

No 'hollow' promises: Allied Steelrode's LT20 tube laser leverages the full engineering and design potential of tubular steel

12 July 2018

The increased popularity and use of square and rectangular section hollow steel tubing is a boon for consulting engineers, as it has opened up many new and innovative design opportunities. This type of steel tubing has many advantages for the consulting engineer as it is cost-effective, light, very strong and when applied in, for example, architectural applications, innovative and aesthetically pleasing.

According to leading steel processor and supplier Allied Steelrode's Executive Director Warne Rippon, square and rectangular hollow tubing is the most recent addition to the range of steel sections.

"Some years ago, we realised the structural, architectural and mechanical advantages inherent in tubular steel. This material is attractive because there is less surface area, and the lack of edges results in a cleaner design and ultimately, more aesthetically-pleasing structures. This material is lighter and more cost-effective than conventional 'I' beams and, when welded together, offers far greater strength.

To fully leverage the opportunities offered by tubular steel – and make these available to their customer base - Allied Steelrode purchased a BLM Adige LT20 Jumbo tube laser at the end of 2015. This revolutionary machine is able to cut openings in steel tube that can be of any shape and size. Using these cut openings, tube sections can be interlocked and then welded with far greater ease.

"Specifying tubular steel allows consulting engineers to give full rein to their imaginations and creativity, as it has myriad applications and design possibilities in terms of construction," explains Rippon.

"For example, we produced the components for a pre-fabricated steel building which had a specialised agricultural application. Once processed by the LT20, the components were taken to site and, with a perfect fit ensured, were rapidly assembled," he continues.

Design in tubular steel is definitely gaining popularity in South Africa; and may be seen in several recently constructed airports, sports stadia and train stations. Rippon adds that, for example, rectangular steel tube would be ideal for the 19 new Gautrain stations which have now been approved for construction.

"The sky really is the limit. Our LT20 Jumbo opens up a completely new range of design possibilities for consulting engineers, architects and structural designers. Now – thanks to this technology - many more beautiful and innovative tubular structures can be designed, as the only limitation is the bounds of architects' own imaginations.

In addition, tubular steel compares favourably with its construction counterpart concrete, as it is fully recyclable, long-lasting, and faster to erect. In addition, in construction, this type of steel lends itself to modular fabrication.

The application of the LT20 is very diverse. It can process tube for architectural and agricultural applications; and meet the requirements of the air, rail and heavy transportation, construction, mining, automotive power generation, shipbuilding and petrochemical industries, amongst others.

Rippon believes that the local consulting engineering fraternity has not been fully aware of the diverse range of opportunities offered by tubular steel; and the capabilities and opportunities which the LT20 tube laser therefore offers.

"Worldwide, tube laser cutting is a comparatively new innovation in the steel processing industry," explains Rippon.

Before tube laser, processing tubular steel involved time-consuming sawing and drilling. Now, with tube laser, it is possible to cut even the most complex geometries in steel tube. The LT20, for example, can process tubes ranging in section from 75mm to 508mm and in lengths of up to 18 metres.

"Unlike many other lasers which can only cut up to 8mm wall thicknesses, the LT20 can cut up to 16mm thick tube walls," adds Rippon.

As the machine produces a finished component in a single cycle, there are no problems with

storing semi-finished work, a factor which streamlines and increases productivity.

The LT20 will cut round, square and rectangular section tubes as well as open structural sections whether they are mild steel, high-strength steel, stainless steel, aluminum, alloys, brass or copper. It is possible to economically produce anything from a one-off prototype to a production run of thousands in a fraction of the time that was previously required.

"In the past, certain steel sections had to be manufactured overseas. Now with the LT20, this manufacturing capability is now available locally," he explains.

The tube laser is an excellent example of Industry 4.0 automation; and as such, eliminates manufacturing inconsistencies caused by human error. With extended production runs, this guarantees absolute product consistency, repeatability and faster turnaround times.

"We drew on this repeatability very effectively, in the supply of tubular steel sections to a major renewable energy project in South Africa," Rippon remarks.

Another example of the application of tubular steel and the capabilities of the LT20 recently completed by Allied Steelrode is in the processing of tubular steel sections for a two storey 100-ton parking garage. "We cut the steel preparation time from what would have taken three weeks to a mere eight days," Rippon explains.

"Major investments of capital equipment of this nature are very much long-term 'votes of confidence' and transforming value-adds in the partnership which we have with our customers - and the industry as a whole," explains Rippon.

With the strong resurgence of the oil price, it is expected that the launch of major new infrastructure development projects will be stimulated. "When that happens, and the industry upturn comes, we expect that tubular steel will be a major, game-changing element in consulting engineers' specifications and design portfolios," concludes Rippon.