

CASE STUDY: LEM di Vicenzotto

Founded: 1988

Staff: 15

Turnover: L2,000,000,000 (\$1m)



How a project defines a production strategy



CASE STUDY: LEM di Vicenzotto

Bringing a new product to market is never a quick or easy task - it requires the ability to design a product suitable for the purpose for which it is required, and the manufacturing equipment and processes suitable to produce it. Diego Vicenzotto of LEM di Vicenzotto recognised this when he was asked to design and manufacture a complete assembly for a new projector. The company had been trading since 1988, specialising in the design and production of electronic component assemblies, however when he was approached to embark on this new project he decided to change its direction. A flexible and expandable punch press system with state-of-the-art design CAD/CAM software was required.

The SIM2 projector contains several components manufactured from 0.5mm aluminium. This requires the machine to deliver a high speed and precise tool hit that can quickly and cleanly cut the metal without distortion. Technology Italiana's local reseller, Sa.Bor srl recommended the installation of a Tecnotransfer 15SR1050 punch press with JETCAM Expert 1 CAD/CAM software. This met LEM's current requirements and also offered the capability of unloading larger components via the 1200mm part chute, while also leaving them an upgrade path in the future. To further ensure that the system quoted would meet LEM's requirements a realtime demonstration was set up to estimate production times on the exact components the system would be required to produce.



Easy access to the fifteen tool stations

The machine and software were delivered and installed in February 2000. Installation and training took five days and consisted of one day commissioning the machine, three days software-based training and one day of combination training directly on the machine tool. Backup assistance such as Technology Italiana's *Tele-Assistance* service, allowing them to remotely interrogate the machine tool and software by dialing in through a phone line was also installed. Patrick Casonato, Programmer commented *"I have never had any CAM experience before but I found the software very easy to learn and was confident with the system by the end of the training sessions."*

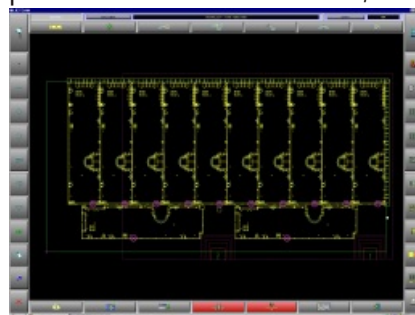
Mechanical vs Hydraulic



There are several advantages for companies that opt for a mechanically powered punch press over hydraulic. The primary benefit is power - a 37 tonne force generated by a 7 tonne machine, attributed to the dynamic kinetic forces generated by Technology Italiana's mechanically powered punches. Materials up to 8mm can be punched making the machine much more flexible.

Another major advantage of mechanical punching over hydraulic is that of accuracy. Penetration can be regulated to 0.01mm within accuracies of +/- 0.01mm - this accuracy is steadily maintained and is ideally suited to precision forming (for louvers etc). Hydraulic machines cannot achieve this as the properties of the machine oil change during normal operation, thus making the machine less accurate.

A benefit which was immediately identified was the flexible link between JETCAM Expert and the machine's tooling. The programmer can automatically tool components at any angle to best fit on the sheet, with the software automatically deciding to either microtag or unload via the part chute depending on component size and orientation. If an urgent job arises, he can mix it into existing work as the Tecnotransfer has fifteen indexed tools, sufficient to cover the requirements for most jobs. This configuration information is initially set up and stored within JETCAM's SEKT (stored engineering knowledge technology) database meaning that the operator never has to specify how a part needs to be nested, tooled or unloaded.

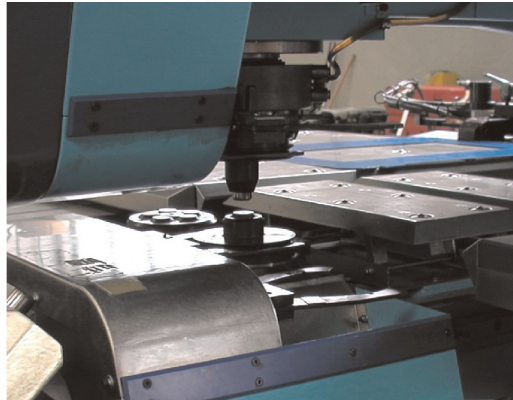
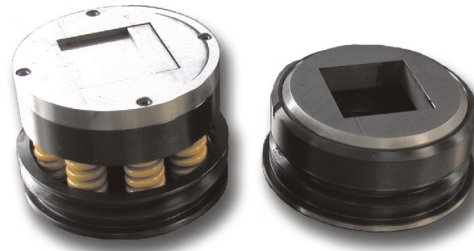


Stored information reduces operator input for nesting, tooling and unloading

Piero Incarnato, Export Manager of Technology Italiana explained, *"As an OEM for JETCAM we work very closely with them to ensure that the software gets 100% out of our machines. Therefore, not only can we offer a superior machine, we can also offer a complete turnkey solution - one supplier, one invoice, one telephone number."*

From design to production

The right tool for the job
When Diego found he required a special tool, he designed it himself and had it made locally. Tools are self centring and can rotate 360 degrees with increments of 0.01degree for tools from 1mm up to 100mm. The optional multi-tool allows up to five small tools to be held in a single tool holder.



Easy access to the fifteen tool stations

As a result he was able to design a large dimension tool which could be rotated in any station. This is now used to clean the edges of part-used sheets that would previously have been scrapped, making much better use of material stocks.

Tool changing is also simplified by the ease of access to tools due to the upper and lower tool magazines operating on a vertical access.

Future Developments: Projection walls



Diego (pictured left) is already looking at future products and markets. A growing market is projection walls for use at concerts and other mass audience events. *"This is a prototype of the casing for one of the projection screens. These can stack several units high and across to make the wall. The units are extremely light due to the use of thicker aluminium over steel, which will make them easier to transport and set up. We could not even contemplate taking on this work without Tecnology Italiana and JETCAM."*

Commented Piero, *"They have the option to upgrade the machine to support the full Tecnotransfer sheet loading system and can upgrade JETCAM to include many other features that will work directly in conjunction with the advanced features of our machines."*

Diego finished by saying *"The combination of Tecnology Italiana and JETCAM is excellent - you simply prepare the drawing, then go to your machine and work. Changes to a part or nest are quick and simple and easy to send from the office to the machine via the network."*

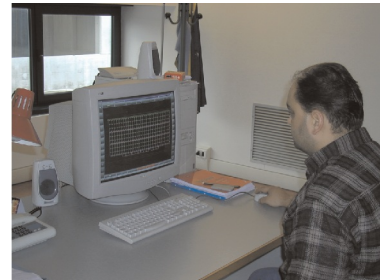


Full upgrade path on machine and software

There is little doubt that the SIM2 projector has been a success - with fifteen design awards currently behind it, and plans for other larger-scale products based on the same technology Diego is confident of a continuation of this success in the future. When these designs pass from prototype to production LEM are confident that their production will be able to cope.



Due to the high level of automation and integration in JETCAM, parts can be designed, nested, nc programs output and queued for manufacture in minutes...



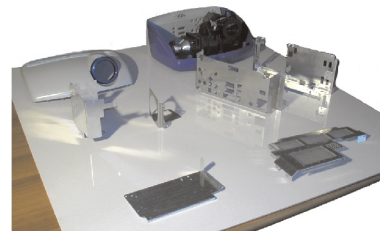
Parts are automatically tooled and nested by JETCAM Expert



CNC programs of the nests can then be quickly downloaded to machine via Rj45 network



Components are punched and either microtagged or automatically unloaded



The components...



...and the final sub-assembled product.

SPECIFICATION: *The delivered solution*

Features of TecnoTransfer 15SR 1050

Rated power capacity	300kN
Max X axis traverse	- 40 / 1550mm
Max y axis traverse	- 40 / 1050mm
Max X axis with a repositioning	- 40 / 3100mm
C axis rotation	50rpm
Max shearing sequence in trajectory 45 degree in relation to the distance between centres of the holes	
• Distance 3mm	480 strokes/1'
• Distance 25mm	310 strokes/1'
• Distance 50mm	200 strokes/1'
• Distance 100mm	190 strokes/1'
Max positioning speed	
• X axis	85metres/m
• Y axis	60metres/m
• Simultaneous axis	104metres/m
Positioning precision	+/-0.1mm
Max revolving shearing diameter	100mm
Max punching/nibbling thickness	6mm
Variation of tool penetration	8mm
Stroke length	20mm
Max weight of sheet metal at work	150kg
Number of rotating tools	15
Tool change time	3 seconds
Min distance between clamps support & tool centre	
• With series 15 tools	50mm
• With series 40 tools	65mm
• With series 70 tools	80mm
• With series 100 tools	90mm
Machining workpieces with folded edges	
• With standard clamps, edge h	20mm
• With special clamps, edge h	30mm
Compressed air feeding	6 bar
Minimum compressed air capacity	200 l/min
Approximate weight	5400kg



Features of JETCAM Expert 1

Stored Engineering Knowledge Technology Database
DXF Viewer
Automatic hazard avoidance (shaped tools, forms)
Interactive CAD
DXF interface for CAD drawing import/export
Automatic tool selection
Automatic micro-joints, lead-ins, lead-outs and loops
Interactive nesting (arrays, free-hand)
Automatic nesting of a single component at 0 and 90 degrees
User definable machine macro commands
Automatic tool path and tool rotation optimisation
Automatic repositioning
Automatic parting and unloading of components at any angle
Automatic turret/magazine loading
Multiple tool libraries
Automatic placement of special tools
Full simulation capabilities



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