

Vibrant Printed Textiles Guaranteed to Last! Introducing ColorArmor™ and the SolidSkinTec® Process.

Why Do Colors Fade?

When sunlight strikes a printed fabric, invisible ultraviolet (UV) rays break down the chemical bonds that give inks their colors. This process, called *photodegradation*, progressively bleaches dyes and pigments. Heat and oxygen accelerate the reaction, and dyes embedded in textiles are particularly vulnerable. Once the binder that holds the pigment together is compromised, the colors wash out and the fabric becomes brittle.

The Challenge of Printed Textiles

Architectural wraps, tensile structures and sun-shading fabrics are often protected with a thin clear varnish. These traditional coatings act as sacrificial skins: they slow down UV damage and weathering but remain porous. Moisture, pollution and plasticisers from the fabric can still migrate into the ink layer, causing mould, mildew and adhesion failure. Over time the topcoat yellows, cracks and peels away, leaving the print dull and vulnerable.

For a commercial project where appearance is critical and maintenance budgets are tight, fading and mildew are unacceptable. As a result, many architects have been reluctant to specify printed textiles for long-term exterior use.

ColorArmor® and SolidSkinTec®

ColorArmor™ (North America) and Printable (European Union) are the only two companies in the world licensed to apply SolidSkinTec®'s patented print-to-polymer processes developed to solve the challenges of printed textiles. Rather than spraying on a simple clear coat, the SolidSkinTec® process fuses the ink and protective barrier into the fabric itself. The process starts with a specialised primer that anchors to PVC or PES/PVC textiles and blocks plasticisers. Solvent-based inks then penetrate into this primer and polymerise inside the upper microlayers of the substrate, locking the pigments in place. Finally, a high-solids, two-component polyurethane encapsulation layer is applied. During an extended cure cycle the polyurethane wets and interpenetrates the ink matrix, crosslinking into a dense, flexible barrier. UV absorbers and free-radical stabilisers are blended throughout the film to convert harmful UV into heat and quench any radicals before they can attack the pigments.

The result is not a coating, but a seamless polymer envelope that chemically bonds substrate, primer, ink, polyurethane and stabilisers into a single macro-network.

Your colors become part of the textile, wrapped in molecular armor.

How It Works — A Simple Analogy

Think of ColorArmor™ as constructing a façade:

- **Foundation:** A specially formulated primer bonds to the underlying fabric and isolates it from plasticisers that would otherwise seep upward and soften the protective layer.
- **Anchored Design:** The solvent ink doesn't sit on top like paint; it sinks into the primer and the fabric itself, becoming part of the structure. This prevents peeling and ensures that colours are mechanically locked in.
- **Structural Cladding:** A thick, high-solids polyurethane layer is applied and allowed to cure for several days. During curing, the network densifies and crosslinks, creating a tough yet flexible barrier. UV absorbers and hindered amine stabilisers are integrated like tinted, laminated glass that blocks both sunlight and the heat it produces.
- **Finishing Touches:** The surface becomes hydrophobic and self-cleaning, similar to the lotus effect. Dirt, moisture and mould cannot adhere, so the print stays bright and the fabric remains flexible.

Benefits for Your Project

- **Long-Lasting Colours:** Independent testing by TÜV-TNO and the COT Institute showed that SolidSkinTec® prints maintained color intensity, adhesion and flex-resistance after the equivalent of 10 years of outdoor exposure. ColorArmor™ now offers printed textiles with replacement guarantees up to ten years against exterior exposure and UV color fading.
- **Dirt and Mildew Resistance:** The hydrophobic surface created by the fusion process repels water, dirt and bacteria; moisture and mould particles cannot adhere. Cleaning is simple—often rainwater is enough—and aggressive chemicals are unnecessary.
- **UV and Pollution Protection:** UV absorbers convert harmful rays to harmless heat, while hindered amine stabilisers neutralise free radicals. This dual action prevents UV from breaking down the pigments and polymer binder. The polyurethane film also blocks oxygen, moisture and pollutants from reaching the ink.
- **Flexibility and Strength:** The polyurethane encapsulation expands and contracts with temperature changes and resists impact without cracking. It is tough enough for truck curtains, building wraps and tensile structures yet flexible enough to remain taut.
- **Wide Creative Freedom:** SolidSkinTec allows you to print any color on a wide range of mesh and solid membranes. The result is vibrant facades, sun shades and tensile structures that can be matched exactly to your design intent and withstand extreme environments.

- **Guaranteed Performance:** Printable Technical Textiles is the only provider offering a 10-year warranty on UV resistance, dirt repellence, ink adhesion and crack initiation. This guarantee is backed by more than fifteen years of research and independent testing

Real-World Applications

ColorArmor™ and SolidskinTec® are used in award-winning architectural projects around the world. From the 2,000 m² textile facade at the Puma Headquarters near Boston to intricate sun-shade roofs on high-end hotels, these systems deliver vivid graphics and durable performance. They have been proven on truck side curtains, tents and outdoor advertising banners that endure extreme weather, air pollution and mechanical stress.

Conclusion

For architects seeking to incorporate printed textiles into their designs without compromising on longevity or aesthetics, ColorArmor™ and SolidskinTec® offer a compelling solution. By fusing the ink with the textile and wrapping it in a thick polyurethane shield, these systems deliver vibrant colours that stand up to sun, rain, pollution and time. They resist dirt and mildew, require minimal maintenance and carry an unmatched 10-year guarantee on appearance and performance. In short, they unlock the creative freedom of textile architecture—without the fading and failures of the past.