

Blackhawk's Turnaround

In 2003, Blackhawk de Mexico switched its production focus from gray to ductile iron. Four years later, the firm's production has more than doubled.

Shannon Kruse, Senior Editor

When Blackhawk de Mexico, Santa Catarina, Mexico, was acquired by Grupo Quimmco, Monterrey, Mexico, in late 2002, it was producing gray iron castings for the electric motor industry. But a varied product mix was stretching the plant's production, and turning a profit was a struggle. As an industrial consortium with businesses in the automotive components, chemical and construction industries, Grupo Quimmco had a plan for the casting firm, with the manufacturing experience to back it up.

Blackhawk de Mexico began as a joint venture between Blackhawk Foundry, Davenport, Iowa and Emerson Power Transmission, St. Louis, in 1999, but by 2002, the partnership ended.

"The amount of volume they expected to bring to the company was never there, and the type of work was not adequate for the plant," said Patricio Gil, Blackhawk's CEO. "Quimmco knew the demand for ductile iron would grow and that it was more suitable for Blackhawk's molding line."

Quimmco decided to focus the plant's efforts on ductile iron components, but introducing the material to the plant would require some adjustment, both on the shop floor and in the sales office.

After months of preparation, Blackhawk began its transition in the beginning of 2003. By October 2006, production had more than doubled, with fewer operators needed on the floor. Ductile iron accounted for 84% of shipments, and the casting facility was turning a profit.

Blackhawk de Mexico, S.A. Santa Catarina, Nuevo Leon, Mexico



Year Founded: Owned by Grupo Quimmco, since 2002.

Metals Cast: Ductile and gray iron.

Installed Capacity: 25,000 metric tons per year.

Current Production: 16,000 metric tons per year.

Employees: 280.

Primary Markets: Heavy truck and farm equipment.

Casting Process: Green sand.

Value-added: Primary painting and machining.



Going Ductile

Quimmco's 16 companies are organized in three major divisions: automotive, chemical and construction. When Blackhawk was acquired, the intention was to use the facility to produce parts for the automotive components division. This division of Quimmco included manufacturers that produced forged and machined parts for commercial vehicles, heavy duty trucks and agricultural tractors.

To fit in the automotive components division, Blackhawk had to switch gears.

"With adding ductile iron, we did have a learning curve, and it was a hard one," said Gustavo Braga, director of operations at Blackhawk. "We went from a nonautomotive plant producing gray iron and changed that almost 180 degrees to be a plant for the more demanding automotive jobs."

The initial plan to go ductile was approved in three months. The transition from 100% gray iron to a gray and ductile iron shop took four months. As the years went by, the firm's gray iron volumes stayed level, while ductile iron shipments steadily grew. In 2003, the product mix was 66% gray and 34% ductile iron; by the next year, the mix was 73% ductile and 27% gray iron. In 2006, Blackhawk's production reached 11,068 tons, more than doubling the 5,215 tons produced in 2003 and turning Blackhawk into a profitable business. The company's production in the first two months of 2007 has put it on pace to produce 15,786 tons on the year.

Mexico's Advantage

The new product mix and casting material weren't the only elements contributing to Blackhawk's success. Gil pointed to the advantage of be-



SAND WEDGE Pneumatic wedging devices are used to de-gate castings during shakeout.

ing owned by a Mexican consortium, where the culture and logistics of operating a Mexican business are better understood.

"It's difficult for a U.S. company to come to Mexico and operate a foundry without paying attention to cultural differences," he said.

Understanding the economic structure is helpful, too. Labor costs in Mexico are lower than in the U.S., but other aspects of operating a metalcasting firm are more expensive. Energy costs are higher than in the U.S., particularly during peak rate hours, when the cost can be four times more expensive than during off-peak hours. Sand normally is imported from U.S. sources, which adds to the raw material costs for Mexican metalcasters. Depending on

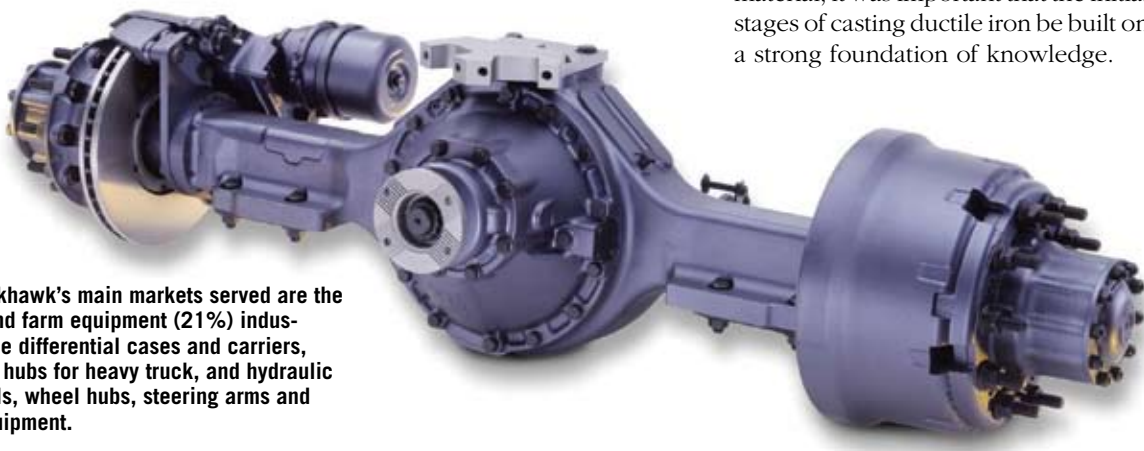
the end-use industry and complexity of the component, in many cases, only 10% of the piece price is from direct labor, so the actual cost savings may be disappointing.

"I believe the perception of the lowest cost is different than what the actual low cost is," Gil said. Still, he recognizes that labor costs remain an advantage for Mexican companies, as does their proximity to the large North American markets.

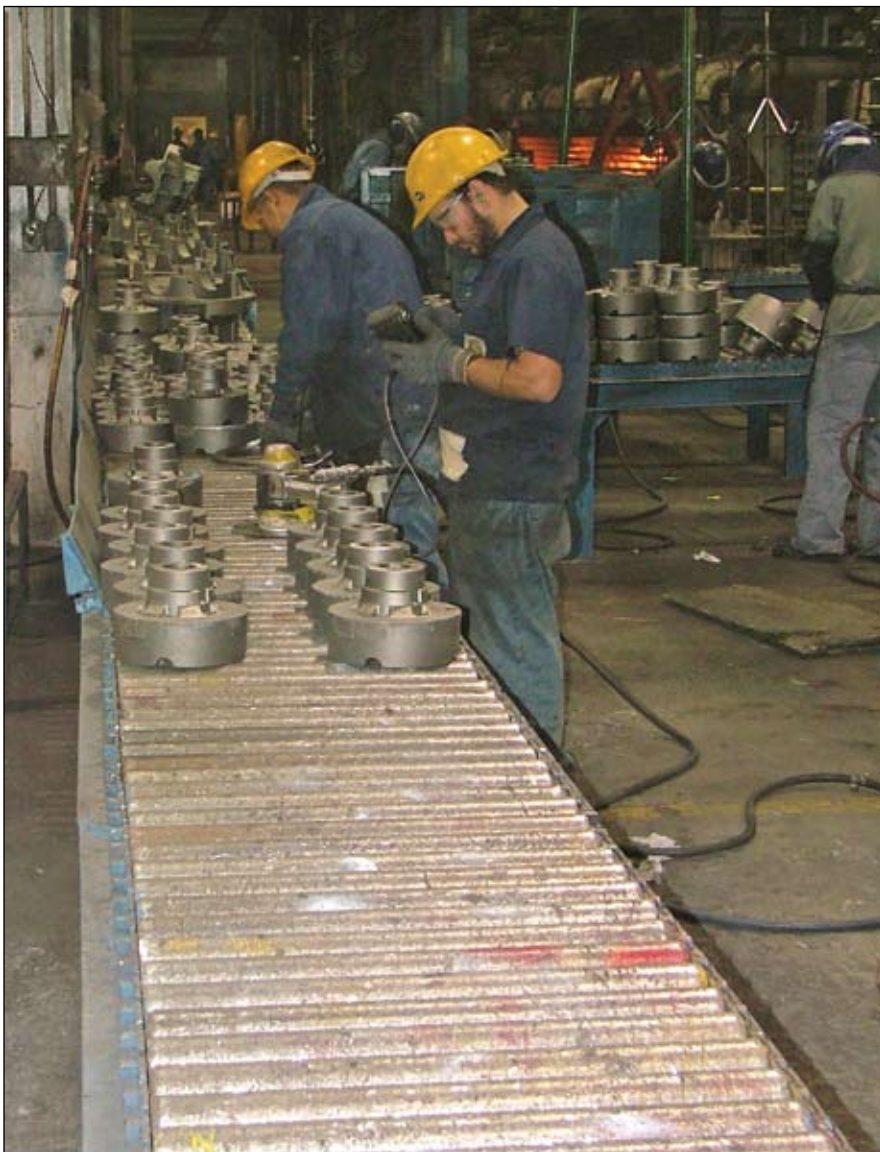
"U.S. manufacturers are moving to where the low cost is," he said, "which is good for Mexico. The market in Mexico is growing fast."

Turning Point

Lack of technical ability had been a stumbling block when the casting facility first began operation. In order to achieve a sound transition to the new material, it was important that the initial stages of casting ductile iron be built on a strong foundation of knowledge.



MARKET SHARE Blackhawk's main markets served are the heavy truck (79%) and farm equipment (21%) industries. Products include differential cases and carriers, slip yokes and wheel hubs for heavy truck, and hydraulic components, flywheels, wheel hubs, steering arms and retainers for farm equipment.



COLOR CODED The visual inspection area of the finishing department includes displays of typical castings (inset) that are marked with various colors to showcase areas in which defects may occur.

Even though the technical development of ductile iron was underway when Gil joined Blackhawk, the average employee age was 29. “The younger workers had the energy to learn, but there was a lack of experience,” he said.

Blackhawk hired retired professionals in tooling, quality and maintenance to bring technical depth to the operation. The company continues to farm the local universities for young staff, who often start as interns, but the foundation of experience had to be put in place.

“We had guys who were willing to teach, and guys who were willing to learn,” Gil said.

During its transition into a primarily ductile iron shop, Blackhawk went through a series of steps. First, it optimized the casting process already in existence, adding an automatic press-pour furnace and in-line shot blast

machines. The company configured a linear arrangement for a streamlined flow, with the melting, sand and core departments in the back of the facility, where they can easily feed into the molding lines.

It kept the FBO V and two FBO III automatic molding machines, with flask sizes of 32 x 32-in. and 20 x 24-in., already installed. The smaller lines can each run up to 75 molds/hour, while the FBO V line, which utilizes automated pouring, can run up to 50 molds/hour.

When ductile iron was added to the mix in 2003, the metalcaster spent some time adjusting the operation to

best fit the new material. An expert on ductile iron was brought in to guide Blackhawk through the introduction and transition as the company developed a product mix that increased the amount of metal poured per mold, improving the firm’s efficiency.

With a less than 7% scrap rate, current productivity at Blackhawk is 35 man-hours per ton. The company’s target is 25 manhours per ton, and plans for an automated finishing line are underway to meet that goal.

“Before, Blackhawk was making 800 tons a month in four shifts,” Braga said. “Now, Blackhawk will make 1,300 tons a month in two and a half shifts.”

With ductile iron production in full swing, the company developed ductile iron castings that would fit the needs of the other automotive companies within the Quimmco group. After Blackhawk

gained some practical experience with the associated customers, it began developing casting customers outside of Quimmco. Its current customers include Sisamex, Arvin Meritor, Volvo, John Deere, Case

New Holland and ConMet.

“I believe the perception of the lowest cost is different than what the actual low cost is.”—Patricio Gil, CEO of Blackhawk de Mexico

Color Coordinated

Along with the shift to ductile iron, Blackhawk wanted to see a shift in its operation. The strategy was to work

“We are more or less in the middle by ourselves. We have defined our niche.”

—Patricio Gil, CEO of Blackhawk de Mexico

on a lean manufacturing plan involving every employee at the plant.

One way to organize production was through the use of visual aids. Workers on the shop floor wear different colored hats that identify their department. In the visual inspection area, casting examples are displayed with colored markers showing where trouble spots might occur.

Workers also are encouraged to be actively involved in maintaining the equipment. Maintenance plans are posted throughout the shop floor and outline the maintenance expected to be performed by the machine operators and maintenance personnel. Stations include clear instructions for the operators to clean the machine each shift. The plan includes strategies for preventive and corrective maintenance.

Beyond Price

As a 280-employee iron casting facility, Blackhawk would be considered one of a number of midsize metalcasters in the U.S., but in Mexico, the company finds itself alone in the middle.

“In Mexico, the big players [in iron] are Cifunsa and Grede-Proeza,” Gil said. “We are more or less in the middle by ourselves. We have defined our niche.”

Blackhawk’s casting range of 20-200 lbs. (9-85 kg) helps in establishing its position in the middle market. The firm hopes to grow its line of mid-size iron castings by adding a nobake line, which would expand its casting size range to as high as 550 lbs. (250 kg). Recently, the firm installed a holding furnace to prepare for the line. The goal is to purchase the molding equipment this year.

Because the mix of casting firms in Mexico tends to be either very large (1,000+ employees) or very small, family shops, Blackhawk views its competitors to be its counterparts



CORE FILES Blackhawk uses coldbox, nobake and shell cores in its castings.

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POUR IT ON Blackhawk produces castings using a 32 x 32-in. and two 20 x 24-in. molding lines.

in the north: ThyssenKrupp Waupaca, Waupaca, Wis., Neenah Foundry, Neenah, Wis., and Dotson Iron Castings, Mankato, Minn.

Gil knows Blackhawk has an advantage with its lower labor costs, but he said competing with North American companies is more than just a price game. "Sometimes there is a quality perception, where we are given higher requirements because we are a Mexican firm," Gil said. "That's not just in casting, but in all Mexican companies."

Blackhawk is combating that perception, aiming to prove that it is as world-class as its competitors.

"We are trying to develop service as a distinction," Gil said. "Quality and lead times are a given, but at the end of the day, I believe cost is the main driver." **MC**

For More Information

"Taking Stock of Casting Imports," K. Kirgin, MODERN CASTING, June 2006.

"Global shipments of Metal Castings to Reach 90 Million Tons in 2008," K. Kirgin, MODERN CASTING, May 2006.



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