

# ACTEGA Kelstar Technical Bulletin

## UV Coating Over Metallic Inks

As the use of ultraviolet (UV) cured coatings coated over metallic inks increases in the Graphic Arts industry, so does the potential for problems. One of the most notable problems is poor intercoat adhesion related to the dryness of the metallic ink (refer to ACTEGA Kelstar, Inc. Technical Bulletin Update #400 for more information related to UV coating adhesion).

One of the most effective methods to achieve intercoat adhesion between the UV coating and a "true" metallic ink is to coat the metallic ink with an aqueous primer coating, prior to UV coating the ink. If an aqueous primer coating is used, it should be applied only after the metallic ink dries/cures thoroughly, or the wet metallic ink will be sealed under the aqueous primer coating and the metallic ink and aqueous primer coating will not dry sufficiently enough to allow the UV coating to achieve acceptable adhesion.

(There are metallic inks that can be coated or laminated. Unfortunately, due to compromises in the manufacturing process they do not have the same degree of luster, and are sometimes referred to as "imitation" metallics.)

An aqueous primer coating (or other UV coating compatible chemistry primer) is most effective in achieving intercoat adhesion due to a couple of reasons. The first is that, in general, UV coating chemistry has very limited compatibility with the lubricant(s) added in the manufacturing process of a metallic ink. During the ink drying process, the lubricant(s) can migrate to the surface and interfere with the UV coating wetting and/or adhesion. Since the level of the lubricant(s) present at the ink/coating interface varies with the degree of dryness of an ink, including the chemistry of

the ink itself and even the porosity of the substrate (which affects solvent retention and drying), the ink/coating interface may always potentially be contaminated with the lubricant(s).

The other most prevalent reason is the generally poor cohesive binding of the metal particles in the ink – the inks are, in essence, tinted varnishes with metallic particles; and, as the varnish dries, the metallic particles migrate to the surface and can rub off easily, creating an unstable surface. Consequently, when the ink is UV coated or laminated, adhesion only occurs on the surface or top layer of the metal particles in the ink.

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