

REVERSE SIDE STAINING A new form of CHEMICAL GHOSTING

Although problems with ghosting and reverse side chemical stains have been an issue for many years, there has been a recent increase in the number of reported incidences. So we thought it was time to once again explain what this staining is, why it happens, and offer corrective measures for future printing jobs.

Definitions:

Chemical Ghost: An image from the first side printed on a sheet fed press showing as a latent image in an image on the second printed side.

Reverse side stain: The latent image of the ink from the first side printed showing as a yellowish stain in the paper on the opposite side of the press sheet.

Background:

In 1988, in their *Bulletin No. 1: Ghosting*, the S.D. Warren Paper Company (Now SAPPI Fine Papers, Boston MA) described the cause of reverse side staining as “associated with volatile oils given off in the ink-drying cycle as sheets dry in a pile”. They also cited that the ink film thickness was an “important factor”, and “that dull inks and gold inks have been bad offenders”.

Why Now?? Stains on a printed job that originate from ink are usually yellow in color. Our experience is that they originate from all ink colors, but at different rates. And, although it has always been a fact that there is a latent stain on the facing sides of most printed sheet-fed jobs, printing papers today are whiter and brighter, so any level of staining is visible.

Current Stain Testing:

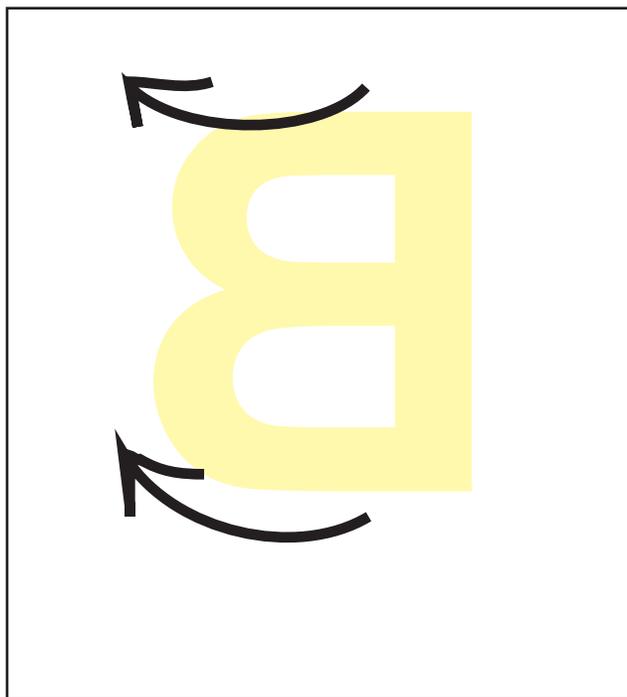
Let’s be clear. First, the stains from the ink on the first side printed are easily seen on the backside of the press sheet before the second pass. The lighting in the room can affect how easily it is to see the stain, but lights containing fluorescence make it easier to see. It is important to note that using a black light will show a stain on the backside of almost all press sheets, but it cannot predict if a stain will be visible on a job.

Although it was assumed that oil from the ink created the stain, tests were conducted on the stain to determine the exact contaminate and it’s source. (The tests used included Solvent Extraction Gas

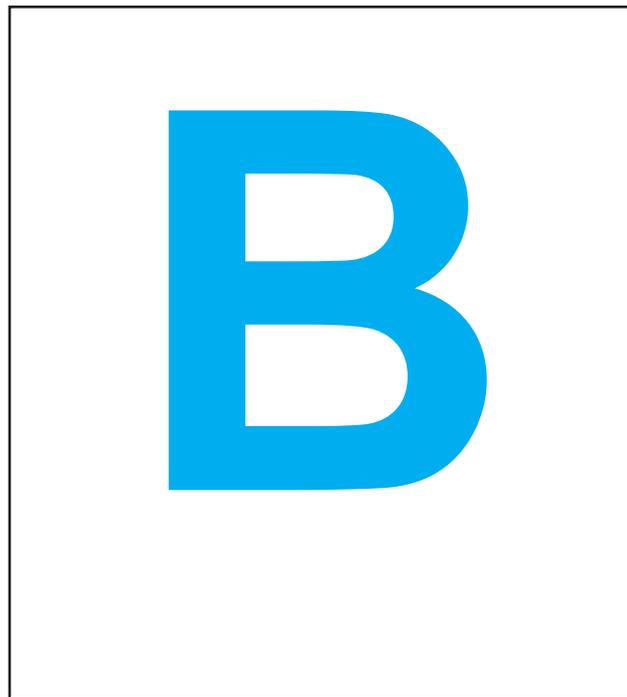
Chromatography followed by GC Mass spectroscopy) These tests confirm that the stain contains minute deposits of an oxidative oil product. The following oils are suspect, since as a chemical group, their make up is similar: linseed, soy, china wood and/or tung oils are all possibilities. On their own, this family of oils are not volatile, however once metallic driers are added, (cobalt, manganese etc.) the drying process is enhanced and the oils will volatilize/evaporate at relatively low temperatures.

RECOMMENDATIONS:

- ◆ Do not use a UV lamp to predict yellow staining
- ◆ Do not use inks that are “oxidative” or contain 100% vegetable/drying oil content. Instead use inks with hydrocarbon solvent oils. Note: Accommodations for their set rate and other printing problems will have to be considered (picking, piling etc.), so contact your ink supplier for guidance.
- ◆ If inks with drying oils (vegetable) must be run, prevent the oils from depositing on the facing sheet by sealing them with an aqueous coating as a barrier on the first side.



Stain of image on the facing sheet



First Side Printed with a cyan Solid
