Toll processor adds cold rolling

By J. Neiland Pennington, Executive Editor

DMS Bliss Corp. rebuilt Ferrous Metal Processing's 50-year-old United four-high combination reversing mill. In cold reduction mode, the mill rolls a constant gauge; it produces constant elongation in skin and temper passing.

Photographs by the author.

Ferrous Metal Processing's combination reversing mill skin passes, cold reduces and temper passes. Potential customers are steel producers, service centers, OEMs and coil coaters.

Skin pass, cold reduction and temper pass capabilities are combined in a four-high reversing rolling mill now being commissioned at the Cleveland headquarters of toll processor Ferrous Metal Processing Co. (FMP). The 66-inch-wide, 750-feet-per-minute mill, said to be the largest of its type operating in North America, processes hot band and cold-rolled steel from 24 inches to 60 inches wide in carbon, HSLA and alloy grades. The maximum entry thickness is 0.250 inches, with a reduction capability up to 85 percent.

The market for outsourced rolling services is the reason for the massive investment by FMP. "The evolution of the way steel is distributed in this country brought this mill about," stated Eduardo (Ed) Gonzalez, president of the 21-year-old company

The payoff processor handles coils up to 72,000 pounds and includes a flattener to remove coil set to facilitate strip threading. To be added is a high-pressure washer for hot band that combines a caustic solution with powered brushes.

that also offers pickling, slitting, shearing, leveling, decambering and inspecting from facilities in Ohio, Michigan and Mississippi.

"Fifty years ago," he said, "the primary mills not only produced the coils, they slit, pickled and cut to length. Little by little, they started outsourcing those operations because they are highly labor intensive. Our rolling mill will make it cost effective for steelmakers to contract low-volume, specialized rolling just like they do slitting and leveling."

Gonzalez noted that most steel producers have rolling mills, but they are usually tandem installations that do not have the versatility of a reversing mill and aren't cost effective for small runs. Those that do have reversing mills lack the width capacity of FMP.

"Our mill is designed to complement and supplement the steel producers' rolling capabilities," he continued. "It lowers costs, increases sales and improves quality, giving customers access to more markets, greater sales flexibility and reduced inventory. And they can obtain those benefits by paying only for the services they need when they need them. They keep their costs variable, without adding capital investment and fixed cost."

Targeting service centers

Service centers are expected to be among the most active customers for rolling services. The economic benefit to distributors, as Gonzalez outlined it, is the ability to cold-reduce coils for new markets. Service centers can convert secondary, off-gauge coils into prime products.

"The way distributors make money is by buying heat lots and selling truckloads," Gonzalez said. "By using our reroll service, they can stock fewer thicknesses and convert those coils to meet their gauge requirements. They turn their inventories faster and stock less metal."

Temper rolling with the reversing mill can produce intermediate tempers. "We have a finer degree of control than a tandem mill," he pointed out. "Currently, the only producers rolling two- and three-tempers are those with narrow strip mills. We can produce intermediate tempers in sheet widths."

The 1950s-era United mill, purchased from a shuttered stainless steel

Hydraulic automatic gauge control maintains a ±0.0005-inch thickness tolerance. A complete work- and backup-roll change can be made in 30 minutes.

The motor and reduction gear for the 2,000-horsepower mill drive. Each of the two tension reels is turned by a 600-horsepower motor.

producer, was stripped to its cast 31-inch by 35-inch posts and rebuilt by DMS Bliss Corp. with drives and controls from TMGE Automation Systems (formerly GE Toshiba). The electromechanical screws were replaced by 30-inch-diameter hydraulic cylinders that exert up to 6.48 million pounds of rolling force on the 56-inch-diameter backup rolls and 16½-inch-diameter work rolls.

The renovation added both hydraulic roll bending for shape control and hydraulic automatic gauge control (HAGC). X-ray gauges measure metal thickness at both entry and exit, and two deflector rolls calculate the speed of the strip on both sides of the mill.

"Our gauge control system uses mass flow technology," Gonzalez said. "It's the most precise way to control thickness and elongation."

Thickness to half a thou

The mill's thickness tolerance is ±0.0005 inch. DMS Bliss and TMGE gave Gonzalez a performance guarantee that has been verified with trial coils.

Tight control of gauge is expected to attract the attention of OEMs. "With our precise maintenance of properties and a thickness accuracy of half a thou," Gonzalez said, "our steel will provide more parts per pound, more parts per run time and less weight per part—up to 7 percent in many automotive applications.

Steel orders are based on a minimum gauge. We approach the minimum so closely that there is little gauge variation to add weight. That's a big economic benefit," he added.

Rolling removes all shape memory from hot band, and does not introduce cold-mill memory. For the manufacturer producing laser-cut parts, there are no internal stresses that the cutting process relieves to cause springback. The result: no distorted parts and no costly damage to laser optics.

FMP has a laser texturing machine for preparing the surface of the work rolls, a capability of interest to coil coaters. According to FMP, laser texturing can produce a finish that improves paint adhesion and enhances finish uniformity and reflectivity.

Texturing is also beneficial to deep drawing. The surface retains more drawing compound for more consistent performance and reduced galling.

Cleveland the ideal location

With its nexus of steel producers, service centers, OEMs and coil coaters, the Cleveland area was seen as ideal for a combination reversing mill. International Steel Group, for example, operates the former LTV facilities in Cleveland but has no skin mill.

"I'm not sure that our installation would work anywhere else," Gonzalez stated. "But there are enough potential customers within 200 miles of our operation, including coil coaters in western Pennsylvania, to warrant the investment."

Had a new mill been built for the project, the total outlay would have approached $15 million. Gonzalez indicated that the commitment was less than that, adding that the cost should be recovered rapidly.

"We're expecting to amortize the investment in four or five years," he said. "We believe the combination mill will provide a vital service to the steel industry."■

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