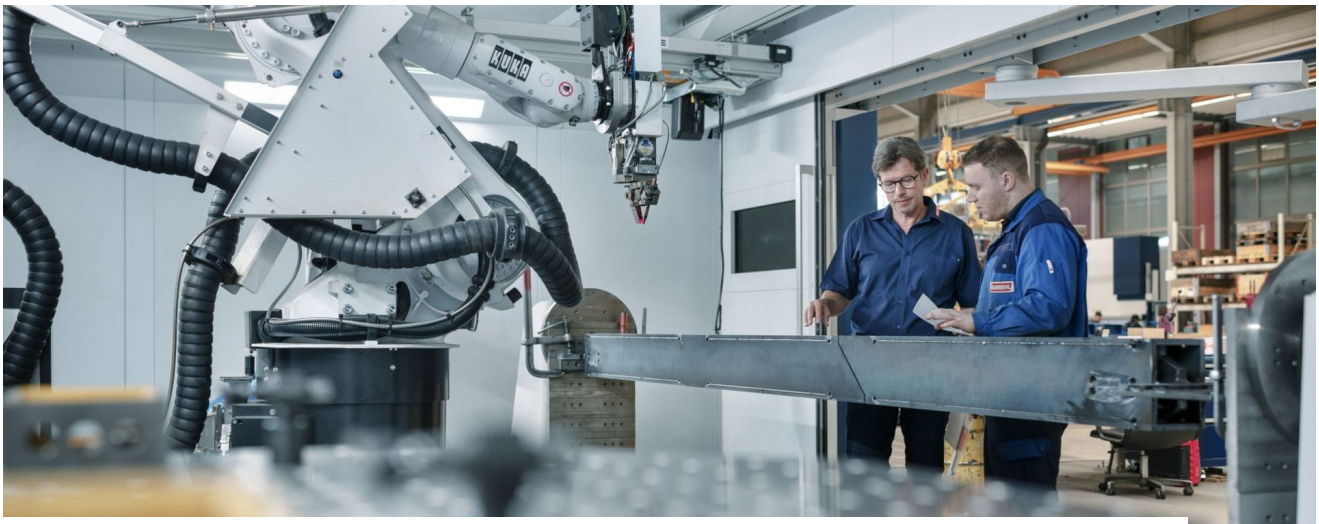


Böhmer opts for XXL laser welding

From MIG and MAG to TIG, Böhmer Systemtechnik specializes in all the most common welding techniques. The only string missing from its bow was laser welding – at least until the TruLaser Weld 5000 came along.

Welding engineer Josef Böhmer spent years running his metal fabrication business without a laser welding machine – yet he always had an eye open for parts that might benefit from laser technology. His interest stemmed from a firm belief that laser welding is here to stay. So when he heard that TRUMPF was looking for a test customer for the large format version of their TruLaser Weld 5000, Böhmer knew it was time to make a move. By September 2018, the large format laser welding cell was up and running at Böhmer Systemtechnik GmbH in the southern German municipality of Langenenslingen. "The initial goal was to tap into our experience to make the machine even better," says Böhmer. "But now the TruLaser Weld 5000 has become an integral part of our business, not least because we understand the importance of giving our customers access to the best new technologies. Though I must admit that sometimes means educating and not just innovating!" he adds with a smile.



The managing director of Böhmer Systemtechnik GmbH, Josef Böhmer, clearly has a passion for welding. His company offers expertise in all the standard welding techniques – and the addition of laser welding has made the package complete.
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Two birds with one stone

Since it was founded in 1949, the family-run company Böhmer Systemtechnik GmbH has served not only machine makers and system integrators, but also companies in the scaffolding, formwork and steel construction sectors. Processing long and oversized parts has therefore become second nature to the company's workforce. Böhmer uses a range of welding techniques – but laser welding had not originally been one of them. "Not many companies have the right experience, expertise and machinery to weld large parts with a laser, so I figured this was an opportunity we could grab with both hands," says Böhmer. By opting to move into laser welding with a large format machine, Böhmer has killed two birds with one stone, expanding its portfolio and adding the missing piece to its welding capabilities at one and the same time.



Josef Böhmer thinks the laser offers great potential for welding oversized parts.
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Intrepid pioneer in laser welding

Josef Böhmer's experience with other welding techniques gives him a clear knowledge edge: "If you can identify which parts are suitable for laser welding, you already have an advantage. We see laser welding as an important and logical addition to our other services, but it also offers lots of exciting new opportunities if you know how to tap into them." Böhmer primarily uses laser welding for long seams: "For oversized parts, other welding methods require very high heat input to make the seams strong enough. That heat warps the metal. But to meet the fine tolerances specified for today's parts, especially in formwork construction, we then face the hassle of having to straighten them, which isn't easy when they're so large!" Even more time is wasted grinding down the seams – and the bigger and thicker the part, the greater the time spent on post-processing. That's why the laser is such a good choice, offering a deep penetration welding process that minimizes distortion by minimizing heat input. The resulting seams are very strong and perfectly suited to Böhmer's purposes. No rework is required, so the company enjoys the twofold benefit of getting better quality faster.

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>
> Josef Böhmer, Geschäftsführer Böhmer Systemtechnik

Looking good!

Böhmer also makes thin-sheet parts for caravan manufacturers – and here it's the appearance that counts. "The materials we use in this case are between 1 and 2 millimeters thick," says Böhmer. "Spatter becomes a real problem when you weld those manually – and that's a definite no-no for visible parts!" In contrast, heat conduction welding with a laser produces seams that are barely visible. "Absolutely no post-processing required," says Böhmer. "And it still looks like it's all been cast as a single piece!"

Showing the way

To really exploit the benefits of laser welding, users need to rethink parts design from scratch. One of Josef Böhmer's tasks nowadays is teaching people how to make that leap: "We work closely with our customers right from the design stage. It's our job to explain how much potential laser welding offers and to show them what works." Laser welding opens up a host of possibilities for designing new parts from the ground up. For example, welding very thin sheets to thick sheets suddenly becomes much easier, says Böhmer, explaining why he feels so optimistic: "We met the same initial resistance when we started offering 2D laser cutting. But customers are always impressed with the quality of our laser-welded parts, so it's not hard to convince them and get them on board."



The TruLaser Weld 5000 large format machine at Böhmer Systemtechnik is equipped with a KUKA robot on a linear axis and a turnover positioner, allowing it to cover a working area 4 meters long and 1.5 meters wide. The rotate-and-tilt positioner gives users the flexibility to weld the occasional small part between a series of larger ones.
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A versatile system

Josef Böhmer also praises the sheer flexibility of the laser welding system: "We work with a KUKA robot on a linear axis, plus a turnover positioner, so we can cover a large working area 4 meters long and 1.5 meters wide. To take the strain off operators, we installed a crane in the machine that makes it much easier to lift heavy parts into and out of the machine. To save space, all the peripherals and system technology are positioned on a dedicated enclosure above the machine."

Occasionally a small part may need to be welded between a series of larger ones, and that's where the flexibility of the TruLaser Weld 5000's rotate-and-tilt positioner comes into play. "It allows us to weld small parts without all the hassle of having to remove a fixture for larger parts on the turnover positioner." What's more, the rotate-and-tilt positioner makes it possible to weld hard-to-access parts in just one clamping set-up thanks to its NC rotary axis integrated into the robot control system.



Deep penetration welding with a laser involves far less heat input than conventional welding methods – and that means less distortion. Josef Böhmer (right): "Parts nowadays have to be made to such fine tolerances, especially in formwork construction. So we save a lot of time by not having to straighten them after welding!
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The beauty of home-made fixtures

Making fixtures is a key part of laser welding, says Josef Böhmer: "We were already familiar with the basics of fixture construction from our automated MAG welding line. I think it's really beneficial to make fixtures in-house because the quality of the results is down to you." Design engineers work closely with jig and fixture makers at Böhmer, coordinating their work and running tests to get each fixture exactly right.

Fixture construction has got a whole lot easier thanks to machine functions that boost the laser's flexibility. One example is the rotary module for supplying shielding gas. The shielding gas nozzle rotates smoothly around the optics so that the robot doesn't have to constantly realign itself. That makes the whole clamping and programming side of things easier and makes parts more accessible.



To save space, all the TruLaser Weld 5000's peripherals and system technology are positioned on a dedicated enclosure above the machine.
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The joy of automation

Böhmer Systemtechnik GmbH currently makes batches of between 25 and 50 parts on the TruLaser Weld 5000, but they're taking steps to win orders for bigger batches. And publicizing the machine's merits also pays off: "Customers often inquire about laser welding for new parts. They are happy to rely on our broad expertise in welding, and rightly so!" But it's not just the ample know-how of Böhmer's experts that customers benefit from. Automated machines such as the TruLaser Weld 5000 improve process planning, ultimately leading to shorter delivery times and higher customer satisfaction. Josef Böhmer is delighted with how things have turned out: "This machine has expanded our portfolio and given us firmer foundations for a successful future. There's no doubt in my mind that it was a worthwhile investment."