

# Drive & Control profile

## Rexroth technology is recipe for success of PDI medical pouch machine



The PDI Medical Combination Pouch System uses a Rexroth control system to convert pre-made medical header bags and shaped pouches to exacting industry specifications at a rate of nearly 200 seals per minute.

Precise control technology, rapid data management lets CMD offer unsurpassed precision in pouch converting

For more than 30 years, CMD Corporation ([www.cmd-corp.com](http://www.cmd-corp.com)) of Appleton, WI, has designed and manufactured high-performance converting equipment for everything from sturdy trash bags to produce bags. Perhaps their most specialized and impressive system is the PDI Medical Combination Pouch System, which converts a complete range of pre-made medical header bags and shaped pouches in a chevron

or shaped seal configuration. The machine presses pieces of poly material together at specific temperatures, for precisely determined lengths of time (dwell time) and with a downward sealing stroke 3 mm to 150mm in length. Pouch sealing can be done in single or multiple lanes across the width of the machine. Impressively, the machine performs precision sealing operations

### Challenge:

- Maximize precision of medical pouch seals
- Allow real-time changes to sealing temperature, pressure and dwell time
- Improve accuracy and precision through data management
- Meet demanding requirements of the medical packaging market
- Minimize material waste

### Rexroth Solution:

- IndraMotion MLC L40 controller with SERCOS communication and Flex Profile functionality
- IndraControl VEP 40 HMI
- IndraDrive Mi integrated servo motor/drive, built-in I/O
- IndraDrive C converter
- IndraDyn MSK servo motor
- Runner blocks and profiled rail
- Aluminum structural framing

### Results:

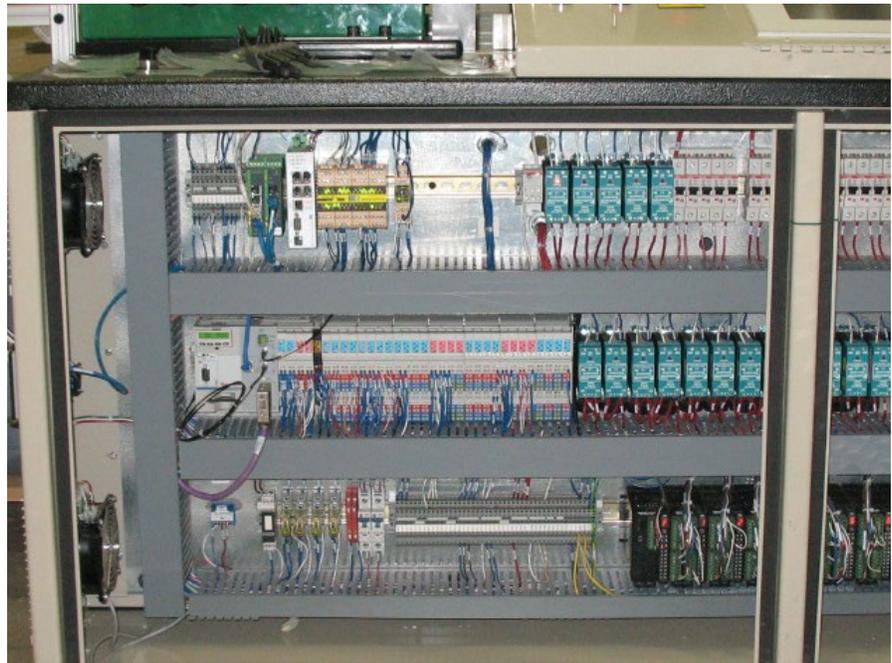
- Recipe-based seal parameter helps machine operator control complex parameters
- Total management of real-time data in for accurate adjustments
- Industry-leading sealer force and positioning accuracy and precision
- High throughput
- Fast switchover between jobs
- Reduction in material waste

at speeds up to two hundred seals per minute.

Increasingly stringent medical regulatory requirements demanded not only quality pouches, but complete specification and sealing data for documenting processes. Each seal would have to be virtually perfect. In addition, to stay ahead of their competition, CMD needed to offer unique advantages: real-time process monitoring, complete data management and controlling of all sealing parameters, primarily temperature, pressure and dwell time. That would give CMD customers better weld quality and precision, optimum consistency and compliance with demanding specifications, and tighter control with fewer discrete components to monitor.

This concept would require basing machine control on actual data points, not just filtered or averaged data. Users would be able to optimize seal parameters whenever needed. Instant analysis of high-volume data was a must, because machine operators needed to know immediately if platen heat was uneven or dwell times split-second too short, requiring processes to be changed or shut down. High levels of accuracy and precision had to be maintained consistently across thousands of seals. CMD customers also needed minimal changeover times between jobs as production demanded.

Meeting these requirements would mean the new generation PDI pouch converting systems would need to be designed with exceptional controls finesse, to give CMD a performance advantage in this demanding market. Fortunately, CMD knew from previous experience that Wisconsin-based



Rexroth's L40 controller allows operators to use real-time data to make changes to the sealing "recipe" to ensure quality and consistency.

machine components distributor CMA/Flodyne/Hydradyne ([www.cmaf.com](http://www.cmaf.com)) had the hands-on expertise, the knowhow, and best of all, the control technology to meet all CMD's needs.

CMD also knew the advantages of Bosch Rexroth ([www.boschrexroth-us.com](http://www.boschrexroth-us.com)): their drive and control components, engineering support and machine logic control programming skills. Rexroth components had been used extensively and successfully throughout other parts of their business, and both CMAFH and Rexroth had been crucial to the success of several previous CMD projects. CMD would partner with these two solutions providers once again and form a team to deliver what CMD customers needed.

Data management improvements required giving the pouch

manufacturer more complete control over sealing parameters. Data would be interpreted instantly and converted into a set of sealing parameters called a "recipe" for creating the seal. Recipe-based programming at the operator panel ensures precise control of customer-specific converting requirements each time a job is changed. The control and quality assurance of recipe-based operating parameters is required for the demanding medical pouch industry because the difference between a good seal and a rejected one can be measured in microseconds. "The operator can flag out-of-spec seals and make adjustments on the spot," says CMD's Intermittent Motion Product Line Manager, Scott Fuller. "that can mean the difference between throwing away a few pouches and losing an entire truckload." Rexroth software made changeovers between jobs easy. Instead of adjusting mechanical components

like cams, the operator can quickly and easily make those changes at an HMI terminal.

To transform better data into optimum control, the machine's hardware was upgraded as well. CMD called on Rexroth's IndraDrive Mi integrated servo motor/drive platform and IndraDrive C converters, which blend inverter and power supply in a single unit. These were combined with Rexroth IndraDyn MSK servo motors, allowing comprehensive and responsive control in a compact space with less cabling. "The IndraDrive Mi's integrated design allowed us to minimize control cable runs and reduce the overall footprint of the controls system," says Brad Brown, CMAFH Sales Engineer. "We could get complete control in a relatively small package." By combining IndraControl VEP 40 HMI, L40 MLC motion logic control and servo technology, CMAFH could realize a large performance upgrade without increased machine size. The compact, scalable IndraDrive Mi has the drive mounted in the motor casing, helping reduce control cabinet space requirements significantly. Its power and communication output run via a single cable, daisy-chained to each integrated drive. A Rexroth KCU compact adaptation box allowed a common coupling to be used for all connections to the IndraDrive Mi units.

For motion synchronization in three axes for cutting, sealing and pouching, CMD relied on Rexroth's IndraMotion MLC L40 motion logic controller with Flex Profile functionality. Flex Profile precisely controls all synchronous (sealing strikes) and time-based (dwell) converting steps. The IndraMotion MLC controls platform



The IndraDrive Mi integrated servo motor/drive allows for precise control with a smaller machine footprint and a significant reduction in cabling and installation costs.

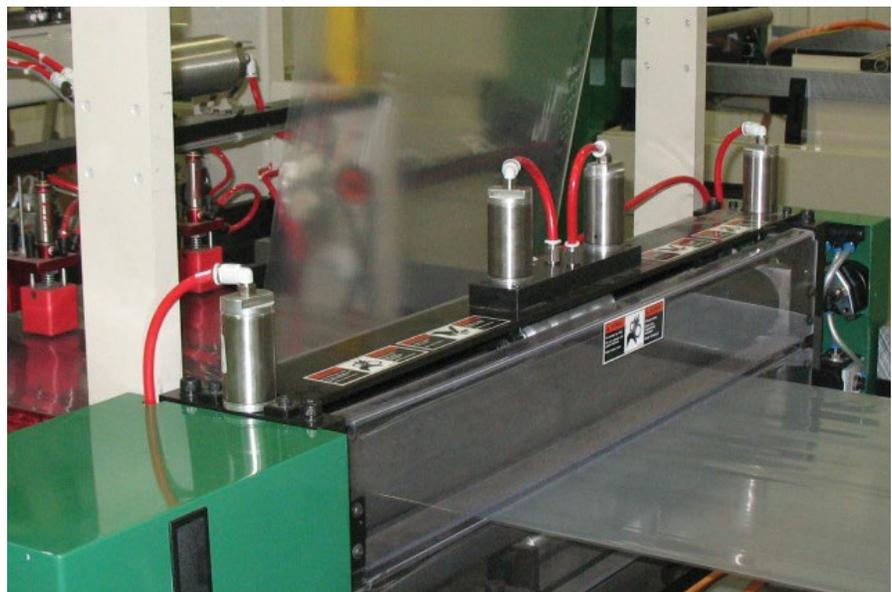
provides the flexible functionality to help CMD reduce material waste, increase throughput and simplify operations.

Best of all, all machine functions would literally be at the operator's fingertips, thanks to the intuitive Rexroth VEP 40 HMI interactive touch screen. The operator could quickly

and easily change recipes between runs of pouches, types of pouches, and even between pouches; the touchscreen also allows the operator to capture data sets instantly.

Along with machine control, Rexroth also supplied pneumatics for cross cooler actuation along with runner blocks and profiled rail for key machine functions such as supporting cutting and sealing operations and stacking pouches. Rexroth anodized aluminum structural framing was used to create the stacking table and support a protective light curtain.

Replacing controls and motors with Rexroth components was comparatively easy. Overcoming differences in control logic that existed between pouch machinery versions was a bigger challenge. CMAFH and Rexroth worked hand in hand with CMD for machine programming, training, testing and overall support. Rexroth's thorough understanding of the medical pouch

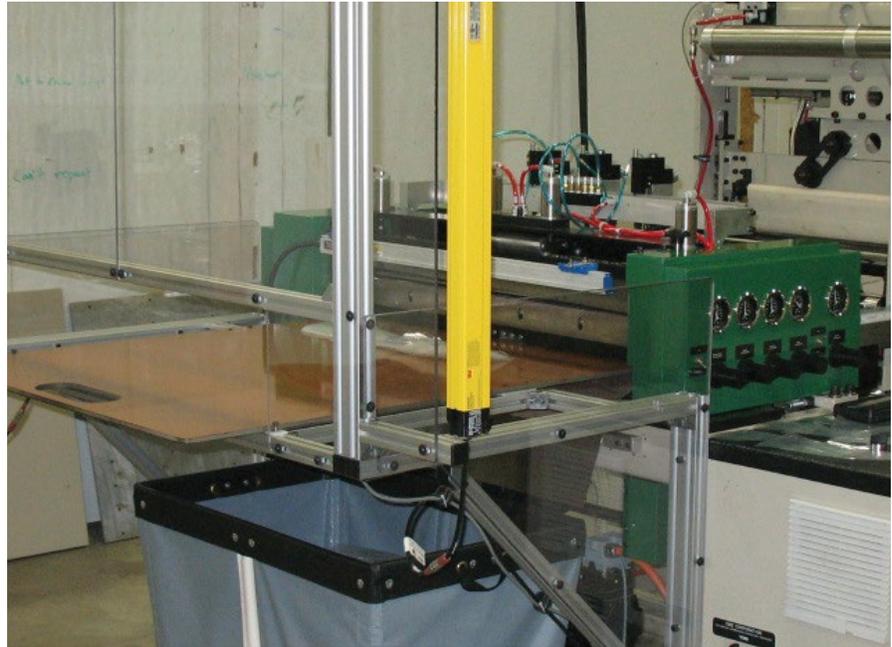


Along with controls, Rexroth provided pneumatics as well as runner blocks and profiled rail for key cutting and sealing operations.

converting application helped keep the project on schedule and minimize troubleshooting needs.

The improved pouch machine delivered everything CMD wanted. “We realized we could supply a very high-performance machine at a competitive price” Fuller says. “It had everything: precision, accuracy, throughput and the ability to adjust everything immediately, using real-time data.” Tests showed that the machine could deliver sealing strikes, each with thousands of pounds of force, within a +/- 1.5% tolerance, the sealing industry’s tightest control. Dwell time, force, and temperature could be adjusted almost instantly, for all three types of pouch sealer: longitudinal, platen and cross, in three axes. The width of pouches, the number of rolls of material involved and the type of material (poly and/ or Tyvek) – all can be altered simply by keying in the appropriate recipe. Real-time data also tracks how thoroughly the machine controls the sealing process, proving compliance with strict regulations.

Compared with the machine’s previous version, throughput and speed increased (a 12" draw chevron pouch at 150 cycles a minute was no problem) while changeover times went down. Along with increased precision



Anodized aluminum framing from Rexroth was used to create the stacking table and support a protective light curtain.

came increased flexibility. It’s easy to change sealing recipes and to identify problem areas – pouches can be tracked by lot number to find and correct any out-of-spec performance.

Immediate customer support is also available, with Rexroth and CMAFH enabling remote troubleshooting and consulting. An Ethernet hub allows remote dial-in for machine diagnostics and troubleshooting in the field. It’s one of the many reasons CMD plans to use the Rexroth drive and

control platform for pouch converting applications for food, dry goods and other applications, as well as medical.

Today’s CMD pouch converter is a classic example of how a challenge – stricter requirements for medical and food pouch sealing – has been turned into an opportunity through innovation and technical expertise. Thanks to CMD, pouch manufacturers can offer comprehensive operator control of complex variables – a key ingredient in the recipe for a better product.

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