Subcontractor upgrades laser cutting and press braking capacity

Nestling in the Dorset countryside on the edge of Bridport, sheet metal subcontractor Ackerman Engineering's freehold, 1,500 m² factory was purpose-built in 2006 by the current managing director, Graham Ackerman, great-grandson of the company's founder, William, who started the enterprise in 1885.

It was a seminal year that saw the purchase of a Bystronic BySpeed 4.4 kW CO_2 laser cutting machine, another press brake from the same supplier and a generation facility for nitrogen. It is the assist gas of choice when laser cutting, as it produces a non-oxidised edge for painting without the need for fettling and also allows cutting speeds up to three times faster in thinner to mid-range gauges.

CO_2 laser technology, which had been used by the company since 2001, was phased out in August 2018 when the 4.4 kW machine was part-exchanged for a ByStar Fiber 8 kW fibre laser cutting centre, which joined a 3 kW BySprint Fiber installed four years earlier. Both are of 3 m x 1.5 m sheet capacity. At the same time, an Xpert 150-tonne, 3.1-metre press brake was added to the six Bystronic models already on-site, one of which dates back to 2001 and is badged Edwards Pearson, which the Swiss manufacturer acquired in 2002.

The advantage of profiling and bending components on the same make of equipment is that Bystronic's offline Bysoft 7 software modules, Laser and Bend, work seamlessly together to produce very precise 3D sheet metal parts. Graham Ackerman says that drawing tolerances are almost incidental, as they are routinely held due to the accuracy of machining. Inspection is scarcely needed, as quality is virtually

guaranteed once a job is in production. Any mistakes are almost always down to human error, so most of inspection effort is at the CADCAM stage.

A customer's drawing or model, which usually arrives in DXF, DWG, IGES or STEP format, is interrogated in the subcontractor's CAD department to ensure the sheet metal component's manufacturability. The file is then exported as a flat blank to the Bysoft CAM environment, where the programs for fibre laser profiling and bending are generated automatically.

Graham Ackerman says: "Fibre laser cutting is massively faster than CO_2. When we installed the 3 k BySprint Fiber alongside the 4.4 kW BySpeed CO_2, the former was so productive that we could have sold the other machine and still hit production targets. The only reason we didn't was to retain back-up capacity for servicing or unusual peaks in order to guarantee customer service and deliveries."

He added that the Bridport factory mainly processes aluminium, stainless steel and mild steel sheet from 0.7 mm to 8 mm thick, with a lot of material in the 1.2 mm to 2 mm range for the manufacture of electrical cabinets destined for the electronics and telecommunications industries. When cutting these gauges, the 3 kW fibre machine is typically two to three times faster than CO_2. When the 8 kW fibre laser was installed, a further increase in throughput was seen, as processing times are less than half those using the 3 kW fibre source.

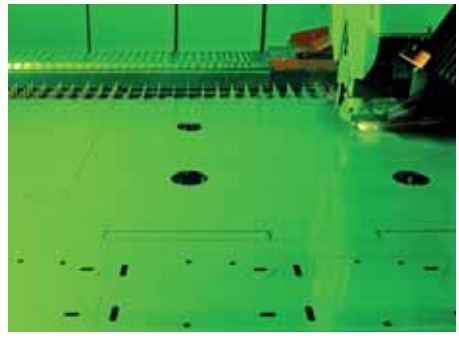
Additionally, CO_2 machines require a 15-minute warm-up in the morning and a similar time to close down at the end of the day, whereas these unproductive periods are avoided with fibre laser cutting. Another benefit of the technology is its low running costs.

Graham Ackerman notes that the firm's larger fibre source draws less than half the power of the previous CO_2 machine yet delivers nearly twice the power to the point of cutting. The wasted energy previously had to go somewhere, which was into the factory in the form of heat, so the fibre-only working environment was more pleasant during the summer months.

Appraising his company's use of fibre laser cutting, Graham Ackerman made a couple of interesting observations. One was that the 8 kW machine is so fast that the expected increase in nitrogen usage did not materialise due to the short cycle times, so it has not been necessary to increase the size of the gas generation plant.

Another comment was that on some delicate parts, which are frequent bearing in mind that the subcontractor operates at the high-quality end of the market, the 8 kW laser beam can be too strong for cutting 0.8 mm or 1.2 mm material, a problem that is easily overcome by turning down the power of the source. To maximise productivity, however, the lower power fibre machine is designated to cut the thinner gauges and the 8 kW laser cutting centre is kept on full power for processing thicker materials.

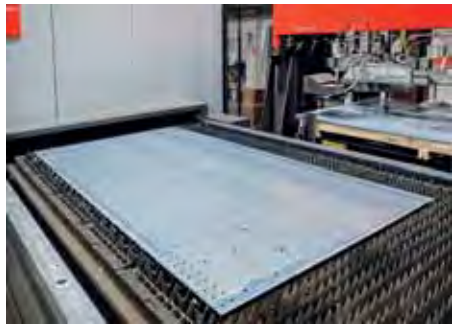
As to his company's move away from other makes of laser profiling equipment to standardise on Bystronic equipment, Graham Ackerman says: "We recognised more than a decade ago, these Swiss-built machines are among the best in the world and highly productive, both in terms of processing speed and maximising uptime.



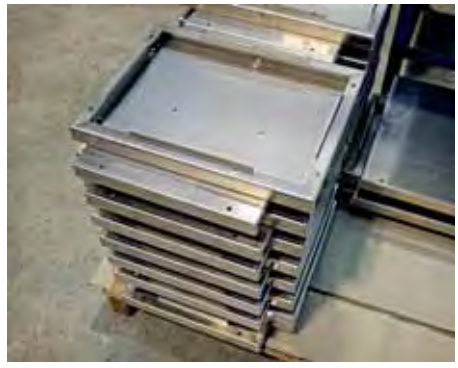
"We especially like the quickness of changeover to the next job, which is important to us as we produce small batches of high added-value work, typically within the range 5- to 50-off."

It is due to these relatively low batch sizes that Ackerman Engineering has restricted its automation equipment to simple ByLoaders for feeding the fibre laser machines with material. The step up to a ByTrans automated sheet loading/unloading arrangement would have not lent itself to such small runs. In any case it would have necessitated tagging components within the sheet, then shaking them out and depipping them, which is not conducive to the premium quality work for which the subcontractor is known.

Modern press braking technology has been a similar boon to the firm's business. Graham Ackerman is particularly impressed with the latest Bystronic Xpert 150, for which he has bought a comprehensive suite of the manufacturer's RF-A segmented tooling. He says it is twice as fast to set up compared with older style tooling, as the punch and die segments are automatically centred when loaded from the front and hydraulically clamped.



Moreover, the system is fully compatible with the Bystronic bending database in the machine control and it is practically impossible to insert an incorrect tool due to laser beam recognition of its profile. Part quality is improved, especially when bending long components.



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