FILE NOTE

Re: Urethane Coated Fabric

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Discussed above subject with Werner H. Seidler, Textile Engineer, Bayer Dyestuffs & Chemicals Ltd., Pte. Claire.

Bayer's interest in this field is the supply of resin systems to coaters. They also have a licensing arrangement in Europe for "Vistram" a urethane coated fabric. The license includes use of the Vistram name, which Bayer promotes, and requires conformation by the coater to fabric and coating specs established by Bayer to maintain the quality standard of Vistram. There are no licensees in North America since the Vistram name has not been promoted and has no particular value here.

Resintex in Barcelona is a licensee of Bayer and is supplying SEAT operations in Spain.

Processes

Two processes are used in making urethane coated fabric - direct application to fabric and transfer method. Vistram is produced by direct application, a process requiring 4 or 5 passes through the coating/curing cycle. It is not recommended for the North American market because of cost of multi-pass system. The inference was left that European manufacturers could also have trouble competitively.

The transfer method is being used by all but one manufacturer in the U.S. and Canada. This process is similar to that used in the plastisol coating method for PVC.

Three alternate techniqhes are used as indicated in Fig. I.

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In Method I, the coated paper is rolled up and cured 24 hrs. Subsequently the web is put through the machine again to apply adhesive and fabric.

In Method II, fabric is brought in contact with the coating while wet and then dried. This method requires the greatest care in maintaining operating conditions.

In Method III, the operations of Method I are in tandem.

In all cases a 24 hr cure of the rolled up goods is required. Subsequently the coated fabric is stripped off the paper, the latter re-used several times.

In configuration, the equipment of Method III is similar to General Tire's plastisol expanded vinyl coater at Toledo with the exception that the latter has a third, blowing oven in series with the gelling ovens.

Equipment Design

Recommended coaters are the knife type - either knife-over-roll (rubber or steel) or knife-over-blanket (or both, on a turret, for maximum flexibility). Reverse roll coater not widely used.

Drying of urethane solution is critical to obtain good product. Temperature requirements are modest since only necessary to drive off solvent (ethyl acetate). Initial temp should be low to prevent surface gelling and entrapment of solvent. Recommend a 2 or 3 stage dryer, counter current flow, so that temperature can be separately controlled along length of dryer and gradually raised. Speed of travel about 15 yds per minute.

European machinery manufacturers are recognized as being advanced in drying equipment design. Canadian textile producers for example largely use European equipment.

A listing of companies supplying coating equipment was provided by Bayer. Copy in file.

Coatings

Bayer offer two coatings:

Impranil CHW - for apparel, handbag etc
Impranil C - for upholstery



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Impranil C produces a little harder film, and is more stable to hydrolysis under extremes of heat and humidity. These are polyester prepolymers, sold in solid chips (100% active) which are dissolved for use in ethyl acetate or MEK to a 30% solution. Resin has a 6 months life at 70°F. Crosslinking is done by isocyanates - Imprafix TH, and accelerator - Imprafix BF. Film formulation is:

Impranil 30% - 100 parts
Imprafix TH 75% - 5
Imprafix BF 10% - 5

Pot life of the formulation is 6 - 8 hours.

Adhesive coats are produced from Impranil modified with a high boiling plasticizer eg methyl glycol acetate.

Impranil data sheets are on file.

Urethane formulations are pigmented with both opaque and coloured pigments. Santocel is used for dull finish. The finished coated fabric may also be lacquered VCF sealer/printer.

Film weight on the finished product is in range of 3 to 4 oz per $yd^2$.

Other manufacturers are also offering blocked isocyanate formulations which depend on the evaporation of the blocking agent to initiate the chemical reaction.

Fabrics

All fabrics used in urethane coating are napped or brushed. Good hand of the final product requires a high density of erect fibres onto which the urethane film is laid.

Both brushed woven fabrics (eg sateens) and jerseys are used. Brushed nylon jersey is common. Weight and type dependent on product application.

Only woven (stable) fabrics can be directly coated by the Vistran process. Jerseys require the transfer process.

Dominion Textile produces brushed cotton fabrics. Burlington has brushed nylon knit.

Specifications on fabrics are forthcoming from Seidler.

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Release Paper

S.D. Warren is the only release paper producer being the same company supplying the plastisol VCF processors. The company has substantial process information available and a tech service laboratory with a lab size coater. This will be a good contact for technical information.

General

Bayer has a pilot coating unit 20" at Union, New Jersey - Verona Dyestuffs.

Seidler will supply us names of leading coaters in Europe for our review as potential licensors. He mentioned Horschu as a leader.

E.H. Toombs

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