Cork Tech TalkNews

Manufacturers of Waterbase, UV+EB Curable Coatings, Varnishes and Adhesives

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GLOSS & PROTECTION; FILM LAMINATION OR COATINGS?

There are choices to be made when seeking to add value by providing gloss and protection to printed graphic arts products, especially when considering cost. Currently liquid coatings and varnishes, based on aqueous, solvent, and UV/EB chemistry, are in widespread use. These products applied to various papers, films and other substrates, are used extensively to provide protection and gloss. Desired mattes and satins are also available for discerning customers. Product applications are broad in a maturing market where coatings and varnishes are applied to a very diverse graphic arts product market. Applications are countless. Included is the lamination of film to packaging paperboard, which is post lamination printed, and/or coated or varnished to provide protection and a choice of an aesthetic glossy, satin or matte finish.

Liquid coatings and varnishes are applied by a variety of application means. Commonly, these are known as roller, gravure, flexo, screen and press applied (with a spectrum of developed special techniques falling under each). Spray application is also used.

Aside from aesthetic appearance factors, liquid coatings and varnishes can offer a range of desirable rub-scuff, water, chemical, packaged product and light (fade) resistances. Tougher products are those that are based on cross-linked chemistry where tight knit dry films are developed when the liquid products are fully dried or cured.

Optimal property development of formulated aqueous and UV/EB coatings and varnishes is usually agreed to result when wet application weights are about one wet pound per thousand square feet of substrate.

Currently, depending on specific formula and/or the quantity purchased, the highest gloss aqueous coatings cost between $1.00 to $1.40 per wet pound. Cost of these coatings is then in the range of $0.001 to $0.0014 per square foot of substrate coated. UV/EB high gloss clear coatings and varnishes are priced between $2.50 and 4.25 per wet pound. Again, assuming one wet pound per thousand square feet is required to develop optimum cured properties; the cost on a square foot basis is $0.0025 to $0.0045.

An alternative to liquid coatings and vanishes is the lamination of film to printed graphic arts products. Films are used to provide gloss, protection and, in some cases, long-term ink fade protection. Film lamination is often the choice when extreme durability is required.

Three standard products dominate: vinyl, pressure sensitive and thermal films. Like liquid high gloss coatings and varnishes, laminated films add durability, enhance appearance, increase the perception of quality, and add value. Two basic lamination processes compete – dry (thermal) or wet adhesive to film lamination. Dry or thermal lamination is more widespread in use, while wet or adhesive applied to film during lamination is gaining in popularity due to inherent lower costs.

There are three parts to a laminating film that must be considered: film, finish and adhesive. Each needs to be evaluated whenever a product application is considered. One must be attentive to the type of film selected for each job, it's properties and it's cost. A range of adhesives is being used so that thermal and pressure sensitive films must be carefully selected. Polyester (PET) and polypropylene (OPP) films are common with high gloss, satin and matte finishes available.

Pressure sensitive films are the least costly and most widely applied of the three standard laminated film products. Application to printed product is easy with the use of moderately priced equipment.

Applications are found on such consumer products as annual report and magazine covers, inkjet and photographic prints.

Pressure sensitive film prices have been reported recently to range approximately from $0.635 to $0.82 cents per square foot.

Thermal films are polyester basically, and offer improved bond strength, high rigidity and superior clarity. Thermal films tend to lay flat and maintain their shape after lamination. Like pressure sensitive films, they are available in high gloss as well as matte and satin finishes.

Thermal films are more costly than pressure sensitive films. Application is a bit more difficult, in that laminating equipment must heat the film uniformly to slightly over 100 degrees F in order to facilitate acceptable lamination to the substrate involved. Equipment is also more expensive. Thermal films are the choice for point of purchase displays, directional signs, menus, and indoor signage. OVER

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Properties include the ability to lay flat, and with added UV light protection provide excellent ink fade resistance.

Thermal film prices have been recently reported to range approximately from $0.71 to $0.93 cents per square foot.

Vinyl films are still more costly than the previously discussed laminating films. Vinyl film laminates that are printed are the films of choice for printed material that will be displayed outdoors. These applications include laminating to transportation vehicles. Vinyl film exhibits excellent weather resistance including the ability to sustain heavy washings. Excellent bond strength produces durability to a variety of substrates. Vinyl signage is guaranteed typically for a year minimum.

Vinyl film prices have been recently reported to range from approximately $0.36 to $1.03/ sq ft.

Waste is perhaps the largest single factor in film lamination economics. Films as we've seen, are priced on a square foot basis. Therefore, any waste, and there is always some matching up to the size of the piece to be laminated and the resulting trim, bears on final laminated product cost and a laminators profit. Compatibility to media substrate also needs to be addressed religiously in order to prevent lamination failures and high scrap costs.

Further to be considered is substrate cleanliness, which is a quality issue in both laminating and coating. Sheet and web cleaning systems are readily available and are used to effectively remove harmful debris and offset printing spray powder.

New film laminate products continue to appear, some offering properties not formerly available. Colored films are increasingly becoming more available as are holographic and metallized film products. Lamination speeds are also improving with newest equipment thermal laminating at over 200 feet/min.

The same can of course be said about liquid coatings and varnishes with new products continually appearing. New products are evolved continuously, some offering properties not previously available.

While many film lamination applications are unique, and will never likely be replaced by liquid coatings and varnishes, the same can be said of some coating and varnish applications. There are numerous graphic arts product applications where finished product expectations can be satisfied by an inexpensive overprint application of coating or varnish. In these cases it is the customers choice if a more expensive film lamination process is to be selected.

One unique evolving technology advance is the application of liquid coating to both narrow and wide format digital inkjet printer roll to roll output. Here, liquid coating application is competing with film lamination on transportation (fleet) graphics, indoor and outdoor signage and billboard applications.

When pondering the protection of graphic arts products consider the economic benefits of liquid coatings and varnishes, both aqueous and UV, especially UV when you're seeking higher gloss, scuff and chemical resistance.

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References: Pamela Mortimer, "Laminates Add Value, Boost Profits", Digital Output, (Jan 2002)
Jeff Peterson, "New Innovations with Film Laminating", Inside Finishing, (Feb – Mar 2002)