



Standard Product Manual

Energy Storage and Power Battery Solution

Invented for Materials

Betterial

PC INSULATED SHEET

Betterial PC Insulated sheet has excellent insulation, extensibility, dimensional stability, chemical corrosion resistance, high strength, heat resistance and cold resistance. It is also self-extinguishing, flame retardant, non-toxic and environmentally friendly. Relying on our own technical advantages, Betterial can customize the anti-counterfeit marking of insulation sheet according to customer requirements. The engraving height can be controlled within 0.005mm without affecting the use of product. It can also effectively prevent intermediate processors from using inferior materials so as to reduce inspection efforts of system manufacturers and ensure to make high-quality product.



Features

-  Anti-Fake
-  Scratch Resistant
-  Flame Retardant
-  High Stability
-  Strong Insulation
-  High/Low Temperature Resistant

Technical Properties

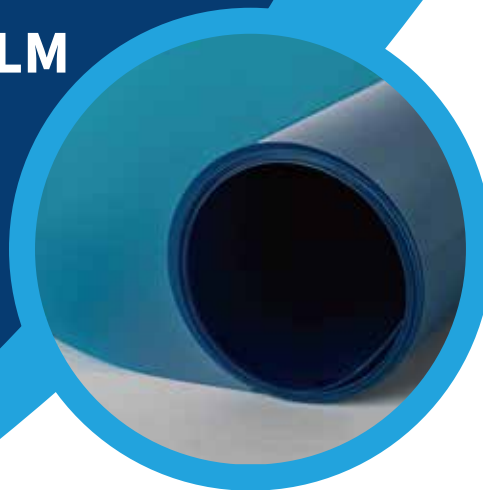
Item	Unit	Standard Values	
Thickness Range	mm	0.05-1.0	
Folding Performance	Frequency	Thickness<0.25mm	≥10
	Frequency	0.25mm≤Thickness<0.5mm	≥6
	Frequency	Thickness>0.5mm	≥4
Tensile Strength	Mpa	MD	≥55
	Mpa	TD	≥55
Elongation At Break	%	MD	≥80
	%	TD	≥80
Flame Retardant UL94-V0	Burning time Of moving flame	T1	Continuous burning time after moving flame 10s.Dripping situation: no dripping
	Burning time Of moving flame	T2	
Heat Shrinkage (135°C±2, 10min)	%	Thickness≤0.175mm	MD≤1.5
	%	Thickness≤0.175mm	TD≤0.5
	%	Thickness>0.175mm	MD≤1.0
	%	Thickness>0.175mm	TD≤0.5
Environmental Requirements	Heavy metal conten (Pb Cr Hg) ppm	Pb Content Less than 1000	
	Heavy metal conten (Pb Cr Hg) ppm	Cr Content Less than 100	
	Heavy metal conten (Pb Cr Hg) ppm	Hg Content Less than 1000	
	HALOGEN ppm	Br Content Less than 50	

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CELL ALUMINUM SHELL BLUE FILM

Betterial Cell Aluminum Shell Blue Film , It uses independently developed special adhesive formula and precision coating process to further improve the functions of anti-aging, electrolyte resistance, insulation performance, cold/heat shock and puncture resistance, and ensure the safety and stability of energy storage batteries.



Technical Properties

Item	Unit	Test Method	Index	
Tape Thickness	mm	GB/T 13542.2-2009	0.11±0.02	
Substrate Thickness	mm	GB/T 13542.2-2009	0.025	
180 °Peeling Force Of Steel Plate	Peeling Force At Room Temperature 8.75-17.5	N/25mm	GB/T 2792-2014	15
	65°C/85%RH, 24H The sStripping Force >8.75	N/25mm	GB/T 2792-2014	13.5
Retentivity	h	GB/T 4851	≥24	
Tensile Strength	N/25mm	GB/T 30776-2014	≥150	
Tensile Elongation	%	GB/T 30776-2014	≥30	
Insulation Resistance	Ω	GB/T 10064-2006	Dc at 1000V in 60 seconds > 20GΩ under voltage	
Leakage Current	(AC) ≥3000V@60S (DC) ≥4000V@60S Leakage Current≤1mA	mA	GB/T 1408.1-2016	DC, ≤0.001mA AC, =0.07mA

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PC INSULATED END PLATE PC INSULATED COVER PLATE

Betterial PC Insulated End Plate/PC Insulated Cover Plate has excellent insulation, extensibility, dimensional stability, chemical corrosion resistance, high strength, heat resistance and cold resistance. It is also self-extinguishing, flame retardant, non-toxic and environmentally friendly. Relying on our own technical advantages, Betterial can customize the anti-counterfeit marking of insulation sheet according to customer requirements. The engraving height can be controlled within 0.005mm without affecting the use of product. It can also effectively prevent intermediate processors from using inferior materials so as to reduce inspection efforts of system manufacturers and ensure to make high-quality product.



Features



Anti-Fake



Scratch Resistant



Flame Retardant



High Stability



Strong Insulation



High/Low Temperature Resistant

Technical Properties

Item	Unit	Standard Values	
Thickness Range	mm	0.05-1.0	
Folding Performance	Frequency	Thickness<0.25mm	≥10
	Frequency	0.25mm≤Thickness<0.5mm	≥6
	Frequency	Thickness>0.5mm	≥4
Tensile Strength	Mpa	MD	≥55
	Mpa	TD	≥55
Elongation At Break	%	MD	≥80
	%	TD	≥80
Flame Retardant UL94-V0	Burning time Of moving flame	T1	Continuous burning time after moving flame 10s.Dripping situation: no dripping
	Burning time Of moving flame	T2	
Heat Shrinkage (135°C±2, 10min)	%	Thickness≤0.175mm	MD≤1.5
	%	Thickness≤0.175mm	TD≤0.5
	%	Thickness>0.175mm	MD≤1.0
	%	Thickness>0.175mm	TD≤0.5
Environmental Requirements	Heavy metal conten (Pb Cr Hg) ppm	Pb Content Less than 1000	
	Heavy metal conten (Pb Cr Hg) ppm	Cr Content Less than 100	
	Heavy metal conten (Pb Cr Hg) ppm	Hg Content Less than 1000	
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AEROGEL THERMAL PAD/SHEET

Silicon dioxide aerogel is a kind of inorganic material with 3d reticulated nanopore structure. Its porosity is as high as 80~99%, the pore size is mainly between 10-50nm and the thermal conductivity at room temperature can be as low as 0.013W/(m.k).



Features



Fire Resistance



Superior Thermal Insulation



Lightweight



Ultra-high Hydrophobicity



High Temperature Resistance

Technical Properties

Item	Test Method	Ceramic Aerogel Thermal Pad	Preoxygenated Silk Aerogel Heat Pad	Fiberglass Aerogel Insulation Mat
Thickness Range	547-301 thickness gauge	1-3.5mm	0.4-3.5mm	0.4-3.5mm
Fire Smoke Resistance	GB/T 6343-2009	high	medium	low
Thermal Conductivity	GB/T 10295-2008	$\leq 0.03 \text{ W/(mK) @25}^\circ\text{C}$	$\leq 0.03 \text{ W/(mK) @25}^\circ\text{C}$	$\leq 0.03 \text{ W/(mK) @25}^\circ\text{C}$
Flame Resistance Rating	UL94	PET film VTM - 0	PET film VTM - 0	PET film VTM - 0
	UL94	PI film V- 0	PI film V- 0	PI film V- 0
	UL94	Rubber frame V- 0	Rubber frame V-0	Rubber frame V-0
	UL94	Aerogel felt V- 0	Aerogel felt V-0	Aerogel felt V-0
Prohibited Items	RoHS & REACH &ELV	RoHS & REACH & ELV	RoHS & REACH & ELV	RoHS & REACH & ELV
Compressibility	/	40+5@2MPa	40+5@2MPa	35±5@2MPa
Fire-Resistant Insulation	GB/T 31838.4-2019	Insulation Resistance:1000VDC,60s,>1000MΩ; Withstand Voltage Current:3000VDC, 60s, < 1mA		

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CCS HOT-PRESSED FILM

Betterial CCS Hot-pressed Film has excellent insulation, extensibility, dimensional stability, chemical corrosion resistance, high strength, heat resistance and cold resistance. It is also self-extinguishing, flame retardant, non-toxic and environmentally friendly. Relying on our own technical advantages, Betterial can customize the anti-counterfeit marking of insulation sheet according to customer requirements. The engraving height can be controlled within 0.005mm without affecting the use of product. It can also effectively prevent intermediate processors from using inferior materials so as to reduce inspection efforts of system manufacturers and ensure to make high-quality product.



Features



Anti-Fake



Scratch Resistant



Flame Retardant



High Stability



Strong Insulation



High/Low Temperature Resistant

Technical Properties

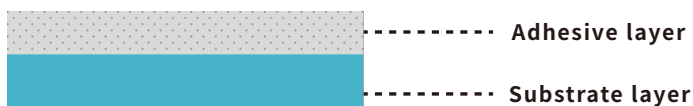
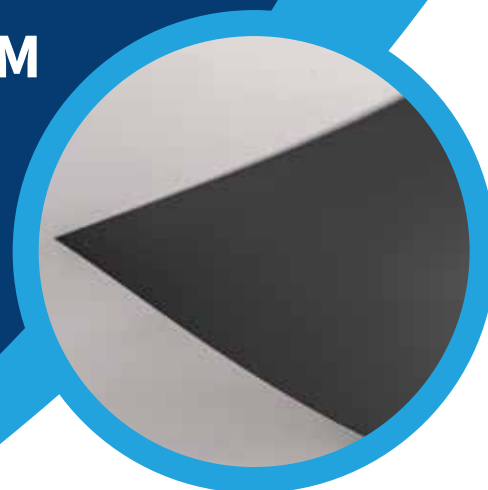
Item	Unit	Standard Values	
Thickness Range	mm	0.05-1.0	
Folding Performance	Frequency	Thickness<0.25mm	≥10
	Frequency	0.25mm≤Thickness<0.5mm	≥6
	Frequency	Thickness>0.5mm	≥4
Tensile Strength	Mpa	MD	≥55
	Mpa	TD	≥55
Elongation At Break	%	MD	≥80
	%	TD	≥80
Flame Retardant UL94-V0	Burning time Of moving flame	T1	Continuous burning time after moving flame 10s.Dripping situation: no dripping
	Burning time Of moving flame	T2	
Heat Shrinkage (135°C±2, 10min)	%	Thickness≤0.175mm	MD≤1.5
	%	Thickness≤0.175mm	TD≤0.5
	%	Thickness>0.175mm	MD≤1.0
	%	Thickness>0.175mm	TD≤0.5
Environmental Requirements	Heavy metal conten (Pb Cr Hg) ppm	Pb Content Less than 1000	
	Heavy metal conten (Pb Cr Hg) ppm	Cr Content Less than 100	
	Heavy metal conten (Pb Cr Hg) ppm	Hg Content Less than 1000	
	HALOGEN ppm	Br Content Less than 50	

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SIDE PLATE HOT-PRESSED FILM

Betterial Side Plate Hot-pressed Film , composed of PET as the substrate and coated with adhesive, is suitable for insulating power battery modules and PACK structural components, as well as electronic packaging insulation of battery modules. It is a flexible and highly reliable insulation material.



Technical Properties

Item	Unit	Test Method	Index
Thickness	μm	ASTM D 347	basal lamina+30
Tensile Strength	MD	ASTM D 882	160
	TD	ASTM D 882	160
Tensile Elongation	MD	ASTM D 882	130
	TD	ASTM D 882	120
Heat Shrink	MD	ASTM D 1204	1.0
	TD	ASTM D 1204	0.5
Peel Strength Between Layers	N/inch	ISO FDIS-8510 180°	38
Breakdown Voltage	KV	ASTM D 149	15
Flame Retardant	/	UL 94	VTM-0
Environmental Protection	/	RoSH	PASS

Recommended hot pressing conditions: Temperature 160~170°C, Time 15~20min, Pressure 10~20kg/cm².

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MPP HEAT-RESISTANT PANEL -WHITE

MPP foam, primarily composed of polypropylene and crafted by specialized processes, boasts a delicate closed-cell structure. This material offers numerous advantages, including lightweight, high strength, thermal and acoustic insulation, waterproofing, moisture resistance, and corrosion resistance, while also being self-extinguishing, flame retardant, non-toxic, and green. MPP foam finds widespread application in sectors like new energy, electronics, and packaging.



Features



Fire Resistance



Superior Thermal Insulation



Lightweight



Ultra-high Hydrophobicity

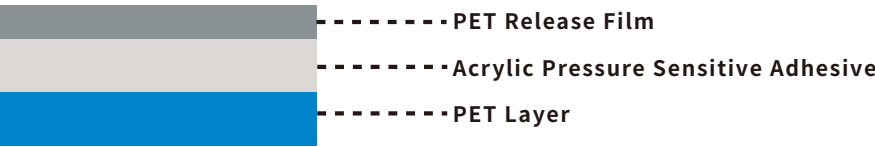
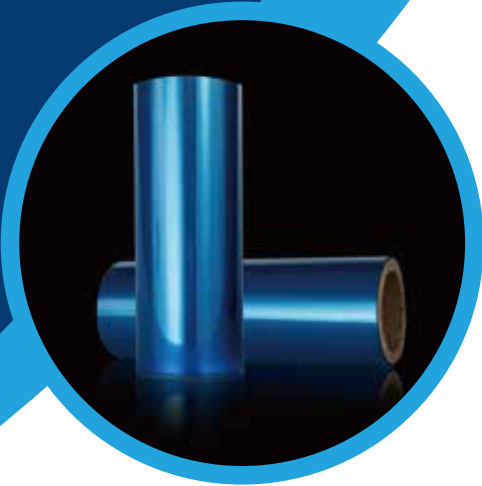
Technical Properties

Performance Indicators	Unit	Test Method	MPP25
Thickness	mm	/	8
Color	/	PANTONE-International Color Card	CMYK 0-20(White)
Density	kg/m ³	Use SanFeng 547-301 Thickness To Detect initial Thickness	36
Tensile Strength	MPa	ASTM-D3574-08 5mm/min(Tensile Rate)	≥1.89
Stretch	MPa	/	≥4
Shear Strength	MPa	ASTM C273C 273M 5mm/min(Shear Rate)	≥1.6
Shear	MPa	ASTM C273C 273M 5mm/min(Shear Rate)	≥1.5
Double 85 After Aging Stretch	MPa	ASTM-D3574-08 5mm/min(Tensile Rate)	Tensile Strength>1.4
MPP To Blue Film	/	GB 10006-88	0.181≤μs≤0.577
Friction Coefficient	/	GB 10006-88	0.112≤μk≤0.535
Roughness	μm	GB/T 1031-2009	5-40
Insulation Resistance	MΩ	1000V DC 60s	≥550
	mA	3000V/60s	<1
Thermal Conductivity	W/ (m·°C)	GB/T 10295-2008	≤0.041
Heating	J/ (kg·°C)	ASTM E1269-2011	85±2 (°C)
	J/ (kg·°C)	ASTM E1269-2011	85±2 (%)

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THE HIGH SHEAR BLUE FILM

The high shear blue film of Betterial has the following advantages: good initial adhesion, not easy to blister when pasting, high shear on aluminum plate after UVA light curing, flame retardant grade VTM-1, environmentally friendly and safe, compliant with ROHS standards, and better insulation protection for lithium battery cells.



Technical Properties

Item	Unit	Test Method	Index
Tape Thickness	mm	GB/T 13542.2-2009	0.08±0.01
Substrate Thickness	mm	GB/T 13542.2-2009	0.05
Steel Plate	N/25mm	GB/T 2792-2014	12-18
Shear Strength	Mpa	GB/T 7124-2008	5-6
Tensile Strength	N/25mm	GB/T 30776-2014	≥150
Tensile Elongation	%	GB/T 30776-2014	≥45
Insulation Resistance	Ω	GB/T 10064-2006	Dc at 1000V in 60 seconds 1GΩ under voltage
Leakage Current	<div>(AC) ≥ 3000V@60S (DC) ≥ 4000V@60S Leakage Current ≤ 1mA</div> mA	GB/T 1408.1-2016	(AC) ≥ 2230V@60S (DC) ≥ 3150V@60S Leakage Current ≤ 1mA

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