

The stretcher leveler is adjustable to prevent double stretching of material.

**coil**processing

# Upgrade to flat material

**JDM Steel Service** retrofit its cut-to-length line to meet customers' requirements for laser-quality steel

BY LAUREN DUENSING

As more companies add laser and plasma cutting to their operations, the need for flat material grows. If material with invisible trapped internal stresses gets put on the laser bed, it can spring back once it is cut or heat is applied. "Obviously, there are two things that are not good about that," says Dean Linders, vice president of marketing and sales for Red Bud Industries, Red Bud, Ill. "One is the parts aren't flat, so it's a quality issue. Two, it can damage the equipment."

"Customers who were looking for incoming material being flat are now demanding stringent flatness after punching, laser cutting, buming and forming," says Rich Merlo, president and CEO of JDM Steel Service, Chicago Heights, Ill. "The expectations for hot-rolled carbon steel have really changed. Our customers were asking us to prove our ability to get material flat and then prove that it would stay flat. With corrective leveling and even temper passing, it was a hit-or-miss proposition."

Merlo says JDM was paying "a tremendous amount of money" for temper passing services from either a mill or an outside processor. As a result, the company began

considering the option of adding stretcher leveling to its capabilities. "We realized that stretcher leveling was quickly becoming the go-to process to improve shape and eliminate springback for hot-rolled and hot-rolled pickled and oiled sheet and plate products," Merlo says. "The process uses brute force to pull steel beyond its yield point and produce dead-flat, memory-free steel."

Although temper passing is a "great process," a temper mill is a "ficky piece of equipment," Merlo says. "It requires the rolls to be ground properly, and it requires the proper leveling between rolls—they can't be tilted or cocked. It requires an operator that has some art to his abilities, and although it can make a great product, you can also induce shape problems with temper mills."

## A longstanding relationship

JDM and Red Bud have worked together on several projects during the past 20 years and have built a strong relationship. "They have done rebuilds on our cut-to-length line twice, as well as built our coil-to-coil SCS line for us," Merlo says. "We treat them as a reliable supplier who has the technical knowledge and production facilities to handle our coil processing needs."

Because of the company's familiarity with JDM's equipment, when Merlo ap-

proached Red Bud about the possibility of adding a stretcher leveler, Linders and his team knew exactly what they needed to do to incorporate it.

"It helps when you've worked with a company in the past because you already know the personnel and you already know the line," Linders says. "In most cases we have to talk to the customer, ask the right questions and go out and look at the machine to determine if we can do it. In this case, we already knew the machine, we already retrofitted it once and a portion of the machine was already our equipment. It made it really straightforward because some of the controls and processes we needed to add were already on the machine because we had already updated some of those items."

The upgraded line now includes a Red Bud stretcher leveler capable of processing ½-inch-thick steel and a new loop feed system. "This has allowed us to stretch and cut-to-length in one operation from 16 gauge through ½ inch hot-rolled, hot-rolled pickled and oiled, and tread plate material," Merlo says.

## Space constraints

Companies must consider a variety of options when choosing to either buy new

equipment or upgrade an existing line. “There are a lot of people that have older equipment but good equipment,” Linders says. “It was built well, it performs well and it doesn’t need to be thrown out because it’s no good anymore. It’s just that it has become antiquated because of today’s requirements.”

To determine if a line is a good candidate for a retrofit, Linders says he usually asks customers, “Does the machine work well, other than being antiquated from a leveling standpoint? Does it hold up? Do you have an exorbitant amount of maintenance? If they come back and say, ‘It’s a good machine; it’s just not able to do what we want,’ then it’s a good candidate.”

Merlo says JDM encountered just two challenges during the retrofit. “The first was inserting a 40-foot piece of equipment into an existing line and integrating it with all the other moving parts. The second was continuing to fill orders while rebuilding the cut-to-length line.

“These two challenges took a great deal of planning and teamwork between Red Bud and JDM,” Merlo says. “We cut a great deal of the material ahead and laid it on the floor and used the December [2011] soft market and holiday season to get the majority of this work done. It was painful, but we survived it without losing any customers or disappointing any of them. From that perspective, I suppose you’d consider it a successful project.”

The space requirements are the “biggest single issue,” in a retrofit, Linders says. “You have to take the existing equipment, including the shear, feed system (if you have one), stacker and conveyors and all that has to move down to allow additional space for the stretcher to be installed. Beyond that, it’s relatively straightforward to incorporate a stretcher because most stretchers have their own PLC that runs in the sequence of how the line operates.”

Once the line is split apart and the stretcher is put in place, it is integrated into the processing sequence. “We basically intercept the signal, tell the stretcher to do its cycle through its own logic and then we take that signal and send it on,” Linders says. “The line doesn’t know that we intercepted the signal and are doing something in the middle of the process. You basically chop the line in half, open it up to make



Overall view of JDM's newly upgraded line.

space and drop the stretcher in the middle of it. It really doesn’t take a rework of any other equipment. We just need space.”

### Steel stays flat

Once the stretcher leveler was up and running, Merlo could assure his customers the steel delivered to them was perfectly flat. Advancements in stretcher leveling make this confidence possible.

“Years ago, if you wanted to adjust the amount of stretch, you turned some hand knobs a half an inch or three quarters of an inch,” Linders says. “That’s all you did. You visually looked when you stretched it to see if it was flat, but you didn’t know if you had taken it past its yield point. Today there are controls that watch the stretch-strain curve in real time. As you stretch, the strain on the material goes up. Once you go past the yield point, you’ll see the load on the machine drop off and plateau. Electronically, through the controls and hydraulics, we’re able to capture the point at which the material goes past the yield point, and we can tell the customer the approximate yield of the material. We can also tell if we’ve taken the material past the yield point.”

JDM also has an SCS processing line, and adding the stretcher to the cut-to-length line has increased the availability of the SCS equipment. “We were using our SCS line not just for brushing and cleaning hot-rolled and our hot-rolled pickled and oiled “brushed pickled” product, but a great deal for shape correction,” Merlo says. “Now if the product is being cut-to-length, we leave the shape correction up to the cut-to-length line with two corrective levelers and a stretcher. The SCS business is now totally focused on brushing, cleaning and coil-to-coil shape correction.”

For JDM, the SCS business took time to catch on, but now that customers are aware of the product’s benefits, their inter-

est in the material continues to grow.

“We operate the only coil-to-coil SCS line in North America,” Merlo says. “It definitely gives our customers a unique product because the shape is worked not only through the stretcher leveler but also we can do some shape correction on the SCS line, as well as clean the steel so they’re getting an SCS surface on a stretcher-leveled product. We also have this product called brushed pickled where we remove 85 percent of the oil off the pickled and oiled. It has 15 percent of the normal oil, which means their lasers are going to burn faster, it’s better handling, there’s less oil in their shop, less cleanup and it’s environmentally friendly. In addition, the brushed surface looks like stainless. It’s beautiful and flat and stretcher leveled.”

Before adding the stretcher leveler, JDM would experience deviations in flatness, Merlo says. “Our product looked OK but we knew we had consistency issues that needed to be addressed. We found ourselves having to back coils up multiple times during a coil to alter leveler setups to compensate for the inbound coils changing shape.

“Since the addition of the stretcher leveler, we see consistency in flatness in sheets throughout the bundles from the first sheet to the last sheet cut off the coil,” he continues. “We no longer experience downtime, backing coils up to readjust our levelers. Our steel maintains flatness from one piece to the next, and we are confident that our product will perform well during laser cutting. Our customers have commented and noticed a difference.” ■

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