POLYVANTIS

PRODUCT DATASHEET

LEXAN™ HPxxX FILM

DESCRIPTION

LEXAN™ HPxxX graphic film is a first-surface printable high-performance coated film offering high quality chemical/abrasion resistance, plus very good UV resistance. There performance capabilities, along with LEXAN film's ease of processing, make HPxxX film a good choice for outdoor and indoor graphic applications where color stability and the ability to use light or white ink systems are important. Suitable applications include: Appliance Labels, Warning Labels on Outdoor Equipment, Gasoline Pumps, Outdoor Lenses, Marine Graphics, Outdoor Menu Boards

TYPICAL PROPERTY VALUES*

PROPERTY	ASTM (ISO) TEST METHOD	UNITS USCS (SI)	VALUE
MECHANICAL			
Tensile Strength @ Yield	ASTM D882 (ISO 527)	psi (MPa)	8800 (60)
Ultimate	ASTM D882 (ISO 527)	psi (MPa)	9000 (62)
Tear Strength			
Initiation	ASTM D1004	lb/mil (kN/m)	1.51 (264)
Propagation	ASTM D1922	g/mil (kN/m)	40 (14)
THERMAL			
Vicat Softening Temperature, B	ASTM 1525	°F (°C)	320 (160)
Heat Deflection Temp. by TMA at 1.8	ISO 75 Modified	°F (°C)	290 (145)
Shrinkage at 302°F (150°C)	ASTM D1204	%	1.40%
PHYSICAL			
Density	ASTM D792 (ISO 1183)	slug/ft^3 (kg/m^3)	2.3 (1200)
Surface Energy (1st surface / 2nd surface)	ASTM D5946-01	-	37/34
Surface Tension (1st surface / 2nd surface)	Dyne Pens	Dyne	36-38/38-40
Pencil Hardness (coated surface)	ASTM D3363	-	HB-F / B-HB
Taber Abrasion	ASTM D1044	delta Haze	11
OPTICAL			
Light Transmission	ASTM D1003	%	92
Yellowness Index	ASTM D1925	%	0.7
Haze	ASTM D1003	%	0.5
Gloss over Flat Black min/max @ 60	ASTM D523-60 (ISO 2813)	%	92 (92)
UV% Transmission at 380 nm	UV/Visual Spectroscopy	%	39

- These are typical properties and are not intended for specification purposes. If minimum certifiable properties are required, please contact your local POLYVANTIS representative or the POLYVANTIS Quality Services Department.
  Reported Values are based on 0.010" (0.250 mm) Thickness unless otherwise noted.

MANUFACTURING SPECIFICATIONS

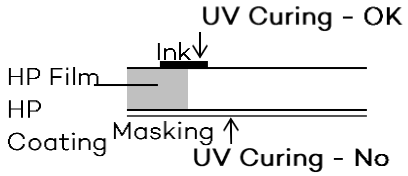
NOMINAL GAUGE RANGES	MIN./MAX LIMIT OF NOMINAL
0.007" (0.175mm)	- 10%/ +24%
0.010" (0.250 mm)	- 5%/+20%
0.015" (0.375 mm)	- 5%/+12%
0.020" (0.500 mm)	-5%/+10%

UV RESISTANCE

LEXAN™ HPxxX film utilizes a proprietary coating technology developed by POLYVANTIS. This special coating resists virtually all yellowing and hazing - no matter how bright the sun. With a yellowness index of less than 3.0 at 1000 hours of QUV testing, LEXAN HPxxX film is a natural choice for demanding outdoor applications and indoor applications where color stability and first-surface printability is important.

MASKING

The standard masking on HP film is not designed to have UV radiation (for curing) passed through it. If this is required, alternate masking is available. Please contact your sales representative for more details.



CHEMICAL AND ABRASION RESISTANCE

A unique feature of LEXAN HPxxX film is its receptivity to multiple-pass, first-surface decoration for selective textures and/or color graphics. This feature requires that the coating be chemically sensitive to a variety of ink formulations. As a result, the coating is subject to attack by aggressive industrial chemicals and some strong household cleaners. Both the chemical resistance and hardness of the coating can be enhanced by exposing the coated surface of the film to UV ink curing conditions. We recommend that only UV-curable inks which are compatible with LEXAN HP films be used. Please consult the LEXAN HP Films Technical Guide for more details. Along with very good UV resistance, LEXAN HPxxX film also has chemical and abrasion resistance comparable with the original HPxxS series of films.

TABER ABRASION RESISTANCE (ASTM D1044) LEXAN™ HPxxX GRAPHIC FILM

CONDITION CS10F WHEEL, 500 GRAMS	UNITS	AS MANUFACTURED	POST CURED ¥
25	Change in % Haze	1.5	2
50	Change in % Haze	2.5	3.4
100	Change in % Haze	3.5	5.5
200	Change in % Haze	7.5	13.1

¥ Post cure conditions: One elliptical focused medium pressure mercury vapor lamp at 300 watts/inch and a conveyor speed of 20 feet/minute

CHEMICAL RESISTANCE

CHEMICAL	RESULTS[†]	
One Hour Continuous Surface Contact at 73° F	**As Manufactured**	**Post Cured**
Acetone	Failed	Failed
MEK	Failed	Passed
Toluene	Passed	Passed
Methylene Chloride	Failed	Failed
Isopropyl Alcohol	Passed	Passed
Cyclohexanone	Passed	Passed
Ethyl Acetate	Passed	Passed
Xylene	Passed	Passed
40% NaOH	Passed	Passed
Concentrated HCl	Passed	Passed
Gasoline (Regular)	Passed	Passed
Gasoline (Unleaded)	Passed	Passed
Butyl Cellosolve	Failed	Passed
24 hour continuous Surface Contact at 120°F		
Coffee	Passed	
Top Job[¥]	Passed	
Fantastik [##]	Passed	
Formula 409 [#]	Passed	
Windex w/ Ammonia D [###]	Passed	
Wisk [¶]	Passed	
Downy [#]	Passed	
Spray N Wash[##]	Passed	
Clorox[*]	Passed	
Mustard	Failed	
Mr. Clean [#]	Passed	
Ketchup	Passed	
Tea	Passed	
Tomato Juice	Passed	
Lemon Juice	Passed	
Grape Juice	Passed	
Vinegar	Passed	
Milk	Passed	

[†] Failure constitutes any of the following: non-removable stain or cloudiness, blistering, delamination, or cracking of the coating or failure to pass crosshatch tape adhesion.

[¶] Wisk is a registered trademark of Lever Brothers Company

[#] Formula 409 and Clorox are registered trademarks of the Clorox Company

[#] Top Job, Downy, and Mr. Clean are registered trademarks of Procter & Gamble

[##] Fantastik and Spray 'N Wash are registered trademarks of Texize, Division of Norton Norwich Products, Inc.

[###] Windex w/Ammonia D is a registered trademark of Drackett Products Company

SAFETY

The processing guidance given in this documentation is given in good faith and the trust that in all cases you wear the correct Personal Protective Equipment (PPE), e.g. helmet, proper gloves, safety goggles etc. to safely fabricate, e.g. (but not limited to) sawing, cutting, forming our sheets and films. In all cases you should follow local and national regulations around the wear of PPE's prescribed or mandatory to perform these tasks in a safely manor

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