WHAT DOCTOR-BLADE CHALLENGES IMPACT WIDE-WEB CYLINDER METERING? PART 2

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Wide-web gravure applications can have doctor blades with lengths greater than 100 in. When doctor blades are that long, setting them correctly and consistently to achieve effective metering can be more difficult because slight variations will be compounded over the length of the blade. Part 1 of this series focused on challenges with setting the doctor blade at an appropriate position and angle. This portion highlights challenges with force control.

Two basic methods to metering

Many blade systems, especially on older presses, are mechanically actuated. That is, a manual hand crank is used to move the doctor blade into position and meter the cylinder (see Figure 1). The fundamental flaw with this mechanism for doctor-blade control is that there is no way to measure or repeat the amount of force being applied to the doctor blade. Narrow- and mid-web blade systems with mechanical actuation can be effective with good operator training.

However, with wide-web applications, it is more difficult to gauge the amount of mechanical force being applied and, most of the time, too much force is used. The extra force over-deflects the doctor blade, resulting in flat blade angles, poor metering performance and increased doctor-blade and cylinder wear. An upgrade to mechanically actuated systems is pneumatics (see Figure 2). Pneumatic air cylinders of appropriate size and quantity coupled to an engineered control system will provide repeatable doctor-blade force that easily is controlled, measured and recorded.

Uniformity of force is key

Regardless of actuation method, mechanical or pneumatic, it is critical in wide-web applications that the doctoring force is applied uniformly across the entire face of the gravure cylinder. Applying force with one or two mechanical mechanisms or pneumatic cylinders located randomly somewhere on the system will not result in an even distribution of force over a +100-in. span. Uneven force distribution over the span of the doctor blade could result in print-density variations across the web width.

A good wide-web doctor blade system will be actuated by multiple, appropriately sized pneumatic cylinders to provide even force distribution. In addition, pneumatic cylinder controls need to be engineered to deliver smooth, predictable motion that doesn't slam the blade on the cylinder. If your blade system doesn't currently have those features, it may be time to start investigating how to achieve them. ■

FIGURE 1. *An older mechanically actuated, doctor-blade system*

FIGURE 2. *A modern pneumatically actuated, doctor-blade system*

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