

Cutting

Case study: Composite parts, Volar Plastics, Finland

Applications

- Cutting
- Machine tending

ABB Products

- IRB 4400
- IRB 6600
- IRB 2400
- RobotStudio

Finnish company Volar Plastic uses robots for sawing or waterjet cutting plastic parts for the tractor and forestry machine industries. And software that allows for offline programming gives the company an edge over its competitors.

On the outskirts of Lahti, a city some 100 kilometers from Helsinki, there's a modest building that hides Volar Plastic, a supplier of heat moulded plastic elements. And their robot master. Volar Plastic is a typical supplier. A company that makes an integral part of a bigger entity, without hassle, and often with little credit – except as renewed orders and long-standing partnerships with its clients. The users of, for example, Ponsse's forestry machines or Valtra's tractors, have never heard of Volar. But without Volar, their life would be just a little bit more miserable as the company manufactures a lot of the interior of a tractor. But the global leader in cut-to-length logging machines and the Nordic countries' leading tractor manufacturer go to Volar for just those pieces.

Moulding specialist

Volar specializes in three kinds of moulded pieces – vacuum-formed plastics, heat-formed felt products, and composites. While the history of the company goes all the way back to 1971, the company in its current form dates to 1993.

Currently, Volar Plastic has net sales of about 5 million euro, of which 8 percent is exported out of Finland, directly by Volar. Valtra, Ponsse and other global Finnish companies spread the Volar expertise further. The company's 40 employees keep the robots busy in two shifts.

"All in all, Volar has eleven robots, of which ten are ABB robots," says Petri Ronkainen, Volar's robot programmer with an ABB "Robotmaster" diploma hanging behind him on the wall. Ronkainen has been with the company since 1995 when Volar Plastic had only two robots, dated to the mid-1980s. Today, the oldest robot is an IRB 4400 from ABB that was acquired in 1997.

For cutting plastic, Volar uses seven IRB 4400 robots. For waterjet cutting, there are two IRB 2400



robots, and in the back corner of the facility, still waiting to be installed in the correct place, there is an IRB 6600 that will be used for transporting material and feeding an IRB 4400 in what will become Volar's first multirobot cell.

Automating to improve

The Volar manufacturing process has changed in the ten years that Ronkainen has seen up close. "In the past we used to mould the plastic with the vacuum, like today, but then we'd have somebody saw the edges manually. Then somebody else would take it to the robot, feed the piece, and take it to the gluing and packing," Ronkainen says. "So, we've eliminated two people from that process. Today, the same person who feeds the vacuum also loads up the robot," he says.





Increased productivity

Volar Plastic makes up to 150 pieces in one shift, depending on the orders, and according to Ronkainen, before the robots, the output may have been just ten percent of that.

What really gives Volar Plastic the edge over its competition, though, is what Ronkainen does with the robots in his little 6-square-meter office. He leans back in his chair, and points to one of the two huge screens on his desk.

“Over here, we have the latest version of Robot Studio, ABB’s offline software that we use to simulate the robots’ movements when we program them,” he says. The client sends Ronkainen a file with a 3D image of the desired product. Ronkainen then sends it to their supplier who creates a 3D image of the required mould. Then Ronkainen fires up his computer and teaches the robot how to unload and cut the part, and where to drill the holes.

From laptop to robot

“I use the latest version of RobotStudio, which was launched in June 2008,” says Ronkainen. Ronkainen can either draw the movement curves on the screen, or define certain points to create the most effective way to do the job. “I basically have to make sure it’s the shortest way to cut, that the tools are facing the right way, that there’s enough space

for the robot to do the cutting, that it reaches all points, and that the cords won’t get tangled up when the robots rotate,” he says. The computer steering also makes it possible for Ronkainen to reprogram the robots on the fly. “The ABB IRC5 controller allows us to connect a laptop to the robot and make changes directly into the program it’s running. As soon as I click on ‘apply the changes,’ the robot changes what it’s doing. In the old days, we’d have to take a disk, bring it to the office, make the changes and then return the disk,” he says.

“The software alerts us about any errors in the programming right away. We have to make changes quite a lot when, for example, the customer wants new holes. I can change the sizes from my computer,” he says. Programming a robot from scratch to a stage where it’s truly at work takes Ronkainen about eight hours “I’m sure RobotStudio gives us a competitive edge, especially in Finland. That’s what makes us unique,” he says.

>FACTS

Volar

- Location: Lahti, 100 km. from Helsinki in Finland
- Founded: 1973
- Employees: 40
- Products: plastic, felt and composite parts to the tractor and forestry machine industries
- Net sales: currently EUR 5 million
- Website: www.volarplastic.fi

The reason for robots

Volar has found a number of benefits to using its robots in the production of plastic parts, including:

- Some 150 parts can be sawed an hour, versus roughly 15 when done manually
- Offline programming using RobotStudio software means less downtime when new parts need to be produced
- IRC 5 Robot Controller allows changes to be made directly into a robot connected to a PC while the program is running