Tech Talk From Prisco®

Tech Talk #C1

PROPER DRYING

COMBINATION OF INFRARED ENERGY, AIR FLOW, AND EVACUATION

Aqueous coating dries by evaporation and absorption of the diluents. Lithographic ink dries by evaporation, absorption and oxidation. Sheetfed lithographic printing utilizing aqueous coating and quickset inks requires a combination of infrared energy, air movement and air evacuation to properly dry the sheet.

Aqueous coatings are designed to be porous when they dry. The dry coating film acts as a protection to the wet ink underneath. Aqueous coating will allow the ink to receive oxygen and dry, while making it resistant to scuffing or marring.

Air movement across the sheet is critical due to the fact that coating is unaffected by infrared energy. The coating film allows the infrared energy to pass through to affect only the ink. Short and Medium wave infrared energy will lower the vapor pressure of the ink solvents and allow them to diffuse into the stock and the atmosphere. Infrared energy also accelerates the oxidation of the ink.

Air movement across the sheet will shear off the vapor and moisture that is surrounding the sheet. The evacuation of the moisture-filled air from the surface of the printed sheet will keep moisture from returning to the sheet and allows for optimum drying. It is recommended to evacuate double the CFMs of the air knife entry volume.

DRYING UNITS: MANUAL VERSUS AUTOMATIC

Some new presses are manufactured with automatic dryer settings. Press installers will recommend that operators use the Auto settings to facilitate drying of the sheet. Some of the automatic dryer settings are similar to a home oven. Once the desired temperature is obtained, the oven will shut-off and begin to cycle on and off. The on and off cycle of the dryer prevents some sheets from receiving the infrared energy they require. This will result in intermittent sticking or offsetting in the load. It should be noted that when a problem occurs sporadically throughout a job, it is a good indicator that the problem is process rather than product related.

It is recommended that printers use manual settings on the drying unit. Infrared settings and air temperatures need to be adjusted to obtain the desired load temperature. Upon first switching to the manual settings the sheet temperature will probably go up considerably. Maintaining the manual settings allows the printer to dry the sheet without the infrared unit being set to maximum. This, in turn, allows the printer some latitude if presented with a drying problem in the future.

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MAKE SURE THE PILE TEMPERATURE READING IS ACCURATE

When the pile temperature is at 95°F (35°C), it still does not guarantee properly dried sheets upon delivery. It is important to verify how the pile temperature is obtained. Read the temperature from the pile using a sword type thermometer. Digital readouts from the dryer units should be verified. A pile temperature of 95°F (35°C) that is obtained solely from the infrared units will lead to slow drying coating. On the other hand, too much hot air and not enough infrared will lead to slow drying ink. We recommend using between 40-60% IR output and adjusting the air temperature to achieve the desired pile temperature of 95°F for the first side application. A slight reduction in the IR settings is recommended to reduce the sheet temperature for the second side application to between 85-90°F.

ALWAYS USE AS MUCH AIR AS POSSIBLE

Maintain air volume at 100%. Never decrease the air volume in order to bring down the pile temperature. The air temperature can be lowered, but it is critical to always maintain the volume.

SPRAY POWDER

Coating was designed to eliminate the usage of spray powder. However, in almost all cases some spray powder is required to maintain sheet separation, to allow airflow between the sheets. A fine to medium micron spray powder is recommended.

INFRARED LAMP LIFE

Infrared lamps must be changed per the manufacturer's recommendation. The infrared energy emitted will decrease over time. This will result in uncontrollable and inconsistent drying.

As always, your local PRINTERS' SERVICE office is happy to answer your questions:

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