

## Portuguese Manufacturer of Automotive Press Tools Uses CNC Machines to Maintain Its 'Western' Technology Advantage



"At PJJF, quality is never an accident," says PJJF director Pedro Santos. "It always results from intelligent work."

People generally associate Portugal with early global exploration and port wines, but those who work in manufacturing are aware of the growing reputation of Portuguese companies that make press tools for leading automotive firms worldwide. Aveiro-based PJJ Ferramentas Lda. (PJJF) is an example. Like many toolmaking firms, PJJF has diversified and built a strong engineering knowledge base, giving it a technological advantage over competitors in East Asia. It also relies on CNC machine tools from Haas Automation.

Since 1995, progressive press tools and dies for automotive first-tier customers have formed the core of PJJF's activity. Thanks to the Haas machines, these complex tools need little or no human intervention between material feed and completed component.

PJJF has enjoyed success in recent years, says Pedro Santos, the company director, and is now well known in the European automotive market. "Our goal is to become an industry reference point for the design and manufacture of tools to form sheet metal parts," Santos states.

PJJF's advantage derives from its deep understanding of die development. According to Santos, a recent trip to China to assess the competition revealed that Far East rivals have yet to match that know-how. "China has the

ability to manufacture simple tools, but not tools for complex processes such as deep drawing," he explains. "In time this will change, of course, but until then we can take steps to ensure we remain competitive."

Technology is a significant differentiator that helps Western European toolmakers compensate for the labour-cost advantage enjoyed by competitors



in low-wage economies. Several years ago, PJJF undertook to refurbish its aging machining capacity. After seeing CNC machine tools exhibited by Haas at a trade fair, the company bought from the Portuguese distributor a Haas

TL-1 CNC/manual toolroom lathe. Soon followed a TM-1 toolroom mill, a VF-7B vertical machining centre, and, most recently, a VM-2 vertical machining centre.

"The Haas machines represent a very competitive price-to-specification ratio," says Pedro Santos. "All of our Haas machines have performed very well and so, whenever we think about a new investment in machining, we now always think Haas."

The company uses the Haas machines to manufacture components from tool steels. The fixtures used are mainly press systems and magnetic plates, typically holding multiple parts and often left to run unattended overnight or at weekends. The cycle-time advantage gained, however, is difficult to estimate.

Santos explains. "It's very different from part to part," he says. Because every part has a different definition, PJJF doesn't measure cycle times. Instead, it compares the estimated production time with the actual, and also the time taken on different machines.

"The performance of the Haas machines in these terms is excellent," proclaims Santos.



All of the Haas machines are programmed on the shop floor. PJJF has no CAD/CAM department, the result of a company decision to optimize its resources and train operators in the latest programming skills. It now has



five operators trained to work with Haas machines. Another two will be fully trained shortly.

PJF has kept its Haas machines busy. Regular customers typically order six to eight tools per project, while PJF develops up to 12 progression tools a year for each client. The company makes progression tools up to 3 m long and also conducts ongoing programmes for tool reconditioning and modification. In addition, PJ Ferramentas is pursuing opportunities to manufacture transfer tools, which use robots to move large fabricated parts between pressing operations. All of these activities demand high quality in the machined parts that constitute PJF's tools.

"At PJF, quality is never an accident," says Santos. "It always results from intelligent work." PJF was the



first company in Portugal to obtain ISO 9001:2000 certification with regard to the design and manufacture of

Progressive press tools and dies for automotive first-tier customers are the main product of PJ Ferramentas Lda.

stamping and cutting tools. Linear tolerances on PJF's machined components are typically 0.05 mm, with 0.02 mm usually required for positioning. Surface finish is also critical.

"On some parts, such as stamping punches and dies, the finishing is very important," explains Santos. "Just like on moulds for plastic injection processes, we need a very smooth finish to avoid friction in the sheet metal forming process. Polishing has no part in our production process: the component has to come off the Haas machines in a finished condition."

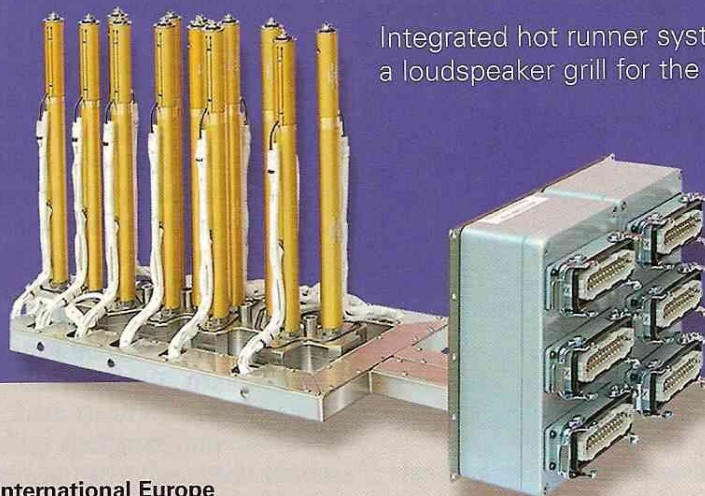
Quality is just one differentiating factor PJF hopes will help it retain and win business in future. "Change is the new paradigm for my generation," says Santos. "If we don't evolve, we won't survive. So, we are constantly challenging ourselves."

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