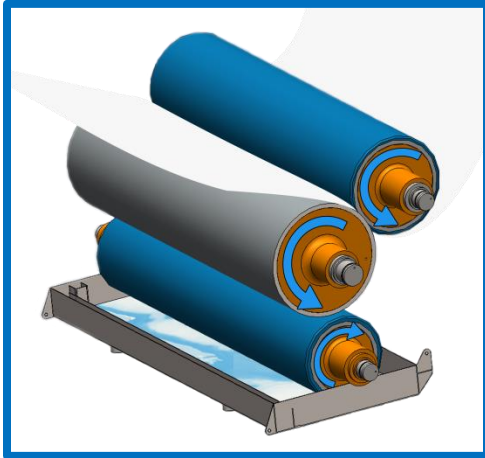




Liquid Application Systems

Closed-loop Control and the Process of Decurling

HOW THE SYSTEM WORKS:



At the heart of the system is a chromium-plated, hydrophilic Transfer roller. A thin film of water is pre-metered onto this Transfer roller by a resilient covered Metering roll, via the supply pan. Both the Transfer roll and Metering roll are independently driven with variable speed motors. The Transfer roller drives the moisture into the sheet by rotating at high speeds in the opposite direction of the sheet travel. A Back-up roller is used to bring the web in contact with the film of water on the Transfer roller. This prevents the sheet from hydroplaning and enables moisture to penetrate the substrate. In some cases, where the top-side of the sheet cannot be touched, the back side of the substrate is allowed to wrap the Transfer roll at 20° to pick up moisture.

THE PRINCIPLE OF DECURLING:

There are two things that must happen to decurl a sheet: First, you must impregnate a small amount of water evenly into the opposite side of the sheet curl. Normally, .5% - 3% moisture addition is all that is required. Impregnating a small percentage of water satisfies the sheet internally by replacing the water that the paper fibers have lost during the production process. Secondly, the paper fibers on the surface will begin to “give up” some of the water via evaporation. When this happens, the fibers tense up on the surface, creating cross-directional shrinkage which counter acts the upward curl, leaving you with a flat, stable sheet.



CLOSED-LOOP CONTROL:



Closed-loop control is achieved by sensing the moisture after the liquid application system via the *CMS Pro 2000 NIR Moisture Sensor*. The Pro 2000 has a linear output that is sent to the PID in the PLC which regulates the reference signal to the Transfer roller drive for speed adjustment. Once you enter your target moisture percentage, the closed-loop control will regulate the Transfer roller's speed. If more moisture is required, the Transfer roller will speed up. If less moisture is required, the Transfer Roller will slow down – all while maintaining the desired moisture application for your substrate.

CMS Industrial Technologies, LLC continues to make improvements to its LAS / Moisturizer design, providing dependable equipment that runs at higher speeds, promotes cleaner operation, accommodates easier maintenance, and prioritizes operational safety without sacrificing quality and performance reliability.

Let us be your path forward.