

Gloss Ghosting



Sappi Printer Technical Service

877 SappiHelp (727 7443)

Problem

An ink/varnish gloss differential on the second side imagery appears in the form of a ghosted image of the first side printing.

Description

A gloss ghost on the second-side imagery of a printed sheet is caused by fuming emissions from the oxidizing ink on the first-printed side of the adjacent sheet in the printed load. This fuming of oxidizing vapors can adversely affect the drying rate of the ink on the second side as the printed images face each other in close contact. These differential drying rates may further result in varying levels of retained ink/varnish gloss.

If a portion of the printed image dries faster in one area, it will incur less surface absorption and retain more ink vehicle with the resins and waxes that normally bloom to the surface to cover the ink pigments. This area will offer maximum retained ink gloss. Conversely, the slower or retarded drying portion of the image will lose more of this same vehicle through higher surface absorption and dry back with more exposed ink pigment and less retained gloss.

Causes

- Oxidizing vapors released from the drying ink of the first-side printing interfere with the drying of the second side ink film between adjacent sheets in the printed load.
- The back-up printing is run before the first side ink is completely dry.
- Inks are drying too slow or have unusually high concentrations of drying agents.
- The printed loads sat for too long without being winded or otherwise exposed to air.
- High ambient pressroom humidity is retarding ink dry.
- Excessive exposure to IR heat.
- Although not considered a paper-specific problem, gloss ghosting is usually more visible on coated paper.

Options and Solutions

GLOSS GHOST PREVENTION

- Allow paper to properly acclimate to pressroom temperature. Recommendations are listed below under Pressroom Environment.
- Run heavier ink coverage side first.

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- Avoid backing-up rush jobs too soon.
- Avoid work-and-turn layouts when heavy solids prevail, especially when utilizing gloss and dull varnishes where solids face smaller imagery, reverse outs, or type on the back-up.
- Avoid fast inks with heavier concentrations of drier additives, especially cobalt. An ink set with higher solvent content and lower percentage of drying agents should fume less oxidizing vapors. Consult with ink supplier.
- Avoid the addition of drying accelerants to fountain solution. High-acid fountain solutions under 4.0 pH, overuse of fountain solution, and/or high ink water pick-up may adversely retard ink dry.
- Maximize drying and exhaust fuming vapors by “winding” loads within a couple hours off press.
- Rack delivery loads in short lifts to allow for better air circulation.
- Use minimal heat and avoid pile temperatures above 90° F. (32° C.). Excessive heat on the back-up pass can alter the oxidation process of ink on the first pass by re-softening the printed surface. Press loads often build in temperature as oxidation begins. Keep loads away from sources of excessive heat, cold, or humidity.
- Keep lifts in the proper run sequence for back-up.
- Varnish in-line whenever possible. If an off-line varnish is necessary, consider low-wax inks for first pass printing (consult ink supplier).

GLOSS GHOST REPAIR

- Continuously check backed-up loads until the ink/varnish is completely dry. If a gloss ghost becomes evident after the back-up pass has been printed, frequently “wind” and rack each lift. It may be beneficial to blank the sheets back through the press with moderate IR heat. Sometimes gloss levels equalize after ink has completely set and dried.
- If a gloss ghost is still evident after thorough drying of the first-side printing, try changing to a different or wax-free varnish formulation and compare results. It should be noted, however, that a wax-free varnish may exhibit greater tendency to scuff, so consider accordingly.

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- If back-up is complete and the gloss ghost remains evident after repeated “winding”, try running affected sheets back through press and pre-heat 90-110° F. (32-43° C.) to soften and reactivate the printed image. Then spotvarnish as needed over gloss or dull ghost while sheets are still warm. Although this technique has often been successful, testing is recommended. It may be necessary to drawdown a variety of different varnishes on ghosted samples to best determine which one may offer the best opportunity to equalize gloss levels. Reprinting with the same varnish formulation seldom helps eliminate a gloss ghost.

PRESSROOM ENVIRONMENT

- Monitor relative humidity and temperature. High relative humidity in the pressroom may adversely retard ink dry and prolong fuming.
- Ideal climate control is 45% ($\pm 5\%$) Rh @ 72° ($\pm 5^\circ$) F. for North America and 52% ($\pm 5\%$) Rh @ 21° C. for Europe. Maintaining the recommended pressroom environment reduces many operating variables on press.
- Allow paper to acclimate to pressroom environment.
 - Paper will acclimate in skid, carton, or ream wraps. Do not open until going to press.
 - Paper acclimation time is relative to environmental extremes and volume of paper.
- Properly conditioned paper runs with a broader operating window on press.