CASE STUDY

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A Bosch Company

A Quiet Place: How Bosch Rexroth's CytroPac Offers Reliable Hydraulic Power for Noise-Sensitive Environments

Gasbarre is a Pennsylvania-based manufacturer of equipment used in the powdered metal and powdered ceramic industries. In existence for more than 50 years, the company produces compaction and sizing presses, as well as furnaces, tooling and automation.

Gasbarre's CNC Hydraulic Presses are designed for delicate or complex compaction tasks, with a closed-loop CNC system that delivers precise control over pressure and speed of both the upper ram and die. The presses compact powders to a high density, after which they can be cut into specified shapes, with only limited machining or heat treatment required. A large global client engaged Gasbarre to produce a high-precision hydraulic press for its facility in the USA, where tungsten carbide powder is produced. The press was to be located in the client's quality lab, where parts are tested to verify conformance to quality specifications following pressing.

In addition to higher precision and reliability, the client needed its new hydraulic press to meet certain technical requirements. Noise reduction was a top priority, given the already loud environment of the manufacturing facility and the close quarters of the quality lab, where loud noises can reverberate at earsplitting levels. Also because of space constraints, the press's overall footprint needed to remain as small as possible. Finally, the press had to fit within the client's budget parameters. The hydraulic power unit, or HPU, is a key component of a hydraulic press, sending hydraulic oil into the piston to move the machine to its PLC-commanded position. Conventional HPUs run constantly, delivering a high level of horsepower and energy, but also emitting a great deal of heat and noise.

Gasbarre, which has had a long working relationship with Bosch Rexroth, knew that Bosch Rexroth would be the ideal partner to implement a HPU solution that delivered the necessary fluid flow for the press's needs, while also meeting the client's sound, price and size requirements.

"I hate to use a cliche, but Bosch Rexroth is kind of like the Cadillac of hydraulic components, in our opinion," said Kalen Fitch, vice president of sales and marketing for Gasbarre. "That comes at a little bit of a premium, but the performance is much higher."

To deliver the necessary hydraulic flow within a small space, Bosch Rexroth devised a solution to link up two CytroPacs in a master/follower configuration.

Gasbarre engaged Bosch Rexroth to implement an HPU solution for a CNC Hydraulic Press that will be located in a client's quality lab.

Bosch Rexroth's line of hydraulic power units includes the medium-sized CytroBox and the smaller CytroPac, both of which take a quantum leap beyond traditional HPUs with their compact, quiet and energy-efficient designs. Their small "smart" pumps and motors only run when needed and remain at low torque when not in use, greatly reducing heat generation.

The specificity of the client's needs presented something of a Goldilocks situation. The CytroBox's capabilities went well beyond the needs for the application, and its height — just under seven feet tall — also made it too cumbersome for the quality lab's small space. On the other hand, the two-foot-tall CytroPac was much more compact, but couldn't generate the hydraulic flow needed to achieve the press speed that Gasbarre's client required. Bosch Rexroth's solution delivered the best of both worlds. The design of two CytroPacs allows them to be seamlessly linked together to take advantage of the units' combined flow capabilities, while taking up a very compact footprint compared to other HPUs on the market. Additionally, the price of two CytroPacs fit well within the project's allotted budget.

Using technical information provided by Gasbarre, Bosch Rexroth used its online Size and Select Assistant to identify the ideal solution for the client's needs. Size and Select allows users to enter their specific p/Q requirements, including pressures, flows, positions and forces, then

calculates which Bosch Rexroth variable speed pump drive or standard power unit is most suitable for the application. Size and Select then generates a PDF proposal providing technical details on any prospective solutions, including their expected performance and impact on energy consumption.

Bosch Rexroth assisted Gasbarre with the technical aspects of linking up the two CytroPacs in a master/follower configuration and connecting them to Gasbarre's hydraulic press. The CytroPac's elegantly simple design lends itself to making this a relatively fast and painless task.

"The beauty of the CytroPac is that everything is inside. The temperature of your fluid, your fluid level, the speed of the electric motor, everything is all compact," said Greg Gulnac of Bosch Rexroth.

Because it has fewer leak points than a conventional HPU, Gasbarre expects its CytroPac-equipped CNC Hydraulic Press to require less maintenance time than normal.

The reduced footprint of the CytroPacs allows them to sit onboard with the hydraulic press inside the drip pan. As for the sound levels, Gasbarre found that the CytroPac was registering at 62 decibels at the front of the machine, about the same loudness as a conversation between two people in a restaurant. Gasbarre's client had specified a maximum decibel level of 83. The factory acceptance test, initially scheduled to last two days, was completed in just three hours due to the simplicity of the system's design.

"It's been phenomenal," Fitch said. "It acts every which way we would expect it to, but most importantly, the noise level is so low. When we had our acceptance test, our customer kind of slapped me on the arm and said, 'Hey, this is awesome. Your chiller unit's literally louder than your hydraulic power unit,' which is a pretty big deal."

With fewer leak points than a conventional HPU, Gasbarre expects the CytroPac-equipped CNC Hydraulic Press to take much less future maintenance time than normal, allowing its client's maintenance team to devote more time to its revenue-generating equipment.

The CytroPac's space-saving design also allows it to make a meaningful contribution to sustainability. Its intelligent combination of a variable-speed pump drive, synchronous motors and an AZPS series external gear pump help achieve an energy savings of up to 80 percent, or 10,000 kilowatt-hours, along with almost 5 tons of CO_2 reduction compared to a conventional unit. The CytroPac's flow-optimized reservoir contains only 20 liters of oil, a reduction of 80 liters from a conventional unit. Together, the two CytroPacs will reduce oil consumption by 1 barrel annually. In addition, the unit's cooling system utilizes an innovative heat pipe to absorb thermal energy from its motor and oil, reducing its cost of heat management.

Gasbarre plans to market this version of its hydraulic press to future clients that are doing hydraulic pressing tasks in lab environments, due to the CytroPac's ability to solve critical noise issues.

"With this type of feature, maybe you can take down walls in your lab that were there for sound insulation," Fitch said. "When you add in the reduced noise and reduced footprint, it might cause some folks to start thinking that maybe it is time to upgrade, because there are enough features to justify the additional cost."

The success of Bosch Rexroth and Gasbarre's partnership demonstrates how the CytroPac can be an effective solution for noise-sensitive and space-constrained environments, while also offering tangible benefits in terms of sustainability, energy savings and ease of maintenance.

Kalen Fitch
V.P. Sales & Marketing
for Gasbarre Products

Bosch Rexroth Corporation
14001 South Lakes Drive
Charlotte, NC 28273
Telephone: (800) REXROTH
(800) 739-7684
info@boschrexroth-us.com
www.boschrexroth-us.com

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