

Galil Controllers Guide Artesà Machine To Mimic Delicate Hand Engravings

Whether it's a crest of arms on an elegant silver serving platter or a deer emerging from the woods on the blade of a hunter's knife, one can't help admire the work of the master artisan who hand-engraved such detailed works of art using a hammer and chisel.

With increased demands for quality engravings on everything from jewelry to cell phones, but not enough hands to do the work in mass quantities, Artesà has developed a machine capable of mimicking the craftsmanship of a living, breathing engraver.

Carrying the same name as the company, the Artesà is the brainchild of Leonardo Di Benedetto who developed it after hearing fellow engravers and customers, particularly those who work with jewelry, talk about the need for a high quality, mass production machine that could produce hand-like engravings.

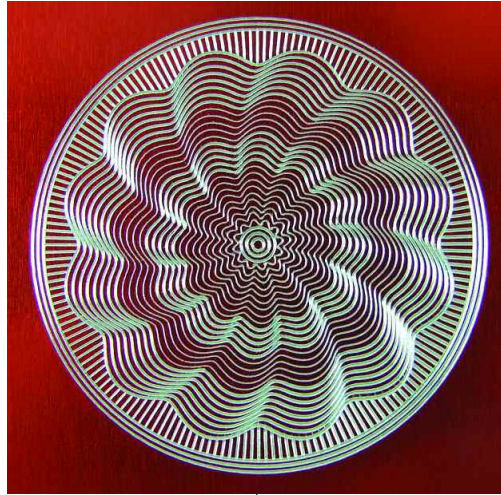
While acknowledging that a machine cannot replicate what a human engraver can create, Di Benedetto says his Artesà "does not suffer pains or get tired. The machine can engrave very well and reproduce a high quality 'hand like' engraving and reproduce it identically as many times as you wish."

"In hand engraving work the artisan performs a downward and upward movement with the chisel each time a cut is made in the surface of the object being engraved. The Artesà's engraved line has a curvilinear or open polygonal trajectory in the vertical plane achieved with non-rotating cutting tools. This is what gives the engraving its brightness and beauty characteristics," Di Benedetto explained.

Essentially, the Artesà consists of a 19.68"W x 9.84"D table with a bed-frame that firmly holds the material to be engraved, such as a copper metal plate. Just above is the spindle-mounted, engraving tool head which includes a laser pointer, three carbide inserts with 35°, 90° and 135° corner cutting edges, and a slot that accommodates such optional accessories as a diamond drag or a 350,000 rpm micro turbine.

To control the complex and precise X, Y and Z movements of the Artesà tool head with carbide inserts, Di Benedetto specified a DMC-2143 four-axis, Ethernet motion controller from Galil Motion Control including their SDM-20240 for driving the four stepper motors.

In addition to the three degrees of freedom that the



A sample of a Guilloché style, intricate geometric design engraved on aluminum by the Artesà.

DMC-2143 provides, it also controls the very critical PT (line depth) and SV (vector tracing) axes.

The PT axis is designed to gradually move the cutting tool downward on a vertical plane so it can cut into the material to a desired depth doing the descending part of the

curve, and then upward to the material surface cutting the ascending part of the curve. The SV axis manages the 360° motion of the cutting tool, making sure the cutting edge always faces in the pre-programmed direction to effectively trace the vector being engraved and do so with a positioning accuracy of 0.004"/1" that is repeatable to 0.0008" under no-load conditions.

"The Galil controller has proven to be very reliable and useful. In addition to motion control, it has other features such as numerous inputs that we assign to the limits control, motor on/off function, material detection and so on," said Di Benedetto.

He also said the Ethernet port of the controller was especially useful during the development of the prototype as many tests were conducted with the instructions delivered from various PCs.

As a numeric controlled engraving machine, the Artesà is programmed to reproduce 2D vector drawings created with the Corel-DRAW® Graphics Suite X3. The drawings are post-processed, converting the 2D vectors into 3D tool paths, and uploaded to the Artesà using the Company's proprietary "Artesà nc" plug-in software.

Having heard the news about the Artesà, local artist and master hand engraver Jordi Sole Sellarés decided to visit Di Benedetto to see firsthand how well this engraving machine could perform. He walked away impressed.

"I've seen Leonardo's plate with my own eyes, and it really surpasses the quality of what I had seen anywhere made by a machine. Some parts could be taken by someone with a non-expert eye as if they were made by a hand engraver. Congratulations for that," Sellarés said. ■

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