The Italian Fimi Group is a leader in cut-to-length and slitting systems for high-quality metal sheets. The materials processed include heavy-gauge, high-strength steel, but also delicate aluminum sheets. The latter not only need to be cut precisely and free from burrs – they also need to be transported and de-stacked especially gently.

Cycle rate 120 – even at a width of 3 meters

Fimi has refined the motion of the mechanism for the new generation of its Vectronic rotary shears. The machine’s throughput, precision, and range of use have been significantly increased in the process: it now achieves up to 120 cuts per minute, depending on the length of the parts and the coil speed. Even for short pieces – and therefore many cuts in quick succession – the blades, which are precisely parallel to the coil, always cut smoothly and straightly at exact right angles, which is important for highly productive laser welding, but also for stacking and transporting the sheets without damaging them.

Open motion control system replaces black boxes

Instead of continuing to buy individual control modules for subtasks such as shear control, synchronization and winding speed control, and separation and de-stacking of the cut sheets, Fimi integrated the complete Vectronic functionality into the Simotion motion control system – as it had already done with several other machine series in the past. “Simotion is well suited to consolidate historically established automation structures and simplify them in an optimized overall system,” says Gianpaolo Pica, based on his experience in electrical engineering. “It offers state-of-the-art motion control, provides extensive technology functions for various fields of application, and also covers the responsibilities of the PLC. We have full access to all the important parameters, algorithms, and program structures if we need it.”

Fast cycle times and top cutting quality

The Italian machine manufacturer Fimi has optimized the rotary shear principle. The Simotion motion control system implements the patented motion and its synchronization with the coil – simply, with high quality, and very energy efficiently.
Due to this open system structure, the Fimi experts can apply their specific process engineering expertise to the motion control details. Here, they build on the Rotating Shear function provided in the Simotion Toolbox, which was adjusted and expanded. Compared to a complete in-house development, this approach significantly reduces the development effort. It minimizes the number of potential points of failure, and the resulting highly functional integration facilitates high-performance machine behavior that is easy to adjust.

Reliable cutting performance, even in highly loaded power supply networks

No matter how well the motion control is programmed, peak loads and reactive power components in the power supply of industrial companies may affect the quality of a drive control. To guarantee flawless cut quality even in situations such as these, Fimi equips the latest generation of Vectronic systems with a regulated infeed and uses high-performance capacitor modules as intermediate circuit buffers.

The infeed, a Sinamics Active Line Module, provides for a stable power supply, even in the case of reduced grid quality. The capacitors in the DC link buffer the braking energy generated in every cutting cycle, which is then available for acceleration processes in the next machine cycle. The braking energy is stored in the capacitor and is used for the acceleration in the next machine cycle – this results in substantial savings in applications such as the Rotating Shear function.

“Siemens offers us competent technical collaboration as well as professional service. In this way we are able to completely satisfy all the special requests of our customers.”

Giuseppe Rovelli, CEO, Fimi Group

“From aluminum and standard steel to high-strength materials, we can operate all cutting technologies and meet all requirements with just one control system, and that’s very efficient,” concludes managing director Giuseppe Rovelli. “We can apply our process expertise much more easily and to a greater extent than before. This results in synergies between mechanics, electrical systems, automation, and equipment partners – and we have more time for special customer requirements. All this provides benefits for the end user and therefore strengthens our position.”