

THE ESSENCE OF COATING REVIEWED

The practice of applying coating successfully comes down to understanding and paying attention to a few fundamentals. Essentially, successful coating may be accomplished when key variables involved are in control. These are pressure, viscosity and pile temperature.

PRESSURE:

“KISS” is the key to successful trouble free coating application. Coating is to be transferred, rolled on from blanket to sheet, with the least amount of pressure possible.

“PRESSURE” is the key to effectively transferring and rolling on coating with the least amount of squeeze.

Each coater manufacturer will have written specifications for properly setting standard nip widths between rollers. Study these carefully, and know the relationships.

A multitude of coating application problems can result from improperly set nip pressures. These can be observed as coating blurring, blotching, thickening at both edges, and transfer and adherence of ink to the blanket cylinder, etc.

Set nip width stripes to the coater manufacturers specifications.

Depending on coater manufacturer and the number of rollers, these standard nip width settings may include pan roller to application form roller, pan roller to intermediate roller to application form roller, application form roller to blanket, anilox roller to blanket or plate, and back cylinder (impression) to blanket or plate cylinder.

The application form or anilox should be set to 3 - 5 mm wide nip width, then backed away until the transferred image breaks up, finally

adjusting just enough to bring the image back to a “KISS” impression of from 1 - 2 mm .

Pack the blanket cylinder to the correct blanket height following coater manufacturers specifications. A blanket height of .000 or +.002 to or over bearer is common. Cut the packing square for the image area only leaving the color bars uncoated.

The only reason for striping a blanket or plate is to verify that it is set square or parallel.

Set the impression cylinder pressure so that coating is transferred, then back the cylinder away until the coating breaks up showing voids. Then increase pressure until the voids just disappear. You are adjusting to bring the coating back to a “KISS” impression.

VISCOSITY :

Viscosity measures the ability of a liquid to flow. High viscosity liquids are thicker and flow with difficulty, while thin low viscosity liquids flow easily. Viscosity cups (metal cups with a precise measured hole in their bottom) are used to determine the amount of time in seconds that it take for a cup to empty. Different size cups are available from a number of manufacturers to measure different ranges of viscosity. Typically number #2 and #3 Zahn cups are used to measure the viscosity range used in the printing industry. It is important to note that cups from different manufacturers will not measure the same. Also cups that are scratched, dented or dirty will not produce accurate results. Unfortunately cups are not able to produce completely accurate reproducible readings. Nevertheless they are the practical choice.

It is essential to remember that temperature has a great effect on the viscosity of a coating.

To achieve any comparison, always measure viscosity at the temperature noted on the coating supplier's technical data sheet. Any aqueous coating will increase in viscosity over time because it evaporates volatiles as it is circulated through the coater and pumping system. Also, this circulation typically raises the temperature of coating.

Procedure for measuring viscosity

Stir and mix container completely.
Take temperature of coating and record.
Be sure that the cup is clean.
Make sure that the coating is foam free.
Immerse cup into coating filling completely.
Lift cup free of liquid with finger ring vertically.
Start stopwatch when top of cup breaks liquid.
Stop timing when coating flow first breaks into drops.
Repeat test to see if two readings agree.
Clean the cup immediately in water and dry, always using a very soft clean cloth.

Don't be anxious to thin an aqueous coating with a water addition. Be certain that a coating is stirred thoroughly and is as warm as the application temperature before considering thinning.

Monitor coating viscosity before and at least every 2 - 3 hours during a run. Keep viscosity at the recommended levels.

PILE TEMPERATURE:

New aqueous coater drying systems on sheetfed offset printing presses utilize short wave I-R (infrared) heat combined with air movement mechanisms. Short wave I-R creates a more consistent heat across both image and non-image areas. High volume air movement is essential in drying aqueous coatings due to their average 60% water content. Three different forms of air movement are generally present in dryer installations.

These will feature:

1. Heated air usually blown at the wet coated sheet through "air knives" designed to strip

moisture laden air from the substrates immediate surface.

2. Air extraction systems utilizing vacuum plates below the sheet and exhaust sections above, designed to remove vast amounts of moisture laden air from the delivery path.

3. Ambient / cold air delivered at the delivery path end to remove heat.

High pile temperatures can soften thermoplastic aqueous coatings causing blocking. Additionally, coatings that are inadequately dried may retain ammonia/amine making the dry coating moisture sensitive and susceptible to picking.

Today with contemporary aqueous coating formulations, we recommend the following pile temperature conditions for paper substrates.

One side sheet coating

Pile temperature at 100 degrees F +/- 5

Work & Turn two side coating

First pass pile temp. at 100 degrees F +/- 5
Second pass pile temp. at 95 degrees F +/- 5

Always measure temperature on the darkest image color for accuracy.

Last but not least, press automation (camera type optical pyrometer) that's available can present drying issues when backing up a warm sheet. Carefully choose temperature control settings so that the elevated temperature of a quickly turned pile will not cause the IR to be turned down resulting in incomplete drying.

Whenever you consider coating, consider CORK!

LOOK TO CORK!..... for your coating and varnish needs, for both aqueous & UV/EB coatings/ and varnishes.