

Aluminum cylinder
block from Form.

Why Form follows function

Robots that can take the extreme conditions at Italy's Form foundries are key to production success. >

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> Foundries in general are not very hospitable places to work. They are hot, noisy, physically demanding, and potentially dangerous. Plus, any occupation that puts you in close proximity to 600° C of molten aluminum has got to be stressful.

Therefore, it's no surprise to find robots hard at work in forward-thinking foundries such as Italy's Form, a leader in aluminum pressure die casting and machining, primarily for the automotive industry. Form currently has 200 robots in its three Italian plants, of which most used in Form's toughest environments are from ABB.

Form has been using ABB's Foundry Prime line of robots ever since they were introduced in 1983. Foundry Prime was designed specifically to withstand the high-stress demands of the foundry environment: dirt and debris as well as wax lubricants used in die-casting. The line is laminated with a special coating to minimize corrosion and has special features developed for foundry use.

"We have had experience with other robotic equipment, but in the foundry environment they weren't as reliable as ABB," notes Stefano Rossetti, automation department manager at Form. "We never felt fully protected with other brands. Foundry Prime is our line of choice. We amortize them in five years, but continue to use some of our original robots. They may have a few marks on them, but they continue to be reliable."

To understand the advantages of Foundry Prime in action, a visitor is invited to follow several of ABB's 33 robots in the company's Cormano (Milan) plant.

In one cell, an IRB 6650 picks up a hot aluminum



An IRB 6650 can handle 30 components per hour, compared with 10 when handled manually.

component that will become an automotive cylinder block. The robot controls the unit's contours and perforations, removes excess metal, holds it in a vat of water to cool it off, stamps the date and time on it, and deposits it in a chest on a pallet, which will be moved to the next cell when the pallet is fully loaded.

In this particular cell, the IRB 6650 handles about

Some 33 robots from ABB work at Form's Cormano plant.



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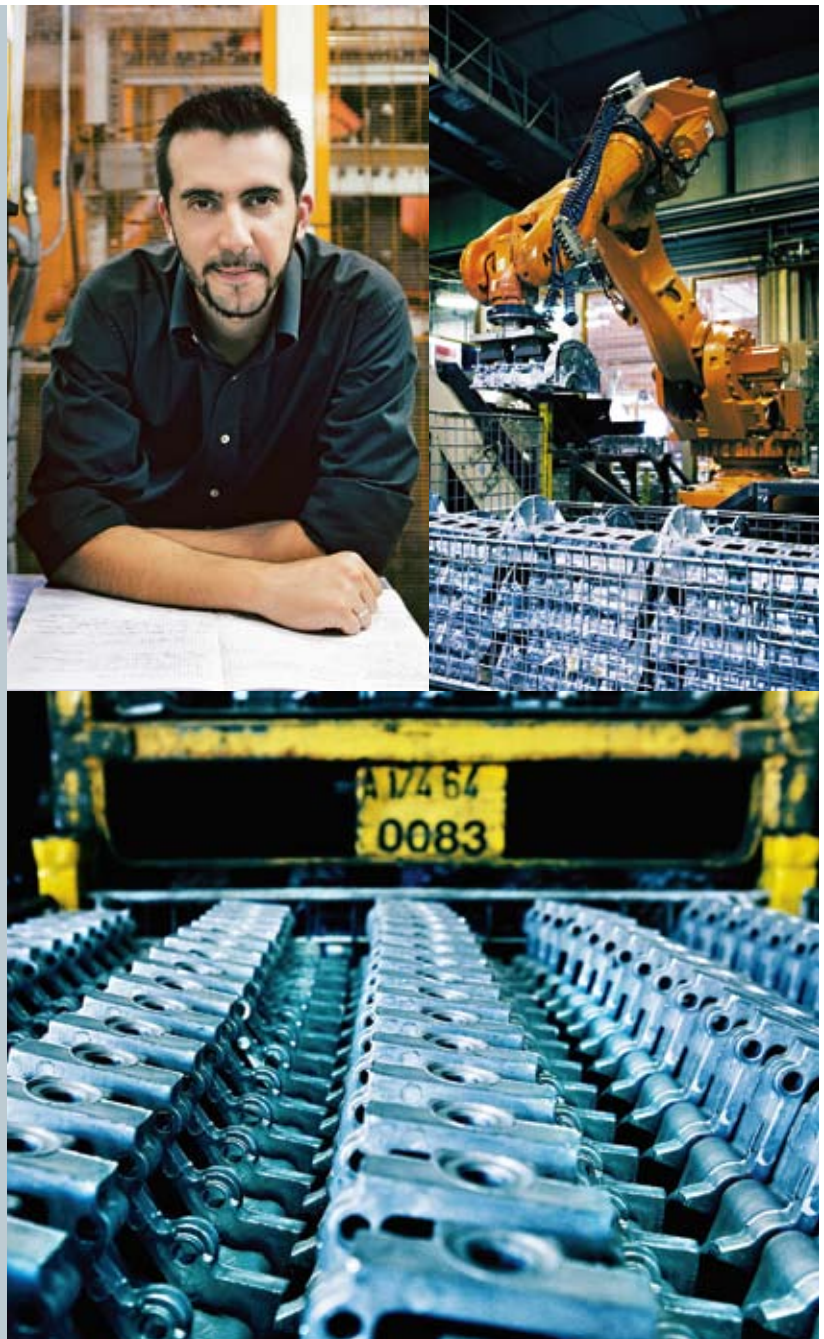
Form at a glance

- Founded as Form in 2005, the fusion of four companies working with aluminum die-cast products: SIMI, SIME, SIS, and FIM S.p.A.
- An Italian leader in aluminum pressure die-casting and machining
- Specializing in automotive parts (about 90 percent of production)
- 900 employees in four production plants in Italy, plus a joint venture in Poland
- More than 35,000 metric tons of aluminum alloy processed annually
- ISO certification TS 16949
- Annually turnover of more than 180 million
- Growth last year of 7 percent

Robotic benefits at Form

“We use robots for a series of reasons – environment, security, performance, quality,” says Stefano Rossetti, Form’s automation department manager. “First, our robots handle the most tiring and monotonous tasks, ensuring better security for our employees.” (Not by chance, Form boasts one of the country’s best safety records for foundries, according to Silvio Mirata, technical support engineer for ABB’s Robotics Division in Italy.)

“Second, the performance of our robots is more consistent and reliable,” Rossetti continues. “Third, robots work faster so overall productivity increases. Finally, the quality of the final product is better. With consistency in timing along the production line, the temperature of the metal is more consistent and this has a direct impact on product quality.”



Stefano Rossetti, Form’s automation department manager, with some of Form’s aluminum parts.

30 components per hour, whereas manpower would have handled roughly 10 units in the same period.

In a different cell, another IRB 6600 receives semi-finished aluminum components at one end. It shapes and perforates each block with a shiver press, places the unit in a sand-blasting oven (the blasting in this case is done with fine pellets rather than sand for technical reasons), removes the unit and drills a hole for oil lubrication, places one out of every six components onto a platform for quality control testing, and places all the completed components onto an assembly line for transport to the next process.

A decade ago, this cell required two men per shift to do what the IRB 6400 handles today under the supervision of one man. Since Form’s Cornano plant has three shifts a day, the robot has cut manpower requirements by more than 50 percent, in addition to taking on the hottest, dirtiest, least pleasant work in the

foundry and doing it with consistency and precision.

Form’s motto is “traditionally avant-garde,” reflecting both the company’s history (its predecessor companies were founded in the 1930s) and openness to new technologies (it has been using ABB robots for 30 years). About 90 percent of Form’s output is for the automotive industry: 1/3 of this is power steering units, almost ¼ is electro-mechanical systems, with the rest consisting of chassis, engine blocks, power trains, and engine parts.

Major clients read like an ABC of car manufacturers: Audi, BMW, Chrysler, General Motors, Mercedes, Nissan, Opel, Peugeot, Renault, and others.

The other 10 percent is for a variety of applications, from public lighting to casings for electrical motors. Ducati Motorcycles, for example, order Form engine blocks for their limited editions and prototype models.

High performance customers like to stay in Form. ○