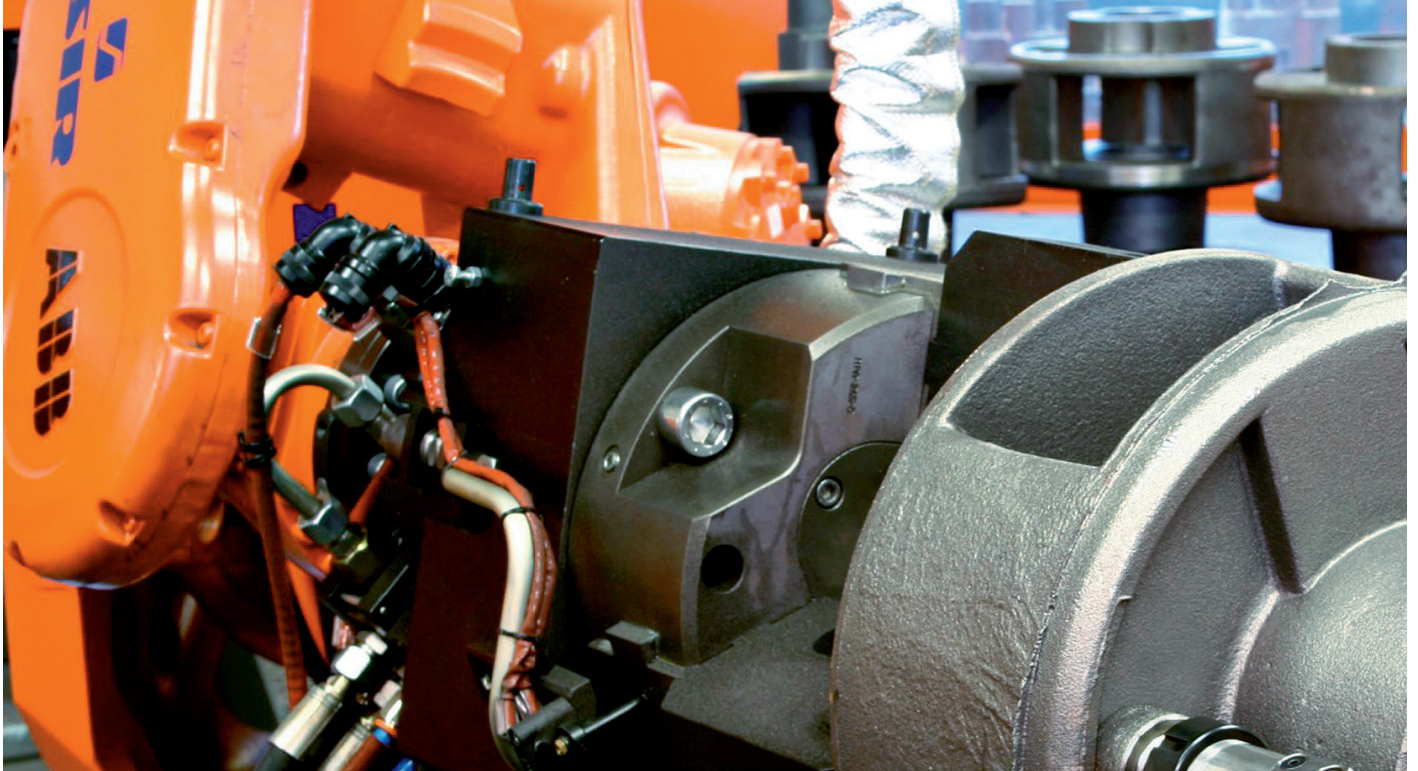


Sir Case study: Foundry/Partner



Software makes deburring easier. Deburring iron castings is hard work. But Italian system integrator SIR has found that using RobotStudio can save time and money in developing new ways of handling this difficult foundry application.

Among the many applications that SIR, the Italian integrator specializing in foundry automation, cast iron foundry deburring is one of the most interesting, especially given just how difficult an application it is.

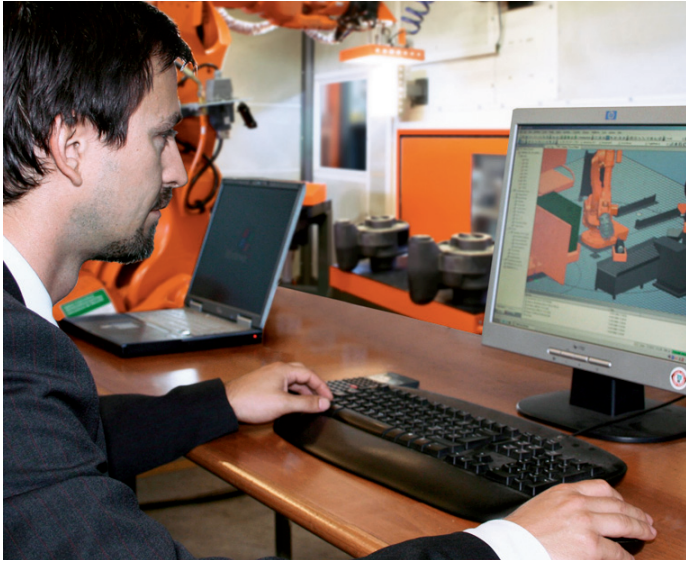
To satisfy the requirements of foundry processes, a machine of extremely high quality is needed, combined with unbeatable reliability and innovative engineering. In deburring applications,

nothing can be left to chance, says Davide Passoni of SIR. Quality isn't the only thing, however. It also takes flexibility and modularity, and SIR robotic cells can be assembled in a variety of configurations, both in terms of number and type of machining units, as well as the feeding system. Even the layout can vary in terms of footprint and configuration and the client can view a future cell in full detail in ABB RobotStudio, which gives a virtual tour of the proposed plant.

Custom built

How is a foundry cell at SIR made? Inside the external cab, which is equipped with dust extraction systems and is able to reduce the noise, is a genuine miniature workshop.

Fully automated and autonomous, the cell is no more than 35 square meters. It is compact but easily accessible, with separate in-feed and out-feed areas for organized pallet and bin handling.



Davide Passoni of SIR.

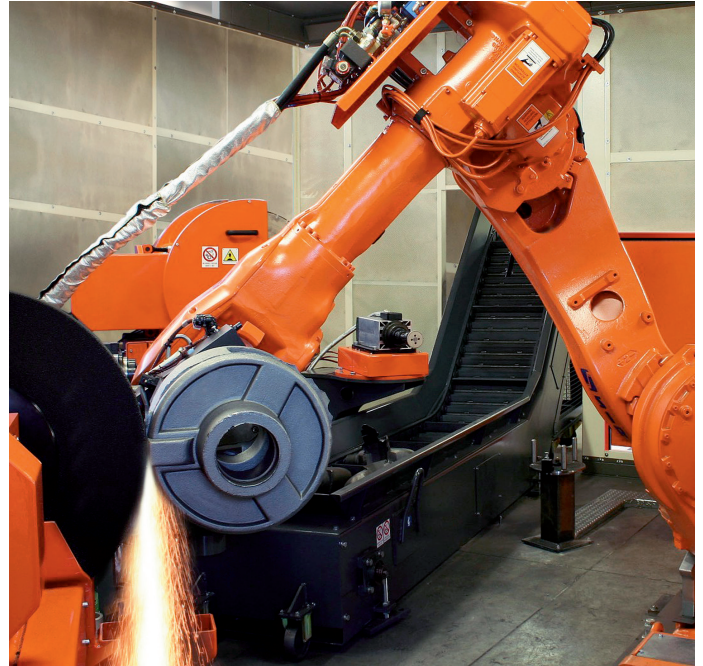
The robot, an ABB IRB 6600 with a 220 kilogram wrist payload, is equipped with an IRC5 controller. The robot is used for deburring and milling and boasts four different quick-mount grippers, each specially designed to handle a single type of part. An opposite configuration, with wrist-mounted tools and fixed workpieces, is also possible.

The robot is integral to the cell, surrounded by the process units. The robotic cell is usually composed of a deburring unit, equipped with multi-directional compensation, a milling unit with axial compensation, and a grinding station. For all these systems, SIR does not use commercially available products, but designs and builds its own. Precise compensation is critical to the accuracy with which the profile is copied, says Passoni, and SIR's solution allows for compensation of the tool position both radially relative to the rotational axis, and along the compression and extension axes.

High precision

To get the correct force on the workpiece, the compensation pressure is software controlled as the tool follows its programmed path. Internal pressurization, constant mill lubrication and sharpening, quick tool changeovers during processing – these are just some of the typical features of SIR equipment, says Passoni.

The fixed stations are complemented by a complex, turntable unit capable of mounting a diamond grinding wheel and cutting disk: with its controlled external axis, this small machine tool works in synchronization with the ABB robot. Cycle times which can vary, depending on the workpiece, from 90 seconds to 4 minutes, the cell cuts off the sprues (which fall onto a conveyor for removal from the cell), grinds the largest burrs and casting pillars, after which the milling and deburring units finish the piece to a precision of a few tenths of a millimeter, despite the enormous variety of the castings they have to process.



Davide Passoni of SIR.

FACTS

SIR deburring systems are fully automated and capable of providing highly repeatable and precise machining: the use of ABB robots is essential to the success of the application. The Absolute Accuracy package, combined with the rigidity of the robot which is required to handle the considerable mechanical and structural stresses generated by the process, enables SIR technicians to eliminate the problems which until recently placed this application at the limits of the possible.

ABB Robotics

www.abb.com/robotics