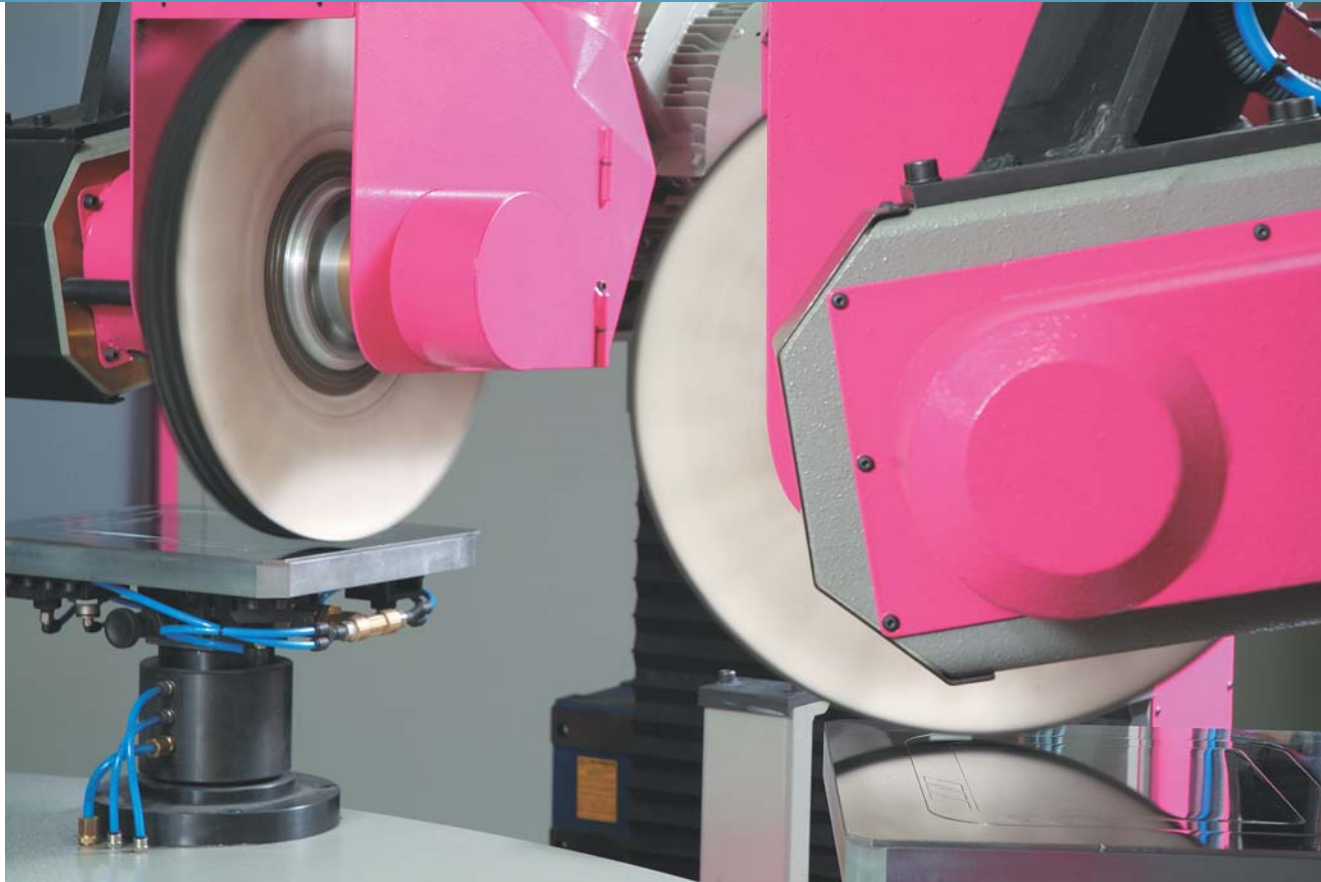


Flawless picture frames thanks to TwinCAT

- TAM Electromecànica specializes in the polishing, grinding and deburring of diverse components such as aluminum profiles, fittings, jewelry, wheels, wooden parts or plastic elements. For the polishing of picture frames, TAM developed a machine with 26 axes controlled via TwinCAT CNC.



The company TAM, based in Artés near Barcelona, develops and produces “next-generation” prototypes for polishing, grinding and deburring as well as automatic systems and robotic cells. Based on long-standing experience and the application of state-of-the-art technologies, TAM is able to offer innovative concepts in the form of advanced production and processing machines for any surface or shape.

High production rates and stunning gloss

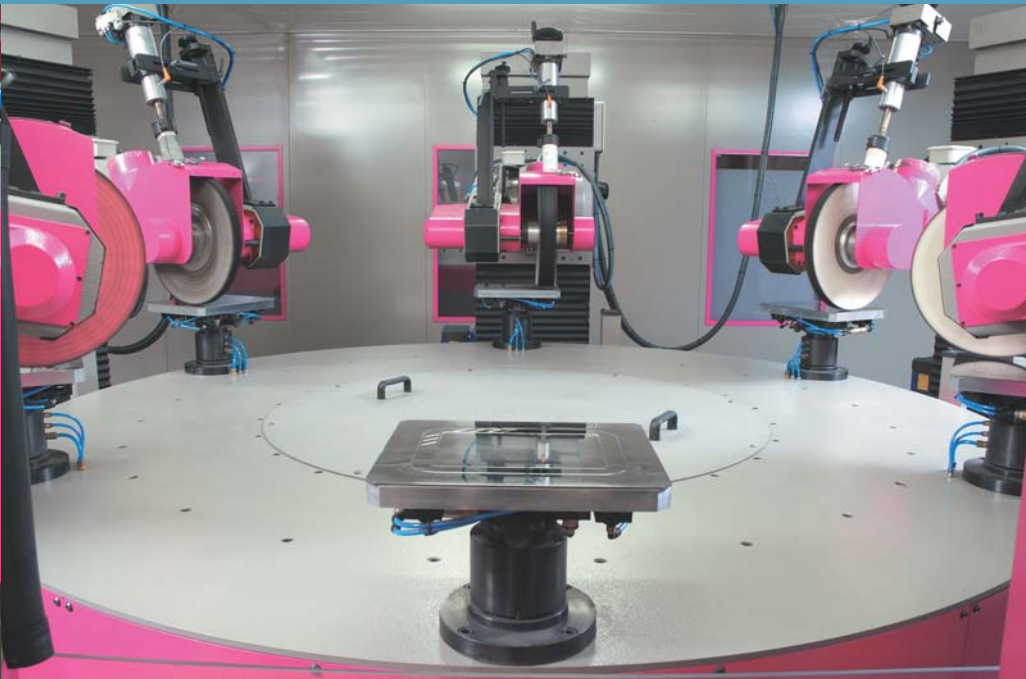
Picture frames must be manufactured in a wide range of variations and from diverse materials such as stainless steel, silver, gold or platinum in a range of thicknesses down to 0.2mm in some cases. The TAM machine with 26 CNC axes polishes the frames effortlessly – as if by hand – thereby achieving maximum quality in a minimal amount of time.

The highly flexible machine features five polishing units with six workpiece holders. It can simultaneously process six different workpieces while one of the holders deals with picking up or setting down the workpieces. The pressure exerted by the polishing heads on the workpiece is continuously monitored and auto-

matically adjusted in order to minimize head wear. Worn polishing heads can be replaced manually, thereby reducing downtime.

Depending on the model, the workpieces can be fitted with clamps or suction cups or simply be placed on the workpiece holder. Application of the polishing material is fully automatic and can be configured precisely. The machine also features two patented innovations: Firstly, a pre-existing dust protection system is no longer required due to new linear guides. Secondly, the servo motors that move the workpiece holder are mounted on the rotating part of the rotary table. This makes the duty cycle significantly faster, because the servo motors can move the machine to the next position while the rotary table is in motion. In order to make loading and unloading even more flexible, the machine is optionally available with a robot linked to the fieldbus.

Thanks to a new, user-friendly program and mobile touch screens, the operator can program and control all functions from any machine position. Various HTML-based programming aids that offer explanatory videos and images facilitate this task.



With flexible and high-performance PC-based control technology from Beckhoff, TAM is able to control up to 50 axes.

Joan Murt, technical director of TAM Electromecànica.

Why TwinCAT and EtherCAT?

Joan Murt, technical director of TAM, explained the reasons for choosing Beckhoff control technology: "Controlling machines with 50 axes or more requires a high-performance CPU and a flexible solution for managing the PLC, CNC and user interface. We decided to use TwinCAT because conventional solutions (PLC + CNC box + PC) are more expensive and take up more room in the control cabinet. The new system facilitates the development of growing, complex and open applications and the simple and convenient reuse of source codes. TwinCAT, in combination with the Beckhoff hardware in the form of IPCs, fieldbus interfaces, servo drives and servo motors, offers an excellent basis for the further growth of our company."

The new polishing machine is controlled by a C6140 Industrial PC

The EtherCAT real-time Ethernet solution was chosen as fieldbus because it is robust and offers high transfer speed: "We can now work with a large number of axes without experiencing positioning problems due to fieldbus response delays."

The switch from fiber optic to Ethernet cables resulted in cost reductions and increased performance.

The I/O system chosen by TAM is a Beckhoff Bus Terminal system with a BK1120 EtherCAT Bus Coupler that enables distances between I/O stations of up to 100 m. The flexible EtherCAT topology offers further benefits for TAM compared with other fieldbus systems: "We can use conventional standard cables and don't have to use a switch or hub. In this way, we linked 26 servo drives and two I/O couplers in order to distribute the electronic devices efficiently."

→ TAM Electromecànica www.tamelectromecanica.com

→ Beckhoff Spanien www.beckhoff.es