Tight, clean rolls with minimum pit depth

New variable strip tensioner eliminates drag problems, upgrades older line

BY SUE ROBERTS

Installation of a fourth slitting line at H&H Metal Source, Grand Rapids, Mich., led to the solution of a problem on an older, existing line. The issue at hand was compounded by a limited pit depth of 15 feet because of the shallow water table at the plant location, just a few blocks off the banks of western Michigan's Grand River.

The addition of the variable strip tensioner upgraded the older slitting line.

A 1-inch-wide, 0.058-inch-thick mult produced with the variable strip tensioner.

"The problem was on an older 48-inch line with a looping pit-driven-type slitter," says Rick Hartman, vice president of operations at H&H. "We weren't able to do specific strip tension control across the width of the coil. Our pit depth severely handicapped us in terms of conventional drag-box, loop-pit-type slitting."

With much of the coil produced at H&H going to furniture and industrial shelving manufacturers and Tier Two and Tier Three automotive stampers in the region, surface quality is always critical. The danger of dragging the strip, which ranges from 0.020 inches up through 16 gauge, was simply unacceptable from a material quality standpoint.

Good idea, good timing

Although not developed specifically for H&H, the variable strip tensioner from the manufacturer of the newly installed slitting line, Braner, Schiller Park, Ill., was new to the market, offering a timely solution to assist H&H in running tight coils with unblemished finishes.

"These days, everybody wants big, tight coils," says Hartman. "The industry used to get away with paper fillers to get the coils to run up tight, but with the amount of roll form business that we do, we have to ship clean, paper-free coils."

"Braner came to us with its newest idea, which was air adjustable across the width of the strip tension stand," he adds. "It sounded like a perfect fit for us on that particular slitter. With the variable tension, we're able to adjust the tension across the width of the steel to control the backloop and therefore get a product off the recoiler that is tight across all the coils. What it eliminated was the need for us to bring back cuts around and rewind them to get the tension right."

Traditional tension stands apply an equal pressure across the width of the slit strands using friction pads or tension rolls. With the variable strip tensioner, the pressure in individual strip strands across the width can be altered. By applying more pressure in the center than on the edges, the strands in the center will wind at smaller diameters than if there was equal pressure across the entire width. Applying more pressure in the center than on the edge allows the tangential speed of the slit strands to be closer to one another, reducing the required depth of the looping pit.

Chuck Damore, Braner's executive vice president, explains, "The advantage of that machine, in a case where you can only dig a shallow pit or in a line that has an existing pit, is that it allows you to control the tension in individual strips so you essentially maximize the pit depth."

With control over the individual strands, H&H operators apply equal pressure to all of the strands as the coil starts. When the coil runs, they lower the pressure on the outside zones to keep the tangential speed of the individual strands as close as possible. This keeps the strands from dragging on the floor of the looping pit. Coils wind tight and straight-walled.

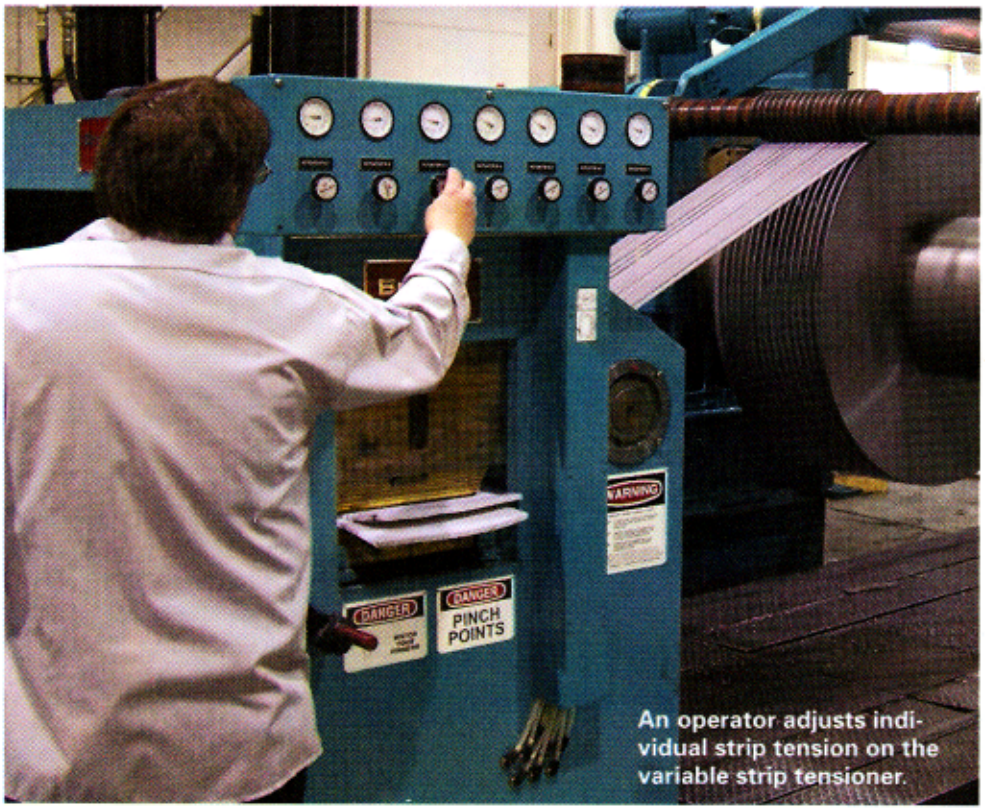
PITS ARE SOMETIMES THE 'PITS'

For a distributor running a coil slitting line, pits can be just that. Since the center strands on a coil being slit are thicker than the outside strands, due to the crown in the strip, they wind on the recoiler as larger-diameter coils. This causes the outside strands to wind at a slower tangential speed.

The tension device applies equal pressure across the width of the strip, and the slack in the outside strands, due to slower speeds, is stored in the looping pit. If the looping pit is not deep enough, the outside strands drag on the pit floor, get tangled and stop the line.

When this happens, the outside strands have to be cut, pulled out of the pit and spliced, or the coil has to be entirely cut and pulled off the recoiler, leaving two smaller coils as opposed to one large one. Splicing the strands or breaking the coil isn't very productive and in most cases is objectionable to the end user.

With coil weights exceeding 60,000 pounds and material thicknesses becoming thinner, it is not uncommon to have looping pit depths of 30 feet or more. Even with a 30-foot-deep pit, running ultra-thin, large coils with even a small thickness variation can be a problem.



An operator adjusts individual strip tension on the variable strip tensioner.

Upgrade solves problems

"It's a piece of technology that certainly has long been needed in our industry," Hartman says. "It fills that void where the only way you could solve the problem was to build a bigger pit, and in some areas, as in our case, it's not possible or it's very expensive."

"It upgraded a slitter that is probably 15 years old and we were able to still use the older slitter with this newer technology and get the tension across the face of the coil that we were looking for," he says.

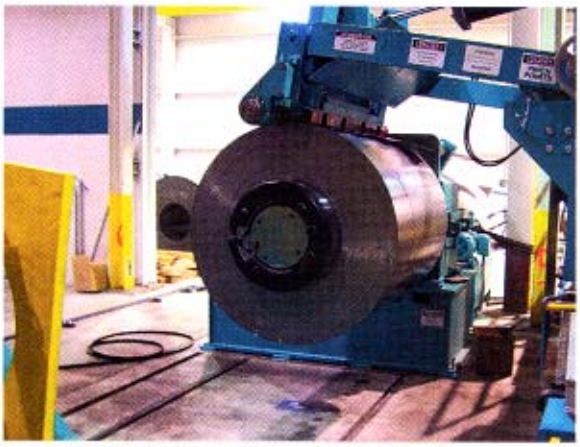
Installation of the fourth H&H slitter line in 2004 led to the addition of the variable strip

tensioner. Its newest 60,000-pound-by-60-inch line from Braner/Loopco processes cold-rolled, coated and hot-rolled pickled and oiled products. Both mild and high-carbon steel up to 70,000 psi shear strength are slit on the line.

New line advantages

One of the features of the new line is an inline shape corrective leveler that improves the shape of the strip by leveling it inline. Inconsistencies like center buckle and edge wave are removed, resulting in a flatter strip.

The two-head turret slitter allows tooling changes to be made offline while a master coil is processed. The 9-inch arbor head is powered by a 200-horsepower gear train that can process eight cuts in ¼-inch-thick material and up to 30 cuts in light-gauge product with a shimless tooling package that holds slit width tolerances of ± 0.002 inches.



Recoiler with tail hold downs.

H&H choose entry and exit coil cars operated by handheld remote controls for easy operation. Without the traditional pendant controls, the operator has free access around the equipment and clear sight lines while loading and unloading coils.

Edge trim is wound on two individual winders powered by two-speed hydraulic motors. Level winds with programmable trimmers allow for compact, tightly wound bundles. Finished bundles are dumped out the bottom into an accumulation trench and pushed off the line by a hydraulic ram into a hopper located on the side of the line. The hopper is staged on a hydraulic lift that elevates to floor level so it can be removed and unloaded with a forklift.

"We met with some very interesting challenges when installing the new line," says Hartman. "We had the same pit-depth limitations as well as a space problem. So we put an addition on the building and designed it to have the Braner slitter kind of shoehorned in there. It worked out nicely." ■

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