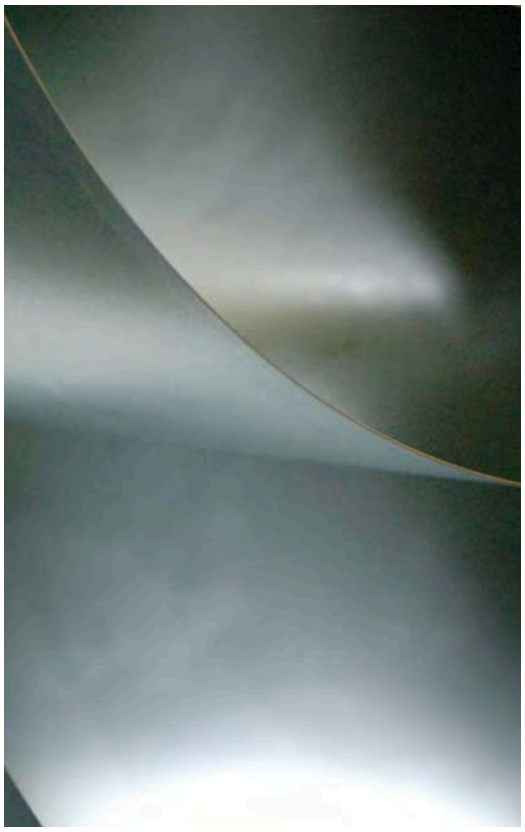
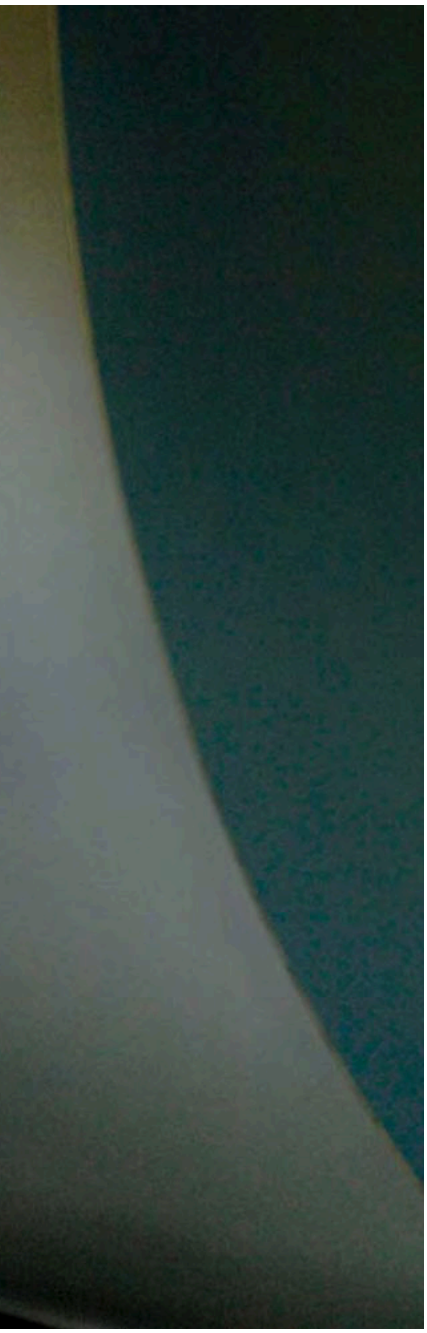


PROGRESSIVE Portugal

by Matt Bailey



Whilst most people know Portugal for its history of exploration and its fortified port wines, it's mainly only those who work in the manufacturing sector who are aware of the growing reputation of Portuguese companies making press tools for the world's best-known automotive firms. Aveiro-based PJ Ferramentas Lda (PJF) is a good example of such a company.

Like many toolmakers of its ilk, PJF has diversified into other areas, and built a strong engineering knowledgebase, giving it a technological advantage over its rivals in the Far East, to where a great deal of European mould work has migrated over recent years.

Since 1995, progressive press tools and dies have formed the core of PJF's activity. The tools the company produces are complex, but need little or no human intervention between material feed and completed component. The company's expertise has attracted a growing number of automotive first-tier customers, such as Gestamp, Faurécia, John Deere, Bombardier, Bosch and, more recently, TRW.

"We've enjoyed good success in recent years, and results have been positive," explains Company Director Pedro Santos. "We are now very well known in the European automotive market, and our goal is to become an industry 'reference point' for the design and manufacture of tools to form sheet metal parts."

PJF's advantage is founded on its deep understanding of die development. Santos claims that a recent trip to China to assess the competition revealed that its Far East rivals have yet to gain the same level of know-how. "This is largely because of process complexity," he explains.

Following the receipt of a customer component drawing, PJF develops a "strip layout" using CAD software. This is submitted for client approval before further discussions lead to the development of detailed 3D CAD drawings. These are again submitted for approval before the designs are finalised and raw materials can be ordered. Machining, hardening and assembly follow, before the tool is tested using PJF's in-house press. The first parts to come off the tool allow the company to focus on improving tolerances, so that dimensional reports can be submitted that meet customer requirements. Once the report is accepted, PJF has to prove the same characteristics on the customer's press. Only when this final phase has been successfully negotiated does PJF get paid. When the customer's plant is in Europe, it's difficult for overseas companies to provide such a high level of service and commitment.

"China has the ability to manufacture simple tools, but not tools for complex processes such as deep drawing," says Mr. Santos. "In time, this will change, of course, but until then, hopefully we can take steps to ensure we remain competitive."

Technology is a significant and common differentiator when it comes to negating the labour cost advantage enjoyed by competitors in low-wage economies. A couple of years ago, PJF began a project to refurbish its ageing machining capacity. After seeing Haas CNC machine tools at an exhibition and meeting with the Portuguese distributor, the company bought and installed a Haas TL-1 Toolroom Lathe. This was followed soon after by a TM-1 Toolroom Mill, a VF-7 vertical machining centre and, most recently, a VM-2 vertical machining centre.

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

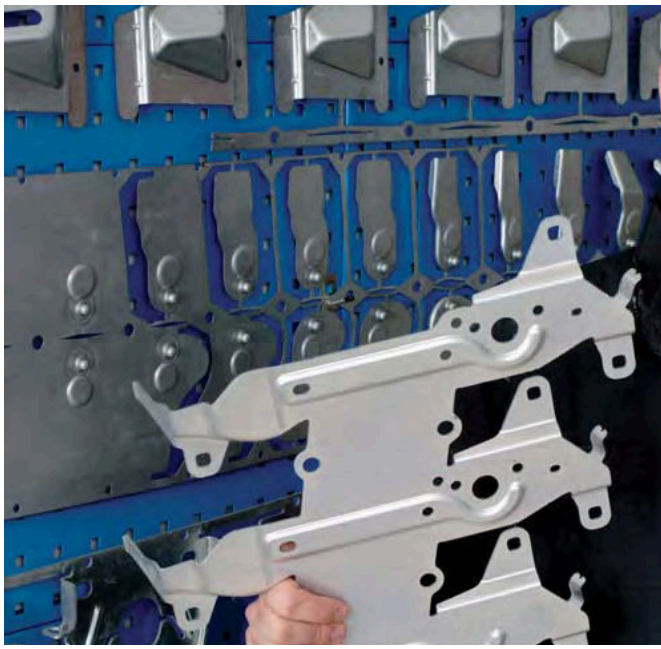
The company uses its Haas machines to manufacture components from tool steels. The fixtures used are mainly press systems and magnetic plates, typically holding multiple parts. The machines are frequently left to run unattended overnight or at weekends. The advantage gained in cycle times, however, is difficult to estimate, as Mr. Santos explains.

"It's very different from part to part," he says. "We don't machine two parts alike; every part has a different definition, so we don't measure cycle times. Instead, we compare the estimated production time with the actual time achieved, and also the time taken on different machines. The performance of the Haas machines in these terms is excellent."

All of the Haas machines are programmed by PJF shop floor operators. There is no CAD/CAM department at the company: the result of a decision several years ago to optimise its resources and train operators in the latest programming skills. Currently, PJF has seven operators trained to work with Haas machines.

The Haas machines have certainly been kept busy in the short time since installation. Regular customers typically order from six to eight tools to fulfill a particular project, while PJF develops up to 12 progression tools a year for each client. The company manufactures progression tools up to 3 metres in length, and also undertakes ongoing reconditioning and tool-modification programmes.

In addition, Santos reveals that the company is actively pursuing opportunities to manufacture transfer tools, which use robots to move large fabricated parts, such as car chassis components, between various pressing operations.



All of these activities demand high levels of quality in the machined parts that constitute PJF's tools.

"Our company deals in quality," says Mr. Santos. "At PJF, quality is never an accident; it always results from intelligent work. We are certified to ISO 9001:2000, and we were the first company in Portugal to obtain the accreditation with regard to the design and manufacture of 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," confirms Mr. Santos. "Just like on moulds for plastic injection processes, we need a very smooth finish to avoid friction in the sheet metal forming process. Today, 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 of the differentiating factors that PJF is hoping will help retain and win business in what is sure to be a period of change.

"Change is the new paradigm for my generation," says Mr. Santos, son of the founder. "If we don't evolve, we won't survive, so we are constantly challenging ourselves."

PJ Ferramentas, Lda.

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