As seen in the December 2012 issue of FFJournal®

[A] Shown here during construction, this Pinewood Toronto Studios facility was built using tube and pipe supplied by JMC Steel. [B] JMC Steel also supplied material for the world's largest domed stadium, Cowboys Stadium, Arlington, Texas. [C] JMC Steel relies on dimple-free material, including the material used to construct the Dallas Cowboys stadium.

An easier run

Cutoff presses make accuracy a straightforward task

Whether engrossed in a film, like the many created at Pinewood Toronto Studios in Canada, or watching football at Cowboys Stadium, fans often overlook the many components used to build the arenas showcasing these crowd-adored performances and competitions. The pipe, tube and electrical conduit running through these structures, and many others, were provided by Chicago-based JMC Steel Group using customized cutoff presses.

Providing customers with hollow structural steel, pipe, tube and electrical conduit, JMC Steel runs sizes from ½ in. to 4 in. electrical metallic tubing primarily made from carbon steel. "We typically run 1004 all the way through 1015 grade steel," says Joseph Burns, plant manager. JMC's tube and pipe fixtures are used as fire sprinkler pipes, fencing products and electrical piping for commercial and residential customers.

Using CT-based Thermatool Corp.'s cutoffs, JMC Steel can run materials 24 hours a day, "and Thermatool is able to keep up with our extreme demand—we need equipment that is reliable," Burns says. "When you run millions of feet a year, you can't afford to give a ¼ in. of material away. That doesn't make sense. We try to keep it to 10 ft. or 8 ft. as much as possible. The closer we can hold to nominal length, minimizing material loss, the better."

JMC Steel runs an array of sizes. "I can run as low as 0.035-in.-thick all the way up to a little over 0.205 in. The product we're running determines the OD and wall requirement.

"We have two smaller mills that handle smaller range sizes and I have two larger mills with cutoffs that run heavier, larger materials," Burns continues. JMC Steel takes the material to its mills in its wide band coil form, which is then slit into different strips. "I produce the tube and use Thermatool's cutoff to cut it to length," he adds. "I produce it and send it to end users that do an array of things with it such as bend it, thread it and even put it in the ground."

JMC Steel's Wheatland Tube facility has four Thermatool cutoffs. Two of the cutoffs have a cut range of 2 in. to 6 in., capable of 600 ft. per min. The other two cutoffs have a cut range of ½ in. to 2 in., designed to run at 1,000 ft. per min. "It is amazing to see something moving so flawlessly at a high rate of speed and hold such tight length tolerances," Burns says.

Custom design

Thermatool's cutoffs allow customers to cut a number of materials, including stainless steel, low-carbon steel, aluminum and

copper. The company can cut copper and lighter strength materials at 1,000 ft. per min. "We cut low-carbon steel for conduit applications at production rates of 1,000 ft.-per-min, 10-ft. cut length," says Mike Abbas, manager engineered systems and product development at Thermatool.

Abbas says JMC Steel approached Thermatool a few years ago and requested a 2 in. stretch die set to fit within the Alpha Mach III cutoff system, a 5 in. press. "Normally we sell standard 5 in. die sets with the Mach III press," Abbas says. "By supplying a 2-in. stretch die set with the 5-in. machine, JMC is able to run their 2 in. and smaller product at 500 ft. per min.

"From that Mach III press, JMC Steel could maximize production by utilizing two sizes of die sets 2 in. and 5 in. to run their mill up to 500 ft. per min. So anytime we get inquiries from JMC Steel, we look at their product matrix and process to see if it is feasible and how to achieve the best results meeting their needs," he continues. "We work very closely with them on their product matrix to get them the proper tooling to achieve the best performance from our presses." JMC Steel also uses a single cut die set that uses one blade for shearing cut shapes.

There are four major components to Thermatool's cutoff presses including a line speed tracking wheel. The tracking wheel measures the mill line speed and track length of the product. Everything is completed online and is a continuous operation as the pipe travels through the press.

The ram part of the machine's only function is to go up and down. The tube is measured as it travels, and when it is time to cut, the ram is then cycled, moving in an orbital motion. The accelerator increases the speed of the die set to match measured line speed.

Once the cut is complete, the accelerator sends the die set back to the home position. The single or double cut die set is the fourth component, which Abbas says is "the heart of the machine."

The system motion controller senses the line speed from the measuring wheel. Once the system is ready to make the cut, the controller sends a signal to the accelerator to move the die set at a speed matching the line speed. Upon reaching speed, the press is actuated to cycle the die set. When the cut is complete, the ram returns to top dead center and the die set returns to its home position awaiting the next cut.

According to Abbas, what differentiates Thermatool's cutoffs is the ability to achieve reliable, high-quality cuts with minimal burr, cut-to-length accuracy and precision control of the press through Thermatool's motion controller.

Reducing or eliminating dimples during the cutting process is necessary for JMC Steel as any imperfection, out of round, or a pinch point at the top of the product where the blade penetrates, can result in further processing. If the pipe is dimple-free, it can be threaded without any further processing.

Thermatool's Mach III uses two sizes of die sets, 2 in. and 5 in., allowing JMC Steel to run its mill up to 500 ft. per min.

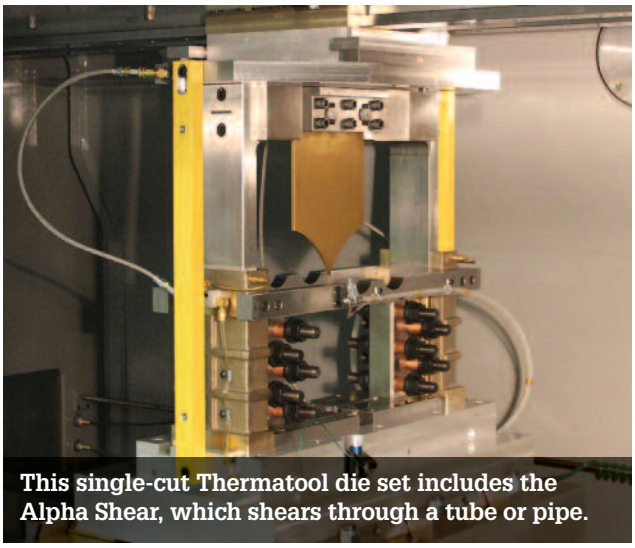
Abbas says JMC Steel relies on dimple-free material to quicken the production process. "If it's too big a dimple, another process is necessary. The product has to go through a de-dimpler machine to open up that end," he says. The Thermatool double cut die set eliminates the need for a de-dimpling process.

"I've used competitors' cutoffs in other companies but hands down, I would choose Thermatool over anyone else," Burns says. "The commitment to high speed—I don't know too many other companies that can match it. Can the competition make a 400 ft. per min. cutoff? Sure they can, but is it as high a quality and as reliable?" **FFJ**

JMC Steel Group, Chicago, 312/275-1600, www.jmcsteelgroup.com.

Thermatool Corp., East Haven, Conn., 203/468-4100, www.thermatool.com.

JMC Steel runs sizes from ½ in. to 4 in. electrical metallic tubing primarily made from carbon steel.



This single-cut Thermatool die set includes the Alpha Shear, which shears through a tube or pipe.

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