

Description:

POLYONICS PolyFLEX™ XF-103 is a 1 mil polyimide film coated with a durable, white hi-resolution printable surface designed for superior ink receptivity with conductive inks.

**Features:**

- REACH and RoHS compliant
- Dimensionally stable at high temperatures
- Chemically resistant
- Heat, cold, solvent and voltage resistant

Uses:

PolyFLEX polyimide films are intended to be used for printed electronics applications that require dimensional stability, temperature resistance, good electrical properties, low profile, and flexibility. The white top coat is designed to be ink receptive with conductive inks. The clear top coat is durable and passes the requirements of circuit board processing as noted by MIL-STD-202G, Notice 12, Method 215K and MIL-STD-883E, Notice 4, Method 2015.13.

Applications:

- The gloss amber polyimide is intended to be printed with conductive, semi conductive, and resistive ink via flexographic, digital, and screen print methods.
- The amber polyimide is intended to be used for applications that require a traditional flex circuit or polyimide appearance (amber color).
- 1 mil polyimide materials are well suited for Digital and Flexographic print methods.
- The amber polyimide is an ideal choice for those electronic applications that are exposed to temperature extremes, cycling between high and low temperatures, or high temperatures for a prolonged period of time where dimensional stability of the film is critical to prevent breaks in the printed circuits.
- The amber polyimide is an ideal choice for those applications where dimensional stability of the film is critical due to extreme temperature exposures.
- The amber polyimide is an ideal choice for those applications that need high volume resistivity, withstand a strong electric field, and resist high voltages.
- The top coat on the amber polyimide is a good choice for high density printed circuits that require high resolution printing.

Special Considerations:

- For screen printed applications that use vacuum ports for holding substrates in place during printing, the 1 polyimide should be evaluated to confirm film deflection does not cause print defects.
- The conductive ink manufacturers identified have printed on the gloss white polyimide and found acceptable results in terms of image quality and ink anchorage. Please consult with these manufacturers for suitable inks for your applications.



POLYONICS

PolyFLEX Substrates

XF-103

1 mil White Coated Polyimide Film

Technical Data

PROPERTIES	TEST METHODS	AVERAGE RESULTS	
		Value	Units
Thickness	ASTM D1000	0.0014 (35.6)	Inch (µm)
Surface Finish	High Gloss >75 GU		
Thermal expansion 1 mil Polyimide	TMA	20	PPM/degree Celsius
Thermal Conductivity 1 mil Polyimide	ASTM F-433-77 (1987)	0.12	W/m.K
Tensile Strength 1 mil Polyimide	ASTM D882	231	MPa
Tensile Modulus 1 mil Polyimide	ASTM D882	2.5	GPa
Elongation 1 mil Polyimide	ASTM D882	72%	@ 20C
Volume Resistivity 1 mil Polyimide	ASTM D-257	10 ¹⁷	Ohm-cm
Dielectric Constant 1 mil Polyimide	IPCTM-650	3.4	@1 MHz
Breakdown Voltage 1 mil Polyimide	ASTM D-149	7.7 (303)	kV/mil (kV/µm)
Ink systems recognized	Conductive Compounds, HC Starck Clevios, Johnson Matthey		

Durability Testing

Properties	Test Method	Test Fluid	Results
Chemical Resistance	MIL-STD-202G, Notice 12, Method 215K MIL-STD-883E, Notice 4, Method 2015.13	Solvent A- 1 part IPA, 3 parts mineral spirits	No visible effect
		Solvent B- 1, 1, 1-Trichloroethane	Solvent deleted per notice 12
		Solvent C- Terpene Defluxer	No visible effect
		Solvent D- Saponifier	No visible effect
Heat/Chemical	Polyonics 80386	Immersed in chemical at 70°C for 5 min	Image Degradation
		Kyzen Corp. Aquanox SSA 30% aqueous	No degradation
		Re-entry KNI 2000 Terpene 40-45°C.	No degradation
		Alpha Metals 2110 Saponifier 10% aqueous	No degradation
		Isopropanol 99%	No degradation



PolyFLEX Substrates

XF-103

1 mil White Coated Polyimide Film

Weathering Test	ASTM G154	No Visible Effect
Temperature Rating:	Long Term	100 hours at 302°F (125°C)
	Operating	5 minutes at 500°F (260°C)
	Short Term	90 seconds at 572°F (300°C)
Shelf Life	1 year below 80°F (27°C) and 60% R.H.	

Polyonics Material Compliance

RoHS- Restriction of Hazardous Substances (EU Directive 2002/95/EC)	Limits set forth in Directive 2005/618/EC amending Directive 2002/95/EC
REACH- Registration Evaluation and Authorization of Chemicals (EU Directive 1907/2006/EC)	Limits set forth in Directive 1907/2006/EC Article 7 (2)
Halogens- Restriction use of Halogen (IEC 61249-2-21)	Limits set forth in International Electrochemical Commission

All SI units are mathematically derived from U.S. conventional units.

NOTE: All values shown are averages and should not be used for specification purposes. Test data and test results contained in this document are for general information only and shall not be relied upon by POLYONICS customers for designs and specifications, or be relied on as meeting specified performance criteria. Customers desiring to develop specifications or performance criteria for specific product applications should contact POLYONICS for further information.

References:

ASTM: American Society for Testing and Materials (U.S.A.) SI: International Systems of Units.

Trademarks:

XJN+ & Aquanox SSA-TM is a trademark of Kyzen Corporation RE-ENTRYTM is a registered trademark of Environsolv Inc.



WARRANTY LIMITATION

Polyonics' products are sold with the understanding that the Buyer will test them in actual use and determine for him/herself their adaptability to his/her intended uses. Polyonics warrants to the buyer that its products are free from defects in material and workmanship, but limits its obligations under this warranty to replacement of the products shown to Polyonics' satisfaction to have been defective, provided that the Buyer has complied with the handling, storage and shelf life requirements as specified by Polyonics in applicable materials specifications.

The above warranties extend solely to Buyer and all warranty claims must be made by the Buyer. Rework or Replacement shall neither exceed nor decrease the original warranty period. The term of all warranty periods shall not exceed thirty (30) days from the date of the original shipment.

THE ABOVE WARRANTIES ARE EXCLUSIVE OF AND IN LIEU OF ALL OTHER WARRANTIES, WRITTEN OR ORAL, EXPRESS OR IMPLIED, STATUTORY OR OTHERWISE. NO IMPLIED STATUTORY WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE SHALL APPLY. POLYONICS SHALL NOT BE LIABLE EITHER IN TORT OR IN CONTRACT FOR ANY LOSS OR DAMAGE, DIRECT, INCIDENTAL OR CONSEQUENTIAL, ARISING OUT OF THE USE OR INABILITY TO USE THE PRODUCT, OR FROM DELAY IN THE REPLACEMENT OR REPAIR OF PRODUCTS UNDER THE ABOVE WARRANTY

Polyonics World Headquarters

28 Industrial Park Drive
Westmoreland, NH 03467
Ph: 603.352.1415
Fax: 603.352.1936
Email: info@polyonics.com

Polyonics Asia

Rm.1804 Gaosheng Commercial Mansion
HongTu Rd. Nancheng
Dongguan, Guangdong, China 523082
Ph: 86.755.8825.0441
Fax: 86.755.8825.2429
Email: infoasia@polyonics.com