

How to maximize the dry crepe process

JAMES H. SLOAN

Improved softness is a primary objective on a dry crepe machine producing high-quality tissue products. The controlled adhesion of the sheet to the Yankee will help to develop creping by improving the crepe frequency. Increased crepe frequency will reduce the sheet stiffness and improve the surface smoothness.

Creping is affected by the physical properties of the formed sheet (such as tensile strength and formation); the sheet adhesion to the Yankee dryer surface; and the geometry of the creping blade, which is the angle at which the creping blade strikes the Yankee dryer surface. Two of these three factors can be affected by changing the coating on the Yankee dryer surface.

First, the adhesive properties of the coating chemistry will determine how much mechanical force is required to doctor the sheet from the Yankee surface. The higher the adhesion level, the greater the crepe development; ultimately, improved softness can be expected.

Measuring improvements in softness off the machine can be very subjective. One indicator is to count the number of crepe bars in the sheet per a given unit length. The crepe count is a numerical value that can be used as a measure of the effect of changing sheet adhesion. Crepe counts are done by taking a sample of the paper from the reel and examining it under a microscope with a grid in the eyepiece. The number of crepe bars per unit length are then counted.

After typical crepe counts from the specific grade of paper and machine are collected, a benchmark can be established by which softness can be measured. Another helpful measurement to track is stretch. As the stretch numbers fall off, the frequency of the crepe generally improves because of the greater work done to the sheet at the creping blade.

In addition to sheet adhesion, maintaining the creping blade geometry must be considered when changing Yankee coatings. During the life of the crepe blade, the tip is being eroded due to friction. A uniform protective organic coating will provide a soft interface in which the blade can reside. Many mills that produce premium grades of tissue have gone to a practice of changing crepe blade at regular intervals (e.g., every four reels of paper to every four hours) to reduce the variation in sheet softness. A good base coating should allow the intervals to be extended by as much as 50%.

For the dry crepe machine, the coating strategy will be to develop a coating and release package that will maximize

adhesion to the Yankee. In this instance, the coating-to-release balance will generally be at or below a 1:1 ratio to maximize the coating development.

On machines that make "away from home" products—those sold for use in institutions such as schools, hotels, and hospitals—a different strategy can be adopted to maximize production while maintaining quality. Many machines producing these types of grades depend heavily on secondary fiber for furnish. Regardless of how technically advanced the deinking operation is, ash and polymeric contaminants will associate with the fiber. These contaminants accumulate on the Yankee surface to form an abrasive coating that will reduce crepe blade life, promote Yankee dryer wear, and downgrade the quality of the final product. It is extremely important, therefore, to develop a doctorable coating on the Yankee surface before the contaminants have an opportunity to accumulate. The creping blade must ride in the applied organic layer rather than in abrasive contaminants from the wet end.

The Yankee coating for this application must have a wider operating window due to the expected greater variation in furnish and higher contaminant levels. In many cases, the variation in the furnish causes wide swings in moisture profiles due to machine clothing contamination. If the coating chemistry is not designed to function under high-moisture conditions, the result will be the loss of blade performance, excessive Yankee wear, and overall poor machine productivity.

Because softness in these grades is not paramount, as in premium grades, the need for high adhesion level is not the primary consideration. Here the consideration will be to maintain the crepe blade so that sheet quality and runnability will not become issues. Additionally, the coating must not allow the accumulation of high ash concentrations that will erode the Yankee surface. ■

Sloan is marketing manager—Paper Chemicals Group at Houghton International Inc., Madison and Van Buren Avenues, Valley Forge, PA 19482, telephone: (215) 666-4000; fax: (215) 666-1376.