SCARFING TUBE AND PIPE—CUT TO THE QUICK

PART II: DRAWING A BEAD ON SCARF REMOVAL AND DISPOSAL

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Editor's Note: This is the second article in a three-part series on cutting, removing, and disposing of weld beads. Part I, which appeared in the July/August issue, discussed the reasons to remove the weld bead and equipment parameters that affect the scarfing process. Part II discusses manual and automated removal processes. Part III, which will appear in the October/November issue, will discuss strategies for improving ID weld bead removal and disposal.

CURRENT practice for removing and disposing of OD and ID weld bead scarf follows two divergent paths—manual and automatic. The processes for the OD weld bead differ from those used for the ID weld bead.

OD WELD BEAD REMOVAL OPTIONS

For manual disposal, an operator uses a pitchfork or a similar hand tool to pull scarf into a scrap hopper. Little training is required other than learning to identify the sharp end of the pitchfork.

The work is more difficult than it seems, and the motions are awkward. In addition, the scarf scrap is hot and sharp, so manual removal exposes the operator to cutting and burning hazards. If the mill is running at 300 feet per minute (FPM), the operator must go to the disposal station every five minutes or so to dispose of the scrap. The operator must attend to the disposal more frequently as the line speed or material gauge increases.

A scarf winder (see **Figure 1**) is one of the automation alternatives and is considered the best practice for OD weld bead scrap disposal. Once the operator has mastered the "threading dance" (starting the tube mill, lowering the OD scarf tool, grabbing the scarf pigtail, and making the initial wrap on the winder), he is free to tend to other business for about 10 minutes.

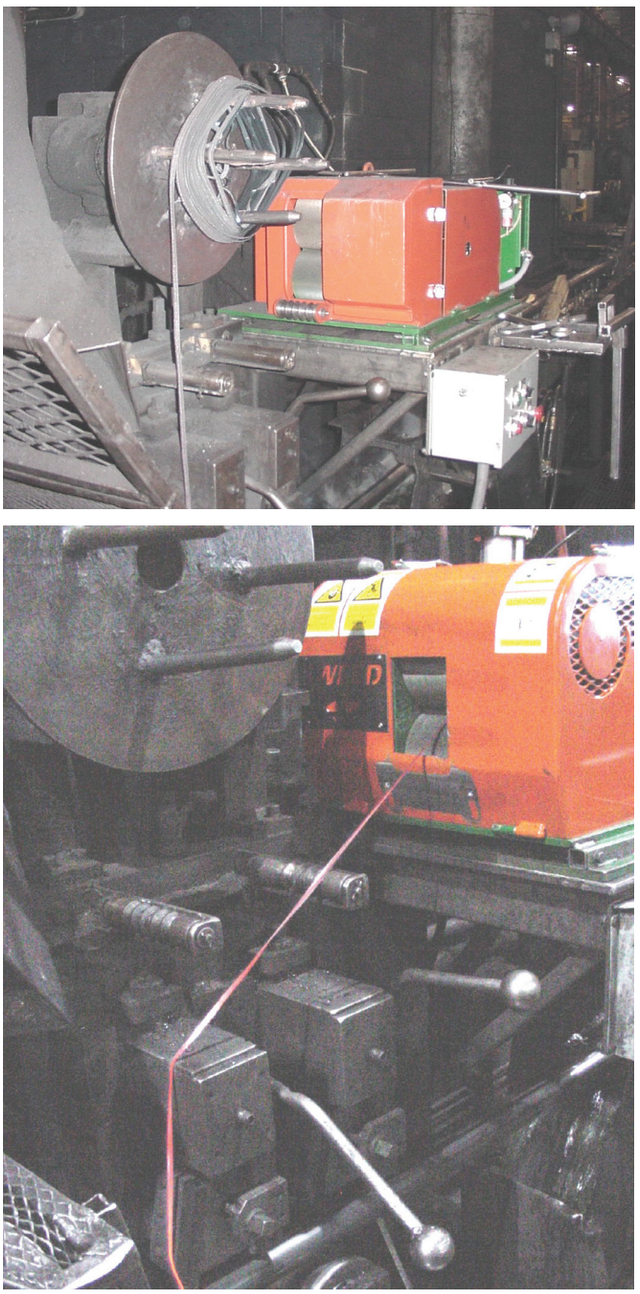

Figure 1

Some tube mills employ both a scrap winder and a scarf chopper. This allows the operator to choose winding (top photo) or chopping (bottom photo). Having both pieces of equipment on one mill provides a backup when one of them is out of service for maintenance or repair.

When the scrap winder becomes full, the operator pulls the scrap ball off the winder, or if he is lucky, he ejects it into a scrap bin.

At this point he has an empty winder and a running mill. To get the scrap winding process going again, he doesn't have to perform steps 1 and 2. The mill is already running, so he goes right to step 3 (grabs the pigtail) and on to step 4 (threads it onto the winder).

Using a winder means the operator has fewer disposal cycles for a given mill speed and material thickness, so he is exposed to the hazards fewer times throughout a production run. However, this doesn't lessen the severity of the hazards. The scarf scrap is just as hot and just as sharp.

Another automated scrap disposal option is the scrap chopper (see Figure 1). This type of machine uses a chopping mechanism to cut the scarf into short lengths (3 inches or so). A conveyor moves the scrap to a bin.

A scrap chopper eliminates repeated threading as long as the mill is in continuous operation and the scarf tool is not retracted from the weld bead. In other words, it is necessary to thread the scrap-chopping machine only once per line start. This further reduces the number of times the operator is exposed to hot scarf. A chopper also eliminates scarf ball handling.

A chopper doesn't solve every problem, and choppers aren't necessarily suitable for every welded tube mill. However, they are a big step forward in scarf handling safety.

ID WELD BEAD REMOVAL OPTIONS

For manual removal of ID weld beads, an operator uses his gloved hand to pull the scarf out of the tube and guides it into a scrap hopper. Little training is required other than identifying the sharp end of the scarf. The work isn't as difficult as manual disposal of OD scarf, but the operator is exposed to the same hazards.

It is not uncommon to use a manual feed scrap chopper for ID scarf. An operator feeds the strand into the chopper and lets the chopper take over the job of pulling the strand from the tube.

Most mills use air or water to blow the scarf out of the tube. This method is considered a best practice for ID scarf removal and disposal. In its simplest form, ID scarf is blown out against a barrier (which prevents it from sailing across the shop), and the scarf drops into a scrap box. The ID scarf scrap is messy and tends to take up a tremendous amount of space. The operator must empty the scrap hopper often.

More advanced methods blow the scarf into either a shredder or chopper to reduce volume.

Compressed air tends to be the easiest to use of the two options, especially if it is employed immediately after the cutoff. The water that remains in the tube (water left over from the flow-through impeder cooling and from the forming steps), combined with the compressed-air blast, does a noisy but effective job. The alternative blowout method uses water at medium pressure (less than 200 pounds per square inch [PSI]) to high pressure (more than 200 PSI) to accomplish the same job. Water blowouts tend to be quieter but more complicated and can lead to shock-related valve problems.

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