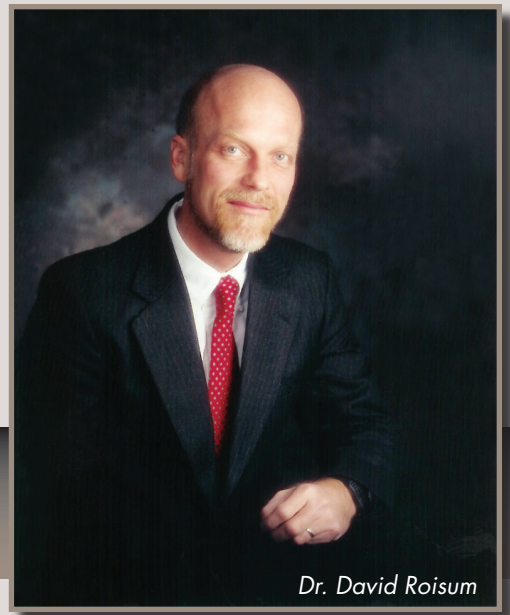


CRITICAL THINKING

by Dr. David Roisum



Dr. David Roisum

When Should I Use Spiral Grooved Rollers?

Conventional wisdom has it that you use spiral grooved rolls to promote spreading. Converters request spiral grooving from their suppliers, who are more than happy to comply. If spirals are not provided, the operator may well add them with masking tape. This science by consensus is further supported by the visual appearance of the spirals, which is strongly suggestive of an outward movement when the roller is turning.

Unfortunately, this outward-running appearance is nothing more than a “barber-pole” optical illusion. I am aware of no documented evidence to support the widespread belief that grooves can spread. Indeed, studies have shown that either (1) the grooving has no effect whatsoever, or (2) has the tendency to wrinkle and mark the web. Why, then, do we persist in spiral grooving?

The roller may be spiral grooved for many reasons. First, the optical illusion is so very convincing. Second, until very recently no one checked whether there was any spreading going on. It was assumed to take place because it appeared reasonable and everyone was correcting for it. Third, there are practical reasons to avoid fixing something that ain't broke. Finally, grooving of some shape may be needed to handle air entrainment when running thin smooth webs at higher speeds. Without grooving or texturing of some type, the web may lose traction with the roller. The spiral is as good as the annular shape in this regard, so why not spiral?

In fact, I am not proposing that spiral grooves be avoided. Use them if you wish, but keep two things in mind. First, don't simply assume that any spreading is occurring. If you need spreading for wrinkle treatment or some other reason, you must get it in some other way. Second, don't make the grooves too wide. Grooves wider than 10-20 times the caliper of the thinnest web risks wrinkling or marking as the web pulls into these crevices.

Test the process

Questions about web spreading can serve to illustrate a more important point about process quality. We can avoid making assumptions, such as this one on spiral spreading, by asking more critical questions of our processes. If the questions have not been definitively answered by science, perhaps we should devise tests before we proceed. It is not just for the application of the moment that we need the answers. We need them so that we do not introduce any more mythology into the industry about what does and doesn't work on the web. Once misinformation gets entrenched, it is as hard as quackgrass to get rid of.

In this case the costs appear to be minor: some additional time on the lathe cutting grooves, some operator time cleaning and applying tape to rollers, a few marks on webs and a few wrinkles that may have been prevented by more aggressive treatment. But maybe it isn't so minor if you look at the big picture. Consider the number of grooved rollers at the tens of thousands of web manufacturing and converting machines. Small things can up to significant costs.

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