

COATINGS ON MAGAZINE COVERS MAKE AN IMPRESSION

Have you looked closely at magazine covers lately and noticed how many are glossy? Maybe not, but look again and there it is. Whether the result of lamination, cover inks or coatings, it's there, attracting your eye while offering protection.

Publishers have recognized that the cover of a magazine or catalog is the first thing that the consumer sees in an initial evaluation. Therefore, there has always been a recognition that everything possible should be done so that the consumer is presented with a defect free, attractive first impression.

Printers, working with suppliers of cover inks, historically have been able to provide improvements in gloss, abrasion resistance and squalene (skin oil) resistance. These advances however, have not always satisfied the requirements of publishers.

Gravure publication printers, because of the liquid ink gravure printing process, were able to take the step of applying a clear varnish in the last press unit, in-line, over inks. This led to immediate improvements in gloss, abrasion and squalene resistance. The basic coatings that have been involved are solvent and aqueous based. There is also the possibility of using UV coatings if an investment is made in curing equipment.

Heatset web printers faced a different challenge because the paste ink litho printing process would not lend itself easily to the application of in-line liquid coatings. Oh, attempts were made, and dampening units were tried and modified, and tried again, but in the long run true liquid coating equipment has to be added. Press varnishes, could also be used but improvements are minimal.

This movement produced a trend starting in the mid-1980's, to the present where we find a tremendous coating capacity in the heatset web publication printing industry.

So what kinds of coatings are being used?

There are three types of coating chemistries that are currently in use. These are:

- UV
- Aqueous (thermoplastic)
- Aqueous (heat set)

While there are differences between these chemistries, their properties, their use and their cost, each offers the publication cover printer notable improvements in:

- Gloss
- Abrasion resistance
- Squalene resistance

During the last decade and a half, a large number of UV coating application devices and companion curing equipment has been placed into the heatset web publication printing industry. Therefore, today a very large UV coating capacity exists.

UV coatings are able to impart the following advantages:

- High gloss
- Excellent abrasion resistance
- Excellent squalene resistance
- Virtually zero VOC, 100% solids
- In-line finishing productivity

The use of UV coatings, as noted above, requires special curing (drying) equipment.

In a typical system, heatset inks that accept UV coatings with acceptable adhesion are printed and then dried in the heatset oven. After the oven and the chill rolls, the printed web is fed through a flexo type coater, where UV coating is applied (dry trapped), and then passed through a curing unit consisting of UV lamps. Most of these systems have been vertically oriented to save space. It may be noted that special ink formulations are required if scotch tape and scratch free adhesion is to result. Paper and heatset inks play a definite role in the performance achievable with UV top coating. Aqueous primers may be used to improve UV coating to ink adhesion.

Aqueous heatset and aqueous thermoplastic coating systems are also in use. These systems were tried extensively early on in the effort to improve magazine cover appearance and performance. These efforts attempted the utilization of existing dampening units and later modified dampening units. Currently users have moved to dedicated flexo coating application systems.

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Attempts have been made to run coatings wet over wet inks. Some success has resulted, but much more attention has to be paid to controlling the variables. First of all when coating over wet inks, the coater must be synchronized to the press or the still wet inks will be sheared by the coating application. Secondly, volatiles leaving drying inks will cause volcano like defects in a coating surface, lowering gloss. Also, the possibility of back-trapping inks on the coater exists. The largest benefit would be that one could run with the single existing ink heatset oven.

Recognition of these difficult wet over wet running parameters has led to the use of dry trapping application techniques where coating is applied over dried inks, and a second oven pass is used to dry the coating. Some savings can result from the use of less expensive inks.

Aqueous thermoplastic coatings are approximately 40% solids, the remainder being mainly water that must be evaporated.

Dry coating solids yield:

- *Medium to high gloss possibilities*
- *Excellent abrasion resistance*
- *Excellent squalene resistance*
- *Low slide angle*
- *Excellent adhesion*
- *Low VOC*

Aqueous heatset coatings may range from 60-80% solids. Today's systems are one part systems that do not require press side additions. These aqueous thermoset coatings chemically cross-link under exposure to oven heat. Heatset coatings yield impressive properties such as:

- *UV range High gloss*
- *Excellent abrasion resistance*
- *Excellent squalene resistance*
- *Low slide angle*
- *Excellent adhesion*
- *Low VOC*

When considering the in-line top coating of heatset web cover production there are, as we have discussed, three choices. All have their differences and relative merits to consider. A major improvement in squalene (skin oil) resistance may be generally expected with the application of any coating. Comparable abrasion resistance can also be expected from the three coating types discussed. Realistically, either of the two higher solid thermoset systems, heatset or UV, should be capable of producing higher gloss and greater cross-linked polymer abrasion resistance. Practically speaking, however, unless the application of these products is optimized, it is easy to achieve lower gloss levels, and less than the best scratch and tape adhesion.

LOOK TO CORK! for a full line of **UV**, **aqueous** heatset, and **aqueous** thermoplastic coatings tailored for web offset heatset magazine and catalog cover use.

LOOK TO CORK! for the experience and technical service that makes a difference.