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 gloss, matte or dull finish. These can be used in combination as a design tool. And now available, scented varnishes.

Gloss varnish reflects more light and adds to the sharpness and saturation of images while matte or dull varnish increases readability by diffusing light and reducing glare.

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.

We now have spot or flood varnish available on 16 page heatset signatures. Gloss, satin or dull finishes are available.

**Aqueous Coating**

These coatings generally contain 60 to 70% water, 25 to 35% solids and 5% additives. Aqueous

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

*Please see feature box on page 3.
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, satin/dull/flat, matte or “soft touch” finishes. Soft touch has a very dull look to it with a soft, almost fuzzy feel. And now available, scented coatings.

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

Finishes available include gloss, matte, dull, grit and receptive.
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 the application of adhesive to the film, pressure is used to affix the film to the printed sheets. Water-based adhesives are cured with IR (infrared) radiation.

Sheet press projects require 24 to 40 hours for final curing. Digital press projects require 8 hours before film lamination and a minimum of 24 hours for final curing.

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.

**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.

**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 and a non-scuff matte.

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

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 varnish on sheet and heatset web press projects and in-line aqueous on sheet press.

Sources:


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

The Folder Store, Dubuque, Iowa