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Faster drying inks

A proprietary ink additive from SpeedyDry Inc. accelerates the cross-linking reactions that normally occur in ink during drying.

By Nancy Lowther

Pressroom

For decades, printers have been searching for faster drying inks. Many have tried ink drying additives, specialty inks and aqueous coatings.

A proprietary ink additive from SpeedyDry Inc. (Charlotte, NC) accelerates the cross-linking reactions that normally occur in ink during drying. SpeedyDry is suitable for use with conventional offset lithographic inks and reportedly performs well on all stock types, even plastic. It has been in use for more than four years.

GATF breaks it down

Independent tests at the Graphic Arts Technical Foundation (GATF) (Sewickley, PA) proved SpeedyDry dramatically decreases ink drying time without significantly impacting print quality and ink properties, such as tone reproduction and tack. Additionally, GATF reported SpeedyDry improves rub resistance. Testing at GATF was performed as follows:

- **Pressroom conditions:** 70.5°F; 45 percent humidity.
- **Press:** Heidelberg 40-inch Speedmaster running at 7,000 sph.
- **Plates:** Diamond Western Litho (175 lpi with a 4 percent bump curve in the midtone).
- **Inks:** INX OSF Vision Plus 4 Color Process.
- **Laydown sequence:** black, magenta, cyan, yellow.

A separate test in the GATF laboratory using high-alkaline reflex blue ink on Yupo synthetic paper showed that without SpeedyDry additive, the single sheet dried in 12.1 hrs. With five percent additive, the drying time dropped to 6.7 hrs.; with 20 percent additive, it dropped to 2.9 hrs.

Printers familiar with this combination are used to two to three weeks' drying time. Frank Kocialski, print production manager at Colorado Litho (Westminster, CO) says, "We ran solid reflex blue with SpeedyDry on an uncoated sheet, and an hour and a half later we varnished it and sent it to cutting. We had a lot of happy salespeople and cutter operators."

Stock performance

Shane Landis, cofounder of SpeedyDry Inc. and a press operator for more than 25 years, was involved in the development and testing. Tested stocks included:

- **Coated stock** (Sappi Magnostar). With its low porous surface, Landis notes that it requires minimal ink and water during the printing process.
- **Uncoated cover stock** (Neenah Classic Crest), which Landis says often has to sit for two or three days to dry because it is highly acidic.
- **A felt stock** (Tomahawk Cool White), which is a soft stock with heavy grain



that is popular for limited-edition art prints. Because of its high absorbency, Landis says, it needs heavy ink coverage.

- **A matte stock** (Sappi Somerset), which Landis notes has a high clay content, like the coated stock, but was chosen because it is high in acid.
- **A plastic sheet** (Transilwrap Tipped Polyester). On this stock, Landis explains, a backer is attached along the gripper with





SpeedyDry is added to conventional offset lithographic ink just before or after adding the ink to the ink fountain. After mixing thoroughly, the job is run normally.

little spots of glue. When the gripper is cut off in finishing, the backer drops away. This stock is used for lit display boxes, soda machines, and so on.

With the exception of the polyester, all stocks were 80-lb. The testers stirred the liquid SpeedyDry additive into the ink with an ink knife prior to putting the ink in the fountain. No special activation procedures or equipment were needed. During each of the five runs, every hundredth sheet was flagged and later pulled for print and setting analysis in the lab using an ink setting and drying time recorder. For drying analysis, sheets within each lift were checked after one and after three hours. The results are shown in the accompanying table.

To get the Tipped Polyester to dry in 10.7 hours, the maximum time for tests, the sheets to be used for print analysis were pulled from the lift and left out in the open air. If the sheets had

been left in the lift, GATF stated they wouldn't have dried that quickly, if ever. These inks were not formulated for printing on plastic, but they dried hard with the SpeedyDry additive.

Dry, dry again

Landis claims SpeedyDry offers a greater flexibility than competing additives. "Current petroleum-based (liquid) drying additives are volatile," he says. "The solid paste types are not as volatile, but are not very effective. Ones with heavy metals repel water but need water to stimulate ink drying. Each type from each ink manufacturer has been developed for specific types of stocks."

Print buyers often request bright white stocks, which have more clay and more calcium than standard brightness papers. Typically, these stocks also take more time to dry. Rick Sherrard, director of the manufacturing specialty group at Quebecor World MIL Inc. (Ontario, Canada) recently tested SpeedyDry on a two-color job using a bright white stock with Hostmann-Steinberg inks and Fuji plates. Says Sherrard, "I would normally back it up in 24 hours because this is a very porous stock, but I was able to back up in 12 hours using SpeedyDry."

Potential benefits

SpeedyDry users report the following benefits:

Spray powder reduction or elimination. Many printers use offset powder blown by compressed air into the delivery section of the press to prevent setoff in the lift. Landis says, "Depending on the stock, offset powder can be eliminated or reduced. This will also reduce powder getting in equipment downstream." Jack Gorman, GM of Printing Concepts (Erie, PA) concurs, saying he's been able to reduce consumption of offset powder on a job-by-job basis.

Slip sheet elimination. Many companies add slip sheets between every sheet to eliminate setoff on the good sheets and move the job directly into binding or finishing. Kocialski says, "We use conventional cloth dampeners and therefore need a little more water. With the ink we were using, we were slip sheeting because two days later a job would still be wet. With SpeedyDry, we've eliminated slip sheeting."

More billable hours. "Before SpeedyDry, we had press operators do maintenance and cleaning while waiting for the first side to dry on a work-and-turn job or a job that had to be backed up," reports Gorman. "That was lost time—non-billable hours. Now, there is far less waiting time, and we don't worry about setoff in the pile from the first pass."

Work-in-process inventory reduction. Press sheets that require drying time are moved from the back of the press and stored somewhere to dry, then moved to the next downstream process. SpeedyDry enables the skid to be moved only once, from the back of the press to the next piece of equipment, usually a cutter.

All of these factors add up to decrease the cycle time of a printed product. If a shop can print, fold and ship on the same day, as opposed to two to three days, it can dramatically increase its manufacturing capacity on an annual basis.

SpeedyDry (www.speedydry.com) is now distributed by Prisco (Newark, NJ). See www.prisco.com.

Ink drying issues

An ink additive can solve chalking, setoff, poor drying or striping problems.

- **Chalking:** Ink appears dry but can be rubbed off easily, leaving the stock bare. If drying is too slow, too much vehicle is absorbed before gelling takes place, and the pigment is left without sufficient binder.



| SpeedyDry stock test results | | |
|------------------------------|--------------------|----------------------------|
| Stock | Normal Drying Time | Drying Time with SpeedyDry |
| Coated stock | 3.0 hrs. | .09 hrs. |
| Uncoated cover stock | 2.6 hrs. | 1.9hrs. |
| Felt stock | 10.4 hrs. | 2.9 hrs. |
| Matte stock | 3.5 hrs. | 1.9 hrs. |
| Tipped polyester | 10.7 hrs. | 2.4 hrs. |

- **Setoff:** Ink fails to set before the next sheet contacts it on the delivery pile. Causes include the ink vehicle penetrating the paper too slowly, paper that lacks absorbency and too much ink.
- **Striping:** the result of glazed rollers; too much dampening solution; or too much gum, phosphoric acid or both in the dampening solution. The rollers become saturated with water and fail to take or transfer ink, and can't maintain color.

Source: GATF's "Solving Sheetfed Offset Press Problems," by Dejidas, et al.

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