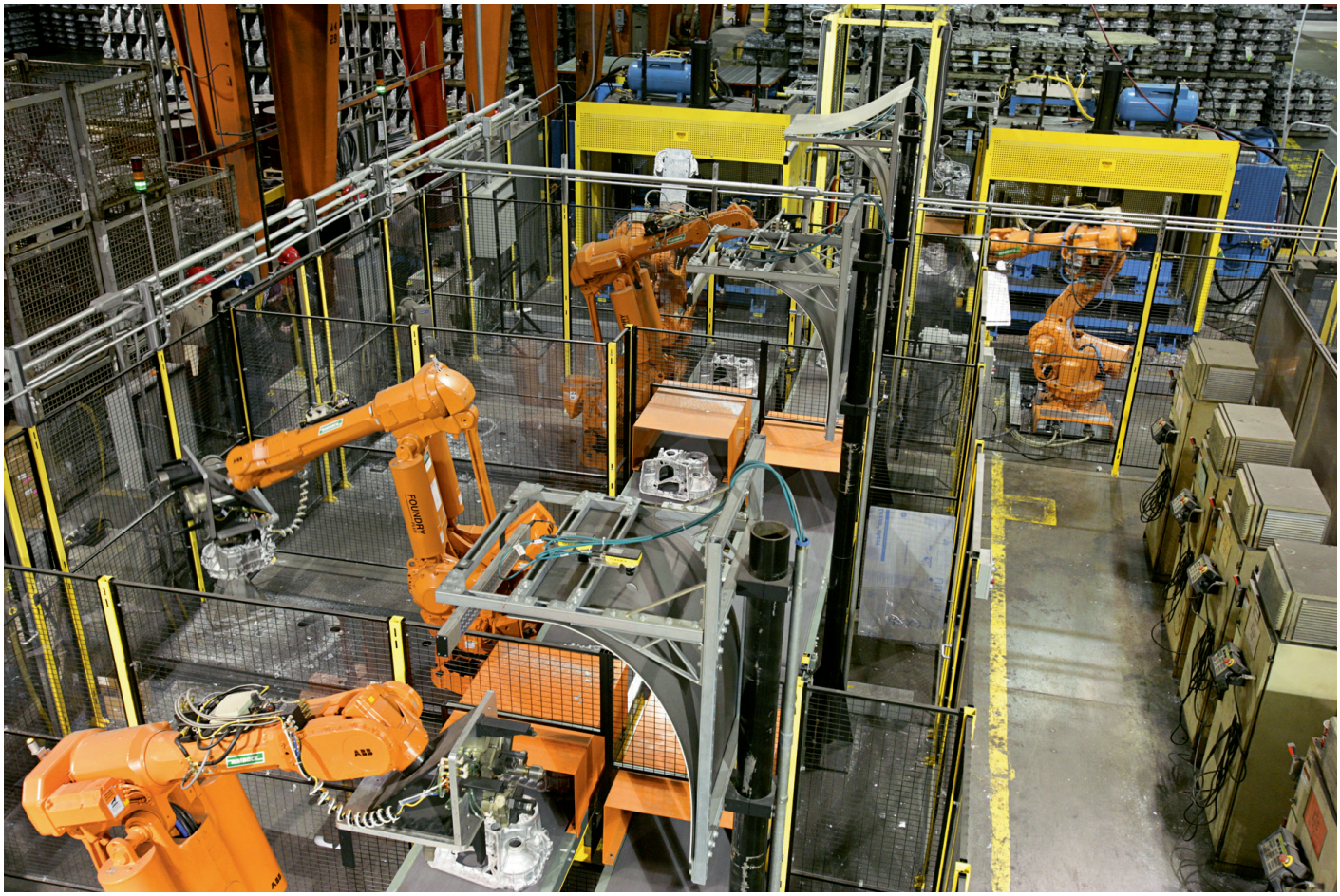
Robotics

Rimrock
Case study: Foundry/Finishing



Super savings for Ryobi. U.S.-based Ryobi Die Casting fi nds that automation means more fl exibility, better quality castings, less waste, fewer shifts and better safety.

Precision is vital

Ryobi, located in Shelbyville Indiana, is one of the largest independent die casters in the world with 2004 sales totalling 161 million u.s. dollars. With 42 die casting machines ranging from 500 tons up to 3500 tons, the company supplies various parts, including cylinder blocks and transmission cases to the automobile industry.

In 2005 the plant installed a fi nishing cell with abb irb 6600 and irb 6400 robots provided by Columbus, Ohio-based Rimrock Corporation to defl ash gearboxes and transmission cases. Two robots begin by loading and unloading castings into two trim presses. The castings are presented to the robots on belt conveyors, and each robot uses a vision system to locate the parts prior to placing them in the trim presses. The castings are then placed on a conveyor that moves them to one of three fi nishing robots – each having a dual end of arm tool.

It is here that the robots equipped with two cameras each again utilize vision technology to identify and locate the castings, determine the die number that produced the castings, and then move the castings to the fi nishing tool. This state-of-the-art vision system allows the same automated cell to fi nish two different casting types each with up to nine different die numbers. Once the castings are defl ashed, they are placed on the conveyor and moved to a shotblast that is then unloaded by the fi nal robot, which

Ryobi Ltd

dumps the shot and places the castings on an exit conveyor. This robot is also equipped with vision so that it can locate and identify the part. The parts are then moved to a leak test station where Ryobi staff members check for any leakage. Due to the increased productivity, quality and consistency realized by this cell, Ryobi has since installed three additional defl ashing systems. Since production did not start at full capacity for most of the follow-on cells, the initial layout only had one deburr robot with the ability to add future robots as production increased.

Says Ryobi's Maintenance Supervisor, Dave Bentley: "It's fascinating to watch the technology change and evolve. I've been here 12 years, and every time I think I've learned something, something new comes along – like the vision."

More than fi nishing

Finishing isn't the only area that can easily become integrated with today's automated technology. Spray and extraction robots are also becoming a necessity for today's die casters. With these tools in place, cycle times are decreased and the cooling time is consistent, resulting in less scrap. Die casters also have to determine what producing quality products is worth to their customers. For instance, a car manufacturer for which Ryobi produces castings is a usd 9 million per year customer. With the quality of the castings worth one percent in cost reduction, this particular customer is realizing an annual savings of usd 90,000 through the reduction or even elimination of the number of bad castings that have been machined. This is certainly a good argument for repeated business with Ryobi.

While overall quality, consistency, accuracy and reduced labor costs are good arguments for automation in and of themselves, there is one added benefi t that may be the most signifi cant advantage of all – safety. Quality and cost may be the most visible elements driving automation today, but safety is the key issue.

Due to the advancements in automated technology, companies who purchase automation equipment have signifi cantly reduced workers compensation claims. In Ryobi's case, this is largely due to the fact that they do very little hand fi ling now. In fact, hand fi ling at the Shelbyville plant has been reduced by approximately 85 to 90 percent.

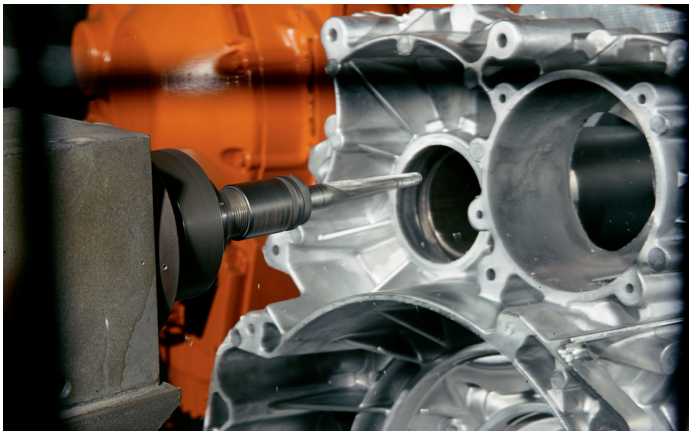


ABB model IRB-6600 robots load and unload the trim presses. The castings are then moved along a conveyor belt where ABB IRB-6400 robots identify and defl ash the castings.

FACTS

Benefi ts to Ryobi Diecasting of automated fi nishing with IRB 6600 and IRB 6400 robots are:

- Improved fl exibility, with robots able to easily handle new castings
- Decreased cycle times
- Consistent cooling times
- Savings of 1 percent – one customer saves USD 90,000 per year
- Hand fi ling reduced by up to 90 percent
- Better safety with fewer workers compensation claims

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