

PPG TESLIN® Substrate

High-performance synthetic paper  
for demanding applications



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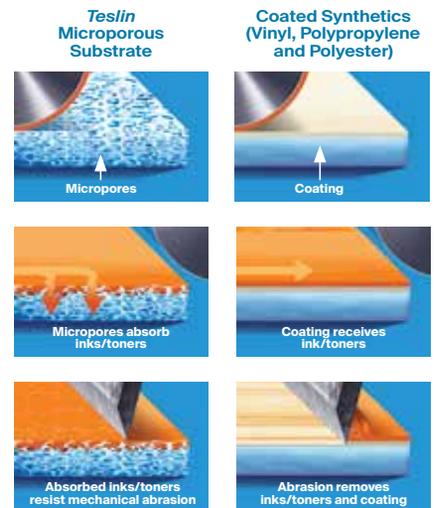
We protect and beautify the world™

# Engineered for durability. Designed for innovation.

Durable, secure and highly-printable, PPG's TESLIN® substrate is a synthetic paper with a legacy of success for highly specialized and common everyday uses by people, businesses and institutions around the world.

Due to its microporous structure, *Teslin* substrate absorbs inks, toners, adhesives and laminates and locks them into its surface, providing an exclusive combination of benefits that pulp-based paper and other synthetic substrates cannot replicate.

When you work with PPG, you also gain access to a broad array of product-development and problem-solving capabilities. We are dedicated to providing highly responsive, personalized service through a team of trained and expertly skilled technical specialists, product researchers and sales representatives.



*The microporous structure of Teslin substrate (above, left) enables it to absorb and lock inks and toners into its surface, rendering printed data virtually impervious to mechanical abrasion. Conversely, non-porous substrates (above, right) leave printed data vulnerable to damage or alteration.*

## Performance benefits

### Extreme durability



Combining the strength and dimensional stability of polyolefin with the absorbency of silica, *Teslin* substrate is highly resistant to water, chemicals, solvents, abrasion, tearing, gamma irradiation, dry-cleaning and steam-pressing. Few synthetic substrates offer such a versatile and extensive array of durability benefits.

### Exceptional print versatility



*Teslin* substrate is compatible with a wide range of print technologies, including inkjet, laser, thermal transfer, offset, flexography, gravure, screen, intaglio and more. In addition to being engineered for brilliant color reproduction of high-definition photos, logos and graphics, *Teslin* substrate requires no special inks, drying equipment, long dry times or corona treatment for digital printing.



Magnified image of the *Teslin* substrate surface

### Built-in security



*Teslin* substrate is inherently secure because it is tear-resistant and locks in inks, toners and laminates to provide a high level of tamper-evident protection. For added security, *Teslin* substrate can be embedded with customized covert and program-specific forensic security features that facilitate credential authentication and deter counterfeiting.

### Powerful mechanical bonding



Laminates and adhesives flow into the pores of *Teslin* substrate, creating powerful bonds that make it up to 10 times more resistant to delamination than other synthetic substrates. Unlike with most papers, laminated projects featuring *Teslin* substrate do not require edge-sealing, enabling pieces to be die-cut into any shape for one-of-a-kind designs.

### Diffusion



*Teslin* substrate's microporous structure enables the transmission of air, vapor and other gases, while offering a functional physical barrier. It also dissipates static to reduce risks associated with electric discharge (passes ESD S.541 @ 50% relative humidity).

# For versatility and value, trust *Teslin* substrate

The durability, printability, security, bondability and porosity make *Teslin* substrate the right choice for a wide range of applications.



With *Teslin* substrate, there's no need to sacrifice beauty for toughness. *Teslin* substrate combines exceptional color reproduction, a luxurious texture, superior lamination strength and digital print compatibility with the resilience of a printable plastic. The result is enhanced appearance and durability for all types of printed and laminated materials, including:

## Typical applications

- Race bibs
- Luggage tags
- Waterproof maps
- Menus
- Temporary license plates
- Heavy-duty manuals
- Laminated signs
- Wristbands
- Ultra-durable point-of-purchase displays

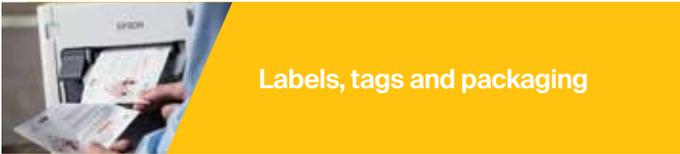
In addition to withstanding everyday use, laminated cards and key tags are commonly required to accommodate magnetic strips, RFID circuits and other embedded electronics, all while maintaining the colorful graphics and high-quality appearance brand owners demand.

*Teslin* substrate answers the challenge with superior lamination strength, data protection, cushioning and a broad range of printing and finishing options. The result is durable, long-lasting and attractive laminated cards and key tags.

## Typical applications

- Smart cards
- Loyalty cards and key tags
- Health care/insurance cards
- Library cards
- Student identification cards
- Financial cards
- Membership cards





### Labels, tags and packaging

*Teslin* substrate unites the advantages of conventional pulp paper with a combination of durability and printability that is unique among synthetic label stocks. Because of its ability to accommodate digital and laser technologies, *Teslin* substrate supports on-demand and variable-data printing.

Extraordinary toughness, bubble-free surface application, static dissipation and the ability to protect data from deliberate tampering and exposure to abrasion, water, chemicals and solvents also make *Teslin* substrate one of the world's most trusted materials for demanding labeling applications.

#### Typical applications

- Pressure-sensitive/self-adhesive labels
- Static-reducing labels
- GHS-compliant labels
- BS 5609-certified labels
- Tamper-evident labels
- Supply-chain security labels and packaging
- Drum, pallet and shipping labels
- Identification, safety and warning labels
- Food, beverage and wine labels
- Medical, pharmaceutical and blood bag labels
- Cleanroom labels
- Nursery and horticulture tags
- In-mold labels



### Government IDs and driver's licenses

Governments, security agencies and other organizations in more than 90 countries rely on *Teslin* substrate to produce credentials that are easy to authenticate, hard to replicate and economical to process.

Used in combination with conventional synthetic card substrates, *Teslin* substrate provides durability, printability, cushioning and lamination strength to enhance the security and prolong the life of printed and electronic ID cards, together with high-resolution and vivid color personalization that make them easier to authenticate.

Inherently tamper-evident, *Teslin* substrate also can be manufactured in program-specific formulations to meet the demands of the industry's most sophisticated secure credentials applications.

#### Typical applications

- National IDs and driver's licenses
- Voter registration cards
- Social security cards
- Birth certificates and other breeder documents





Teslin substrate enables educational, financial, governmental and other institutions to protect the security of certificates, personal records, diplomas, transcripts and other documents while streamlining production and allowing in-house personalization.

In addition to accommodating color-shifting and fluorescent inks, microprint, guilloches, intaglio and other security features, Teslin substrate enables easy, high-quality color printing of photos and variable data.

Institutions can add prestige to documents with the rich, velvet-like texture of Teslin substrate, which fully accepts rubber-stamping, foil-stamping and hand signatures, and can resist delamination up to 50 times more effectively than paper.

**Typical applications**

- Diplomas and mark sheets
- University certificates
- Professional certificates
- Title and deeds
- Bonds and corporate stock certificates
- Birth, death, marriage and citizenship certificates
- Vehicle registrations and other owner documents



Already integrated into millions of e-Passports around the world, Teslin substrate is engineered to protect and support these critical security documents through its ability to fulfill three essential functions:

- Cushion and protect RFID inlays and embedded electronics
- Provide tamper-evident security via highly-bondable lamination performance
- Meet 10-year service-life mandates



The microporous nature of Teslin substrate facilitates the flow of various liquids and gases, while providing strength and a barrier to other materials. Optional surface coatings can be applied to Teslin substrate to further optimize its inherent absorption, transmission and permeability characteristics.

**Typical applications**

- Fragrance diffusion in air-fresheners
- Medical or food labels requiring targeted delivery of moisture, airborne contaminants and gases such as oxygen.



# Teslin substrate product grades

Teslin substrate is available in a range of product grades to address specific application requirements. The chart below helps users identify the best Teslin substrate grade for specific applications and printing processes.

Product	Recommended Print Technologies	Grade	Thickness	
			Mil	Micron
<b>Teslin SP substrate</b> A high-quality, all-purpose substrate, SP designates the standard product line.	<ul style="list-style-type: none"> <li>• Offset</li> <li>• Flexography</li> <li>• Gravure</li> <li>• Intaglio</li> <li>• Thermal Transfer</li> <li>• Inkjet (pigment-based)</li> </ul>	600 700 800 1000 1200 1400 1800	6 7 8 10 12 14 18	145 178 203 254 305 356 457
<b>Teslin HD substrate</b> Greater stiffness, tear resistance and UV light stability than other Teslin products/grades. Tested to survive high temperatures for extended time periods, making it suitable for difficult in-mold applications, such as vulcanization.	<ul style="list-style-type: none"> <li>• Offset</li> <li>• Flexography</li> <li>• Gravure</li> <li>• Intaglio</li> <li>• Digital</li> <li>• Thermal Transfer</li> <li>• Inkjet (pigment-based)</li> </ul>	700 1400 1800	7 14 18	178 356 457
<b>Teslin TS substrate</b> For applications where fixed graphics are printed before digital or laser variable data printing. Thermally stabilized (TS) substrate is more resistant to shrinkage when exposed to high temperatures.	<ul style="list-style-type: none"> <li>• Offset</li> <li>• Flexography</li> <li>• Gravure</li> <li>• Intaglio</li> <li>• Digital</li> <li>• Thermal Transfer</li> <li>• Laser (B&amp;W, color)</li> <li>• Inkjet (pigment-based)</li> </ul>	600 700 800 1000 1200 1400	6 7 8 10 12 14	145 178 203 254 305 356
<b>Teslin SPID substrate</b> Pre-coated to enhance conveyance and release from fuser in laser (xerographic) printers that apply fuser oil to the fuser roll.	<ul style="list-style-type: none"> <li>• Laser (B&amp;W, color)</li> </ul>	600 700 800 1000 1200 1400	6 7 8 10 12 14	145 178 203 254 305 356
<b>Teslin Digital substrate</b> Developed specifically for Xeikon® digital print models, and unlike other synthetics, does not require coating.	<ul style="list-style-type: none"> <li>• Digital</li> <li>• Thermal Transfer</li> <li>• Laser (B&amp;W, color)</li> <li>• Inkjet (pigment-based)</li> </ul>	1000	10.5	267
<b>Teslin IJWP substrate</b> Developed to be waterproof (WP) for two-sided, dye-based inkjet (IJ) applications.	<ul style="list-style-type: none"> <li>• Inkjet (pigment-based)</li> <li>• Inkjet (dye-based)</li> </ul>	600 700 800 1000 1200 1400	6 7 8 10 12 14	145 178 203 254 305 356
Application-Specific Grades				
<b>Teslin Food-Grade substrate</b> Fully compliant under U.S. Federal Food and Drug Administration (FDA) and all applicable U.S. food-additive regulations as a food contact material, the product is not limited by food type, amount of material used or operating conditions. It is also certified by ISEGA, passing all overall migration limits involving food contact with dry foods with no free fats at the surface at room temperature and below, as defined by Commission Directives 2006/141/EC and 2006/125/EC.	<ul style="list-style-type: none"> <li>• Offset</li> <li>• Flexography</li> <li>• Gravure</li> <li>• Digital</li> <li>• Thermal Transfer</li> <li>• Laser (B&amp;W, color)</li> <li>• Inkjet (pigment-based)</li> </ul>	600 700 800 1000	6 7 8 10	145 178 203 254
<b>Teslin Blue substrate</b> Similar to the standard product, Teslin Blue substrate has a 12% to 15% whiter appearance.	<ul style="list-style-type: none"> <li>• Offset</li> <li>• Flexography</li> <li>• Gravure</li> <li>• Intaglio</li> <li>• Digital</li> <li>• Thermal Transfer</li> <li>• Laser (B&amp;W, color)</li> <li>• Inkjet (pigment-based)</li> </ul>	600 700 800 1000 1200 1400	6 7 8 10 12 14	145 178 203 254 305 356
<b>Teslin Biodegradable substrate</b> Environmentally responsible material breaks down into microbe-consumable particles in anaerobic conditions. Studies show 7.8% degradation over 74 days, with continued breakdown expected.	<ul style="list-style-type: none"> <li>• Offset</li> <li>• Flexography</li> <li>• Gravure</li> <li>• Digital</li> <li>• Thermal Transfer</li> <li>• Laser (B&amp;W, color)</li> <li>• Inkjet (pigment-based)</li> </ul>	600 700 800 1000 1200 1400	6 7 8 10 12 14	145 178 203 254 305 356
<b>Teslin Security-Grade substrate</b> Sold through a secure supply chain and manufactured with security features embedded in the material. Can be supplied with program-specific formulation.	<ul style="list-style-type: none"> <li>• Offset</li> <li>• Flexography</li> <li>• Gravure</li> <li>• Intaglio</li> <li>• Digital</li> <li>• Thermal Transfer</li> <li>• Laser (B&amp;W, color)</li> <li>• Inkjet (pigment-based)</li> </ul>	600 700 800 1000 1200 1400	6 7 8 10 12 14	145 178 203 254 305 356

For added assurance, please contact PPG to find out which grade is recommended for your application and print technology.

PPG gives no guarantees and strongly advises that pre-test qualification of material, processes and equipment be conducted, along with testing to ensure suitability.

## PPG: We Protect and Beautify the World.™

PPG TESLIN® Substrate Products group is part of the Specialty Coatings and Materials business, headquartered in Monroeville, Pennsylvania (USA), near our global corporate headquarters in Pittsburgh. Founded in 1883, PPG employs more than 45,000 people in 70 countries.

From lightweight coatings for airplanes and colorful paints for your living room to synthetic paper that makes labels more durable and secure, we create high-performance products that drive innovation around the world.



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### Production Notes

Brochure printed on *Teslin* SP1000 Blue substrate (10 mil/254 microns) with gloss UV coating.

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