

UNDERSTANDING COATED FABRICS: PVC, PU, TPE, SILICONE

There are 3 basic categories for upholstery:

- **Leathers:** made from the skin of cattle, goats, and pigs.
- **Woven Textiles:** made from 2 or more sets of yarns interlaced at right angles.
- **Coated Fabrics:** made from a textile substrate surface coated with a polymer compound.



There are 4 basic Coated Fabrics categories appropriate for upholstery:

1. Vinyl (PVC):

- Features
 - Inexpensive
 - Durable
- Trade Off's
 - Stiff and less flexible than other coated fabrics
 - Not breathable. Tends to make you sweat in a warm environment
 - Lack of stretch can lead to puddling over time
 - Most vinyls have poor chemical resistance to alcohol-based cleaners
 - Plasticizers (softeners) can leach out from exposure to chemical cleaners, leading to cracking
 - Environmental and health safety concerns with PVC and its additives

2. Polyurethane (PU):

- Features
 - Moderately priced
 - Soft and flexible
 - Breathable. Adjust to your body temperature for increased comfort.
 - Inherent stretch makes it easy to tailor
 - Higher grades can be durable
 - PVC-Free
- Trade Off's
 - Lower quality versions degrade when exposed to heat and humidity (hydrolysis)
 - Chemical cleaners can cause peeling and cracking
 - Some have poor elasticity (bounce back after being stretched) which can lead to puddling
 - Thin surface skin is susceptible to abrasion at the seams on furniture
 - Environmental and health safety concerns with some additives and from solvents used in the manufacturing process
 - Some PU's reduce the amount of solvent used by eliminating the foam layer, but are stiffer, less comfortable, and less resistant to cracking from chemical cleaners

3. Thermoplastic Elastomer (TPE): TPE is a blend of polymers formulated to enhance performance. Each formulation is unique, so it is hard to narrowly define the Features and Trade Off's. The following speaks to LDI's proprietary EnviroLeather™ TPE that has a polyurethane backbone but is designed to be more durable and more sustainable than traditional polyurethane coated fabrics.



- Features
 - Good environmental and health safety option
 - Durable
 - Soft and flexible
 - Breathable. Adjusts to your body temperature for increased comfort.
 - Resistant to degradation from heat and humidity (hydrolysis)
 - Resistant to peeling and cracking from chemical cleaners
 - Elastic to help retain a tightly tailored appearance
 - Good seam abrasion resistance
 - Does not contain additives such as plasticizers, flame retardants, antimicrobial biocides or perfluorochemicals
 - PVC-Free
- Trade Off's
 - Moderately expensive
 - There is solvent used during the manufacturing process. However, very little is left in the finished product; shown by passing indoor air quality testing for VOC emissions.

4. Silicone:

- Features
 - Good environmental and health safety option
 - Does not breathe like PU or TPE, but is thermally neutral to heat and cold
 - Resistant to degradation from heat and humidity (hydrolysis)
 - Enhanced stain resistance
 - Enhanced flame resistance
 - Elastic to help retain a tightly tailored appearance
- Trade Off's
 - Expensive
 - Shiny and waxy in feel
 - Gets tacky when exposed to chemical cleaners and abrasion



What to look for when specifying a coated fabric for commercial interiors:

- Minimum of 100,000 double rubs Wyzenbeek Abrasion
- Minimum 98% recovery when stretched in all directions
- Minimum 15 weeks Hydrolytic Stability using test method ASTM D 3690-02
- Passes CAL 01350 for low VOC emissions
- Ensure the material contains no:
 - Phthalate Plasticizers
 - Added Flame Retardants
 - Antimicrobial Biocides
 - Perfluorochemicals
- The reality is that very few product failures are due to defective material. Longevity of the product is directly related to how it is cared for. Encourage the facility to follow manufacturer's instructions on how to care for and maintain the product. However, due to infection control protocol this is often not practical. Thus, plan for the worst and evaluate the warranty:
 - Ensure the cleaning and disinfecting protocol of the facility does not void the fabric warranty
 - Ensure the warranty is not for single shift environments if the facility operates 24/7
 - Understand what is covered under the warranty if the claim is deemed valid. For instance, who is responsible for labor?