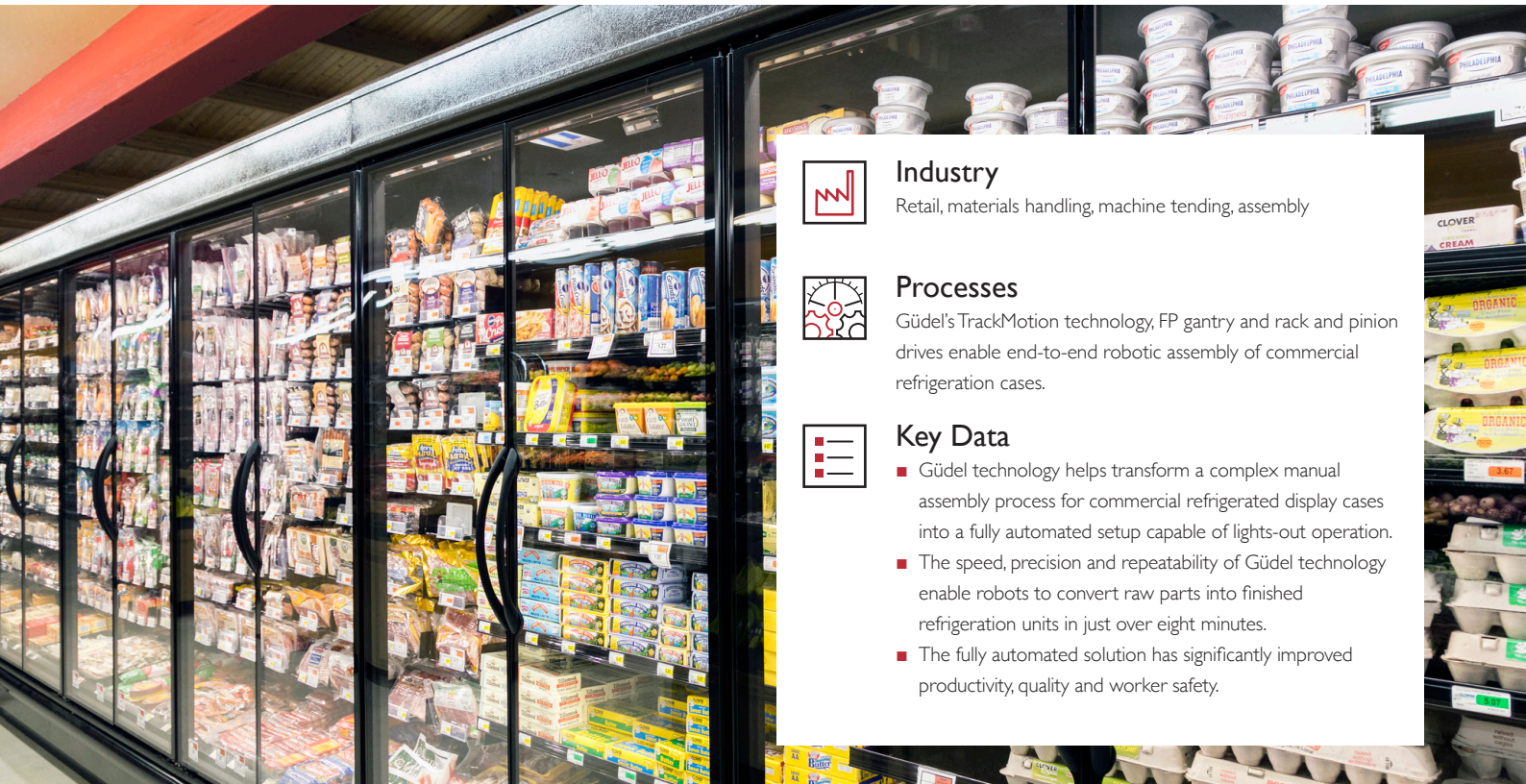


Making Light Work of Large Appliance Assembly

Güdel's automation equipment enables eight-minute cycle times.



Industry

Retail, materials handling, machine tending, assembly



Processes

Güdel's TrackMotion technology, FP gantry and rack and pinion drives enable end-to-end robotic assembly of commercial refrigeration cases.



Key Data

- Güdel technology helps transform a complex manual assembly process for commercial refrigerated display cases into a fully automated setup capable of lights-out operation.
- The speed, precision and repeatability of Güdel technology enable robots to convert raw parts into finished refrigeration units in just over eight minutes.
- The fully automated solution has significantly improved productivity, quality and worker safety.



Güdel Helps Robots Tackle Both Heavy Lifting and the Finer Details

Most grocery shoppers pay little attention to the refrigerator display cases in their local stores unless a bad seal or other defect causes a glass door to fog over. A well-assembled, high-quality refrigerator display case rarely draws attention to anything but the food inside it. Such was the hallmark for the cases from one leading manufacturer, whose reputation for quality and reliability made its systems a fixture in retail stores nationwide.

The company's inefficient manual assembly process, however, was putting the freeze on productivity and profit margins. Its manufacturing operation was disorganized, and its materials control system tracked materials inconsistently throughout the production process. These inefficiencies adversely affected throughput and labor and increased costs due to wasted materials. On top of all this, the laborious and slow assembly process required

frequent heavy lifting and repetitive actions that posed risks to worker safety.

The manufacturer recognized that automation could significantly shorten cycle times, improve efficiencies and minimize risk, but neither its bulky appliances nor its complex assembly process made the path to automation simple. Automating the process would involve seamlessly integrating multiple discrete stages of production. Additionally, it would require robots to closely align steel panels measuring 160 x 60 inches and to perform detailed fastening tasks while manipulating heavy half-assembled refrigeration systems.

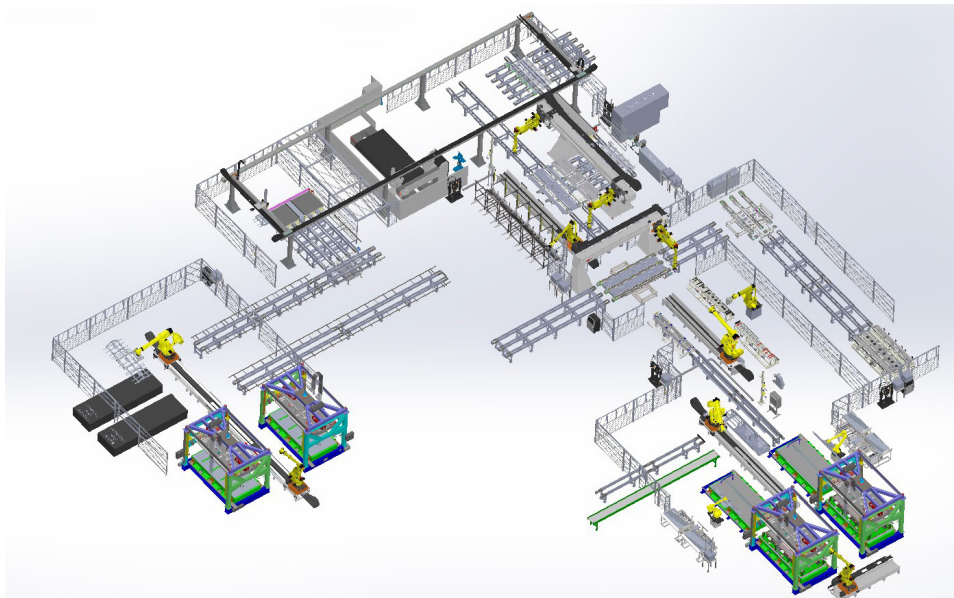
The manufacturer turned to one of Güdel's integration partners to combine robotics with integrated automation systems to solve this complex manufacturing challenge. After an on-

site review of the client's process, the integrator confirmed that heavy-payload robots could handle all the substantial lifting and alignment tasks, but the finer work in some stages would require precise and repeatable manipulations of some very weighty parts.

As an expert in linear motion for factory automation, Güdel was a natural source for these components, and the rigidity and precision of its tracks and gantries became instrumental to the success of the fully automated operation.

End-to-End Assembly

The solution leverages five FANUC robot work cells to automate all materials handling, machine tending, assembly, milling, gluing and fastening tasks in the display case maker's 35,000-square-foot operation. The process employs 12 heavy-payload robots. Five



Güdel helps automate assembly of heavy commercial refrigerator display cases, improving efficiency, throughput, quality and worker safety.

of them are mounted on Güdel TrackMotion Floor (TMF) tracks, while another three are suspended from Güdel's TrackMotion Overhead (TMO) tracks. The automated process also relies on a Güdel dual-bridge overhead gantry robot.

In the first robot work cell, two heavy-duty robots slide along a TMF track to transfer flat galvanized steel panels from a pair of conveyors to Güdel's 3-axis, dual-bridge FP gantry robot. These raw panels will eventually form the back and canopy of a refrigerator unit. But in this stage, the gantry bot maneuvers the panels through a bridge saw that trims them to size and creates pass-throughs for electric cabling.

The gantry then transports the modified parts to the next cell, where two heavy-payload robots mounted on a TMO track apply insulating foam between pairs of panels before a third robot, riding on a Güdel TMF track, transfers them to a vertical press until the foam cures. Panels are then sent to another station, where the overhead bots join the canopy and back panel, apply a layer of glue and fasten them together.

"To reliably complete this assembly, the two overhead robots need to repeatably align heavy panels and shelving units that measure 160 inches long," said Bob Rochelle, an account manager for Güdel. "Güdel's TMO track was instrumental to this step by enabling the bots to place parts within about a 32nd of an inch tolerance."

The next stage of the system relies on six robots to perform a series of milling, taping and gluing tasks. Three of those bots rely on Güdel TMF technology to keep assemblies moving smoothly to the final

robot work cell. There, another TMO track enables a robot to fasten the base tank to the back panel and complete the refrigeration unit.

Eight-Minute Cycle Time

Güdel's TrackMotion technology, FP gantry and rack and pinion drives are all vital to the speed, accuracy and repeatability of the automation system that its integration partner developed for the commercial refrigeration manufacturer.

"Güdel's technology and support enabled development of a fully integrated robotic assembly process that converts raw steel panels and other materials into a finished commercial refrigerated display case in just over eight minutes," said Rochelle. "Our expertise supporting robotic assembly significantly simplified the design process for each robot work cell and helped accelerate the time to implement and commission the system."

Güdel's technology enabled the incorporation of repeatable processes and stringent tracking systems into the manufacturing flow. The system ensured more precise control over the parts, hardware and consumable products used, and it delivered more consistent quality in the fit and finish of the assembled display cases. More specifically, the automated process reduced the manufacturer's waste to less than 1%, doubled output and minimized risks to both worker safety and product quality.

The success of this solution led to further discussions with the client about the possibility of implementing a similar operation to serve the European market.

Güdel Technology

- TrackMotion Technology
- 3-Axis Gantry FP
- Rack and Pinion Drives
- High-Performance Gearboxes

About Güdel Inc.

Güdel Inc. is the US subsidiary of Güdel Group, a global manufacturer of robotic automation products, systems and services. Güdel supplies linear-motion modules, robot track motion units, gantry robots and components to OEMs, systems integrators and machine builders serving the automotive, aerospace, logistics, heavy industrial and power-generation industries. Güdel Inc. is located in Ann Arbor, Michigan, in a dedicated 45,000-square-foot facility, providing North American customers with engineering, design, production and support.

Güdel Group was founded in 1954. Headquartered in Langenthal, Switzerland, today Güdel operates in more than 30 locations worldwide.

Contact

Güdel Inc.
 4881 Runway Blvd.
 Ann Arbor, Michigan
 48108 USA
 Phone: +1 734 214 0000
 Fax: +1 734 214 9000
info@us.gudel.com | gudel.com/us