With its largest and most efficient cutting and machining center for wooden parts in Laufenburg, Switzerland, Balteschwiler AG opens up new opportunities not only for joiners’ and carpenters’ workshops and wood construction companies but also for steel construction companies active in industrial building construction and bridge construction. The technological heart of the fully automated production unit is a Vision III-TTT Sprint CNC machining center from Reichenbacher Hamuel GmbH, located in Dörflis-Esbach, a town near Coburg in the Upper Franconian region of Bavaria, Germany. With travel paths of 14.2 m x 4.2 m x 0.78 m (X, Y, Z), it is one of the largest machining centers built by the company. A variety of saw blades from three pickup tool changers can be used to precisely cut workpieces that are up to 250 mm thick. The swiveling five-axis head that is moved in all directions (X, Y, Z) by the gantry performs further machining processes such as milling, chamfering, and grinding. A multiple-drill gearbox with 15 vertical and four horizontal spindles, the latter with double mounts, has been integrated for drilling tasks. This large number of synchronous positioning and processing tasks requires
a highly flexible and efficient multichannel control system. All the travel movements and processes of the Vision machining center are coordinated with high dynamism and precision by the Sinumerik 840D sl premium CNC. The CNC system, scalable in terms of power and number of axes, supports the modular machine concept and enables individual yet cost-efficient designs in accordance with the user’s specifications. The Sinumerik control system is also an interface for superimposed CAD/CAM systems. With direct data transfer via networks, it enables the shortest possible preparation and retrofitting times.

Safety included

With integrated safety functions (Sinumerik Safety Integrated), the CNC control system features straightforward, maximum protection for man, machine, and workpiece without compromising operability. This enabled the machine manufacturer to implement its time-tested safety concept for the enclosed sheet-steel gantry with the typical red safety terminal strip in bumper design in this case as well. Upon contact, it shuts the machine off within the required reaction time. Integrated safety functions such as Safely Limited Speed (SLS) make it possible to easily and flexibly implement and monitor safe, limited speeds during set-up. Sinumerik’s safety functions comply with all the requirements of DIN EN 61508 for operation, including SIL 2 (Safety Integrity Level) and category 3 as well as PL d (Performance Level) in accordance with DIN EN ISO 13849. This makes it possible to easily and economically comply with all the essential requirements for functional safety via Profinet or Profibus and the Profisafe profile, without additional hardware and wiring effort.

Economical and energy-efficient drive technologies

To reduce cabling costs and installation time when commissioning a plant with more than 20 individual drives, the machine manufacturer also always relies on Siemens drive technology. Simotics S-1FK and S-1FT servomotors that cover the entire efficiency range are found at every critical point. As with the signals from the absolute encoders of the axes, the electronic nameplates of the motors are automatically read out by the control system via the digital system bus (Drive-Clq), which eliminates the need for time-consuming and error-prone manual parameterization.

With regenerative converters from the Sinamics S120 series, the machine manufacturer is also well positioned when it comes to energy efficiency. “The Sinamics converters feed energy back into the grid sinusoidally every time the brakes are used, reaching a power efficiency of almost one. Our machines are therefore very low-loss and clean,” explains Hans-Joachim Kahl, chief marketing officer at Reichenbacher. However, the energy balance can also be improved by shutting off parts of the plant that are not essential for its operation. This is accomplished with the Profienergy functionality, which automatically and selectively removes unnecessary components from the network from a central point, for example, during breaks.

Repair service contract ensures availability

There are many reasons why Reichenbacher Hamuel prefers integrated automation technology from Siemens. One of these reasons is the worldwide presence of the company, which also entails readily available spare parts and support. The machine manufacturer also goes one step further and concludes a repair service contract with Siemens for all machines in order to be able to ensure guaranteed response times and minimal downtimes for users – in other words, highest availability.

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