

# W H I T E P A P E R

## Coated Fabric Construction Basics

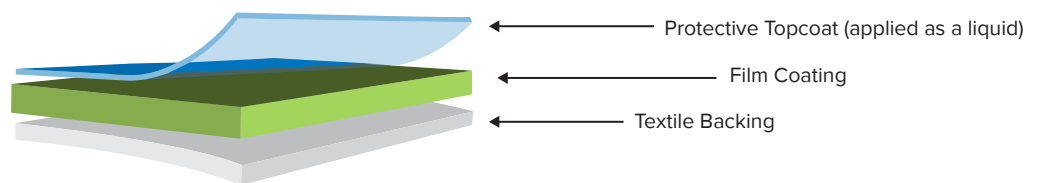
Coated fabrics, such as PVC (vinyl) and polyurethane (PU) upholstery, have a high degree of durability and cleanability. Although practically all coated fabrics have these attributes in common, they can be designed and produced using a range of materials and constructions, with each combination providing unique properties and advantages in end use.

## Construction Basics

Coated fabrics typically include three major elements: the protective topcoat, the film coating and the textile backing (Figure 1).

### Protective Topcoat

The topcoat layer is a protective finish applied to give the coated fabric upholstery enhanced durability and cleanability.



**Figure 1.** Basic coated fabric construction

### Film Coating Layer

The most common types of film layer, or film coating, for upholstery are PVC and PU. There is also a combined PVC/PU film called semi-PU. Polyester coating is often used as a film layer for awnings and boat covers.

### Textile Backing

A variety of textile backings are used in coated fabric upholstery including woven, nonwoven and knit. Each strongly influences the overall character of the upholstery.

# The Film Coating Layer

The film layer is the key component of the coated fabric, giving the upholstery its look and feel. It can be developed using a range of materials and methods to create the desired visual and tactile experience.

## PVC Upholstery

PVC upholsteries are very stain and abrasion resistant, soft to the touch and available in a range of textures, colors, and designs. They can be formulated without halogens or heavy metals, providing a balance of aesthetics, performance and environmentally-preferred features.

## Calendered Vinyl Upholstery

Many vinyl coated fabrics are produced using a calendaring process in which PVC is mechanically fused to the textile backing using heat and pressure (Figure 2). This vinyl upholstery is available in two types, expanded and non-expanded.

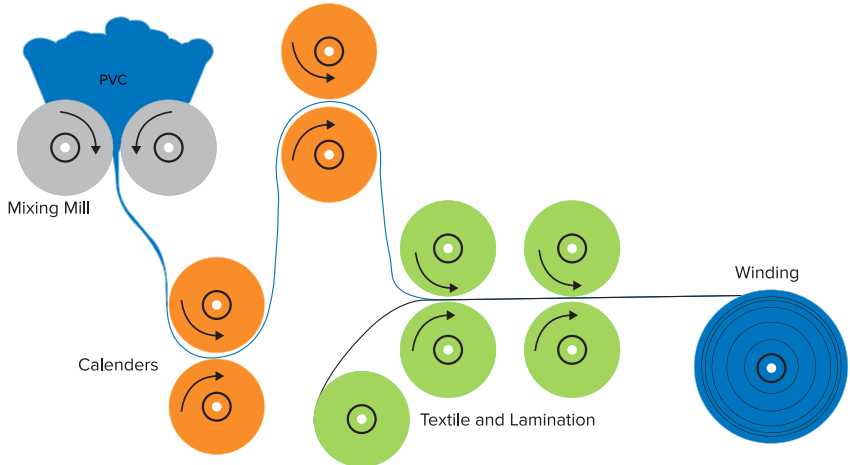


Figure 2. Calendered PVC Vinyl production process

For the highest durability, non-expanded, or solid, vinyl is recommended (Figure 3). For a softer touch, consider an expanded PVC construction, featuring a foamed layer within the vinyl (Figure 4).

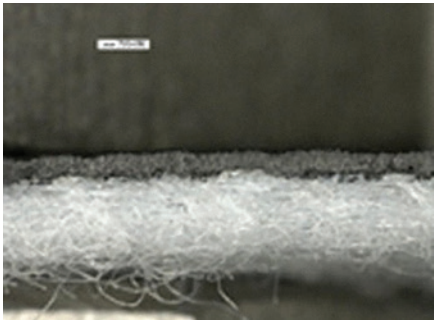


Figure 3. Magnified cross-section of non-expanded PVC

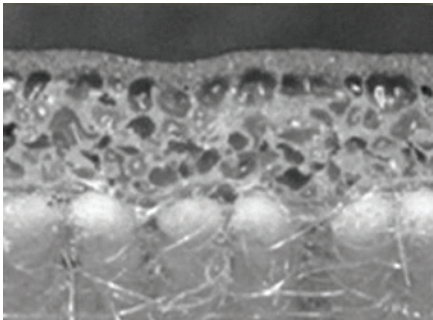
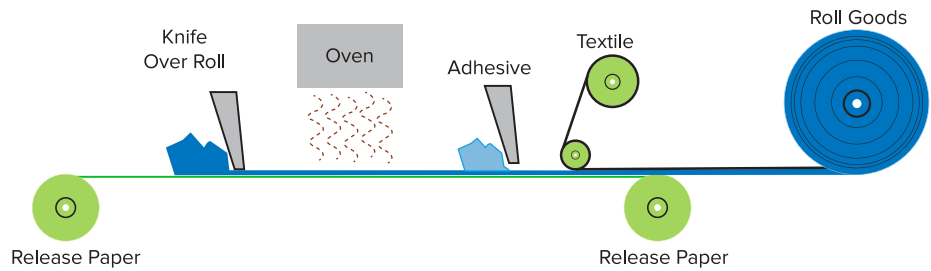


Figure 4. Magnified cross-section of expanded PVC Vinyl

## Cast Vinyl Upholstery

In the cast process, a PVC dispersion is coated onto a release paper and then laminated to the textile with an adhesive and cured in an oven (Figure 5). Cast products have a softer hand than either expanded or non-expanded calendared vinyl.



**Figure 5.** Cast PVC production process

## PU Film

OMNOVA's PU coated fabrics take softness one step further by featuring a luxurious touch for the ultimate in comfort. They are cast onto a release paper in the same process illustrated above.

## Semi-PU Film

Semi-PUs have an expanded PVC layer with a PU topcoat. They are typically manufactured in a cast process. Semi-PU coated fabrics provide the softness of a PU but with a slightly lower price tag.

## Polyester Film

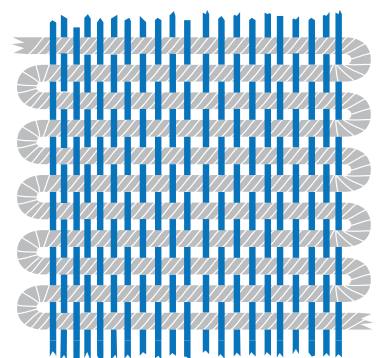
Polyester films are used for outdoor applications such as boat toppings, where UV stability and fabric strength are needed. They are typically urethane top coated for weave stability and offer a good balance of strength and lightness.

# Textile Backings

There are a variety of textile backings used in coated fabric upholstery, each strongly influencing the overall character of the upholstery.

## Woven Backing

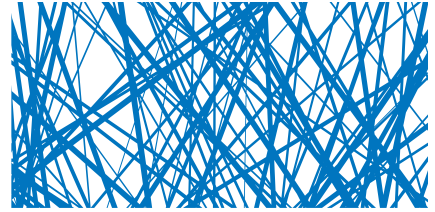
Woven textiles are produced by the interlacing of yarns in the warp (machine) and weft (cross machine) directions (Figure 6). Typically, woven textile's stretch and elongation are limited. They feature high tensile strength, puncture resistance and stability in use.



**Figure 6.** Magnified illustration of a woven backing

## Nonwoven Backing

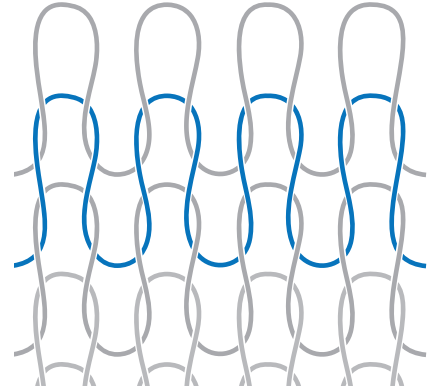
Nonwoven textiles used in coated fabrics are produced by mechanical interlocking (tangling) in a random web or mat (Figure 7). They are typically produced via needle punch method. They feature puncture resistance and improved loft and hand. However, sagging can occur across large, expansive areas.



**Figure 7.** Magnified illustration of a nonwoven backing

## Knit Backing

Knit textiles are produced by interlocking series of loops of one or more yarns. Knit textiles feature higher stretch than woven textiles and a surface that “bounces back” (Figure 8). Often, sewing of a coated fabric with a knit backing is done by turning the pattern to run on a diagonal of the backing and double stitching to resist tearing.



**Figure 8.** Magnified illustration of a knit backing

### Examples of Knit Textile Backings:

- Polyester Jersey Knit
- Polyester Terry Loop Knit
- Lockstitch Knit
- Filament Polyester Knit
- Double Knit

## Protective Topcoat Finishes



### PreFixx® Protective Finish:

**PreFixx** performance finish features industry-leading ease of cleanability, stain and chemical resistance and durability, benefiting a wide range of markets and applications.

### Clear Vinyl (CV) Protective Finish:

Available in a range of gloss levels, CV offers good flexibility and moderate abrasion resistance. It is more economical but has lower cleanability.

OMNOVA Solutions designs and manufactures a complete range of coated fabrics for transportation, bus seating and marine, as well as healthcare, hospitality, and corporate office seating.

To order a kit of sample coated fabrics representing the different constructions discussed in this white paper, please visit [www.omnova.com/cfsamples](http://www.omnova.com/cfsamples)



[www.omnova.com](http://www.omnova.com)



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