



Laminating Adhesives

The Effect of Ink Drying on Bond Performance

Technical Bulletin

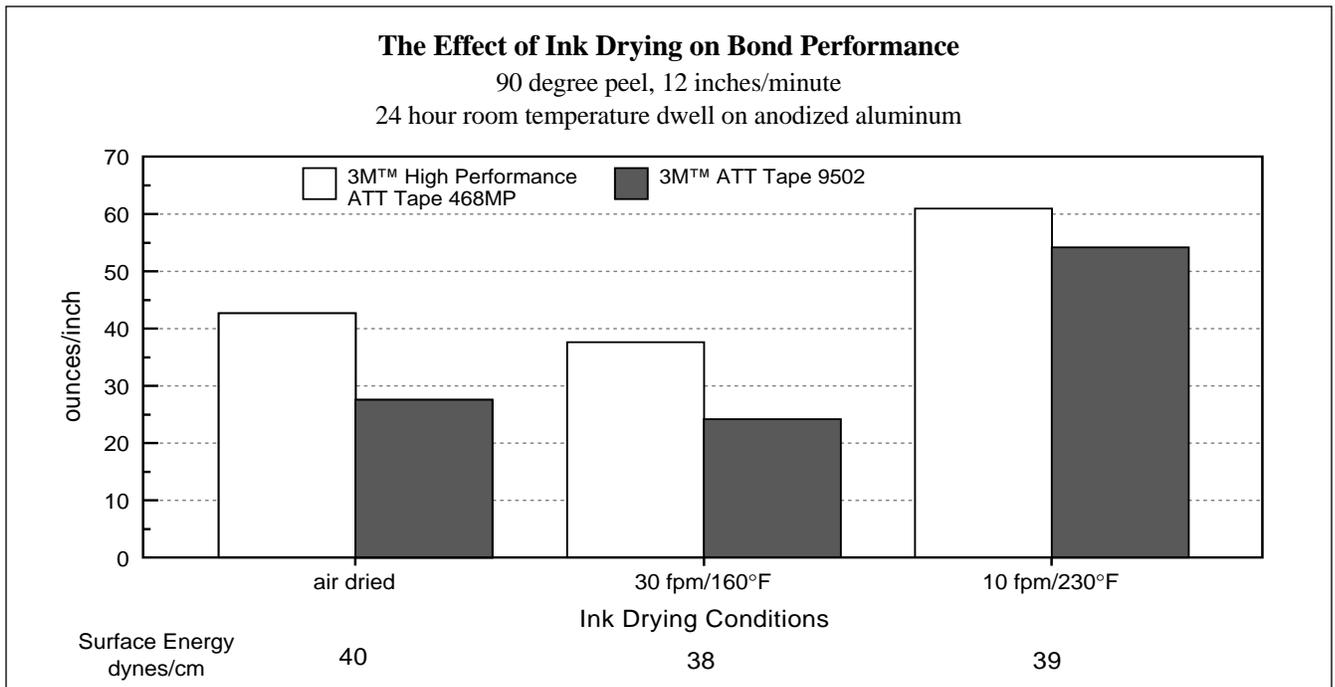
February, 2005

In the durable graphic area, Lexan® or polyester is subsurface printed with one or more layers of ink. Following an air or oven drying step, the graphic pieces are laminated with 3M™ Laminating Adhesive (adhesive to the ink). The pressure sensitive adhesive is then used to bond the graphic to the manufactured item in the automotive, electronic and appliance industry.

This information describes the effect of changing the drying conditions on the bond performance between the ink layer and the adhesive of one particular ink. The ink used is a standard solvent based ink supplied by a common ink supplier. The results of the test may not be identical for every ink tested, however, the trend is one to consider if adhesive/ink bond performance is low. Unfortunately, the slow speed and high temperature resulted in the highest bond performance. This suggests that processing parts quickly may reduce the bond between the adhesive and the ink layer.

ASTM D3359 describes a quick process aid for testing ink or other coatings. In this procedure, the ink or a dried sample is scored with a fresh razor blade about every 1/16" in both directions, (forming a grid pattern) covering about one square inch. After scoring, an aggressive tape (Scotch® Filament Tape 898) is applied over the scored area. The tape is removed at a 180 degree angle rapidly from the scored ink. The ink should remain firmly anchored to the coated substrate. If the ink does not remain anchored, a review of the process conditions during drying (speed, temperature and air flow) may be useful.

Careful consideration to the process conditions when using UV cured inks is especially important. Following the guidelines provided by the ink supplier is recommended. As UV lights age, the energy output declines, requiring more time under the lights to produce the same cure. The crosshatch test described above can also be used with the UV systems to help determine if the ink is cured adequately.



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Printed in U.S.A.
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