



EDITORIAL



A Roll Is Not A Roll Unless It's A "Super-Roll" !

*Ready for NEW TECHNOLOGY?
It is called the "Super-Roll" and there is only one company that
solves that problem... RMTS.*

By Joe Olson

In the 1930's, when tube, pipe, and roll forming started to come into its own, there were some very serious problems with the manufacturing process of the roll tooling. These antiquated manufacturing processes seriously affected the performance of the roll tooling. As technology advanced, the method of manufacturing roll tooling remained the same, with the exception for the use of CNC turning machines. The CNC turning machines allowed the tooling manufacturers to turn the contours rather than grinding the contours. The rest of the manufacturing process has remained the same since the 1930's-as that's what we have always done and no one questioned it....until now!

The grinding of any part of a tube, pipe or roll form prevents the roll in achieving its maximum wear ability. Wear-ability refers to the amount of footage we get off of a roll before it needs to be refurbished or reground. The word reground is used because that has been the machining technology used for the bores and faces, and, until recently, the contours. This grinding also destroys the inside diameter of the bore of the roll to the point it needs reconditioning which is very expensive. When the bore is out of tolerance, we will not be able to hold the finished tube size. The out of tolerance bore will cause another expensive problem- wear of our tube mill stands. Now, is that a vicious circle or what?

At the same time, this old technology also destroys the face of the roll. This happens when the roll and the spacer move against each other. With the ground face of the roll, this surface will wear. As more wear continues, the spacer will wear. With both of these surfaces wearing, additional wear to both the roll and spacer increases. At this time both the roll and the spacer need to be repaired or replaced.

Did you know with today's new technology, the roll can be replaced for the cost of the bore and face wear? Getting interesting, wouldn't you say?

Let's leave grinding for a moment and discuss the catastrophic effect of the old technology for the keyway (the little square key). This key is the drive link from the shaft to the roll on the tube mill and its tooling. Now you are probably saying that this is the first I have heard about this. About the same time in the 1930's, the technology to machine a keyway was pretty much the way it is today- meaning mechanically cut into the soft, non-heat treated roll with a broach. A broach leaves a jagged, oversize keyway on an angle. The broach can leave deep tool marks and sharp corners, which is the major cause of the roll stress cracking and breaking.

Here is the real problem. Was the keyway cut to the proper specifications, which is spelled out in the ASTM handbook as .005" over the key size of the shaft? This is a major, major, important tolerance. This can be achieved with a skilled operator with the old broach in the non-heat treated roll. After the roll is heat-treated, and every roll must be heat -treated to raise the hardness to the proper specifications, the whole keyway moves during this process. The keyway will no longer be straight and it came up with an arbitrary nominal number for the keyway to be .030" wider than the key of the shaft.

I am sorry to have to say that is how rolls are presently being made, and that is obviously a serious error. This is the main cause for the premature wearing of the roll tolerance after several runs. Also, there is a definite connection to roll marks, shears, straightness, crooked tube, out of tolerance tube, etc.

Now of course the domino effect says the shafts are next to wear due to this process and that converts to big money, but these are not the biggest issues. The largest issue is the T.I.R. (total indicated run-out). Yes, and this is where the tube changes size in every revolution of the roll. That's the bad news. Now, the really bad news. Once the total indicated run out (T.I.R.) is in the roll, normal regrinding processes cannot correct it and it is there forever.... until now.