



Ex Tech™

Extruded Technical Film Solutions

Ex Tech™ is a full range of high-performance thermoplastic films & sheets, including polyurethane (TPU), polyester, polyamide, polyolefin and aliphatic urethanes. These materials can be customized to provide the optimum performance characteristics for specific applications, and can be produced in a range of colors, opacities, and surface finishes required. From breathable films to those that are FR rated, Ex Tech™ film products can be manufactured in thicknesses from 1 mil to 12 mil and in widths from less than one inch to 62 inches. Ex Tech™ films are receptive to a variety of inks and can be further customized with many printing processes including offset, flexographic and thermal methods.

Our Ex Tech™ specialty adhesives and film products are developed with the most advanced raw materials and chemistries to provide ideal solutions for unique applications. Bemis' diverse TPU (Thermoplastic Polyurethane) films and co-extrusion capabilities offer you cost effective solutions that are unsurpassed by other film technologies.

Ex Tech™ films offer a broad range of high-performance properties and characteristics becoming the material of choice for many new applications. These films are strong, resilient, and easy to work with. They do not contain plasticizers or VOC's (Volatile Organic Compounds) making them the environmentally friendly choice for fabrication. When compared against other materials such as rubber, PVC and PE compounds, Ex Tech™ films usually are chosen for a combination of requirements. TPU films exhibit excellent low temperature flexibility, lamination capabilities and soft hand.

Bemis is a strategic partner for applications in the industrial, textile, automotive, medical, consumer, electrical, sports & recreation, composites and building markets. Our knowledge of advanced technical textiles and modern machinery allow us to provide unparalleled technical service and products to innovative designers and engineers.



CUSTOM ENGINEERED SOLUTIONS

High Resistance Barrier Films
Fire Retardant Chemistries
Printed / Pigmented Films
Co-Extruded Tie Films
Optically Clear Films
Multi-Layered Films
Tear Resistant Films
Breathable Films
Adhesive Films
Colored Films



TPU FILMS

Ex Tech™ polyurethane films exhibit high tensile strength, excellent flexibility and good abrasion resistance. These films can be used with a variety of manufacturing methods ranging from hot-melt to flame lamination. Many different welding operations including ultrasonic, HF, RF and platen sealing can be used to activate these films. Ex Tech™ films meet and exceed the requirements in textile, medical and automotive applications.



	ET 3500	ET 3505	ET 3510	ET 3573	ET 3600	ET 3800	ET 3810
Composition	Poyurethane Ester	Poyurethane Ester	Polyurethane Ester	Polyurethane Ester	Polyurethane Aliphatic	Polyurethane Ether	Polyurethane Ether
Appearance/Surface	Smooth/ Translucent or Textured/ Frosty	Smooth/ Translucent or Textured/ Frosty	Smooth/ Translucent or Textured/ Frosty	Diamond embossed	Translucent	Smooth/ Matte or Textured/ Frosty	Textured/ Frosty
Nominal Thickness	.002",.004"	.002",.004"	.002",.004"	.005"	.004"	.0015",.003"	.002",.004"
Substrate	NA free film	NA free film	NA free film	NA free film	Release Paper	NA free film	NA free film
Width	Up to 62"	Up to 56"	Up to 62"	Up to 48"	Up to 60"	Up to 62"	Up to 58"
Hardness¹ (Shore A)	93A	85A	98A	80A	90 A	87A	85A
Specific Gravity²	1.21 g/cm ³	1.19 g/cm ³	1.21 g/cm ³	1.19 g/cm ³	1.12 g/cm ³	1.12 g/cm ³	1.12 g/cm ³
Tensile Strength³	8000 psi	6000 psi	7600 psi	5200 psi	6300 psi	5800 psi	5500 psi
Ultimate Elongation³	450%	600%	500%	530 %	400 %	550%	610%
100% Modulus³	1600 psi	800 psi	1400 psi	630 psi	1100 psi	1010 psi	940 psi
300% Modulus³	3500 psi	1400 psi	3400 psi	1500 psi	3750 psi	1595 psi	1690 psi
Tensile Set @ 200 % Elongation	12 %	6 %	17 %	3 %	3 %	22 %	10 %
Tear Strength⁴	600 pli	500 pli	500 pli	400 pli	430 pli	342 pli	400 pli
Abrasion Loss⁵	55 mm ³	50 mm ³	60 mm ³	40 mm ³	30 mm ³	40 mm ³	35 mm ³
TMA On-Set Temperature⁶	160°C (320°F)	155°C (311°F)	170°C (338°F)	155°C (311°F)	108°C (226°F)	162°C (324°F)	162°C (324°F)
Melt Flow Index⁷	10 g/10 min	12 g/10 min	3 g/10 min	10 g/10 min	6 g/10 min	6 g/10 min	6 g/10 min
Comments	Excellent chemical resistance & good hydrolysis	High elongation & good low temperature properties	Excellent wear performance, good low temperature flexibility & enhanced UV stability	High elasticity & excellent recovery	Excellent UV stability & color /clarity retention	Excellent microbial & hydrolysis resistance	Excellent UV & hydrolysis resistance

¹ Hardness: ASTM D-2240

² Specific Gravity: ASTM D-792

³ Tensile Strength: ASTM D-412

⁴ Tear Strength: ASTM D-624

⁵ Abrasion: Method DIN 53516

⁶ TMA: ASTM D-1525

⁷ Melt Flow: ASTM 1238 190°C, 2.16 Kg Load

CO-EXTRUDED FILMS

The best possible film solutions manufactured today are achieved with the use of co-extrusion equipment. The ability to simultaneously fabricate a film layer and adhesive layer significantly reduces your manufacturing complexity and cost while enhancing the film's overall performance. Co-extruded films reduce the probability of defects. Custom and complex combinations of varying layer types can be achieved. Below are some examples of the co-extruded films we produce.



	ETST104	ETST505	ETST604	ETTF100	ETTG400
Composition Layer 1 (Adhesive) Layer 2 (Barrier)	Polyurethane Polyurethane	Polyurethane Polyurethane	Polyurethane Polyurethane	Polyester Polyurethane	Nylon Polyurethane
Appearance/ Surface	Smooth, Translucent, white or grey	Smooth, Translucent	Smooth, Translucent	Assorted Colors	Assorted Colors
Nominal Thickness Layer 1 Layer 2	4 mil 2 mil 2 mil	5 mil 3 mil 2 mil	3.50 mil 1.50 mil 2.00 mil	6.9 mil 3.0 mil 3.9 mil	6.9 mil 3.0 mil 3.9 mil
Width	Up to 56"	Up to 56"	Up to 56"	Up to 56"	Up to 56"
Hardness¹ (Shore A)	98 A	98 A	92 A	92A	92A
Specific Gravity²	1.21 g/cm ³	1.21 g/cm ³	1.22 g/cm ³	1.22 g/cm ³	1.22 g/cm ³
Tear Strength³	500 pli	500 pli	500 pli	350 pli	350 pli
Abrasion Loss⁴	60 mm ³	60 mm ³	60 mm ³	30 mm ³	30 mm ³
TMA On-Set Temperature⁵ Layer 1 (Adhesive) Layer 2 (Barrier)	84°C (183°F) 176°C (349°F)	89°C (192°F) 176°C (349°F)	116°C (240°F) 184°C (363°F)	125°C (257°F) 184°C (363°F)	120°C (248°F) 184°C (363 °F)
Melt Flow Index⁶	40 g/10 min	40 g/10 min	30 g/10 min	24 g/min	9 g/10 min

¹ Hardness: ASTM D-2240 ² Specific Gravity: ASTM D-792 ³ Tear Strength: Barrier Layer : ASTM D-624

⁴ Abrasion: Barrier Layer : Method DIN 53516 ⁵ TMA: ASTM D-1525 ⁶ Melt Flow: Adhesive layer : ASTM 1238 175°C, 2.16 Kg Load

POLYOLEFIN FILMS

Polyolefin films exhibit good chemical resistance making them the ideal choice as a barrier film.

	ET6340	ET6343	ET6344	ET6371
Composition	Polyolefin, modified polypropylene	Polyolefin, modified high density polyethylene	Polyolefin, modified ethylene vinyl acetate	Polyolefin, modified linear low density polyethylene
Appearance/ Surface	Clear	Translucent, Cloudy	Translucent, Cloudy	Translucent, Clear
Nominal Thickness	.002"	.001", .0015"	.006"	.0015"
Substrate	NA free film	NA free film	Release paper	NA free film
Width	Up to 60"	Up to 60"	Up to 60"	Up to 50"
Hardness¹ (Shore A)	90A	96A	95A	88A
Specific Gravity²	0.9 g/cm ³	0.94 g/cm ³	0.93 g/cm ³	0.92 g/cm ³
TMA On-Set Temperature³	140°C (284°F)	123°C (253°F)	102°C (216°F)	118°C (244°F)
Melt Flow Index⁴	5 g/10 min	6 g/10 min	3 g/10 min	3 g/10 min
Chemical Resistance Oil Weak Acid Solutions Weak Solvents Combustable Fuels Water	Good Good Good Good Good	Good Good Good Good Good	Good Good Good Good Good	Good Good Good Good Good

¹ Hardness: ASTM D-2240

² Specific Gravity: ASTM D-792

³ TMA: ASTM D-1525

⁴ Melt Flow: ASTM 1238 190°C, 2.16 Kg Load

SPECIAL & CUSTOM FILMS

Bemis has been formulating thermoplastic films, adhesives and coatings for more than 40 years. We've combined this experience with the latest machinery and new chemistries to bring our customers high quality films that are designed to perform the functions they require. Films featuring breathability and fire retardation are just some examples of the specialized films we can manufacture.



	3 LAYER
	ETEB3106
Composition Layer 1 Layer 2 Layer 3	Adhesive Elastic Adhesive
Appearance/ Surface	Transparent, Clear
Nominal Thickness Total Layer 1 Layer 2 Layer 3	.0080" .0015" .0050" .0015"
Width	Up to 56"
Hardness¹ (Shore A)	83 A
Specific Gravity²	1.19 g/cm3
Tear Strength⁴	370 pli
TMA On-Set Temperature⁵ Layer 1 Layer 2 Layer 3	72°C (162°F) 155°C (311°F) 72°C (162°F)
Melt Flow Index⁶	40 g/10 min
Comments	Heat Sealable Elastic

¹ Hardness: ASTM D-2240

² Specific Gravity: ASTM D-792

³ Tear Strength: ASTM D-624

⁴ Elastic Layer (Layer 2)

⁵ TMA: ASTM D-1525

⁶ Melt Flow: ASTM 1238,
adhesive layer @175°C, 2.16 Kg Load

	BREATHABLE	FIRE RETARDANT	
	ET3801	ET3802	ET3803
Composition	Polyurethane Ether	Polyurethane Ether (Halogenated)	Polyurethane Ether (Non-Halogenated)
Appearance	Translucent / Cloudy	Opaque	Opaque
Nominal Thickness	.001"	.002"	.002"
Substrate	PP Liner or Free Film	PE Liner	PE Liner
Width	Up to 60"	Up to 60"	Up to 60"
Hardness¹ (Shore A)	80 A	85 A	87 A
Specific Gravity²	1.21g/cm3	1.25 g/cm3	1.15 g/cm3
Tensile Strength³	4000 psi	4000 psi	5800 psi
Ultimate Elongation³	800 %	650 %	550 %
100% Modulus³	600 psi	800 psi	870 psi
300% Modulus³	1000 psi	1050 psi	1600 psi
Tensile Set @ 200% Elongation³	10 %	17 %	52 %
Tear Strength⁴	390 pli	360 pli	350 pli
Abrasion Loss⁵	55 mm3	150 mm3	45 mm3
TMA On-Set Temperature⁶	160°C (320°F)	153°C (307°F)	160°C (320°F)
Melt Flow Index⁷	3 g/10 min	38 g/10 min	4 g/10 min
Other	MVT ⁸ 650 g/m2/day	Flame Rating UL94V0 Oxygen Index ⁹ 32 %	Flame Rating UL94V0 Oxygen Index ⁹ 26 %

¹ Hardness: ASTM D-2240

² Specific Gravity: ASTM D-792

³ Tensile Strength: ASTM D-412

⁴ Tear Strength: ASTM D-624

⁵ Abrasion: Method DIN 53516

⁶ TMA: ASTM D-1525

⁷ Melt Flow: ASTM 1238 190°C, 2.16 Kg Load

⁸ MVT: Method ASTM E-96B; @ 23oC and 50% RH

⁹ Oxygen: Method ASTM D-2863



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