■ Goratu Máquinas Herramienta, Spain

Innovative Machining Strategy

Machine tool manufacturer equips new multi-functional series for milling and turning with Sinumerik 840D sl control systems.

Siemens AG

Goratu Máquinas Herramienta, S.A. manufactures a complete range of CNC milling machines and CNC lathes under the Lagun and Geminis brand names. With almost 200 employees, the company is one of the largest Spanish machine tool builders and maintains global subsidiaries for sales and services. The wide product range responds to the needs of different industrial sectors addressed by the company, such as power generation (windmill shafts), aerospace, iron and steel, petrochemical, railway, and ship-building.

Combined technologies in single machine tools

With several thousand units installed globally, the company has long-standing experience in designing, engineering and manufacturing machine tools. Their newly-developed, multi-functional devices improve customer productivity in the manufacture of large-size components in different shapes, high quality and short time. Therefore turning and milling technologies are combined into one unique machine. Such a unit allows the machining processes without the reclamping of workpieces. Doing everything in one clamping, that is, turning, milling and drilling, saves both on machines and alignment, including set-up steps, thus reducing resulting errors and time spent.

Basing on the two common manufacturing lines, Geminis for turning and Lagun for milling, Goratu offers a wide range of choices. Lagun CNC bed mills has been extended to customize the solutions according to individual production needs. For example, the GMM travelling column milling machines and the GCM travelling column milling machines with fixed tables that are giving increased capacities. For heavier or larger workpieces, milling offers a solid table, allowing component weights up to 3.5 ton/m².

Powerful programming features

To provide customers not only high quality machines with flexible milling and turning functionalities, but also with state-of-the-art control systems, the tool manufacturer decided to equip the new multifunctional machining centers with Sinumerik 840D sl. It provides functionality for the most varied technologies and make it as simple as possible to use and control complete machining on turn-milling machines. According to the Goratu management, Siemens controls are not only user-friendly, but they also offer powerful and versatile programming features. To get the best out of it, the company's training academy offers courses for new and advanced Sinumerik operators.

Goratu's machines are modular in design and specifically developed to perform a full range of machining operations in a single setup, on a wide variety of materials. On the one hand, the latest developments on floor-type moving-column milling machines and on the other heavy CNC horizontal lathes, both in combination with Sinumerik controls. The machining centers demonstrate state-of-the-art technology for the processing of complex workpieces. Virtually unlimited capacity is combined with the ability to manage large parts profitably, delivering the versatility and flexibility for large part machining. ■

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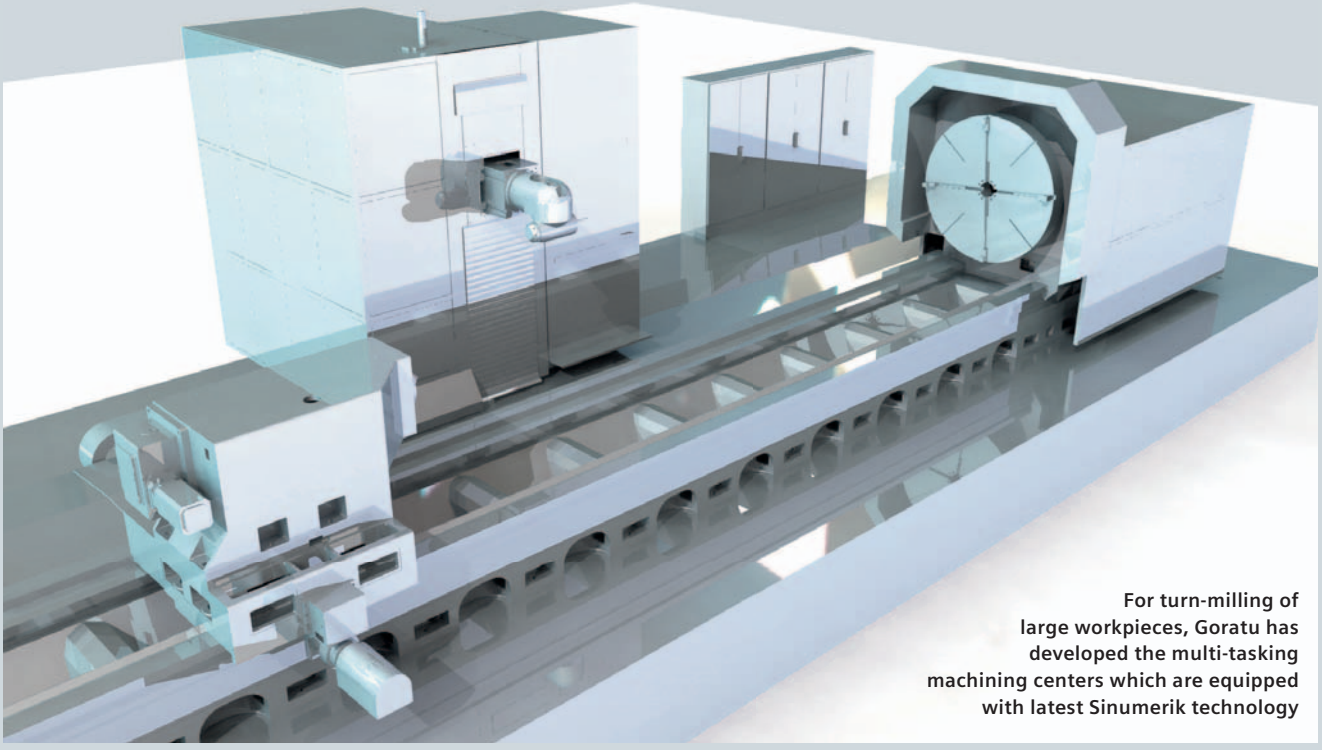
Functionality for turn-milling in all its variations

With Sinumerik 840D sl, customers gain a variety of significant benefits, such as:

- **Multi-functionality** with optional function packages for the Sinumerik 840D sl controller: users can configure solutions for almost any machining task in turning, milling, drilling, circular milling, turn-milling, crankpin milling, B-axis turning and five-axis machining with functions such as orientation interpolation, slotting, gear hobbing, curve table interpolation and cam milling.
- **Flexible programming** for optimum processes in turn-milling (and other technologies): flexible and optimized processes can be achieved through synchronized motion actions that can be initiated synchronously with axis and spindle motions. Up to 256 such synchronized actions can be defined per part program.
- **Simple operation** with advanced HMI functions: in addition to standardized or user-generated screen forms and help graphics, Sinumerik 840D sl offers further HMI functions that make complex machining processes more transparent and therefore more easily controllable.
- **Specific post-processors** enable users to use the extensive possibilities of the multi-functional Sinumerik 840D sl fully and efficiently during turn-milling.
- **Safe retraction** in case of error: with the drive-independent function "extended drive stop and retract" (ESR), Sinumerik offers a flexible response to various sources of error. Safe retraction is enabled by defined, time-delayed stopping, and by tool retraction from the machining plane into a position where it is protected from collision.
- **High precision** for reliable production processes: innovative control/drive functions such as "dynamic stiffness control" (DSC), "active vibration damping/advanced position control" (APC) and "auto servo tuning" (AST) help achieve high precision and the greatest possible dimensional and geometrical accuracy during turn-milling.
- **Safety** is ensured with a package of safety functions that are integrated into the control/drive system. This integration enables very short response times. Communication with the process is performed directly using safety-related input/output signals.
- **Virtual machining** and prior simulation of machining tasks is recommended to achieve the greatest process certainty before the start of production with turn-milling. For these tasks, the Sinumerik virtual NC kernel (VNCK) solution can be integrated into simulation systems.



For turn-milling of large workpieces, Goratu has developed the multi-tasking machining centers which are equipped with latest Sinumerik technology

Goratu