PPG TESLIN® Substrate

Technical Data Sheet

PPG TESLIN® substrate is a microporous, dimensionally stable, highly filled, single-layer, polyolefin-based synthetic material. A non-abrasive inorganic filler comprises 60 percent of the weight, and it is 65 percent air by volume. The porous, uncoated nature of *Teslin* substrate absorbs inks, adhesives, coatings and laminates into its structure to form strong, interlocking bonds with the substrate.

Typical Properties[1]	SP600	SP700	SP800	SP1000	SP1000 Digital	SP1200	SP1400	HD1400	SP1800	HD1800	Reference
Gauge (microns)	148	178	203	254	267	305	356	356	457	457	ASTM D-3776
Gauge (mils)	5.8	7	8	10	10.5	12	14	14	18	18	ASTM D-374
Yield (m²/kg)	10,3	8,7	7,5	6,0	5,2	4,9	4,1	3,4	2,9	2,8	
Yield (in²/lb)	7513	6263	5143	4150	3672	3511	2907	2549	2032	1931	
Grammage (g/m²)	97	115	134	167	194	206	243	290	345	363	
Basis weight (oz/sq yd)	2.8	3.3	3.9	4.9	5.8	6.1	7.4	8.7	10.2	10.7	
Density (g/cc)	0,63	0,64	0,66	0,69	0,74	0,70	0,71	0,85	0,79	0,82	
Tensile Properties											
MD Tensile Strength (N/cm)	22,8	25,2	28,8	34,3	44,4	40,6	43,8	57,8	54,3	61,3	
MD Tensile Strength (lb/in)	13.0	14.4	16.5	19.6	25.4	23.2	25.0	33.0	31.0	35.0	
Elongation %	600	650	700	750	760	770	790	860	660	770	ASTM D-882
Stress at 1% strain (N/cm)	6,0	5,8	6,3	7,4	7,5	8,1	7,4	8,6	7,9	12,3	
Stress at 1% strain (lb/in)	3.4	3.3	3.6	4.2	4.3	4.6	4.2	4.9	4.5	7.0	
CD Tensile Strength (N/cm)	9,3	10,3	11,6	15,1	18,6	17,0	19,6	24,5	25,9	28,0	
CD Tensile Strength (lb/in)	5.1	5.9	6.7	8.4	11.0	9.7	11.0	14.0	14.8	16.0	
Elmendorf Tear MD (g) [2]	66	93	111	183	226	267	253	349	300	480	ASTM D-1922
Brittleness Temperature	<-70°C	<-70°C	<-70°C	<-70°C	<-70°C	<-70°C	<-70°C	<-70°C	<-70°C	<-70°C	ASTM D-746
Brittleness Temperature	<-94°F	<-94°F	<-94°F	<-94°F	<-94°F	<-94°F	<-94°F	<-94°F	<-94°F	<-94°F	
Max. shrinkage[3] (%)	4,0	4,0	4,0	4,0	4,0	4,0	4,0	4,0	4,0	4,0	
Optical Properties											
Brightness %	90	90	90	90	90	90	90	90	90	90	ISO 2470
Whiteness Index	80	80	80	80	80	80	80	80	80	80	ASTM E-313
Opacity (%)	90	92	94	96	95	98	98	99	99	99	ISO 2471
Transmission (%)	17	15	11	8	9	6	5	4	3	3	ASTM D-1003
Sheffield Smoothness											
Top	46	41	44	42	54	42	40	49	63	55	ASTM T-538
Bottom	74	64	65	66	95	61	54	99	97	123	
Master Roll Configuration[4]											
Roll Length (m)	2134	1829	1601	1524	1280	1143	1006	1006	732	732	
Roll Length (ft)	7000	6000	5250	5000	4200	3750	3300	3300	2400	2400	
Roll Weight (kg)	298	305	311	368	363	341	354	422	365	384	
Roll Weight (lb)	657	673	685	812	800	751	781	930	805	847	

[1] Typical properties are meant to be informative of the product's general characteristics and should not be used for setting specifications.

[2] MD = machine direction. *Teslin* substrate is highly resistant to tearing in the cross-direction (CD)

[3] Measured at 135°C/275°F for 15 minutes in a forced air oven.

[4] Standard master roll width is 57”/1447mm and 28”/711mm OD. 40”/1016mm OD rolls available upon request. Custom widths up to 61”/1549mm available upon request. Master rolls are put up on 6”/152mm ID cores. PPG can also supply custom sheet sizes for all product grades.

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PPG TESLIN® substrate is available in a range of product grades to meet specific print and application requirements. For added assurance, contact PPG to learn which grade is recommended for your application and print technology.

Print Grades:

***Teslin* SP substrate**: A high-quality, all-purpose substrate. SP designates the standard product line. Available grades: 600, 700, 800, 1000, 1200, 1400, 1800.
***Teslin* HD substrate**: Offers greater stiffness, tear resistance and UV light stability than other product grades. Tested to survive high temperatures for extended time periods, making it suitable for in-mold applications. Available grades: 1400 and 1800.

***Teslin* TS substrate**: The maximum allowable shrinkage for Thermally Stabilized (TS) grade is 2% (2.5% for TS600). All other properties are the same for TS and SP grades. Available grades: 600, 700, 800, 1000, 1200 and 1400.

***Teslin* IJWP substrate**: Developed to support dye-based ink jet applications by allowing them to “hold out” and to make the print waterproof. Coated on both sides, the substrate is treated to optimize ink jet printability. All other properties are the same for SPID and SP grades. Available grades: 600, 700, 800, 1000, 1200 and 1400.

***Teslin* Digital substrate**: Developed specifically for Xeikon digital print models, and unlike other synthetics, does not require coating. Available thicknesses: 1000.

Application-Specific Grades:

***Teslin* Blue substrate**: *Teslin* Blue substrate has a 12 to 15 percent whiter appearance. All other properties are the same for Blue and SP grades. Available grades: 600, 700, 800, 1000, 1200, 1400.

***Teslin* EMI/RF (electromagnetic interference/radio-frequency) shielding material:** For electronic applications that require shielding to function properly, protect RF transponders from illegitimate reading or writing, or provide a durable grounding path.

***Teslin* Food-Grade substrate**: Fully compliant under U.S. Federal Food and Drug Administration (FDA) and all applicable U.S. food-additive regulations as a food contact material, 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 European Regulation (EC) No 1935/2004 and Regulation (EU) No 10/2011 of 14 January 2011. All other properties are the same for Food Grade and SP grades. Available grades: 600, 700, 800, 1000.

***Teslin* Bio substrate**: Sustainably advantaged material breaks down into microbe-consumable particles in anaerobic conditions. Studies show 7.8% degradation over 74 days, with continued breakdown expected, but it isn’t known if the rate of degradation for the portion of *Teslin* Bio substrate that will degrade naturally will remain constant over time. ASTM D5511 testing conducted by independent third-party. All other properties are the same for Bio and SP grades. Available grades: 600, 700, 800, 1000, 1200, 1400.

***Teslin* Security-Grade substrate**: Manufactured with security features embedded in the material. Can be made for program-specific applications. All other properties are the same for Security-Grade and SP grades. Available grades: 600, 700, 800, 1000, 1200, 1400.

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