been conceived to perform cladding, hardening and measuring operations. The change is easily performed by just changing the mirror from hardening to focusing and mounting the powder nozzle or the probe unit. BMW's choice of this laser system is explained by the fact that today it is more cost-effective to repair a damaged mould with laser than with traditional TIG welding methods as done in the past.

Main advantages include reduction in time and definitely better quality in repairing, as material filling can be accurately carried out. Furthermore, the complete elimination of manual operation allows a significant reduction of costs.

In particular, Laser Speeder is equipped with a high-power fiber-coupled diode laser complete with internal water-air-cooler device. The machine features also a thermal control unit of the laser power output.

## Laser beam cladding

This technology is used to create wear-resistant layers on mechanical components. In this specific application BMW will use Laser Speeder to repair and/or add new complex geometries, through 3D additive manufacturing, on moulds and dies for the automotive field.

The selected technology is a diode laser using a Fe-base alloy as filler material. The nozzle is water-cooled.



## Laser beam hardening

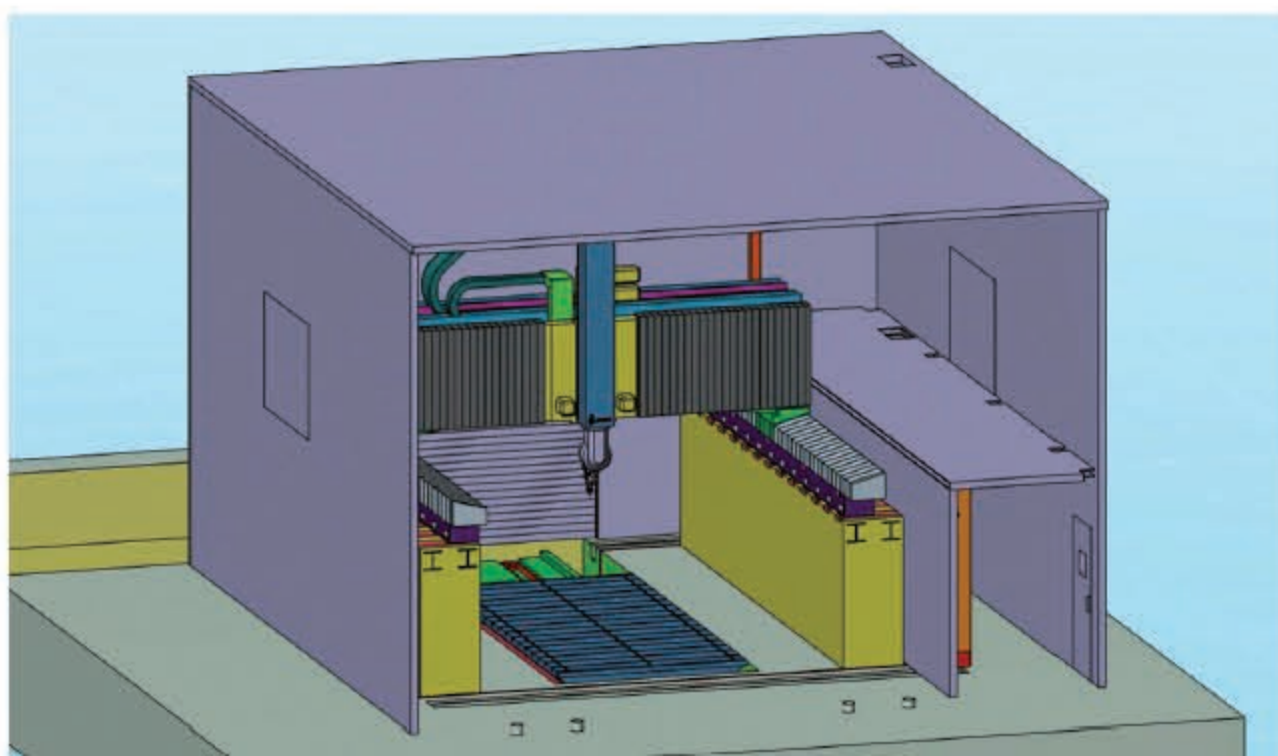
This application is used to increase hardness on all commercial toughenable steels. Compared to other technologies, like flame or inductor, this system only treats locally reducing the distortion.

The temperature control ensures high process reliability and excellent quality even on complex geometries and contours.



### Design principles:

- Reliability and standardization for "special" solutions
- Structures optimized through FEM for first-class dynamics
- Linear axes with roller guides, rack and double pinion, central lubrication system
- 3 rotary axes with Direct Drive technology, torque motors and direct measuring systems for maximum accuracy and optics interchangeable through quick coupling system



### Technical features:

- Linear axes:
  - longitudinal X-axis 6.000 mm
  - transversal Y-axis 3.500 mm
  - vertical Z-axis 1.500 mm
  - distance of 2.500 mm between working table and the front of the cabin
  - direct measurement system with optical scales
  - axes speed up to 50 m/min
  - acceleration up to 1.5 m/s<sup>2</sup>
- Rotary axes:
  - C1-axis ± 200°
  - B-axis ± 120°
  - C2-axis ± 200°
- CNC Siemens 840D SL