

Developments in profile

October's EuroBLECH exhibition in Hanover saw 1,500 exhibitors attract nearly 70,000 visitors. There were developments in profiling, punching and bending, as Andy Sandford reports

Relecting the growing requirement for combining contouring and forming operations in a single set-up, EuroBLECH saw the launch of several new combination laser/punch machines.

Trumpf's new Trumatic 7000 picks up on an idea previously applied on the company's flat bed cutting machines, adding additional X and Y axes on the laser cutting head that are superimposed on the movements of these flying optic axes. This increases the absolute traverse speed and shortens processing times, particularly for detailed parts with complex contours.

The table doesn't need to brake and accelerate to produce right-angle movements; it simply takes the shortest path while the parallel additional axes even out the difference and produce the finer geometries.

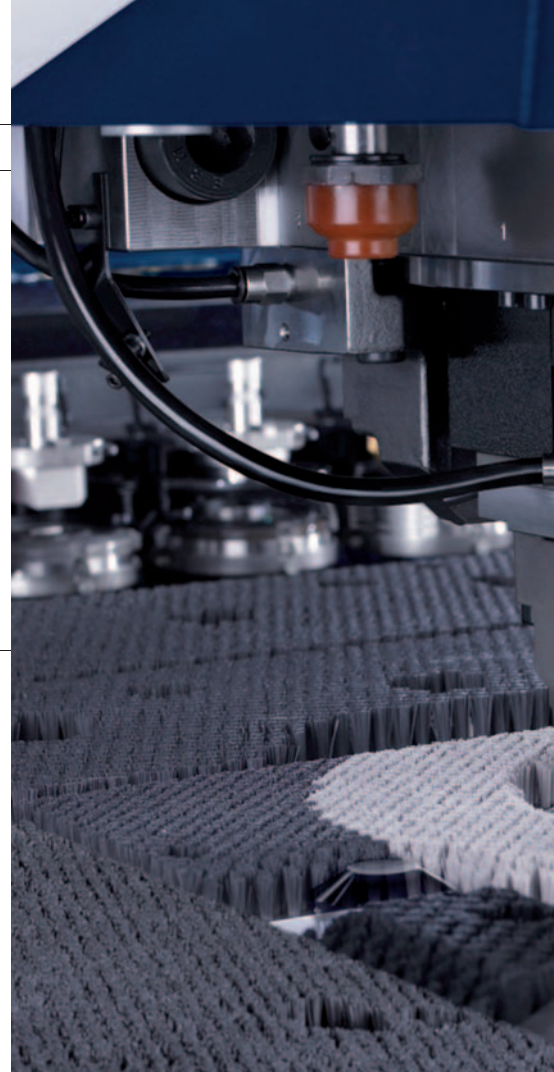
LVD says that while other manufacturers generally added a laser to their most productive punching machines, when you have a laser you don't need that much punching capacity. So the new LVD Strippit LP-1225 Laser-Punch only has a small 32-tool twin track turret. The laser can do any profiling or shaped holes, while the punching tools are used for what they are best at – formwork and cutting small, accurate holes. The turret can be set up with all the forming tools needed for a day's production and, says LVD, the customer gets a combination machine for the price of a punch press.

Bypassing the more familiar names in laser cutting, the first generation of flat bed fibre laser cutting machines made their debut at EuroBLECH. These solid state lasers are said to offer a number of advantages over CO₂ lasers in terms of efficiency and can be delivered by fibre optic rather than requiring a complex beam guide. The resonator for these lasers comprises an optical fibre with a doped core, the lasing medium, and two layers of cladding. Energy is pumped into the laser using diodes, exciting the core to emit laser light at a 10th of the wavelength of a CO₂ laser.

CUSTOMERS WANT MORE

French welding and cutting giant Air Liquide showed its Fibertome 3015, a 2 kW 1.5 by 3 m flat bed cutting machine. This can cut up to 12 mm mild steel, 5 mm in stainless and 4 mm in aluminium, with accelerations of 1 G and speeds of 100 m/min.

Air Liquide's product manager for automatic cutting, Régis Augeraud, explained: "We have had plasma machines for a long time, but our customers were asking for increased quality, higher precision and smaller holes. The main attraction of the fibre laser is that it is 25 per cent efficient compared to maybe 10 per cent for a CO₂ laser, which reduces the power consumption, and the wavelength of the fibre laser is absorbed much better by metals."

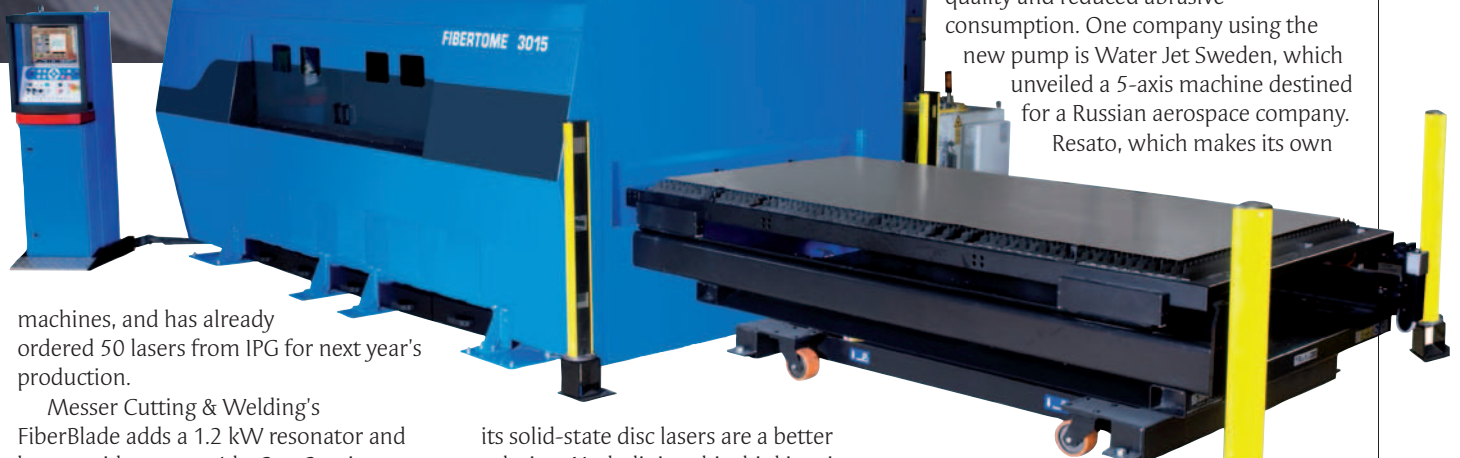


He says that this gives a very high power density beam that dramatically increases cutting speeds for the same laser power.

Eagle is a German company created to manufacture fibre laser machines and it is working with an Indian partner, SLT, which has a lot of experience in laser systems for the diamond industry. For the new machines, SLT provides the machine body and Eagle does the rest of the manufacturing in Germany, with the 2 kW fibre laser supplied by IPG. Eagle has completed two 2 kW machines so far, with the one on show at EuroBLECH already sold to a Polish sub-contractor.

Peter Littlejon, director of Eagle, says that fibre lasers have been used in 3D cutting and welding for some time, but haven't before gone head-to-head with CO₂ flat bed profiling machines. He says the performance of a 2 kW fibre laser is comparable with a 5 kW CO₂ laser. The cutting thickness will be nearly the same but it will draw about 20 kW compared to 60 to 65 kW for the CO₂ laser.

As well as the machines produced by Eagle, SLP has its own manufacturing facilities in India, the US and China. SLP in India currently has orders for four



machines, and has already ordered 50 lasers from IPG for next year's production.

Messer Cutting & Welding's FiberBlade adds a 1.2 kW resonator and beam guidance to a 4 by 2 m 2-axis shuttle table machine, with the delivery cable simply carried in the drag cable. It says that the laser is 30 per cent efficient, so that its 1.2 kW resonator will give the same performance as a 2 kW CO₂ machine.

Salvagnini is offering a fibre laser version of its new L1X laser system, and says that although it believes it cannot replace the CO₂ laser at the moment, the company says it is an interesting alternative in some applications.

Trumpf, although it has been developing fibre lasers and recently acquired UK fibre laser manufacturer SPI Lasers, is not convinced they are the best answer for metal profiling and says that

its solid-state disc lasers are a better solution. Underlining this thinking, it introduced the Trulaser 7040 NEW flat bed cutting machine fitted with a solid state 6 kW disc laser. As well as delivering the full 6 kW at one cutting head, the beam can also be split to give 3 kW of simultaneous cutting power when using two cutting heads.

PROFILING ALTERNATIVES

The growth in the number of companies offering waterjet cutting machines at EuroBLECH was quite noticeable – over 20 at a rough estimate. Harmmanus Bijmolt, managing director of Dutch manufacturer Resato, represented in the UK by Cotswold Machine Tools, says that it is a growing market and it is longer

seen as a niche technology.

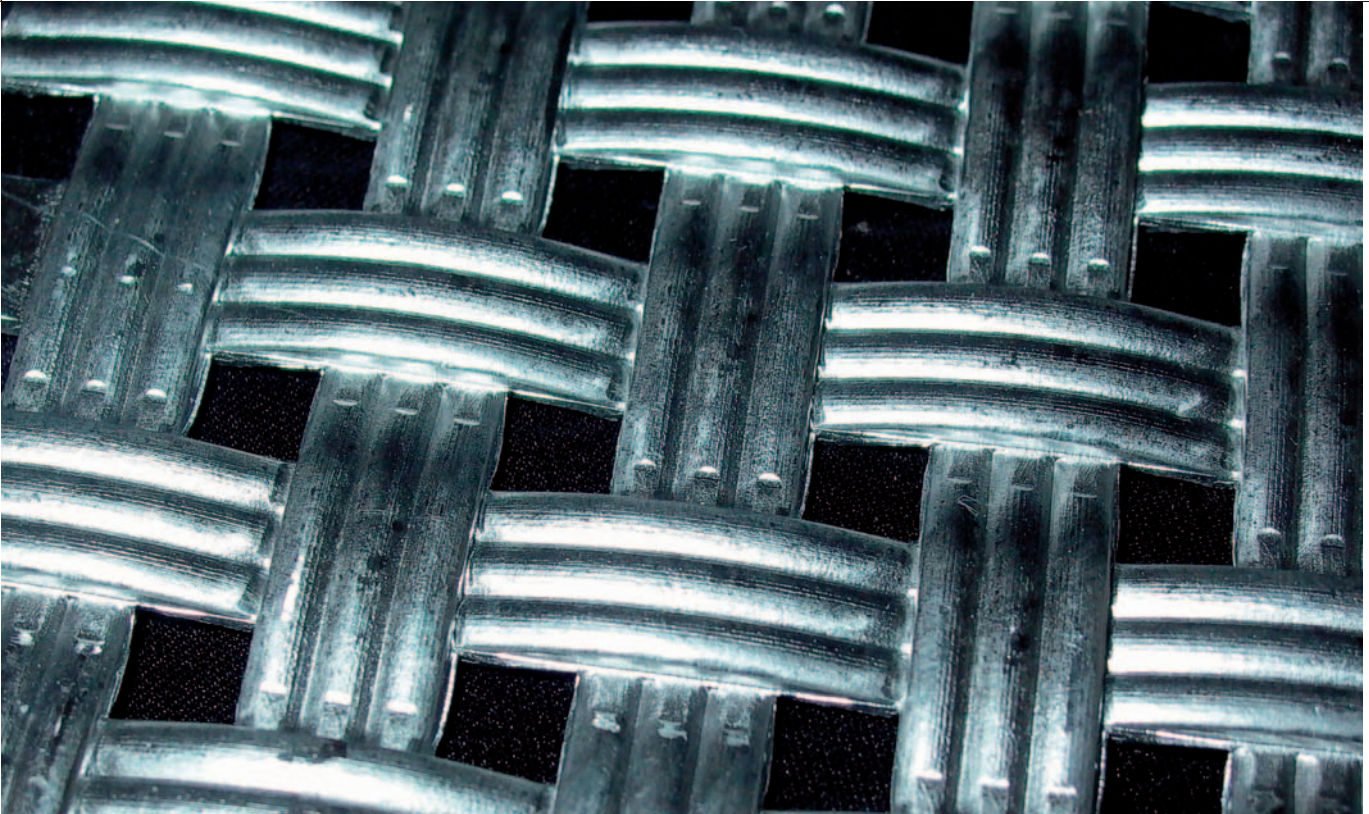
"Compared to a laser they are very competitive in price, you can easily improve productivity at very little expense by cutting with two or three cutting heads at the same time, and the reliability of the machines is much better than it was – and they are a lot less expensive than they were. In shops where you already have plasma and laser, the waterjet is a complementary technology, allowing you to cut plastics, stone, wood and so on and a wide range of thicknesses."

Jet pressures keep increasing and KMT, which supplies the waterjet systems for nine of the machine makers exhibiting at EuroBLECH, has just launched a 6,200 bar high pressure system that is said to give higher cutting speeds, improved cut quality and reduced abrasive consumption. One company using the new pump is Water Jet Sweden, which unveiled a 5-axis machine destined for a Russian aerospace company. Resato, which makes its own

*Top – Trumpf's Trumatic 7000;
Above – Air Liquides' fibre
laser profiler*

waterjet units, launched a 6,000 bar pump which it says increases productivity by 50 per cent and operates at less than 72 dBA. Other innovations from Resato included direct linear drives and a cutting head that compensates for the bevel generally produced on a waterjet cut.

Putting some fresh thinking into plasma cutting, Australian company AIMS introduced its ImaQut vertical plasma cutting machine. With a 1,520 by 3,650 mm sheet capacity, the machine is



German company Pass Stanztechnik showed a number of innovative ideas on punch press tooling – wickerwork texturing was one of the offerings

just 850 mm wide, so three will fit into the space of one conventional machine – it can even be sited against a wall. The operators can easily access the sheet to remove parts without having to lean across a flat table, and these can either be micro-tagged or drop out under gravity. The machine is fully enclosed for operator safety, reduced noise and fume control and, by taking the hot fumes off at the top of the enclosure, the heavy extraction capacity of a conventional plasma machine is not required.

IT'S A TWISTER

For press brakes, automation was the order of the day. The Turkish manufacturer Ermaksan, for example, showed a machine fitted with Antil's Twister – a robot designed for use with press brakes that mounts on the side of the machine and moves out the way for manual operation.

The Twister also featured in Darley's Bendingcell. Other new features from Darley included the latest Lazersafe block laser safety system. This detects the position of the press brake upper tool and automatically defines a safety zone around the punch tip for fast set-ups. It also allows the tools to close at high speed and still stop in time if the operator

is in the way. If there are no obstructions, the tools descend at high speed to just 2 mm above the surface of the material to be formed, giving faster cycle times as well as improved operator safety.

Safan showed its third generation servo-electric belt drive technology E-Brake, which uses just half of the energy of a hydraulic machine and needs no crowning system. The company now offers E-Brakes from 35 to 100 tonnes and has also introduced a lower cost, entry level machine, the E-Brake B, and the R-Brake; the latter integrates a 100 tonne 3.1 m E-Brake with a handling robot. The robot is mounted on a 6 m track on the front of the machine to give a compact design that can also be operated manually.

The company also showed the latest version of its sheet thickness measurement system, which monitors variations in thickness and compensates for them in the movement of the beam. This is a lower cost alternative to in-cycle bend angle measurement and removes the main cause of variability in bend angle with no effect on the cycle time. The company says it now supplies this system on 90 per cent of its machines.

Interesting developments in sheet metal tooling included aluminium press

brake tools from the Italian company Angelo Romani. The tooling is based on extruded aluminium sections with TiN coated hardened steel or rubber inserts on the working surfaces. When the tools wear, these are simply replaced.

The tools are light, can withstand similar loads to a steel tool and, because manufacturing doesn't involve machining, they are cheaper than conventional tools, too.

A MATTER OF AESTHETICS

German company Pass Stanztechnik showed a number of innovative ideas on punch press tooling. For applications where aesthetics matter, on products such as garden furniture and architectural details, it offered a range of texturing tooling giving, for example, the effect of wickerwork and granular structures.

From a technical perspective, the most interesting aspect of the company's exhibits was its work on integrating RFID (Radio Frequency Identification) chips into punch press tools. By using over-writable transponders in the punch and die it is possible to ensure the right tools are loaded for the program, track wear and maintenance requirements, and transfer information to and from the tool in real time. □