

## TECHNICAL DESCRIPTION OF

**HI SPEED 5D-SHAPER MACHINE WITH 5 AXIS CNC CONTROL WITH GANTRY ON Y AXIS FOR FOAM SHAPING, WITH AUTOMATIC TILTING SYSTEM, AND AUTOMATIC TOOL-CHANGE, OPTIMIZED FOR THE PRODUCTION OF SURFBOARDS, SAILBOARDS, SUP, KITEBOARDS AND SIMILAR**



## 1. DESCRIPTION OF MACHINE

N.1 vertical milling machine with 5 interpolated axis with CNC control, Cartesian type, along the 3 axis X, Y, Z, with gantry system on Y axis and 2 rotations around vertical and horizontal axis, as described as follow:

- number of working axis:	5
- number of brushless motors:	6
- linear positioning precision:	0.5 mm/1000mm;
- linear direction precision:	0.5 mm/1000mm;
- repeatable position precision:	+/- 0.5 mm;
- X axis working length:	from 3000 to 5000 mm;
- Y axis working length:	from 800 to 1100 mm;
- Z axis working length:	from 400 to 500 mm;
- Rz vertical rotation	360 °;
- Rx horizontal rotation	270 °;
- combined total linear precision:	0.5 +/- 0.5 mm;
- working speed:	0.01 – 100 cm/s;
- power supply:	380 / 440 Vac single or 3 phase, 50/60Hz
- Installed power:	from 4.5 to 18.0 kW

comprehensive of:

- n.1 main frame realized in carbon steel , with overall dimensions up to 6700(L) x 2600(W) x 2600(H) mm, provided with n. 4 / 6 anti-vibrating and adjustable feet;
- n.1 couple of guides for movement along X axis, realized by means of rectified rails with ball bearing cars with maximum run from 3000 to 5000 mm. The power train is realized by means of motor-reducer, pinion gears and racks;
- n.1 couple of guides for movement along Y axis, realized by means of rectified rails with ball bearing cars with maximum from 800 to 1100 mm. The power train is realized by means of a Gantry System with 2 motor-reducers, pinion gears and racks or under request by means of rectified ball bearing worm screws;
- n.1 couple of guides for movement along Z axis, realized by means of rectified rails with ball bearing cars with maximum run from 400 to 500 mm. The power train is realized by means of motor-reducer, pinion gear and rack;
- n.1 geared bearing for 360° rotation RZ around Z axis, realized by means of high-precision motor-reducer, pinion gear and driven gear on bearing;

- n.1 horizontal shaft for 270° rotation RX around X /Y horizontal axis, realized by means of high-precision motor-reducer, belt pinion gear and driven gear on bearing;
- n.1 shaping head constituted of a 3.0 to 13.0 kW spindle motor with speed from 12.000 to 18.000 rpm, 20 to 30 mm shaft tool support, eventual automatic tool-change for cutters and suction device for foam powders produced during shaping;
- n.6 servo-controlled brush-less motors, complete of drivers, special cables, closed loop control and mounted on motor-reducers;
- n.3 cables chains for X, Y e Z axis;
- n. 1 electrical board comprehensive of complete electrical equipment installed on the machine;
- n.1 5 axis CNC control with Gantry System, predisposed for the execution of external programs in ISO language ( G-CODE ) and creation of proper own working sequences independently from external programs;
- n.1 vacuum and filtering device for foam powders from 1500 to 2200 W power, complete with 10 m of flexible hose, 100 to 160 mm diameter and bag for powder;
- n.1 industrial PC, MODEL Z32-C15-FZ specially made for high speed CNC controls, complete with monitor, keyboard, I/O devices, hardware and software necessary for complete functioning;

1.2. N.1 complete system for positioning and holding the blanks to be shaped comprehensive of:

- n. 3 adjustable supports for the blank to be shaped, each equipped with 2 suckers made in silicon with 75 mm diameter to hold the blank by means of vacuum suction for middles and center blank;
- n. 2 adjustable supports for the blank to be shaped, each equipped with 1 suckers made in silicon with 75 mm diameter to hold the blank by means of vacuum suction for nose and tail of blank;
- n. 2 adjustable devices for positioning and centering the blank to be shaped, each equipped with symmetric auto-centering clamps along Y axis (extra stringer requested);

- n. 2 adjustable devices for positioning and centering the blank to be shaped, each equipped with symmetric auto-centering clamps along Y axis (extra stringer NOT requested);
  - n. 1 or 2 dry type vacuum pumps, complete with manometer and pressure limit switch;
  - n. 1 or 2 pneumatic plant for vacuum from pump to suckers;
- 1.3. N.1 tilting system to automatically tilt 180° the blank so to be all shaped without the need of the operator, all in once. With the automatic tilting system, the production may arrive up to 4 complete boards in one hour.
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## PHOTOS OF DETAILS

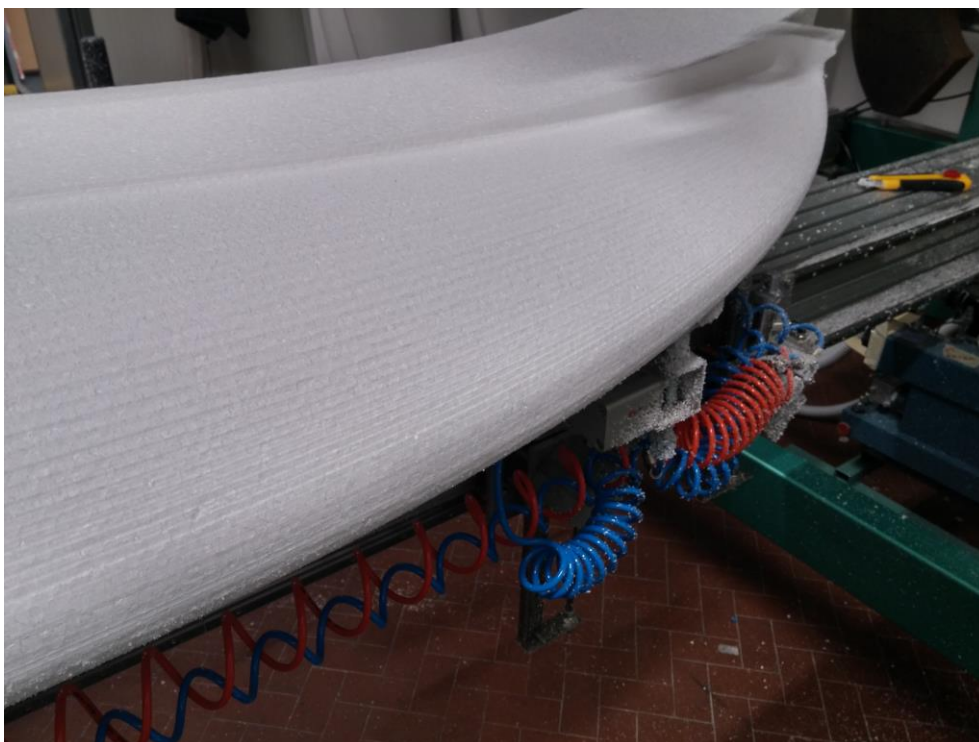
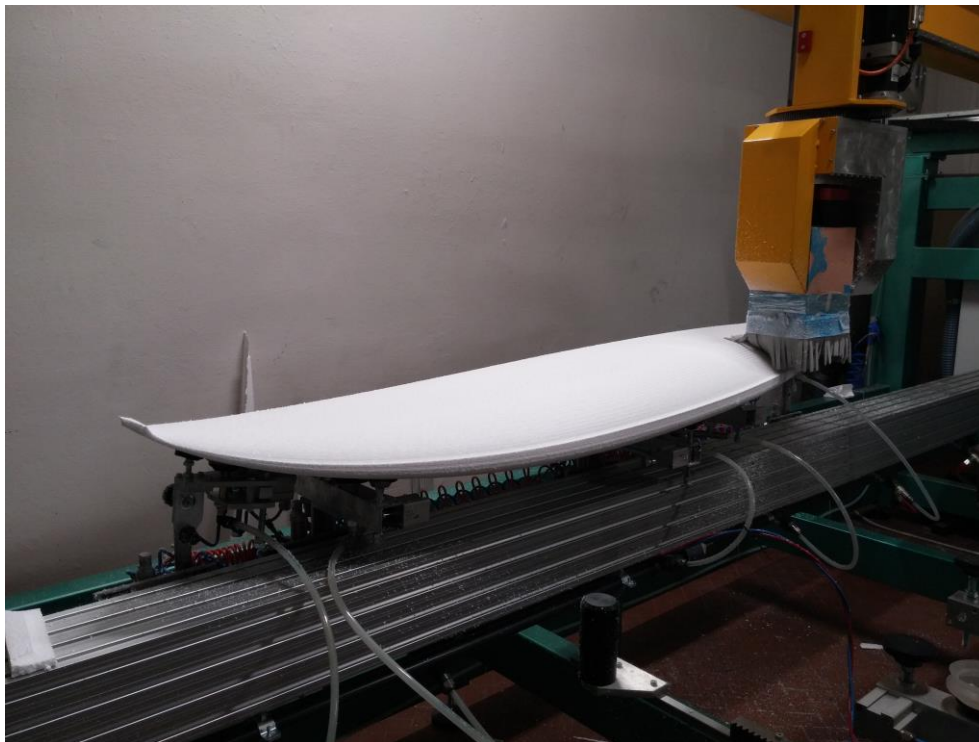


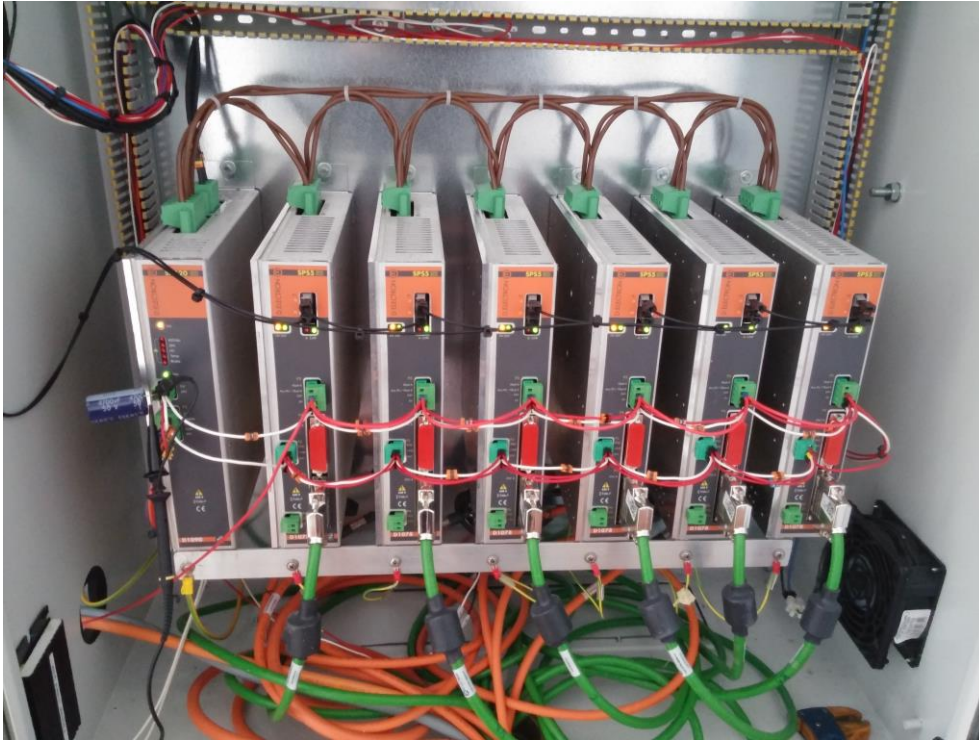
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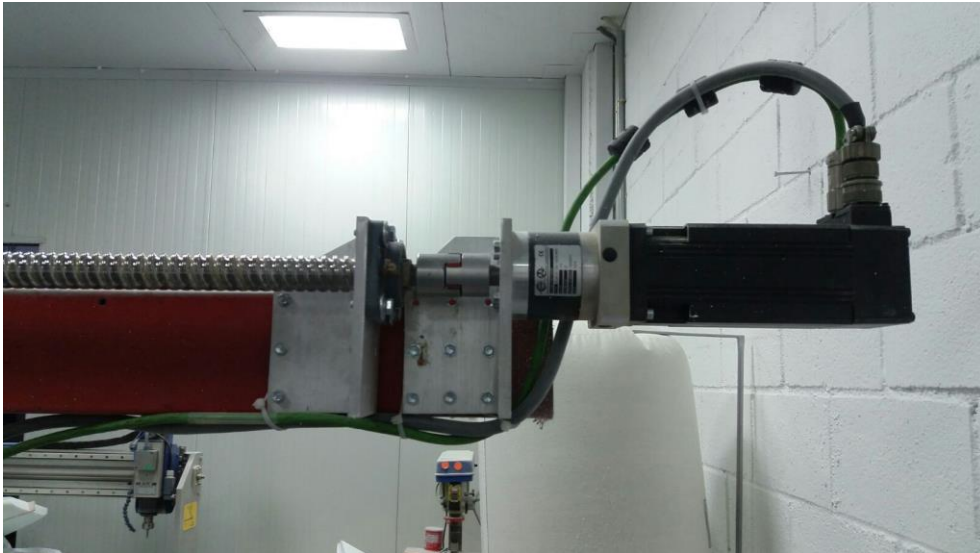
DI MASSIMO MORINI E C.

SETTORE

ROBOTICA RICERCA SPERIMENTALE  
AUTOMAZIONE MACCHINE SPECIALI







Worm screw version for Y axis

