# application report

# Olympic Steel brings home the gold

### DEREK WESTON

SOFTWARE

## LASER CUT-TO-SHAPE PROCESSING

### **BENEFITS FROM ADVANCED NESTING**



etals service center Olympic Steel, headquartered in Cleveland, Ohio, a value-added provider of flat rolled steel, operates 15 facilities across the United States, including locations in Ohio, Minnesota, Iowa, Georgia, and Pennsylvania. Founded in 1954, the

company attributes its success to developing long-lasting relationships with its customers, suppliers, and employees while maintaining a focus on providing personal service and consistent quality.

A major part of meeting customer needs is cut-to-shape processing, which is performed on more than 30 laser, gas, and plasma cutting machines manufactured by companies including TRUMPF, Tanaka, Cincinnati, Bystronic, LVD, MG, Controlled Automation, ESAB, and Farley.

The laser cut-to-shape processing business segment has made a significant contribution to Olympic's growth and profitability in recent years. The relatively high capital equipment costs for laser technology necessitates optimized productivity to achieve the necessary return on investment (ROI). CAM programming plays a leading role in delivering that ROI.

As laser capabilities were added, the company was using numerous OEM and third-party CAM software programs, including an old and dated version of ProNest from MTC Software. This meant that CAM



Advanced nesting software enables Olympic Steel to more efficiently process a high volume of material. programmers had to be trained to operate some or all of these programs and the company faced mounting, recurring software update and maintenance costs. Therefore the company made a strategic decision to identify and implement a global corporate approach to CAM programming to achieve productivity goals.

Initial results in the search for an enhanced CAM nesting software solution were disappointing. For example, one potential vendor unsuccessfully attempted to create a working software trial of its program. However, after contacting MTC Software to discuss available CAM software solutions that would meet its needs, Olympic installed a trial version of MTC Software's ProNest 8. After experiencing its power and ease of use, the company made the decision to upgrade to ProNest 8 for the majority of its CNC sheet and plate cutting operations nationwide.

# Advantages of advanced nesting

Commenting on the use of enhanced nesting software at Olympic Steel, Cory DeWitte, CNC planning specialist, says, "We now use ProNest (Version 8), which has been a path to increased productivity in recent months because it is an ideal marriage of manual and automatic nesting. There are many features that help us. For example, I like that I can have two or three instances of the program open at any time so I am able to set up one big nesting job and start it running, meanwhile I can begin work on another job, increasing my productivity."

Olympic Steel processes a high volume of material-more than 36,000 tons per year at the Plymouth, MN, location alone. To manage the workload, the company uses Part and Sheet Nest List functionality in the nesting software feature on a daily basis, allowing interaction with the company's internal MRP system and the nesting software. Programmers are provided a large file containing all work orders twice per day. All relevant CAD files for the related work orders are loaded in seconds, along with the specific parameters for each part (leads, feed rates, quantity, material type and thickness, grain constraint, customer, etc). During this process the software automatically performs CAD file revision checking to ensure that the latest versions are used to update the jobs and avoid scrap. Next, the company is able to go directly to automatic nesting of the parts, where shapes

are efficiently nested on the correct material and thickness. Part nesting priorities can even be automated based on delivery dates, overriding the default nesting approach and enabling Olympic to get rush jobs across the machines and to customers even more quickly than normal, when necessary.

With the company's previous software it took a programmer of three laser machines an entire day to perform the nesting. Now the programmer programs eight machines per day, more than doubling programming productivity, while achieving a minimum of 70 percent nest utilization, even with the most challenging part geometries.

The software's collision avoidance feature is especially useful on some of the older lasers where the process of raising and lowering heads is slower. They can now traverse with the cutting head down versus a full retract between every pierce, which translates to a savings of just over an hour of production time per day, per laser. This feature eliminates 95 percent of the head raises they had been doing in an effort to run the machines without crashing the cutting head. This significantly reduces wear and tear on the laser machines; which reduces costs. DeWitte says, "For quality reasons, customers are moving away from allowing us to use tabs to prevent tip up scenarios during the cutting process. With collision avoidance we can now eliminate tabs by automatically optimizing leadin placement and internal/external sequencing to avoid instances in which a head crash may occur. Pro-Nest will automatically decide whether full raise or an avoidance move (traversing around a tip up scenario) is required. This also can be controlled manually by the programmer."

He continues, "We used to use CAD to manually apply a radius to all intersections in our CAD files. On average, we would spend five to ten minutes per part manually drawing and inserting a small radius at sharp corners. We have found that by applying a small radius on all intersections, corners maintain a better cut quality due to the heat build up from the pause in motion before changing direction and the tail of the beam not being able to catch up at the bottom side of the plate. Before using corner radii, when our parts had a sharp corner, the cut quality suffered. The only other solution to remedy this issue was to reduce our cutting feed rate, which just wasn't feasible. A radius on all sharp corners gives us better quality parts while maintaining the maximum cutting feed rate, allowing Olympic Steel to stay competitive with price and supply our customers the quality they expect. With material costs rising, we simply cannot afford to let quality issues on corners lead to scrapped parts.

"Since upgrading to ProNest version 8, we have used the automatic corner radius feature, which has eliminated time-consuming CAD work, and given us complete peace of mind knowing that every corner was taken care of. It has also led to reduced production time (as a result of faster cut speeds on corners) and cost savings, as the older lasers have less wear on both the ball screw and rack and pinion drive systems, since the drives are no longer making a hard stop on the part corners."

Common Line Cutting (CLC) allows two or more parts to be cut with a common line taking into account movement from heat and stresses within the material and automatically compensating for kerf to ensure geometric accuracy. ProNest can automatically tool path a group of CLC parts to ensure that movement is limited by allowing the plate to hold parts in place during cutting, decreasing production time anywhere from 12 to as much as 40 percent, with an increase in material utilization by nesting parts using kerf spacing versus traditional part separations. An advanced CLC module allows the user to totally control the cut path, CLC both similar and dissimilar parts by bumping or hovering over a part, CLC parts with the plate edge, and apply safety cuts to create a safer cut path to help avoid torch collisions with tipped up parts.

# Conclusion

The application of advanced nesting software provides benefits including part quality, machine productivity and wear reduction, material utilization, and programming time-savings. These benefits may be achieved using both current and older model laser systems and the resulting financial impact can be positive for virtually all laser processing facilities. **\*** 

Derek Weston (DerekW@mtc-software.com) is VP, international sales and marketing, for MTC Software Inc., Lockport, NY; www.mtc-software.com.

Industrial Laser Solutions Copyright © 2009: PennWell Corporation, Tulsa, OK; All Rights Reserved.