

TechLines

Technical Information Sheet

P3

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A Primer on Coatings

Designers appreciate the creative opportunities they allow. Retailers and dealers applaud the visual appearance. End-users appreciate the durability.

Coatings on covers offer protection and sheen in varying degrees. Here is a primer on four different types of coatings available to our customers. The accompanying chart should serve as a quick reference to the characteristics of each.

Overprint Varnish

Applying varnish is an inexpensive way to add gloss to a printed piece. Although not as hard as other coatings, varnish does offer some protection, mainly resistance to dirt, smearing and water.

Varnish is available in a matte (dull) or gloss (shiny) finish. These can be used in combination as a design tool.

Spot (or pattern) varnishing of specific images, photos or graphics is available. Varnish can also be color tinted.

Varnish can be applied in-line as the last "color" in a multicolor press (wet-trapping). When done as a separate pass, this dry-trapping application offers more gloss.

Aqueous Coating

These coatings generally contain 60 to 70% water, 25 to 35% solids and 5% additives. Aqueous formulations afford greater protection than varnish and have gloss characteristics that fall between varnish and UV coatings. In some cases, aqueous coatings are used as a base for UV application. It is available in gloss (shiny) or matte (dull) finishes.

This coating can be prepared for different degrees of gloss. The relationship between gloss and rub

Quick Reference Chart of Coating Characteristics

Coating Type	Gloss	Scratch Resistant	Yellowing	Metallic Inks	Imprinting	Scoring	Foil Stamping
Varnish	Some	Poor	Yes	Yes	Yes	After	Before
Aqueous	Yes	Better	No	Yes	No	After	After
UV	Yes	Best	Some	Yes with Primer*	No	After	Before
Film Laminating							
Polypropylene	Yes	Yes	No	Yes	No	After	No
Nylon Lay-flat	Yes	Yes	No	Yes	No	After	No
PET Light G.S.	Yes	Less	No	Yes	Yes	After	Yes

*Please see feature box on page 3.

If you plan to inkjet address and personalize...

Water-based inkjet inks do not get along well with coatings.

If using **overprint varnish**, a solvent-based ink will work with additional drying time, which is achieved by slowing down the product stream – whether a binder or mailer.

With **aqueous** and **UV**, a blackout space (called a window) *without coating* is preferred for scheduling flexibility. If addressing only, the minimum uncoated area is 4" wide x 1-1/2" high. With personalization, the width needs to be expanded depending on your messaging or code needs. If possible, this would be the preferred method for overprint varnishing.

For more information regarding the inkjet window, please request our TechLines Sheet **Designing Your Mailpiece for Inkjet Addressing (M7)**.

coatings are solvent free and emit no VOCs (volatile organic compounds).

Drying is instantaneous with exposure to ultraviolet radiation. Printed sheets are then allowed at least 24 hours for final curing.

UV coatings are often done in-line by large publication/periodical printers for long runs. Typically, this process yields a slightly thinner coating with less durability and gloss. In our medium run environment, we recommend off-line application as a proven way for successful results.

Printing must be done with UV inks or inks that do not contain micro crystalline wax (also called wax-free). Pigments must be heat and chemical resistant. If nonresistant colors are used, the color may fade, change or bleed into unprinted areas. The following colors or mixes containing these colors should be avoided or be tested prior to coating: rhodamine red, purple, fluorescents, reflex blue, violet and warm red.

UV coatings are not compatible with cast-coated stocks such as Kromekote.

To ensure proper drying and coating adhesion on 4/color process photos, separations need to be ordered with undercolor removal (UCR)/maximum ink density set at 280%.

Film Lamination

This top-of-the-line finishing features high gloss with a very smooth, tough finish. Matte finishes are also available that give a satiny feel. Besides offering scratch resistance, the lamination will not crack.

Solvent- and water-based adhesives make up approximately one-half of all laminating done. Following

resistance is as follows: a high gloss finish has less rub resistance. Conversely, greater rub resistance reduces the degree of gloss. Based on shelf life and end use of your product, you may want to express a preference.

Following application, the coating sets up immediately with the aid of warm air which starts the evaporation process. Sheets are then allowed to cure for 24 hours.

The cured coating does inhibit complete drying of the inks. It is gas permeable which allows for some drying by evaporation. But because of this, aqueous coated covers are not water/liquid resistant.

Aqueous coating has also proven a good primer base coat for UV. Improves UV adhesion to metallic inks.

The biggest concern with this coating is the intended end use, packaging requirements and shipping. At temperatures over 140°F, aqueous coatings may soften, causing sheets or books to stick together. Shrink wrapping or any other heat-processed wrappings should not be used. Books to be transported in the summer should be shipped on their spines so there is no pressure exerted on the individual covers.

UV (ultraviolet cured) Coating

The UV coating process gives an extremely high gloss hard finish that is chemical and abrasion resistant. UV

the application of adhesive to the film, pressure is used to affix the film to the printed sheets. Sheets then sit for 24 to 40 hours for final curing. Water-based adhesives are cured with IR (infrared) radiation.

In thermal film laminating, pretreated films are affixed with heat and pressure. These films do not contain VOCs. Thermal film is difficult to run on stocks 70# text weight or lighter.

The following film types are available to our customers and all are available in gloss or matte finish.

Polypropylene (OPP) is a standard grade film that is least expensive. It is preferred for book and magazine covers, greeting cards and dust jackets since it is less likely to curl.

Nylon Lay-flat film is designed specifically to negate the effect of curling caused by paper-absorbed moisture. This glossy film is very scuff resistant. It is also available in a matte (dull) finish.

PET Light G.S. (polyester light glueable stampable) is designed to accept foil stamping and adhesion to binder boards for hard cover books. Available in gloss or matte finish.

Some Considerations

UV and film lamination, which are available from outside vendors, require additional time for drying of ink before coating and curing after coating. Cover artwork, transparencies and materials should arrive early so that delivery dates can be met.

Testing of metallic or other inks should be done before printing an entire run.

Aqueous and overprint varnish, which can be done in our plant do not require any extra lead time. In some special applications, especially with metallic inks, we will also test to be assured of compatibility.

Here at Ripon Printers...

We offer overprint varnish and in-line aqueous coating. Both of these coatings are available in gloss and matte (dull) finishes.

Metallic inks pose UV coating problems

Metallic inks should be used with caution in conjunction with UV coating as these are actually tinted varnishes with metallic particles. As the varnish dries, the metallic particles rise to the surface and rub off easily creating an unstable surface. For this reason, an ink company cannot guarantee the successful coating of a metallic ink. Silver is particularly difficult. We use an imitation silver ink which maintains a good metallic luster while ensuring coating adhesion.

The application of a wax-free overprint varnish or an aqueous primer coating before UV coating has also proven helpful. A period of 36 hours after printing and before coating is recommended.

Sources:

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Giff Miller, Owner, CLS Services, Appleton, Wis.