ES ELETTRO SYSTEM

MARPOSS

TWIMP

TWIMP

AUTOMATIC ROBOTIZED MACHINE FOR LASER APPLICATIONS

WHAT'S TWIMP?
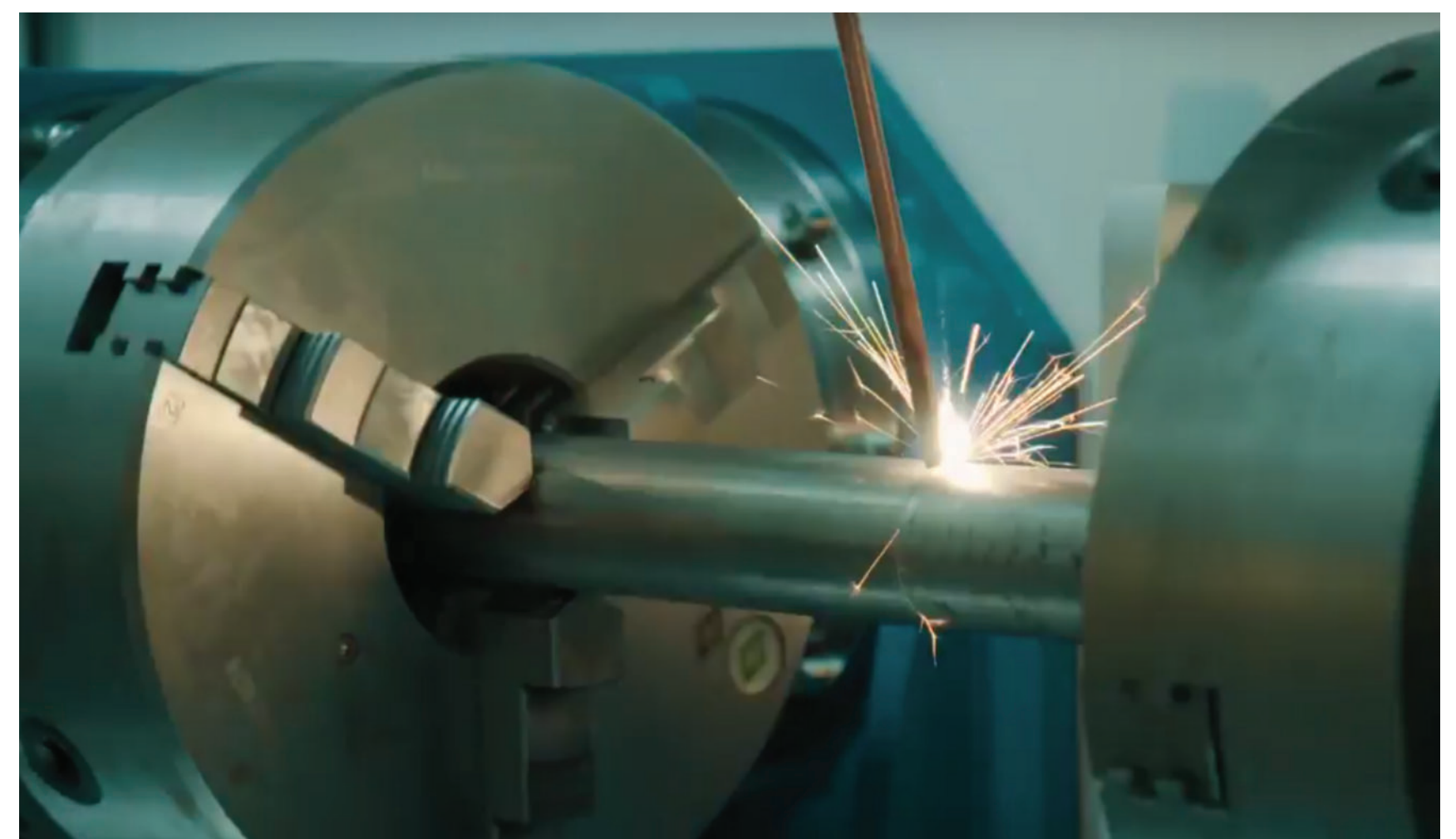
TWIMP *is the output of a co-funded H2020 Phase II project. It's a machine, but not only.*

TWIMP *is a robotized machine for cutting and welding through the laser more innovative and modern technology.*

TWIMP *is a complete service, rich of competences, available before, during and after the purchasing of the machine. With the* **TWIMP** *team, Elettrosystem is not a mere supplier, but a reliable partner.*

TWIMP

Compact

The study of the concept was focused on a topic of relevant impact the the actual industrial world. TWIMP takes advantage of this study result having a very compact footprint. The basic model has a footprint of less than 10 sqm (110 sq ft about).

Modular

TWIMP is configurable according to the specific need of a project or of an indutrial reality. Its modularity is one of the most importat aspects, because thanks to it TWIMP will follow the evolution of the productive of qualitative needs in the time.

Flexible

Without any hardware or software modification of TWIMP, the Customer has the opportunity of adapt the tools & fixtures to a determined product. With TWIMP is possible to host and manage an infinite number of active interchangeable jigs.
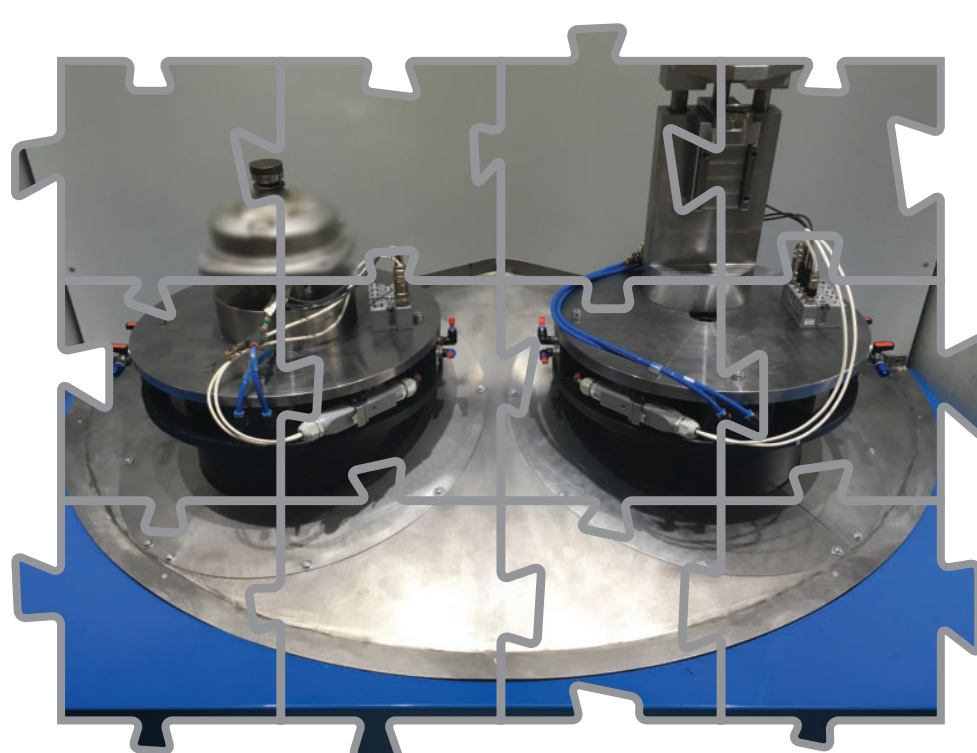
Customizable

A standard tailored machine, this is TWIMP. The advantages of a standard machine, with the plus of the customizzation of the operator side.
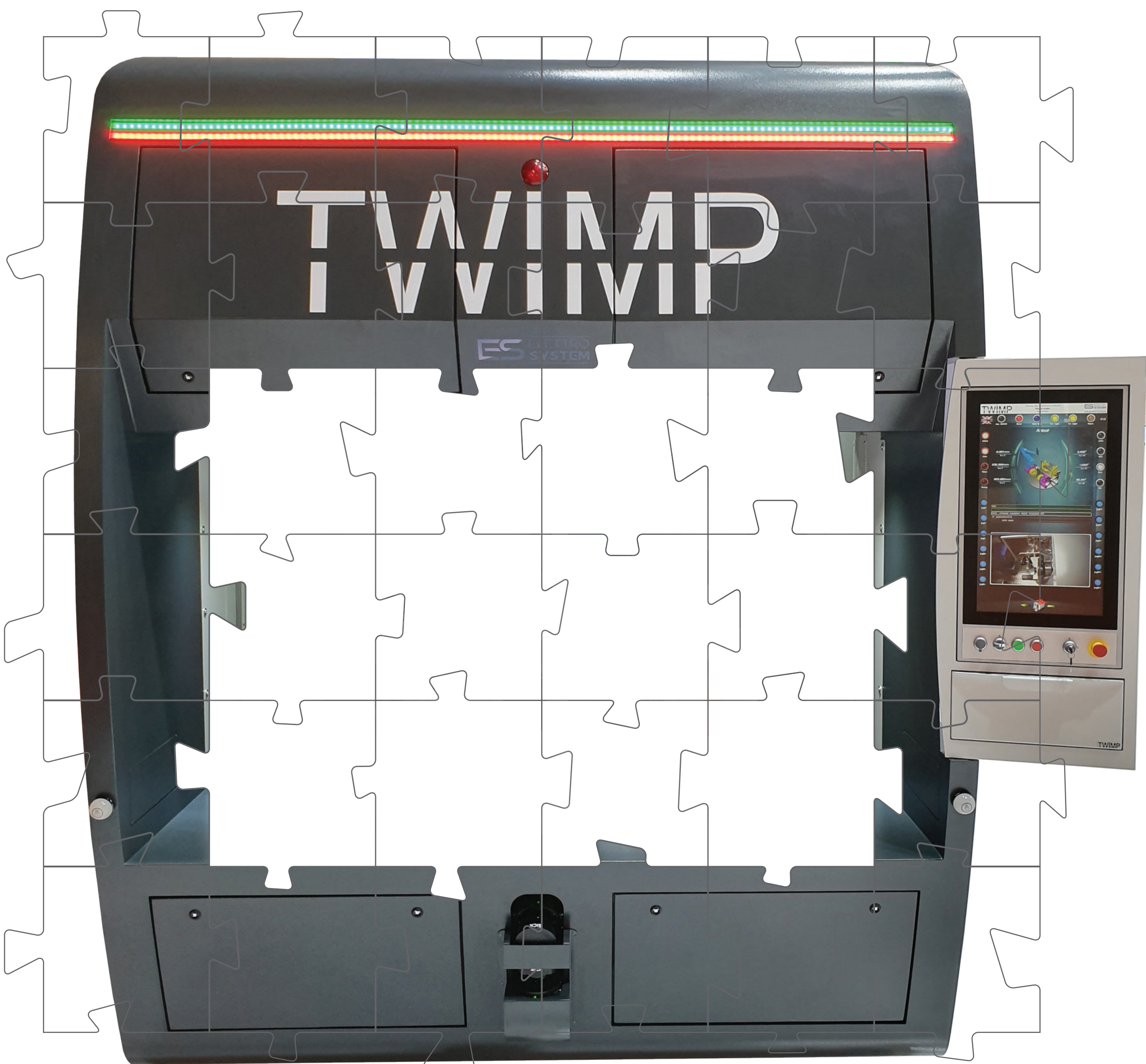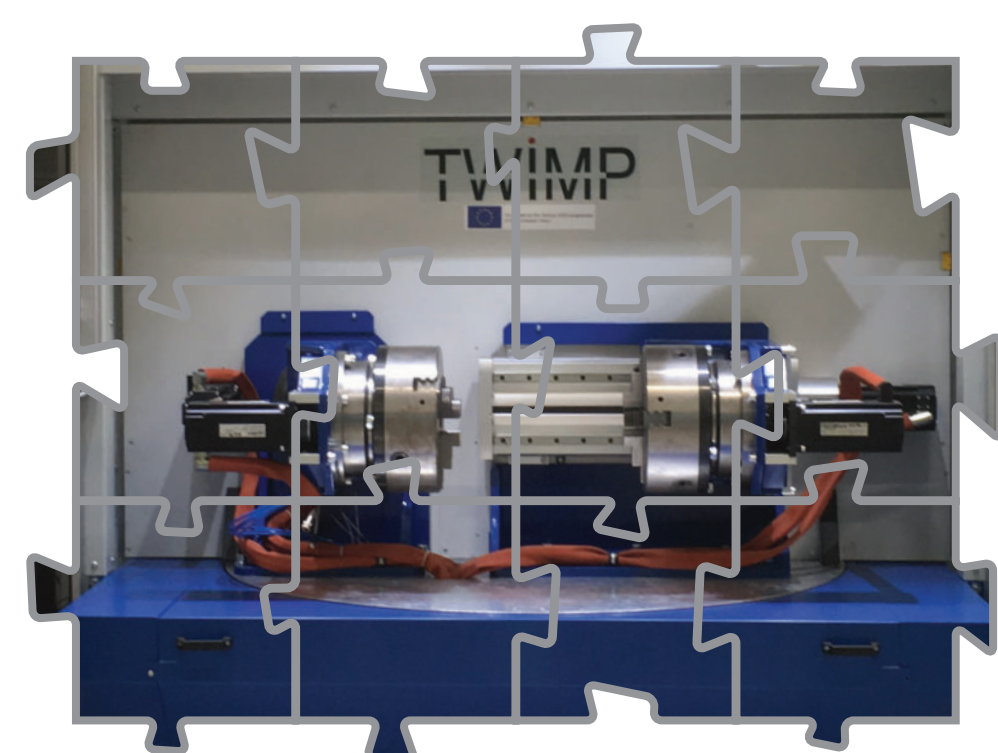

for instance...
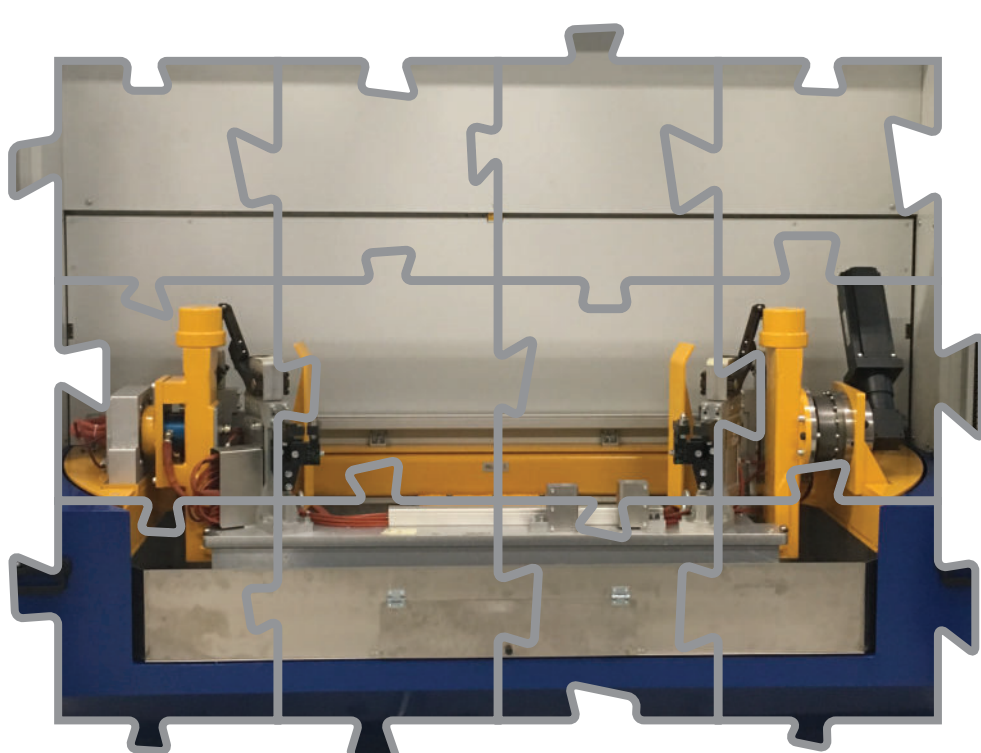
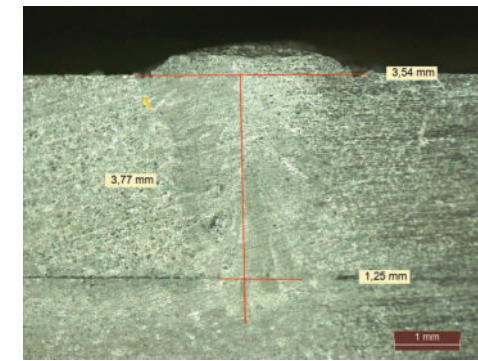Tilting support

Mandrels

Multiple axis

Processes

✎ Welding

The welding technology is based on a no-filling-material process. Any kind of metal is suitable to be joined regardless the shape or the alloy, the thickness or the mechanical coupling (abutted, overlapping, transparence) with TWIMP .
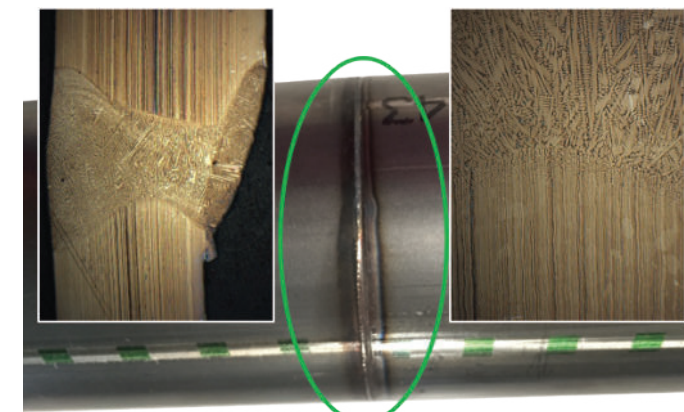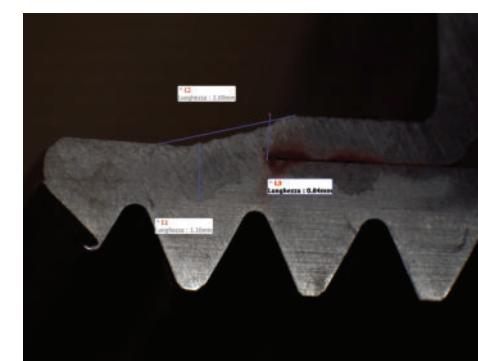
Large gaps

Al6060

Mg

Threaded parts

Mn steel

AISI306

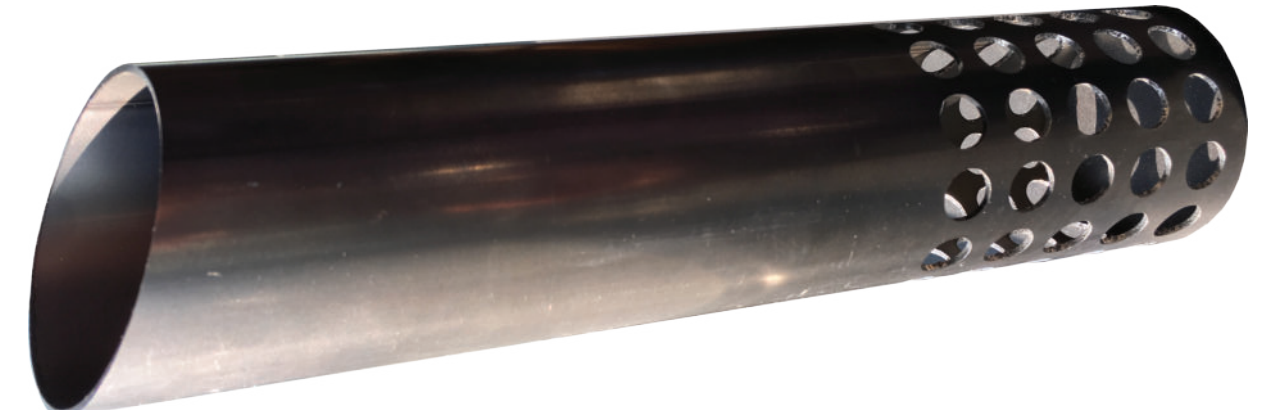## ⬇ Cutting

Cutting machines market is rich of high-performance products, but the most are XYZ-portal based. TWIMP , instead is equipped with a very precise anthropomorphic robot which allows articulated paths to be followed easly. The best laser equipment integrated make the rest.

Tubes

Great thickness

Complex shape

Reflecting Surface
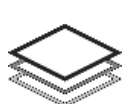
▤ Coating

Another declination of TWIMP is coating. The specific laser system on board of the robot arm is the perfect solution to coat parts, also semi-assebled parts.

🌡 Hardening

The very precise mechanical works and the efficency of manufacturing force to reduce the productive steps and their costs. The heating treatments, so, if localized on folded paths or holes or other critical areas are the solution to match the quality with the convenience. This is what TWIMP offers with a dedicated configuration.

```
137    ;calcolo velocità mandrino da mm/s a "/min: 360" * 60 * feed (mm/s) / (diametro (mm)* PI)
138    F (360 * 60 * Mandrel[myMandInSt].myFeedSalda) / (Mandrel[myMandInSt].myDiametro * 3.141);"/min
139    G110 ACC=500 ;"/s^2
140    G91
141    G126 0 ;Raccordo a zero
142    ;Controllo correttori validi
143    N60
144    G172 ;Controllo correttori saldatura
145    for k=0 to 3
146        if (abs(Mandrel[myMandInSt].myCorrezione[k] > 1))
147            GOTO N60
148        endif
149    endfor
150    ;Attivo l'emissione diretta del laser
151    myDirect = 1
152    ;Tratto di accelerazione
153    G01 U=30
154    ;Emissione
155    myLaserPower = 2300
156    G01 U=90 Z = Mandrel[myMandInSt].myCorrezione[0]
157    G01 U=90 Z = Mandrel[myMandInSt].myCorrezione[1]
158    G01 U=90 Z = Mandrel[myMandInSt].myCorrezione[2]
159    G01 U=90 Z = Mandrel[myMandInSt].myCorrezione[3]
160    myLaserPower = 1200
161    G01 U=90 ;sormonto
162    ;spegnimento laser
163    myDirect = 0
164    myLaserPower = 0
165    myLaserOn = 0
166    ;tratto di decelerazione
167    G01 U=30
168    N900
169    G90
170    G172
171    ;Sgancio il mandrino reale
172    myStGear = 0
173    G172
174    ;spengo le valvole del gas di copertura
175    myRobotGas = 0
176    myStGas = 0
177    myCrossJet = 0
178    myLampOn = 0
179    ;imposto il buono
180    myGoodSt = 1
181    ;ritorno indietro
182    G126 50; arrotondamenti
183    G90
184    F60000
185    G110 ACC=5000 ;mm/s^2
186    ;se non devo andare sulla stazione 4 mi porto in posizione di home
187    ;altrimenti torno nel main
188    if not (myEnableSt4)
```

Despite the many functions, many features available, TWiMP is characterized by a great semplicity of management. TWiMP is programmable in ISO G-Code or in a structured linguage.

Motion: the robot arm and up to three external axis are interpolated together with the standard G-Code functions; no more linguages, no more heterogenous platforms, no more pendants.
Logic: the instructions are written in a unique program with the motion, in the same language.

The whole machine is governed through an inclusive environment.
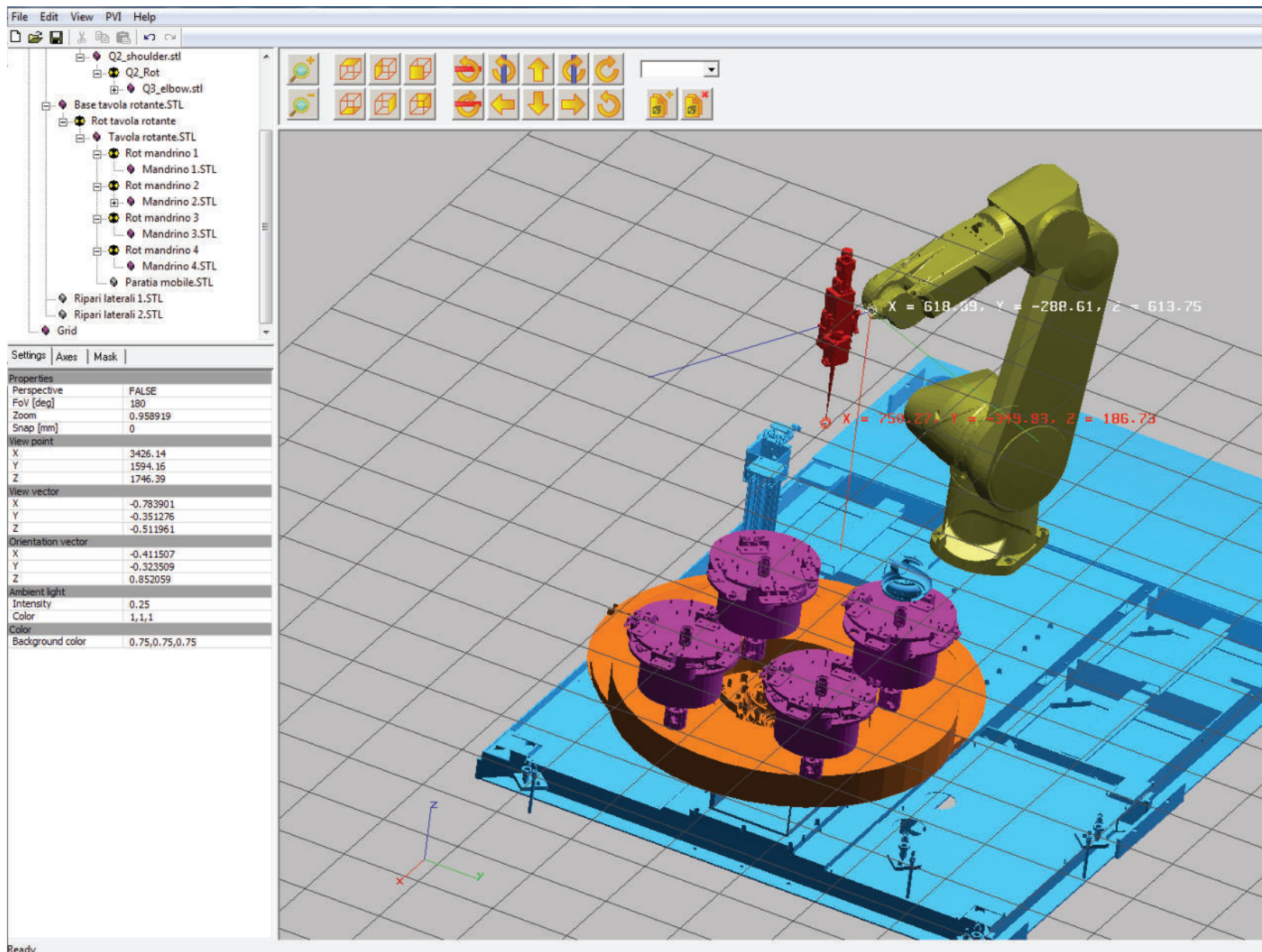
TWiMP makes exactly what is necessary. The offline simulation, or the online monitoring, completes the tools available in TWiMP.

The technical department or the team leader has the opportunity of program the machine sending the final part program to the machine.

TWiMP is infact Industry 4.0 compliant and the storage are of the programs is accessible via FTP or any other kind of communication protocol.

TWiMP operates also in parametric mode, so a csv or text file is enough to start the production.

CONSULTING

The high skilled engineers of TWiMP are prepared to study the feasibility of any process validating the results through laboratory tests.
The objective data, indeed, are the only reliable way of qualifying a laser application, expecially in case of welding.
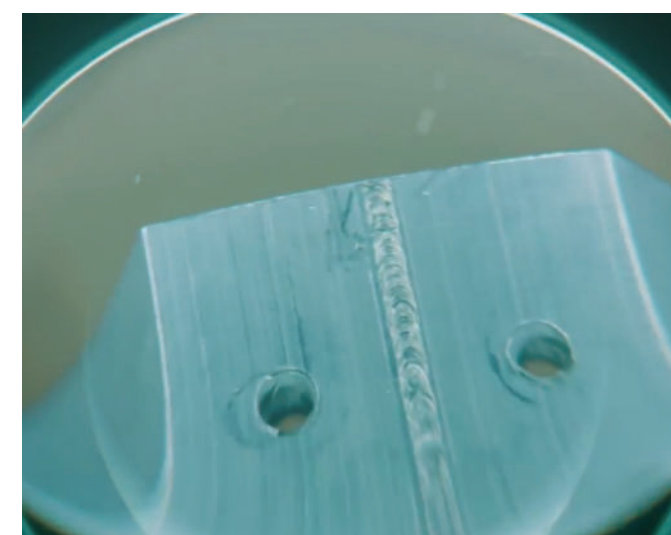
The results are significant if obtained having maestry of the context. Porosity, micro-crevices, penetration, are only few aspects to be monitored during the inspection of the samples and TWiMP technicians are experienced to valuate them.

The high level of prepartion of the technicians is supported by professional instruments. TWiMP counts on people provided of efficient instruments to avoid any alteration of the material.

Ask for a competent consulting about **"hairpins"** and **"busbar"** welding
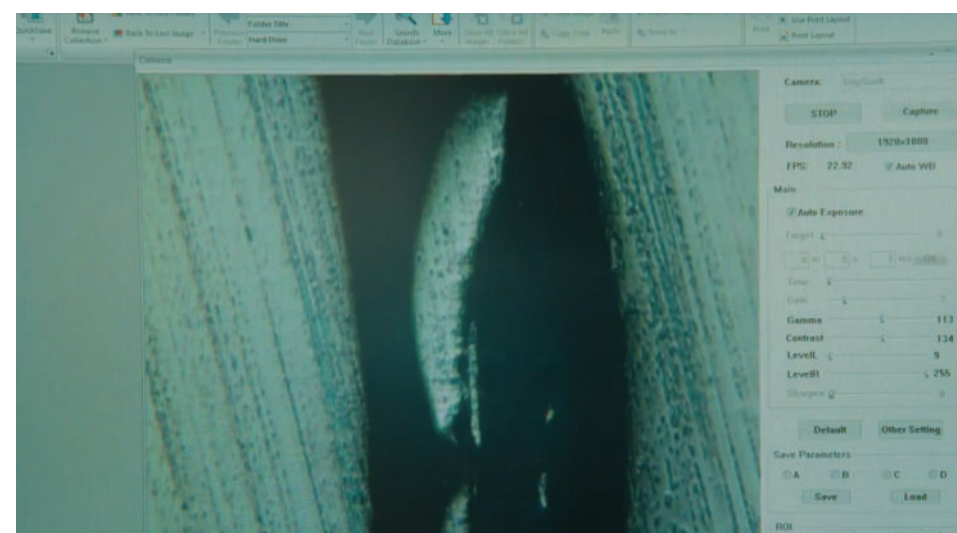
WORKSHOP

Monothematic workshops are periodically provided to heterogeneous audience. Different levels of contents, according to the participiants background and requests, are focused on laser works (cutting, welding, titanium,...). At the end, a certificate of completion is released to each attender.

MAINTENANCE

Furthermore, one of the appreciated services provided by TWiMP is the maintenance of installed laser systems.

Notwithstanding the high level of efficency of the laser, particularly fiber or diode laser, a careful plan of maintenance is necessary to avoid any damages. Lens cleaning, emitted power control, cooling system check, are only part of a more articulated program of maintenance.
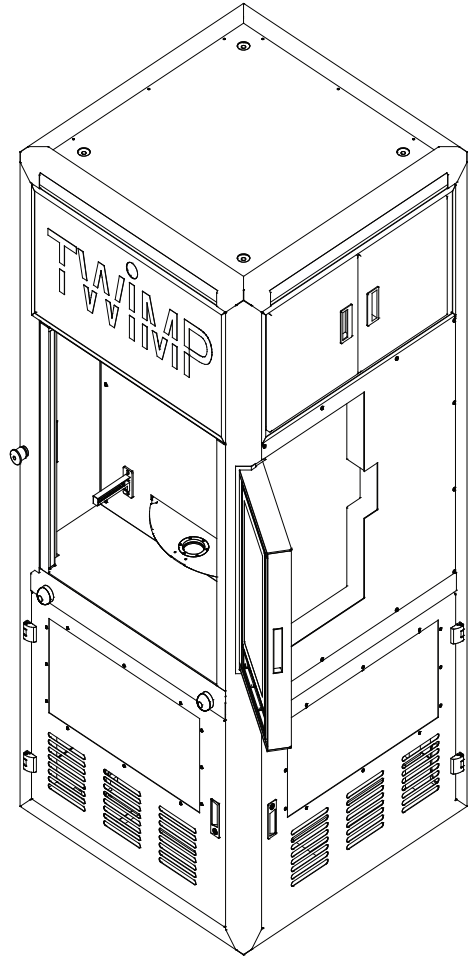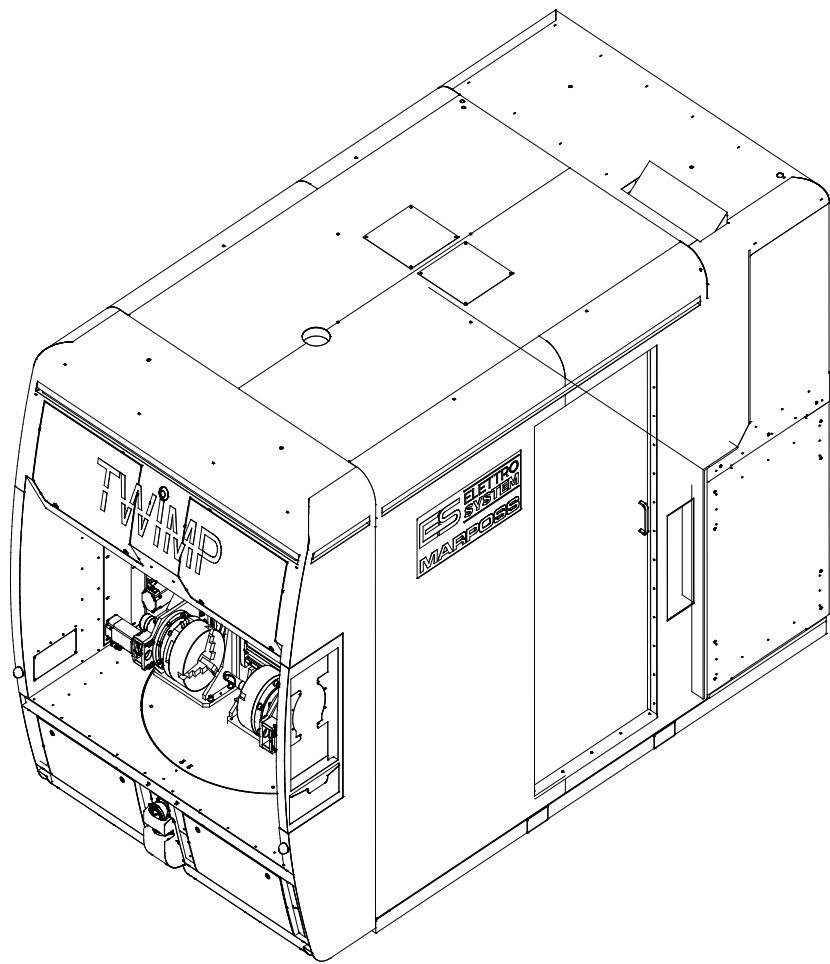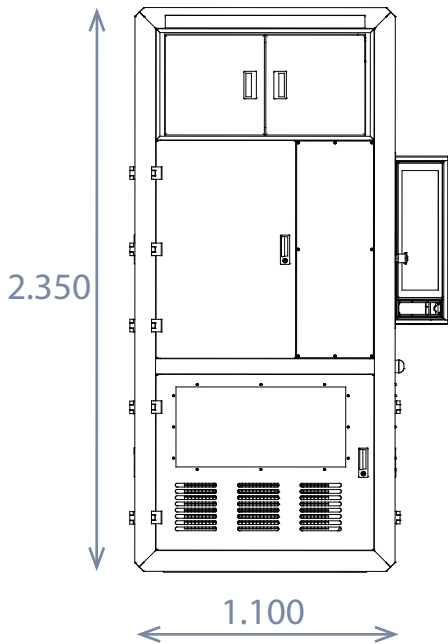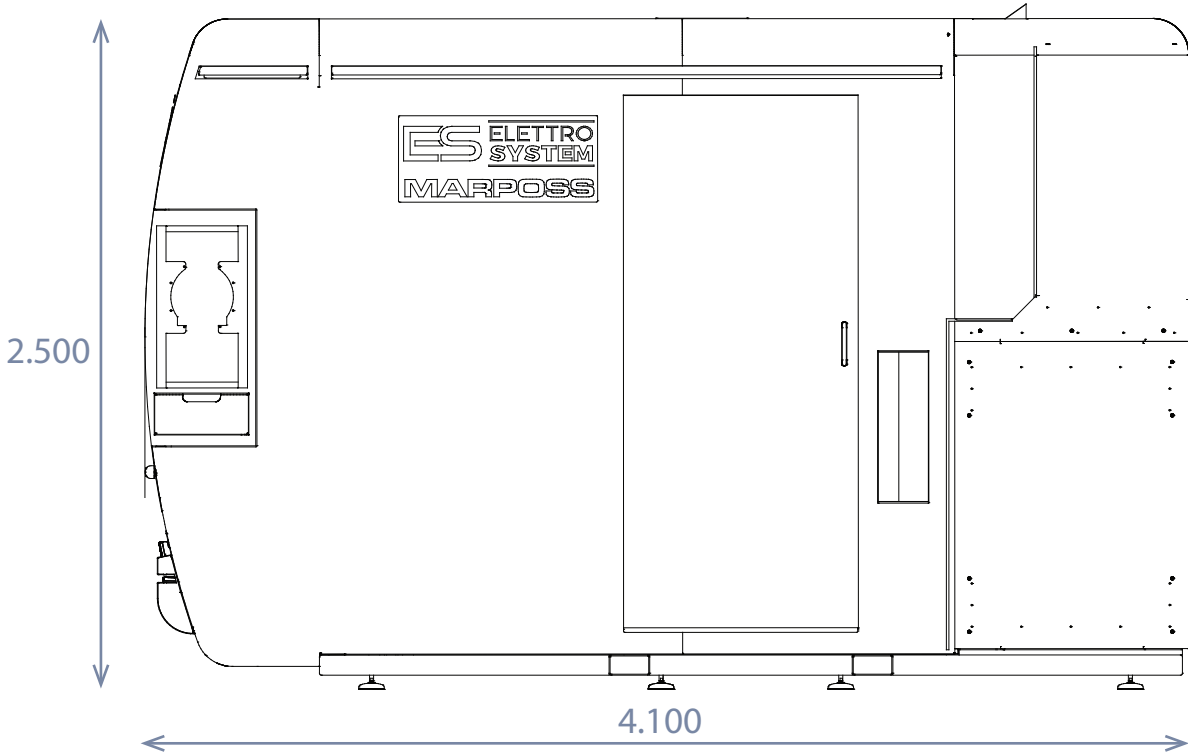

TWiMP

TWIMP Machine

TWIMP Micro

|		TWIMP Machine	TWIMP Micro
AXIS DETAILS			
TYPE		High Accuracy Robot	High Accuracy Torque and Linear Motors
AXIS QUANTITY (nr)		6 + up to 3 virtual external axis	up to 4 axis
REPEATABILITY (nr)		± 0,05 mm	± 0,01 mm
DIMENSION - WEIGHT			
CELL MIN DIMENSIONS wxhxd (mm)		2.100x2.500x4.100	1.100x1.100x2.350
ESTIMATED WEIGHT (kg)		6.000-9.000	1.500-2.500
ROTARY TABLE WITH MANUAL LOADING (standard form)			
MAX TABLE DIAMETER (mm)		1.750	600
MAX NUMBER OF WORKING STATIONS (nr)		3+3	3
MAX WORKING VOLUME PER STATION wxhxd (mm)		1.200x500x600	100x100x100
MAX LOADING WEIGHT PER SEMITABLE (kg)		1.000	0,5
LOADING HEIGHT (mm)		700	1.100
LOADING WINDOW HEIGHT wxh (mm)		1.850x980	760x830
PIECE POSITIONER			
HORIZONTAL TURNING TABLE		Yes	Yes
SPINDLES		Yes	Yes (without rotary table)
TILTING FRAME		Yes	-
TRUNNION SUPPORT		Yes	-
GENERAL LASER SPECIFICATIONS			
LASER SOURCE	Brand	Convergent, IPG, Laserline (only diode), nLight,	Convergent, IPG, nLight
	Power (W)	1.000-12.000	500-1.000
	Technology	fiber, diode	fiber
	Fiber Ø (micron)	26-600	14-100
CHILLER	Cooling capacity (W)	up to 25.000	up to 3.000
	Circuits (nr)	up to 3 (source, optics, oil pump)	1
PROCESS HEAD	Brand	IPG, Laserline (only diode), Lasermech, Precitec	IPG, Lasermech, Precitec
	Process	cutting, welding, coating, hardening	cutting, welding
INDUSTRY 4.0			
INTERFACING	MES/ERP	OPC-UA, SQL, Ethernet	OPC-UA, SQL, Ethernet
	Third machine	OPC-UA, Profinet, Ethernet, wired I/O	OPC-UA, Profinet, Ethernet, wired I/O
	FTP	FTP	FTP
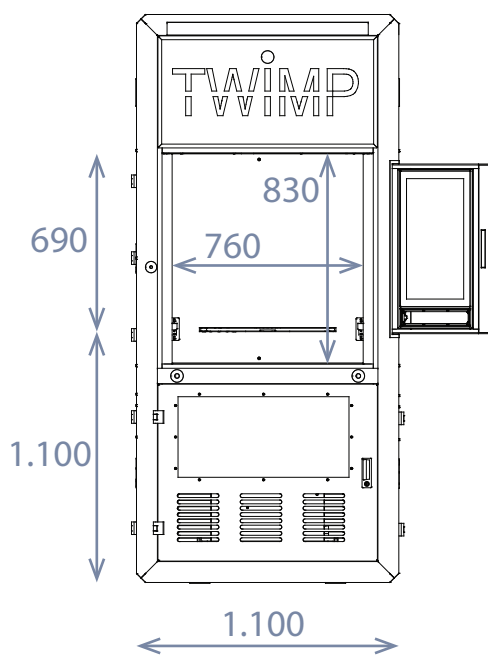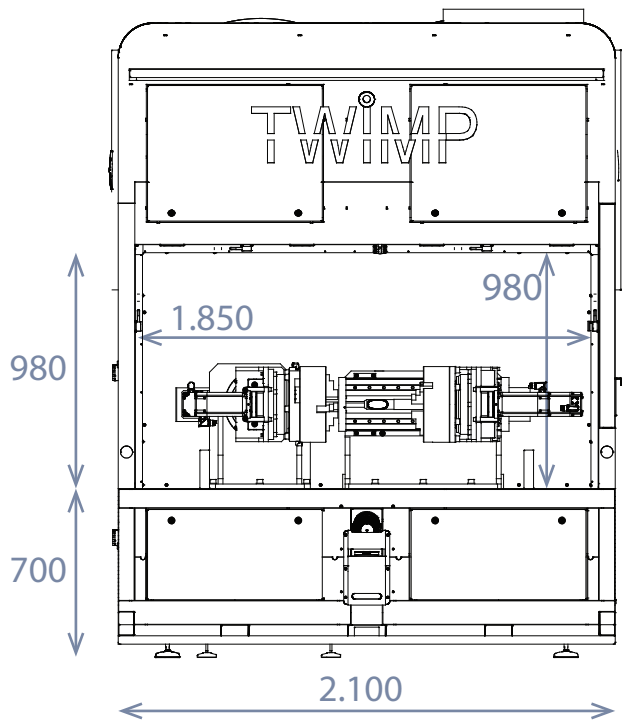
TWIMP

developed, designed and manufactured in Italy
by

ES ELETTRO SYSTEM

MARPOSS
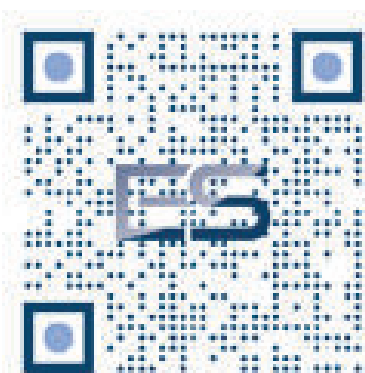
(+39) 0141 203003

www.elettrosystem.com
twimp@elettrosystem.com