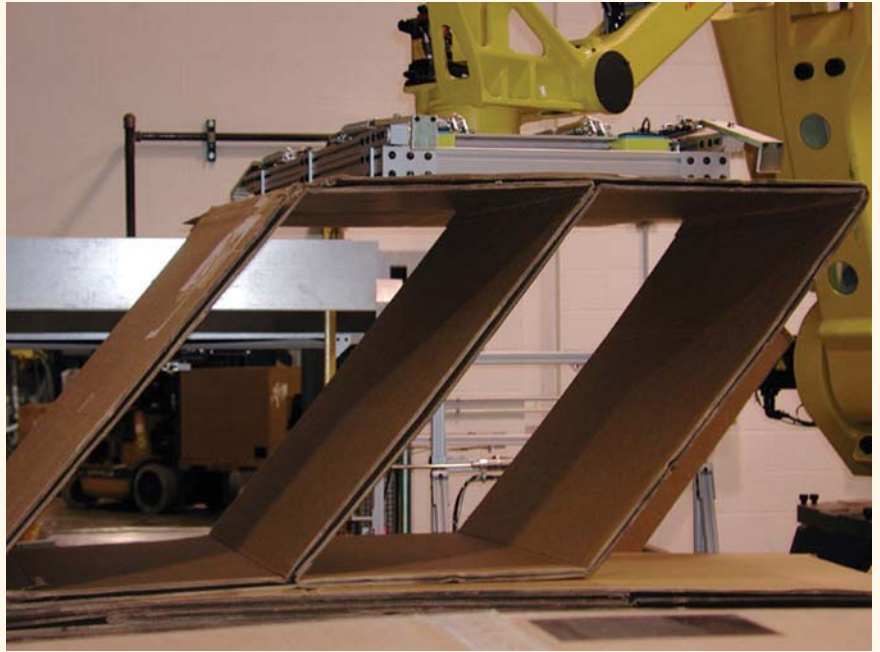


Finding An Ergonomic Tote Assembly Solution



Companies that currently use robots, and those that are considering using them in the near future, have an incredible opportunity to significantly cut costs and prevent injuries to employees.

“As U.S. manufacturers face stiff competition from cheap overseas labor rates, we have experienced a steady influx in requests for robotic automation solutions,” says Sean Wells, senior engineer at Promatech. “Companies are also turning to robotic automation in order to prevent employee injuries from on-the-job accidents.”

Promatech LLC, New Berlin, Wis., is a robotic systems integrator that has developed more than 100 different customized robotic solutions over the past few years. Promatech designs and deploys robotic models from Fanuc, Yamaha, Motoman and ABB.

Most recently, Promatech’s engineers were asked to develop a solution for automating tote assembly; the customer wanted to reduce material handling time and prevent workers from doing unnecessary bending and lifting.

The Solution

In order to come up with the most ergonomically sound and cost-effective solution, Promatech designed a tote assembly system that incorporated a 4-axis M-410iB/160 articulated arm robot from FANUC, and a dual-function vacuum gripper from PIAB Vacuum Products.

The dual function vacuum gripper sys-

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Promatech was asked to craft an automated solution to handle the customer’s heavy-duty corrugated cardboard containers (totes), which were stationed on a manufacturing line. The solution included use of PIAB’s VGS 3010 end-of-arm vacuum gripper.

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tem, PIAB's VGS 3010, made up the end of arm tooling on the robot. The VGS 3010 is a newly released unit that features DURAFLEX suction cups and COAX, a proprietary multi-stage ejector technology.

"COAX integrates the internal components of a multi-stage vacuum pump into a vacuum cartridge" says John Holmes, packaging manager at PIAB. "The result is a smaller, more efficient, more reliable and highly flexible technology that allows users to design a modular system."

The VGS 3010's vacuum pump is integrated in a single unit, called a "Gripper." This avoids the pressure loss problems inherent to traditional vacuum systems that utilize a centrally located vacuum pump. The pump can function at operating pressures below 45 psi, providing reliability even in the case of a breakdown in the air pressure network.

Another major factor in choosing PIAB's VGS 3010 was the durability of the suction cups. Because they are made from specially developed polyurethane named DURAFLEX, the suction cups can easily grip porous leaky materials and coarse, uneven or curved surfaces.

"PIAB's DURAFLEX suction cups allow for safe and stable lifting, and they are particularly good for handling corrugated boxes," says Wells.

The Result

In the fall of 2004, Promatech put the new automated tote solution to the test with one of its largest customers, a well-known consumer products manufacturer.

"The customer's existing

assembly process required two employees to manually lift the bulky totes and hand-assemble them on individual pallets," says Wells. "This was a labor-intensive operation with the potential for repetitive motion injuries and muscle strains."

Promatech crafted an automated solution to handle the customer's heavy-duty corrugated cardboard containers (totes), which were stationed on a manufacturing line—this was a perfect opportunity for PIAB's VGS 3010.

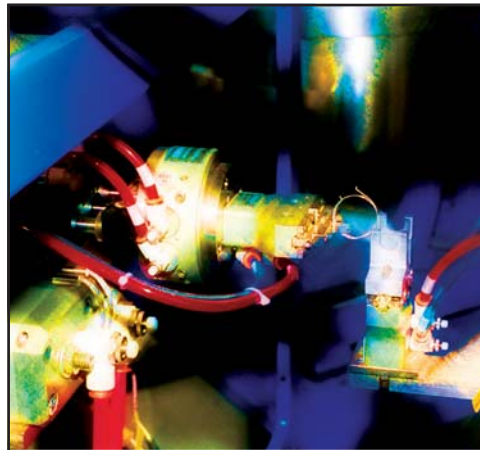
Promatech installed a total of 9 VGS 3010 units, each with 3.5-inch suction cups, on the arm of FANUC's M-410iB/160 4-axis articulated arm robot, which is FANUC's latest-generation palletizing industrial robot.

Almost immediately after the new tote assembly solution was installed, the customer realized a cost savings of 8 hours per day, allowing the company to reassign one of its full-time workers to a more productive task.

Additionally, the customer has now eliminated any unnecessary bending, lifting, and other movements that could be detrimental to its employees. Also, because the new system uses so much less floor space, the customer's employees have a more open, less cluttered working environment with room for additional machines where totes were stacked at the beginning of each shift in the past.

The positive results from this project prompted the customer to commission Promatech and PIAB for a second project involving multiple Fanuc M-410iB robots performing high-speed multi-lane, multi-product palletizing of finished products.

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