Laser-based systems
Welding and special-purpose applications

Combining the expertise in laser applications with an extensive know how in automation, Fives offers high-productivity systems

Welding – 3-D Cutting – Cladding – Additive manufacturing
Drilling – Hardening – Wire stripping

TYPICAL APPLICATIONS

Automotive
- Gearbox & transmission components
- Driveline components
- Engine parts (shafts, turbochargers, ...)
- Axle components
- Tubular chassis components
- Seat recliners

Aerospace & other industries
- Cutting/welding of aluminum alloy parts
- Cutting of tubular products
- Laser surfacing of used parts (repair of turbine blades)
- Laser cladding to build up near net shape parts

With over 30 years of experience, Fives is a global player in the design and manufacturing of systems using high power laser (≥ 1 kW) for the welding of mechanical parts. This expertise is now extended to other laser-based applications such as 3-D cutting, wire stripping, hardening, cladding and additive manufacturing.

- From Standalone machines to Multi-featured laser-based assembly lines
- High-production systems
- Standard modular design
- Ability to integrate all types of laser sources: CO2 Lasers, Solid-state Lasers (YAG, fiber, diode Laser)
Fives proposes both standalone machines and multi-featured laser-based assembly lines as well as the related automation systems.

**STANDALONE SYSTEMS**

Compact and multi-purpose equipment (welding, cutting, hardening, drilling, ...)
- Based on a standard modular design fitted with customized fixtures (for round parts, shafts, ...)
- Manual loading upgradable to a fully automated system
- Standalone machine or integrated into a full-featured assembly cell
- Additional functions can be implemented on purpose (pressing, heating, control, ...)
- Available in dual station version:
  - 2 rotating tables
  - 2 spindles
  - 2 upper stops
  - 1 shared focusing head
- Integrated automatic loading/unloading (input/output conveyors)

Ideally suited to laser surfacing for the accurate repair of used parts and 3-D manufacturing of complex geometry products
- 5 axis available: 3 axes (X Y Z) + 2 axes (B C)
- Powdered metal feeder and nozzle(s) for Laser Metal Deposition (LMD) & laser assisted additive manufacturing
- Laser surfacing for the accurate repair of used parts (turbine blades) & 3-D manufacturing of complex geometry products (near net shape production for aerospace, mining, energy, medical industries)
- Adaptable working volume up to 1,000 x 700 x 1,000 mm
- Bi-material or multi-material manufacturing

This system can be also used for 5-Axis laser welding, cutting, drilling and hardening operations.

**FULLY-AUTOMATED LASER ASSEMBLY LINES**

Modular, multi-featured concept & fully automated
The welding operation is supported by a Fives compact welding machine.
Other systems commonly integrated into the laser welding lines:
- Washing & drying module
- Pressing module
- Heating module
- In process & final welding seam control modules
- Brushing, deburring module
- Marking module
- Customized automation & interlinking solutions allowing a flexible layout:
  - Buffer magazine
  - Conveying system
  - Gantry
  - Robot
  - Manipulator

Complementary Fives modules are integrated into the laser cutting cells for achieving the upstream and downstream operations.

**BENEFITS**

**Laser**
- Energy delivered to the workpiece is minimized (minimal heat affected zone)
- High speed processing
- The beam can be guided into hard-to-reach areas
- Operations are performed under normal atmospheric pressure
- Unrivaled repeatability
- Excellent quality finish

**Industrialization**
- Automation for high-volume production
- Industrial mastery of laser process quality
- Highly reliable systems with low maintenance cost
- Laser safety expertise

**CUSTOMER SUPPORT**
- Global Support Network
- Preventive maintenance, Remote maintenance
- Process support: training, trials, ...