

ULTEM™ UTF120 FILM

PRODUCT DATASHEET

KEY FEATURES & BENEFITS

ULTEM™ Polyetherimide (PEI) UTF120 film offers solutions for professional-grade dielectric film capacitors, meeting the most stringent technical demands. ULTEM UTF120 film exhibits stable properties through temperature (-40 °C to +150 °C) and frequency, including stable Capacitance, good Insulation Resistance, stable Dielectric Constant (Dk) and low Dissipation Factor (Df). ULTEM UTF120 film has been validated with both film-foil and metalized electrodes, including flat aluminium, heavy edge/light body and fused/patterned electrode designs. ULTEM UTF120 film has been developed to offer excellent handling through metallization, winding and capacitor squashing / flattening. ULTEM UTF120-based capacitors have been shown to provide stable electrical performance through standard 260°C solder reflow processes.

TYPICAL PROPERTY VALUES*

Property	Test Method	Units	4µm	5µm	7µm	10µm
Thickness						
Mean Thickness	In-line x-ray	µm	4.0	5.0	7.0	10.0
Thickness variation	In-line x-ray	% (3σ=x% of thickness)	2.9	2.9	2.5	2.0
Electrical						
BDS Large Area Electrode (200V/µm)	SABIC Method	Cumulative counts/0.033 m ²	1.1	0.2	0.1	0.0
BDS Large Area Electrode (250V/µm)	SABIC Method	Cumulative counts/0.033 m ²	5.9	1.5	1.1	0.3
BDS Large Area Electrode (300V/µm)	SABIC Method	Cumulative counts/0.033 m ²	25.8	14.9	11.0	3.4
Breakdown strength (BDS) at 23°C	ASTM D149	V/µm			580	
Breakdown strength (BDS) at 150°C	ASTM D149	V/µm			495	
Dielectric Constant (Dk) at 27°C, 1 kHz (metallized film)	ASTM D150				3.175	
Dissipation Factor (Df) at 27°C, 1 kHz (metallized film)	ASTM D150				0.0022	
COF (Dynamic) - Metal/Bare film	JIS K7125				0.39	
COF (Static) - Metal/Bare film	JIS K7125				0.48	
Volume Resistivity	ASTM D257	Ω-cm			2.93x10 ¹⁶	
Surface Resistivity	ASTM D257	Ω/square			9.9x10 ¹³	
Thermal						
Coefficient of Thermal Expansion (MD)	ASTM E831	(x10 ⁻⁵ /°C)			49	
Coefficient of Thermal Expansion (TD)	ASTM E831	(x10 ⁻⁵ /°C)			62	
Glass Transition Temperature (Tg)	ASTM D3418	°C			214	
Shrinkage @ 170°C / 0.5 hr (MD)	ASTM D1204	%			0.5	
Shrinkage @ 170°C / 0.5 hr (TD)	ASTM D1204	%			0	

Physical						
Density	ASTM D792	g/cm ₃				1.29
Water Absorption, Equilibrium, 23°C, 24 hrs	ASTM D570	%				1.16
Water Absorption, 50%, 23°C, 24 hrs	ASTM D570	%				0.23
Surface roughness of roll face	TM0022	µm	0.10	0.10	0.09	0.08
Surface roughness of air face	TM0022	µm	0.09	0.10	0.09	0.09
Mechanical						
Tensile Modulus (MD)	JIS K6781	MPa				3307
Tensile Strength @ Break (MD)	JIS K6781	MPa	105	136	154	190
Tensile Elongation to Break (MD)	JIS K6781	%	66	47	60	95
Tensile Modulus (TD)	JIS K6781	MPa				3265
Tensile Strength @ Break (TD)	JIS K6781	MPa	95	125	140	172
Tensile Elongation @ Break (TD)	JIS K6781	%	20	24	30	40
Tear Strength (MD)	JIS K7128	N/mm	99	99	99	103
Tear Strength (TD)	JIS K7128	N/mm	90	90	90	92

* These are typical properties and are not intended for specification purposes. If minimum certifiable properties are required, please contact your local SABIC Innovative Plastics, Specialty Film & Sheet representative or the Quality Services Department. Reported values are based on 5-micron film thickness and are tested at machine direction unless otherwise noted.

MANUFACTURING SPECIFICATIONS

Gauge	4, 5, 7 and 10 µm
Standard Roll Width	620 mm
Standard Roll Length	5000 m
Color code	1000
Color	Natural amber

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