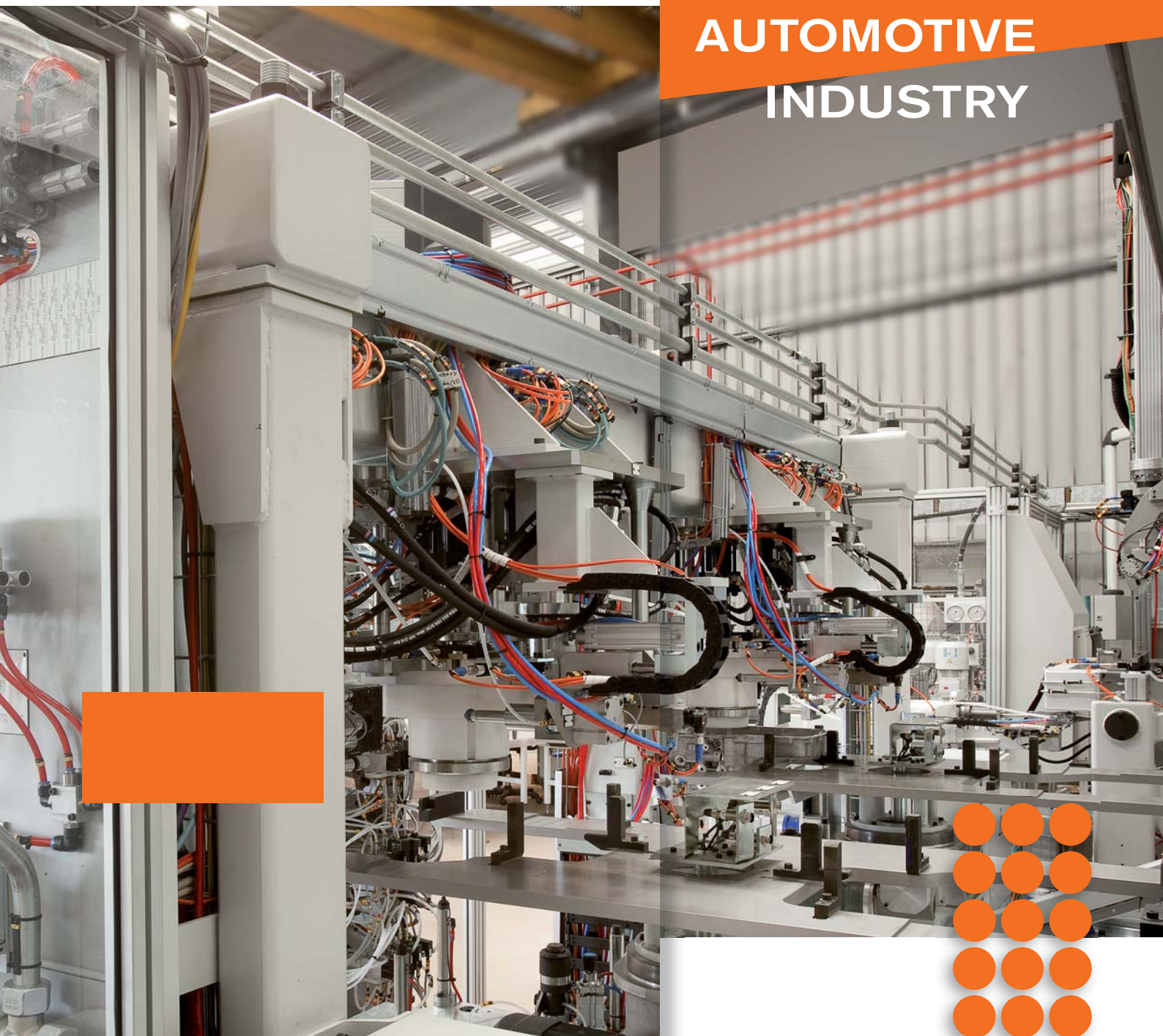


**AUTOMOTIVE  
INDUSTRY**



**EQUIPMENT & SYSTEMS**

R&D CENTRES | MECHANICAL PLANTS | ASSEMBLY PLANTS

# R&D centres



## TEST BENCHES IN HYDRAULICS, AEREAULICS AND MECHANICS

### LEAKS

#### CONTROL MACHINE

- Air leak under water
- Air / Air
- Leak test with Gas (helium) plotter
- Gas analysis (smelling)

### DURABILITY FATIGUE TEST BENCH

#### FLUID PROCESS

- Static or Dynamic pressure control
- Flow rate control
- Temperature control

#### MECHANICS

- Stress / Displacement
- Torque / Speed (rpm)
- Vibration

#### THERMAL APPLICATIONS

- Tests in climatic environment
- Hygrometry
- Thermal shock or thermal cycles, in fluid or in environment

#### CHEMICAL APPLICATIONS

- Erosion / Corrosion
  - by fluid with corrosive or abrasive components, high mass flow
  - by the environment : Salt spray / projection of aggressive liquids

### PERFORMANCE AND EFFICIENCY

#### CHARACTERISATION TEST BENCH

- Pressure
- Flow rate
- Temperature
- Shaft speed (rpm)
- Torque
- Stress
- Efficiency
- Gas emission (HC ...)

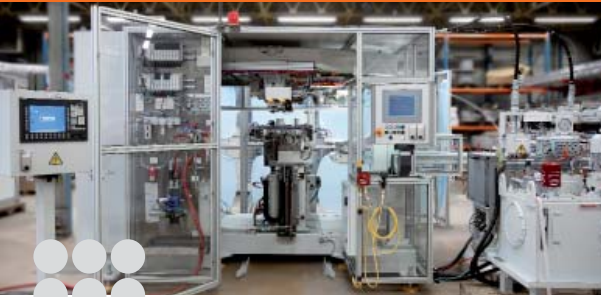


Our testing systems support you in the design and validation of your products :

- Engines (heat engine, cryogenic engine, ...)
- Electrical engines
- Mechanical components (brakes, gearboxes, pumps, alternators)
- Hydraulic and aeraulic components
- Driving robots for cars (steering, pedal, gear shift,...)
- Electrical components and assembled systems
- Batteries
- Specific test systems on request



# Powertrain plants



Drive the powertrain technology expertise :

- Combustion engine
  - Conrod
  - Crankshaft
  - Cylinder head
  - Cylinder block
  - Crankcase
- Transmission
  - Gears & shafts
  - Housings
  - Differential casing
- Axles
  - Hubs
  - Brake disks
  - Front & rear axles



## CONVEYOR SYSTEMS

### TURNKEY AUTOMATIC SOLUTIONS FOR MACHINING & ASSEMBLY PROCESS

For machining & assembly workshops

- Facilities (off) loading
- Interlinking automation

Our solutions implement all kinds of conveyors, robotic and gantries cells, manipulator arms, ...

## ASSEMBLY LINES & STAND ALONE STATIONS

### MANUAL, SEMI AUTOMATIC, AUTOMATIC SOLUTIONS MATCHING DIFFERENT PROCESS :

- Riveting, screwing, crimping
- Pressing, adhesive bonding, inspection, vision

## INSPECTION TEST BENCHES

### INSPECTION FACILITY

- Dimensional & geometric check
- Electronic & air technologies

### LEAK TEST FACILITY

- Pressure decay & mass flow checks

### NDT FACILITY

- Eddy current & ultrasonic technologies

In process dedicated or flexible concepts.  
In house data acquisition & application software.

## TRANSMISSION TEST BENCHES

### E.O.L. (END OF LINE) TEST BENCH

- All transmissions and axles testing
- Ratio check, force shifting inspection, NVH,

### SHAFTS & GEARS MONITORING TEST BENCH

- Nick & run out detection, dimensional inspection, NVH

### SHIFTING ROBOT

- Synchronized X&Y axis servo drives

# Assembly plants



Turnkey systems and equipment for your workshops:

- Body assembly
- Painting
- Final assembly

## ASSEMBLY SYSTEMS

### WELDING CELLS FOR DOORS AND BODY IN WHITE SUBASSEMBLY

- Assembly line and body in white subassembly lines
- Carbon tools
- Control of body in white tools



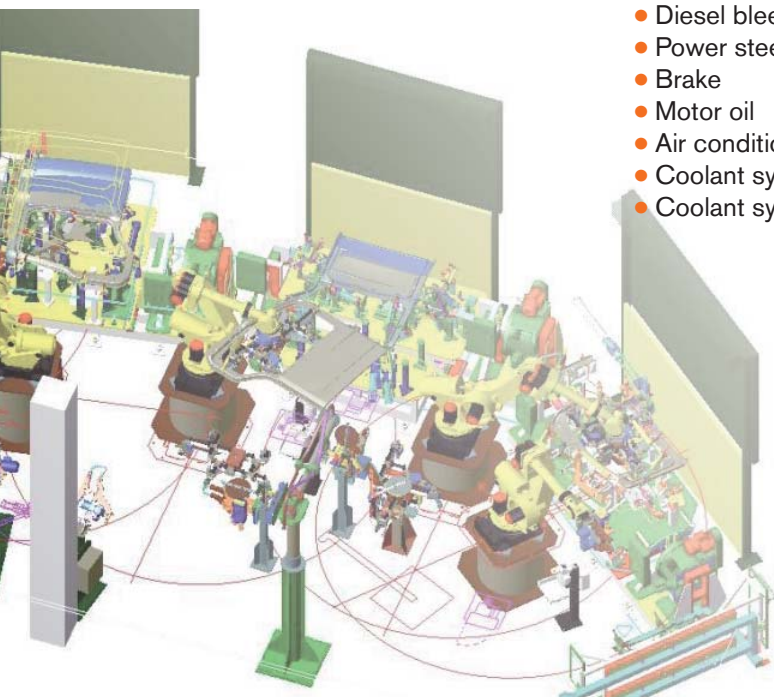
### GLUING EQUIPMENT FOR GLAZING, BODY PARTS, ROOFS, DOOR PANELS, INTERIOR ....

- Surface preparation (cleaning, priming)
- Laser treatment
- Cut -, sanding - and polish applications
- Applying PU with mono or two-component adhesives
- Assembly & geometric control

## FILLING EQUIPMENT

### FLUID CIRCUITS

- Fuel / Adblue (Urea)
- Diesel bleeding
- Power steering
- Brake
- Motor oil
- Air conditioning
- Coolant systems
- Coolant systems for hybrid cars...



## SUPPORT PLATES

### FOR THE PREPARATION OF THE MECHANICAL ORGANS

- Powertrain, front & rear axles, frame,...
- All mechanical under body components
- Welding tools

# Partner of your innovations



## HYBRID & ELECTRIC VEHICLES

Our knowledge of the automotive process and our constant will to support our customers in their innovations make CLEMESSY the reference partner for your R&D departments or your production facilities.

### R&D CENTRES

Test benches and characterization / endurance Test for cells, electronic modules, batteries and battery packs.

Test benches and characterization / endurance test benches for e-Motors.

Power electronics characterization & endurance test benches.

TestInView: complete user-friendly software solution dedicated to automatic validation of Electronic embedded Architectures , (Software In the Loop, Hardware In the Loop, Model In the Loop).

Mechanical, electrical, fluids characterization & endurance test benches.

### MANUFACTURING PLANTS

Turnkey solution provider, batteries process & assembly expert. Storage, synchronization, assembly and connection on the vehicle, either "stop & go" or "pull by" in & out process.

Batteries cycling test benches (charge/discharge), final acceptance and validation test benches.

Test benches for control and performance validation and final acceptance tests.

Turnkey solution provider, handling & assembly Expert.

Test benches for power electronics and validation of the final product.

Turnkey solution provider, batteries process & assembly expert. Storage, synchronization, assembly process expert, connection on the vehicle, either "stop & go" or "pull by" in & out process.

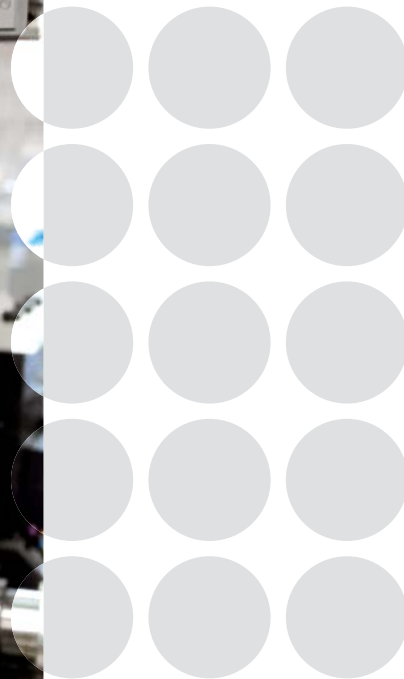
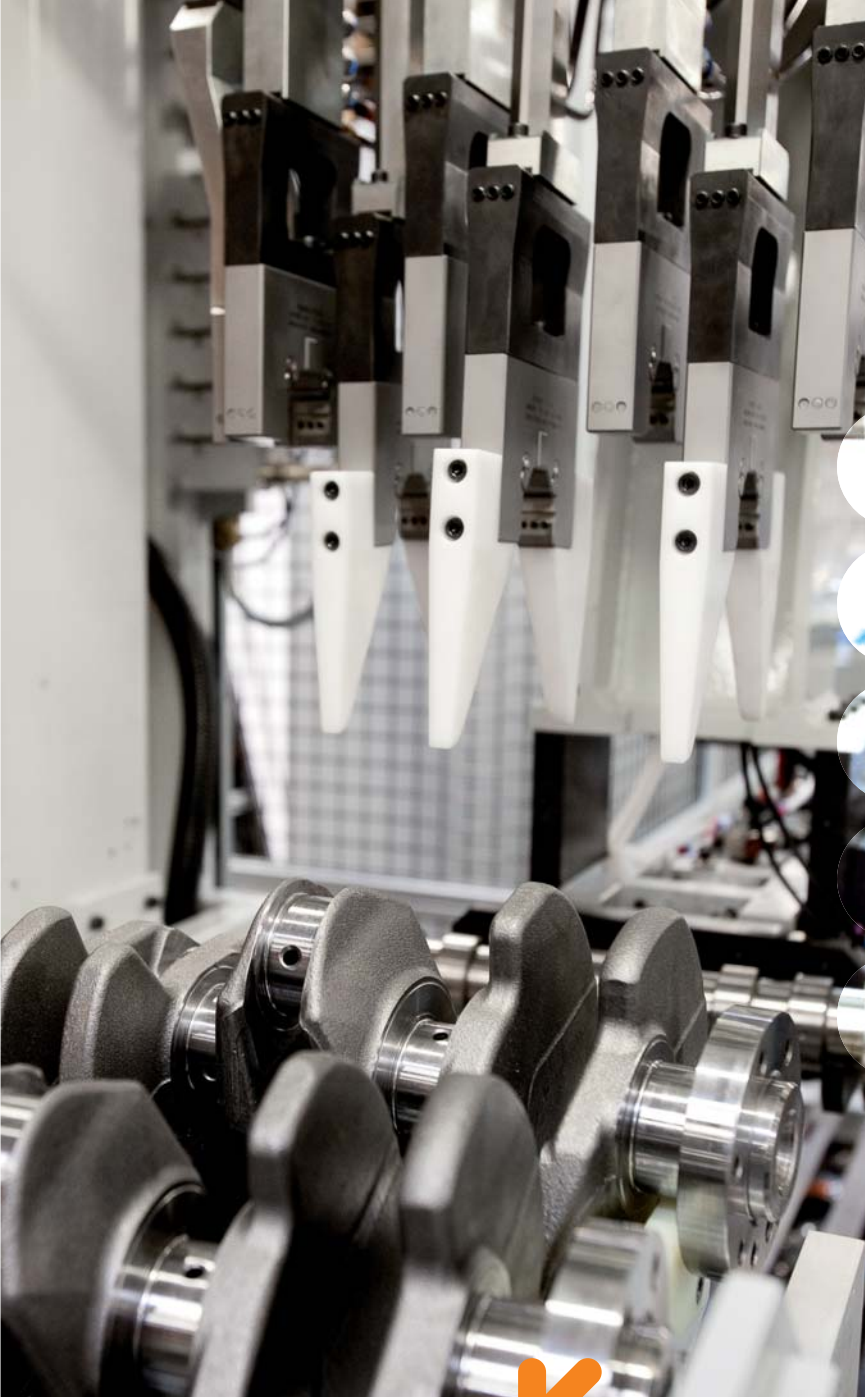
Control and Validation test benches.

## CELLS, BATTERIES & BATTERIES PACK

## e.MOTORS

## ELECTRICAL & ELECTRONIC FUNCTIONS

## HYBRID & ELECTRICAL POWERTRAINS



**SYSTEMS AND  
EQUIPMENT DELIVERED  
ALL OVER THE WORLD**



 **CLEMESSY**

Headquater  
18 rue de Thann - BP 52499  
68057 MULHOUSE CEDEX 2  
FRANCE  
tél.+33 (0)3 89 32 31 67  
fax+33 (0)3 89 32 32 05

[www.clemessy.com](http://www.clemessy.com)