ALISHAN EPE ENCAPSULANT

ALISHAN GREEN ENERGY PVT. LTD.

Alishan EPE is multilayer coextruded film of EVA-POE manufactured by Alishan Green Energy with the cutting edge manufacturing facility. Alishan EPE is suitable for TopCon, PERC and HJT technologies for M10 or G12 configurations. Alishan EPE ensures acid free environment inside the module and hence provides excellent suitability with any metal grid.

Product	Alishan EPE				
Linear meter	Up to 300 meters				
Width	Up to 1350 mm				
Thickness	Up to 0.80 mm				
Properties	Description	Standard	UOM	Alishan EPE	Alishan EPE-T
Physical properties	Tensile strength	ASTM D 638	MPa	12 ± 3	12 ± 3
	Elongation		%	≥ 600	≥ 600
	Adhesion with Glass	ASTM D 903	N/cm	≥ 75	≥ 75
	Adhesion with Backsheet		N/cm	≥ 75	≥ 75
Thermal Property	Thermal Shrinkage	160 Deg C / 5 min	%	MD ≤ 3	MD ≤ 3
				TD ≤ 1	TD ≤ 1
Water Ingress	WVTR	ASTM F 1249	$g/m^2.day$	< 5	< 5
Electrical Property	Volume resistivity	ASTM D257-14	Ohm. cm	$>1\times10^{15}$	$>1\times10^{15}$
Gel content		ASTM D 2765	%	> 75	> 75
Optical Properties	Transmittance	ASTM E 424	%	≥ 91	≥ 91
	Yellowness Index		-	< 2	< 2
	UV-cut off		nm	360 ± 30	-
Lamination Parameters			UOM	Values	Values
	Vacuum / Evacuation Time		Minutes	5 - 8	5 - 8
	Lamination / Pressing Time		Minutes	10 - 14	10 - 14
	Lamination Temperature		°C	120 – 150	120 – 150

RELIABILITY DATA OF ALISHAN EPE

ALISHAN
GREEN ENERGY PVT. LTD.

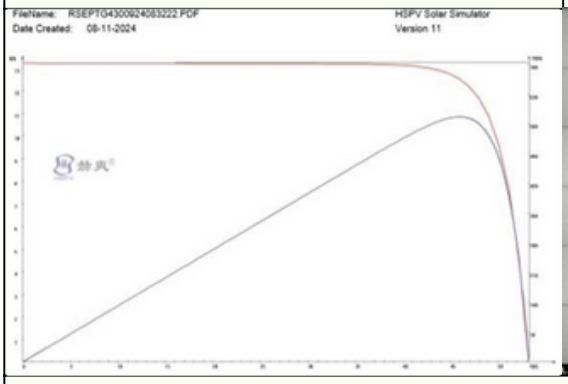
Ageing	Standard	Parameters	Value
DH 3000 hours 85% RH, 85°C	IEC 62788-2	Peel strength with Glass	> 50 N/10 mm
		Peel strength with Backpro-KPC	> 50 N/10 mm
		Peel strength with Backpro-KPC-T	> 40 N/10 mm
		Transmittance	> 91 %
		Yellowness Index	< 3
UV 180 kWh/m^2	IEC 62788-2	Peel strength with Glass	> 60 N/10 mm
		Peel strength with Backpro-KPC	> 50 N/10 mm
		Peel strength with Backpro-KPC-T	> 40 N/10 mm
		Transmittance	> 91 %
		Yellowness Index	< 2
PID Resistance	IEC 62804	Power degradation	<2%

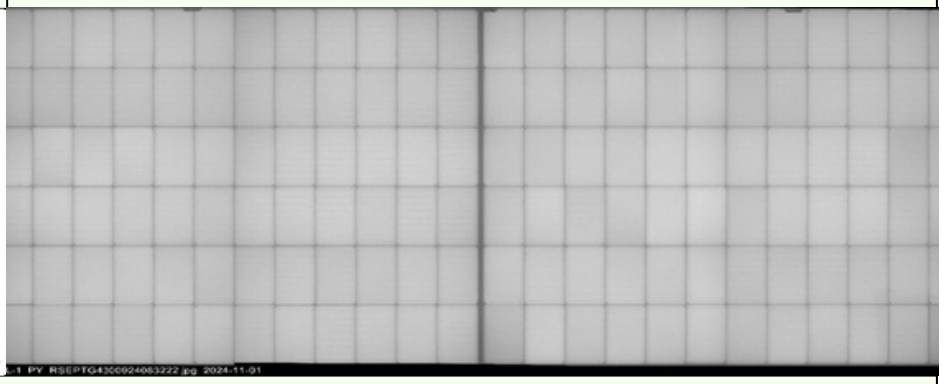
RELIABILITY DATA OF ALISHAN EPE

(PID performance with Topcon cells)

ALISHAN GREEN ENERGY PVT. LTD.

3rd Cycle Results - ElectricalParameter & Electroluminescence (EL) Images			
Voc (V)	53.24	FF (%)	81.92
Isc (A)	13.23	Efficiency (%)	22.34
Vmp (V)	45.61	Rseries / Rshunt (Ohm)	0.27/535.81
Imp (A)	12.65	Cal. ID (& Power)	RSEPT2060224003193 (576.65 Watt)
Pmax (W)	576.78	Control ID (& Power)	RSEPT2060224000792 (577.51 Watt)
IV Curve		Electroluminescence (EL) Image	





Visual Inspection Result after 3rd Cycle: No defects found.					
Wet Leakage Test Data - Final					
Measured Value	6033 MΩ	Pass Criteria	≥ 40 MΩ.m^2	Result	PASS
Power degradation after PID test					
Total Power Degradation in Watt : 3.60 Watt in % : 0.62 %				Criteria	Result
				≤ 5 %	PASS

Packing

The EPE rolls are wound a standard 3 inches (inner diameter) paper core, the standard length of EPE film in a roll is up to 300 meters. Each roll was wrapped in polyethene film and placed in a carton box and 9 boxes are placed in a pallet.

Storage

Must be stored in a dry and temperature of ≤ 30℃ and humidity ≤ 60%, the shelf life of this product is 9 months from the date of manufacturing.

ALISHAN POE ENCAPSULANT

ALISHAN GREEN ENERGY PVT. LTD.

Alishan POE is Polyolefin based encapsulant manufactured by Alishan Green Energy Private Limited, in the world-class manufacturing technology with proven raw materials. Alishan POEs are excellent PID and snail trail resistant and suitable for both Glass – Glass and Glass – back sheet modules. Our POE ensures the reliability and life of solar modules in the field.

Product	Alishan POE			
Linear meter	Up to 300 meters			
Width	Up to 1350 mm			
Thickness	Up to 0.80 mm			
Properties	Description	Standard	UOM	Alishan POE
Physical properties	Tensile strength	ASTM D 638	MPa	12 ± 3
	Elongation		%	≥ 500
	Adhesion with Glass	ASTM D 903	N/cm	≥ 70
	Adhesion with Backsheet		N/cm	≥ 70
Thermal Property	Thermal Shrinkage	160 Deg C / 5 min	%	MD ≤ 3
				TD ≤ 1
Electrical Property	Volume resistivity	ASTM 257-14	Ohm. cm	>1×10 ^{16}
Gel content		ASTM D 2765	%	> 60
Optical Properties	Transmittance	ASTM E 424	%	≥ 90
	UV cut off		nm	360 ± 30
	Yellowness Index		-	≤ 1
Lamination Parameters			UOM	Values
	Vacuum / Evacuation Time		Minutes	6 - 10
	Lamination / Pressing Time		Minutes	12 - 16
	Lamination Temperature		°C	140 – 160

RELIABILITY DATA OF ALISHAN POE

ALISHAN
GREEN ENERGY PVT. LTD.

Ageing	Standard	Parameters	Value
DH 3000 hours 85% RH, 85°C	IEC 62788-2	Peel strength with Glass	> 50 N/10 mm
		Peel strength with Backpro-KPC	> 40 N/10 mm
		Peel strength with Backpro-KPC-T	> 40 N/10 mm
		Transmittance	> 90 %
		Yellowness Index	< 3
UV 180 kWh/m^2 85% RH, 85°C	IEC 62788-2	Peel strength with Glass	> 60 N/10 mm
		Peel strength with Backpro-KPC	> 50 N/10 mm
		Peel strength with Backpro-KPC-T	> 40 N/10 mm
		Transmittance	> 91 %
		Yellowness Index	< 2

Packing

The POE rolls are wound a standard 3 inches (inner diameter) paper core, the standard length of POE film in a roll is up to 300 meters. Each roll was wrapped in polyethene film and placed in a carton box and 9 boxes are placed in a pallet.

Storage

Must be stored in a dry and temperature of ≤ 30℃ and humidity ≤ 60%, the shelf life of this product is 9 months from the date of manufacturing.

ALISHAN POE - T ENCAPSULANT

ALISHAN GREEN ENERGY PVT. LTD.

Alishan POE - T is Polyolefin based encapsulant manufactured by Alishan Green Energy Private Limited, in the world-class manufacturing technology with proven raw materials. Alishan POEs are excellent PID and snail trail resistant and suitable for both Glass – Glass and Glass – back sheet modules. Our POE ensures the reliability and life of solar modules in the field.

Product	Alishan POE - T			
Linear meter	Up to 300 meters			
Width	Up to 1350 mm			
Thickness	Up to 0.80 mm			
Properties	Description	Standard	UOM	Alishan POE - T
Physical properties	Tensile strength	ASTM D 638	MPa	12 ± 3
	Elongation		%	≥ 500
	Adhesion with Glass	ASTM D 903	N/cm	≥ 70
	Adhesion with Backsheet		N/cm	≥ 70
Thermal Property	Thermal Shrinkage	160 Deg C / 5 min	%	MD ≤ 3
				TD ≤ 1
Electrical Property	Volume resistivity	ASTM 257-14	Ohm. cm	>1×10 ^{16}
Gel content		ASTM D 2765	%	> 60
Optical Properties	Transmittance	ASTM E 424	%	≥ 90
	UV cut off		nm	-
	Yellowness Index		-	≤ 1
Lamination Parameters			UOM	Values
	Vacuum / Evacuation Time		Minutes	6 - 10
	Lamination / Pressing Time		Minutes	12 - 16
	Lamination Temperature		°C	140 – 160

Packing

The POE - T rolls are wound a standard 3 inches (inner diameter) paper core, the standard length of POE - T film in a roll is up to 300 meters. Each roll was wrapped in polyethene film and placed in a carton box and 9 boxes are placed in a pallet.

Storage

Must be stored in a dry and temperature of ≤ 30°C and humidity ≤ 60%, the shelf life of this product is 9 months from the date of manufacturing.

ALISHAN FC
EVA ENCAPSULANT

ALISHAN GREEN ENERGY PVT. LTD.

Alishan FC is one of the fast-cure variants of EVA encapsulants manufactured by Alishan Green Energy Private Limited, in world-class manufacturing technology with proven raw materials. Alishan EVAs are PID and snail trail resistant. Our EVA ensures the reliability and life of solar modules in the field, these fast cure EVA encapsulants can be laminated in up to 15 minutes at a temperature varying from 140 - 150° C.

Product	Alishan FC			
Linear meter	Up to 300 meters			
Width	Up to 1350 mm			
Thickness	Up to 0.80 mm			
Properties	Description	Standard	UOM	Alishan FC
Physical Properties	Tensile strength	ASTM D 638	MPa	≥ 16
	Elongation		%	≥ 600
	Adhesion with Glass	ASTM D 903	N/cm	≥ 75
	Adhesion with Backsheet		N/cm	≥ 75
	VA Content	-	%	28 ± 2
Water Ingress	Water absorption	ISO 62	%	≤ 0.1
Thermal Properties	Thermal Shrinkage	160 Deg C / 5 min	%	MD ≤ 3
				TD ≤ 1
	Thermal conductivity	ISO 22007	W/ m K	0.2475
Electrical Properties	Dielectric Strength	ASTM D 149	kV/mm	32
	CTI(Comparative Tracking Index)	IEC 60112	V	600
	Volume resistivity	ASTM 257-14	Ohm. cm	>1×10 ^{15}
Gel content		ASTM D 2765	%	≥ 75
Optical Properties	Transmittance	ASTM E 424	%	≥ 91
	UV cut off		nm	360 ± 30
	Yellowness Index		-	≤ 1
	Refractive Index	ASTM D 1218	-	1.48
Lamination Parameters			UOM	Values
	Vacuum / Evacuation Time		Minutes	4 - 6
	Lamination / Pressing Time		Minutes	8 - 10
	Lamination Temperature		°C	140 – 150

Packing

The EVA rolls are wound on a standard 3 inches (inner diameter) paper core, the standard length of EVA film in a roll is up to 300 meters. Each roll was wrapped in polyethene film and placed in a carton box and 9 boxes and placed in a pallet.

Storage

Must be stored in a dry and temperature of ≤ 30°C and humidity ≤ 60%, the shelf life of this product is 9 months from the date of manufacturing.

ALISHAN LOW ACID EVA

ALISHAN GREEN ENERGY PVT. LTD.

Alishan Low Acid EVA is specially formulated to overcome the corrosion issues related to traditional EVA. Our low Acid EVA can be used to ensure minimum water ingress and acid leaching for stable performance of sensitive cells surfaces like TOPCon or HJT.

Product	Alishan Low Acid EVA			
Linear meter	Up to 300 meters			
Width	Up to 1350 mm			
Thickness	Up to 0.80 mm			
Properties	Description	Standard	UOM	Alishan Low Acid EVA
Physical Properties	Tensile strength	ASTM D 638	MPa	≥ 16
	Elongation		%	≥ 600
	Adhesion with Glass	ASTM D 903	N/cm	≥ 75
	Adhesion with Backsheet		N/cm	≥ 75
	VA Content	-	%	28 ± 2
Water Ingress	Water absorption	ISO 62	%	≤ 0.1
Thermal Properties	Thermal Shrinkage	160 Deg C / 5 min	%	MD ≤ 3
				TD ≤ 1
	Thermal conductivity	ISO 22007	W/ m K	0.2475
Electrical Properties	Dielectric Strength	ASTM D 149	kV/mm	32
	CTI(Comparative Tracking Index)	IEC 60112	V	600
	Volume resistivity	ASTM 257-14	Ohm. cm	$>1\times10^{15}$
Gel content		ASTM D 2765	%	≥ 75
Optical Properties	Transmittance	ASTM E 424	%	≥ 91
	UV cut off		nm	360 ± 30
	Yellowness Index		-	≤ 1
	Refractive Index	ASTM D 1218	-	1.48
Lamination Parameters			UOM	Values
	Vacuum / Evacuation Time		Minutes	4 - 6
	Lamination / Pressing Time		Minutes	8 - 10
	Lamination Temperature		°C	140 – 150

Packing

The EVA rolls are wound on a standard 3 inches (inner diameter) paper core, the standard length of EVA film in a roll is up to 300 meters. Each roll was wrapped in polyethene film and placed in a carton box and 9 boxes and placed in a pallet.

Storage

Must be stored in a dry and temperature of ≤ 30°C and humidity ≤ 60%, the shelf life of this product is 9 months from the date of manufacturing.

ALISHAN FRONT EVA ENCAPSULANT

ALISHAN GREEN ENERGY PVT. LTD.

Alishan Front EVA is one of the fast-cure variants of EVA encapsulants manufactured by Alishan Green Energy Private Limited, in world-class manufacturing technology and proven raw materials. This is especially meant for front/top EVA solutions with UV transparency and better PID resistance. Our EVA ensures the reliability and life of solar modules in the field, these fast cures EVA encapsulants can be laminated in up to 15 minutes at a temperature varying from 140 - 150° C.

Product	Alishan Front EVA			
Linear meter	Up to 300 meters			
Width	Up to 1350 mm			
Thickness	Up to 0.80 mm			
Properties	Description	Standard	UOM	Alishan Front EVA
Physical Properties	Tensile strength	ASTM D 638	MPa	≥ 16
	Elongation		%	≥ 600
	Adhesion with Glass	ASTM D 903	N/cm	≥ 75
	Adhesion with Backsheet		N/cm	≥ 75
	VA Content	-	%	28 ± 2
Water Ingress	Water absorption	ISO 62	%	≤ 0.1
Thermal Properties	Thermal Shrinkage	160 Deg C / 5 min	%	MD ≤ 3
				TD ≤ 1
	Thermal conductivity	ISO 22007	W/ m K	0.2475
Electrical Property	Dielectric Strength	ASTM D 149	kV/mm	32
	CTI(Comparative Tracking Index	IEC 60112	V	> 600
	Volume resistivity	ASTM 257-14	Ohm. cm	$>1\times10^{15}$
Gel content		ASTM D 2765	%	≥ 75
Optical Properties	Transmittance	ASTM E 424	%	≥ 91
	UV cut off		nm	-
	Yellowness Index		-	≤ 1
	Refractive Index	ASTM D 1218	-	1.48
Lamination Parameters			UOM	Values
	Vacuum / Evacuation Time		Minutes	4 - 6
	Lamination / Pressing Time		Minutes	8 - 10
	Lamination Temperature		°C	140 – 150

Packing

The EVA rolls are wound on a standard 3 inches (inner diameter) paper core, the standard length of EVA film in a roll is up to 300 meters. Each roll was wrapped in polyethene film and placed in a carton box and 9 boxes are placed in a pallet.

Storage

Must be stored in a dry and temperature of ≤ 30°C and humidity ≤ 60%, the shelf life of this product is 9 months from the date of manufacturing.

PRODUCT PORTFOLIO

BackPro BACKSHEETS

Solar modules have to go through harsh environmental conditions like extreme heat & sunlight, and also excessive rain and humidity. They are expected to withstand such environmental stresses for 25 years without excessive degradation (<20%) in power for them to qualify for most applications.

Backsheet plays a key role in protecting the solar panel and giving it the required longevity. **Alishan BackPro** Backsheets provide everything required for protecting solar panels, such as:

BackPro

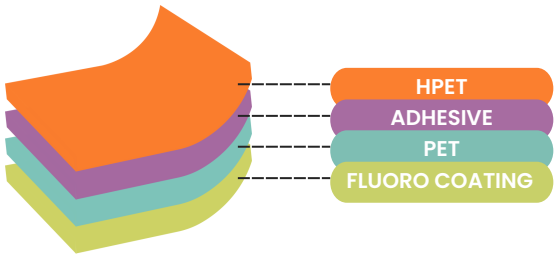
- FLUORO
- NON FLUORO
- TRANSPARENT
- BLACK

- Moisture Proof
- Zero Decolouration
- High Reflectance
- Excellent UV Withstanding
- High Dielectric Strength
- Superior Bonding with EVA
- High Electrical Resistance
- Upto 1500 V System Discharge
- 3X IEC Tested
- Superior Interlayer Adhesion
- No Chalking
- Near Zero Thermal Shrinkage
- Highly Reliable

ALISHAN
GREEN ENERGY PVT. LTD.

BackPRO ABS-PPC

Alishan Back Sheet BackPro ABS-PPC is available with 1000 & 1500 V system voltage with airside HPET layer and proprietary cell side Fluoro coating layer.

STRUCTURE DETAILS		ABS - PPC
LAYER NO.	PARTICULARS	
1	Air side HPET layer	
2	Adhesive layer	
3	Middle PET layer	
4	Cell side Fluoro Coating	

S. NO.	PROPERTIES	UOM	TEST METHOD	ABS – PPC (1000 V)		ABS – PPC (1500 V)	
1	Thickness	µm	Micrometer	195 ± 5 %		310 (-10/+15)	
2	Width	mm	Scale	Up to 1350		Up to 1350	
3	Tensile Strength	MPa	ASTM D 882	MD	≥ 100	MD	≥ 100
				TD	≥ 100	TD	≥ 100
4	Elongation	%	ASTM D 882	MD	≥ 100	MD	≥ 100
				TD	≥ 90	TD	≥ 90
5	Thermal Shrinkage	%	150° C / 30 min	MD	≤ 1.0	MD	≤ 1.0
				TD	≤ 1.0	TD	≤ 1.0
6	Interlayer Adhesion	N/cm	ASTM D 903	HPET-PET	≥ 4	HPET-PET	≥ 4
		Grade	GB / T9286	Cell Side	Grade 0	Cell Side	Grade 0
7	Adhesion with EVA	N/cm	ASTM D 903	≥ 60		≥ 60	
8	MVTR	$g/m^2/day$	ASTM F 1249	≤ 0.5		≤ 0.5	
9	CTI	V	IEC 60112	> 600		> 600	

Packing : Up to 200 meters per roll, 9 or 12 rolls per pallet
Storage Condition : To be stored in sealed packing at temperature ≤ 30° C & Humidity ≤ 60 %
Shelf life : Recommended to use within 24 months from the date of manufacture

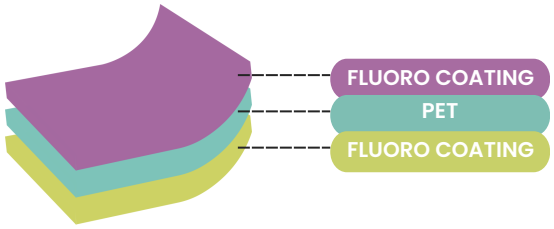
The above properties are a typical range of properties and are not to be used for designing or establishing the limits of specification.

MAKE IN INDIA

ALISHAN
GREEN ENERGY PVT. LTD.

BackPRO ABS-CPC

Alishan Backsheet BackPro ABS-CPC are available in both 1000 V & 1500 V system voltage. The backsheet comes with a proprietary coating layer on both the airside and cell side.

CONSTRUCTION DETAILS		ABS - CPC
LAYER NO.	PARTICULARS	
1	Air Side Fluoro Coating	
2	Middle PET Layer	
3	Cell Side Fluoro Coating	

S. NO.	PROPERTIES	UOM	TEST METHOD	ABS – CPC – 1000 V		ABS – CPC – 1500 V	
1	Thickness	µm	Micrometer	275 ± 5 %		310 (-10/+15)	
2	Width	mm	Scale	Up to 1350		Up to 1350	
3	Tensile Strength	MPa	ASTM D 882	MD	≥ 100	MD	≥ 100
				TD	≥ 100	TD	≥ 100
4	Elongation	%	ASTM D 882	MD	≥ 100	MD	≥ 100
				TD	≥ 90	TD	≥ 90
5	Thermal Shrinkage	%	150° C / 30 min	MD	≤ 1.0	MD	≤ 1.0
				TD	≤ 1.0	TD	≤ 1.0
6	Coating Adhesion	Grade	GB / T9286	Air Side	Grade 0	Air Side	Grade 0
				Cell Side	Grade 0	Cell Side	Grade 0
7	Adhesion with EVA	N/cm	ASTM D 903	≥ 60		≥ 60	
8	MVTR	$g/m^2/day$	ASTM F 1249	≤ 2		≤ 2	
9	CTI	V	IEC 60112	> 600		> 600	

RELIABILITY DATA OF

BackPRO ABS-CPC

ALISHAN GREEN ENERGY PVT. LTD.

Ageing	Standard	Parameters	Value
DH 3000 hours 85% RH, 85°C	IEC 62788-2	Peel strength with Alishan EPE	> 50 N/10 mm
		Peel strength with Alishan POE Appearance	> 40 N/10 mm Normal
UV 180 kWh/m^2 85% RH, 85°C	IEC 62788-2	Peel strength with Alishan EPE	> 60 N/10 mm
		Peel strength with Alishan POE Appearance	> 40 N/10 mm Normal

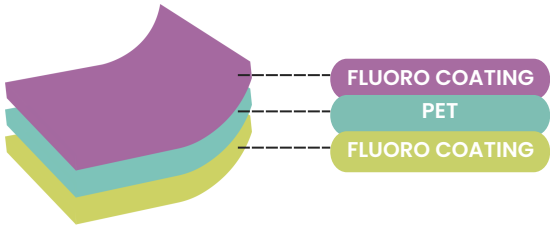
Packing : Upto 200 meters per roll, 9 or 12 rolls per pallet
Storage Condition : To be stored in sealed packing at temperature ≤ 30° C & Humidity ≤ 60 %
Shelf life : Recommended to use within 24 months from the date of manufacture

The above properties are a typical range of properties and are not to be used for designing or establishing the limits of specification.

ALISHAN GREEN ENERGY PVT. LTD.

BackPRO ABS-CPC-T

Alishan Backsheet BackPro ABS-CPC-T are available in 1500 V system voltage. The backsheet comes with a proprietary coating layer on both the airside and cell side.

CONSTRUCTION DETAILS		ABS - CPC-T
LAYER NO.	PARTICULARS	
1	Air Side Fluoro Coating	
2	Middle PET Layer	
3	Cell Side Fluoro Coating	

S. NO.	PROPERTIES	UOM	TEST METHOD	ABS – CPC – T - 1500 V	
1	Thickness	µm	Micrometer	305 ± 2	
2	Width	mm	Scale	Up to 1350	
3	Transmittance	%	ASTM E 424	> 91	
4	Tensile Strength	MPa	ASTM D 882	MD	≥ 100
				TD	≥ 100
5	Elongation	%	ASTM D 882	MD	≥ 100
				TD	≥ 90
6	Thermal Shrinkage	%	150° C / 30 min	MD	≤ 1.0
				TD	≤ 1.0
7	Coating Adhesion	Grade	GB / T9286	Air Side	Grade 0
				Cell Side	Grade 0
8	Adhesion with EVA	N/cm	ASTM D 903	≥ 60	
9	MVTR	$g/m^2/day$	ASTM F 1249	≤ 2	
10	CTI	V	IEC 60112	> 600	

Packing : Upto 200 meters per roll, 9 or 12 rolls per pallet
Storage Condition : To be stored in sealed packing at temperature ≤ 30° C & Humidity ≤ 60 %
Shelf life : Recommended to use within 24 months from the date of manufacture

The above properties are a typical range of properties and are not to be used for designing or establishing the limits of specification.

RELIABILITY DATA OF

BackPRO ABS-CPC-T

ALISHAN GREEN ENERGY PVT. LTD.

Ageing	Standard	Parameters	Value
DH 3000 hours 85% RH, 85°C	IEC 62788-2	Peel strength with Alishan EPE	> 50 N/10 mm
		Peel strength with Alishan POE	> 40 N/10 mm
		Yellowness Index	< 4
		Appearance	Normal
UV 180 kWh/m^2	IEC 62788-2	Peel strength with Alishan EPE	> 60 N/10 mm
		Peel strength with Alishan POE	> 40 N/10 mm
		Yellowness Index	< 4
		Appearance	Normal
Acid tests	24 hours immersion in acidic solutions	Visual	No Visual defects

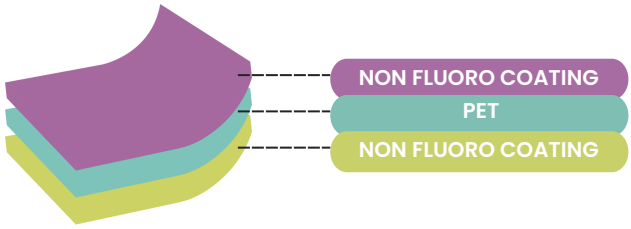
Packing : Upto 200 meters per roll, 9 or 12 rolls per pallet
Storage Condition : To be stored in sealed packing at temperature ≤ 30° C & Humidity ≤ 60 %
Shelf life : Recommended to use within 24 months from the date of manufacture

The above properties are a typical range of properties and are not to be used for designing or establishing the limits of specification.

ALISHAN GREEN ENERGY PVT. LTD.

BackPro ABS-CPC-NON FLUORO

Alishan Backsheet BackPro ABS-CPC-NON FLUORO are available in both 1000 V & 1500 V system voltage. The backsheet comes with a proprietary coating layer on both the airside and cell side.

CONSTRUCTION DETAILS		ABS - CPC - NON FLUORO
LAYER NO.	PARTICULARS	
1	Air Side Non Fluoro Coating	
2	Middle PET Layer	
3	Cell Side Non Fluoro Coating	

S. NO.	PROPERTIES	UOM	TEST METHOD	ABS – CPC - NON FLUORO – 1000 V		ABS – CPC – NON FLUORO - 1500 V	
1	Thickness	µm	Micrometer	275 ± 5 %		310 (-10/+15)	
2	Width	mm	Scale	Up to 1350		Up to 1350	
3	Tensile Strength	MPa	ASTM D 882	MD	≥ 100	MD	≥ 100
				TD	≥ 100	TD	≥ 100
4	Elongation	%	ASTM D 882	MD	≥ 100	MD	≥ 100
				TD	≥ 90	TD	≥ 90
5	Thermal Shrinkage	%	150° C / 30 min	MD	≤ 1.0	MD	≤ 1.0
				TD	≤ 1.0	TD	≤ 1.0
6	Coating Adhesion	Grade	GB / T9286	Air Side	Grade 0	Air Side	Grade 0
				Cell Side	Grade 0	Cell Side	Grade 0
7	Adhesion with EVA	N/cm	ASTM D 903	≥ 60		≥ 60	
8	MVTR	$g/m^2/day$	ASTM F 1249	≤ 2		≤ 2	
9	CTI	V	IEC 60112	> 600		> 600	

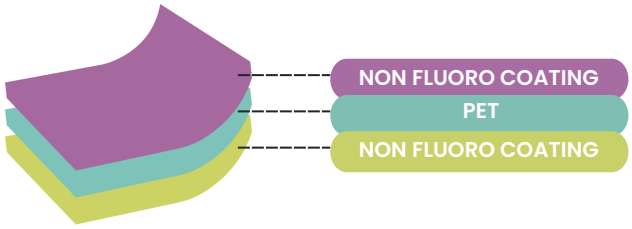
Packing : Upto 200 meters per roll, 9 or 12 rolls per pallet
Storage Condition : To be stored in sealed packing at temperature ≤ 30° C & Humidity ≤ 60 %
Shelf life : Recommended to use within 24 months from the date of manufacture

The above properties are a typical range of properties and are not to be used for designing or establishing the limits of specification.

ALISHAN GREEN ENERGY PVT. LTD.

BackPRO ABS-CPC-T-NON FLUORO

Alishan backsheet backpro ABS-CPC-T is available in 1500 V system voltage. The backsheet comes with a proprietary transparent non fluorocoating on both air and cell side.

CONSTRUCTION DETAILS		ABS - CPC-T-NON FLUORO
LAYER NO.	PARTICULARS	
1	Air Side Non Fluoro Coating	
2	Middle PET Layer	
3	Cell Side Non Fluoro Coating	

S. NO.	PROPERTIES	UOM	TEST METHOD	ABS – CPC – T - NON FLUORO - 1500 V	
1	Thickness	µm	Micrometer	305 ± 2	
2	Width	mm	Scale	Up to 1350	
3	Transmittance	%	ASTM E 424	> 91	
4	Tensile Strength	MPa	ASTM D 882	MD	≥ 100
				TD	≥ 100
5	Elongation	%	ASTM D 882	MD	≥ 100
				TD	≥ 90
6	Thermal Shrinkage	%	150° C / 30 min	MD	≤ 1.0
				TD	≤ 1.0
7	Coating Adhesion	Grade	GB / T9286	Air Side	Grade 0
				Cell Side	Grade 0
8	Adhesion with EVA	N/cm	ASTM D 903	≥ 60	
9	MVTR	$g/m^2/day$	ASTM F 1249	≤ 2	
10	CTI	V	IEC 60112	> 600	

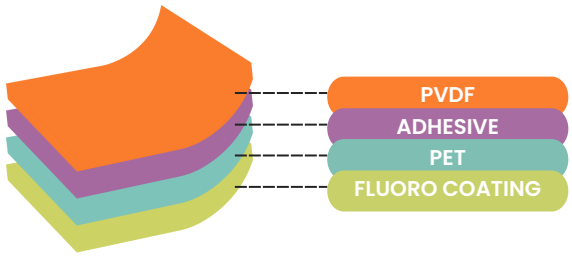
Packing : Upto 200 meters per roll, 9 or 12 rolls per pallet
Storage Condition : To be stored in sealed packing at temperature ≤ 30° C & Humidity ≤ 60 %
Shelf life : Recommended to use within 24 months from the date of manufacture

The above properties are a typical range of properties and are not to be used for designing or establishing the limits of specification.

ALISHAN
GREEN ENERGY PVT. LTD.

BackPRO ABS-KPC

Alishan Back Sheet BackPro ABS-KPC is of 1500 V system voltage with airside PVDF layer and proprietary cell side Fluoro coating layer.

STRUCTURE DETAILS		ABS - KPC
LAYER NO.	PARTICULARS	
1	Air side PVDF layer	
2	Adhesive layer	
3	Middle PET layer	
4	Cell side Fluoro Coating	

S. NO.	PROPERTIES	UOM	TEST METHOD	ABS – KPC – 1500 V	
1	Thickness	µm	Micrometer	315 ± 5 %	
2	Width	mm	Scale	Up to 1350	
3	Tensile Strength	MPa	ASTM D 882	MD	≥ 100
				TD	≥ 100
4	Elongation	%	ASTM D 882	MD	≥ 100
				TD	≥ 90
5	Thermal Shrinkage	%	150° C / 30 min	MD	≤ 1.0
				TD	≤ 1.0
6	Interlayer Adhesion	N/cm	ASTM D 903	PVDF-PET	≥ 4.0
7	Coating Adhesion	Grade	GB / T9286	Cell Side	Grade 0
8	Adhesion with EVA	N/cm	ASTM D 903	≥ 60	
9	MVTR	$g/m^2/day$	ASTM F 1249	≤ 0.5	
10	CTI	V	IEC 60112	> 600	

RELIABILITY DATA OF

BackPRO ABS-KPC

ALISHAN GREEN ENERGY PVT. LTD.

Ageing	Standard	Parameters	Value
DH 3000 hours 85% RH, 85°C	IEC 62788-2	Peel strength with Alishan EPE	> 50 N/10 mm
		Peel strength with Alishan POE Appearance	> 40 N/10 mm Normal
UV 180 kWh/m^2 85% RH, 85°C	IEC 62788-2	Peel strength with Alishan EPE	> 60 N/10 mm
		Peel strength with Alishan POE Appearance	> 40 N/10 mm Normal

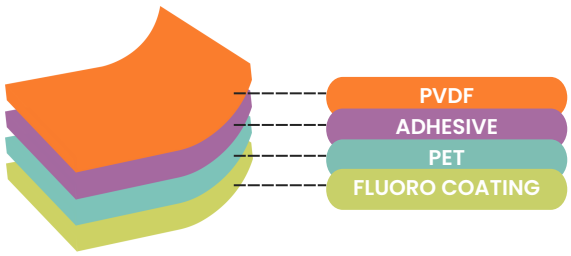
Packing : Up to 200 meters per roll, 9 or 12 rolls per pallet
Storage Condition : To be stored in sealed packing at temperature ≤ 30° C & Humidity ≤ 60 %
Shelf life : Recommended to use within 24 months from the date of manufacture

The above properties are a typical range of properties and are not to be used for designing or establishing the limits of specification.

ALISHAN GREEN ENERGY PVT. LTD.

BackPRO ABS-KPC-T

Alishan Back Sheet BackPro ABS-KPC-T is of 1500 V system voltage with airside PVDF layer and proprietary cell side Fluoro coating layer. It comes with the benefits of superior transmittance and hydrophobicity for high efficiency M10 and M12 modules.

STRUCTURE DETAILS			ABS - KPC-T
LAYER NO	PARTICULARS	THICKNESS (µm)	
1	Air side transparent PVDF	25	
2	Adhesive layer	10	
3	Middle transparent PET	275	
4	Cell side Coating	6	

S. NO.	PROPERTIES	UOM	TEST METHOD	ABS-KPC-T (1500 V)	
1	Thickness	µm	Micrometer	315 ± 5 %	
2	Width	mm	Scale	Upto 1350	
3	Transmittance	%	ASTM E 424	>91	
4	Tensile Strength	MPa	ASTM D 882	MD	≥ 100
				TD	≥ 100
5	Elongation	%	ASTM D 882	MD	≥ 100
				TD	≥ 90
6	Thermal Shrinkage	%	150°C / 30 min	MD	≤1.0
				TD	≤1.0
7	Interlayer Adhesion	N/cm	ASTM D 903	PVDF-PET	≥4.0
8	Coating Adhesion	Grade	GB / T9286	Cell side	Grade 0
9	Adhesion with EVA	N/cm	ASTM D 903	≥ 60	
10	MVTR	g/m²/day	ASTM F 1249	≤ 2	
11	CTI	V	IEC 60112	> 600	

Packing : Up to 200 meters per roll, 9 or 12 rolls per pallet
Storage Condition : To be stored in sealed packing at temperature ≤ 30° C & Humidity ≤ 60 %
Shelf life : Recommended to use within 24 months from the date of manufacture

The above properties are a typical range of properties and are not to be used for designing or establishing the limits of specification.

MAKE IN INDIA

RELIABILITY DATA OF

BackPRO ABS-KPC-T

ALISHAN
GREEN ENERGY PVT. LTD.

Ageing	Standard	Parameters	Value
DH 3000 hours 85% RH, 85°C	IEC 62788-2	Peel strength with Alishan EPE	> 50 N/10 mm
		Peel strength with Alishan POE	> 40 N/10 mm
		Yellowness Index	< 4
		Appearance	Normal
UV 180 kWh/m^2	IEC 62788-2	Peel strength with Alishan EPE	> 60 N/10 mm
		Peel strength with Alishan POE	> 40 N/10 mm
		Yellowness Index	< 4
		Appearance	Normal
Acid tests	24 hours immersion in acidic solutions	Visual	No Visual defects

Packing : Up to 200 meters per roll, 9 or 12 rolls per pallet
Storage Condition : To be stored in sealed packing at temperature ≤ 30° C & Humidity ≤ 60 %
Shelf life : Recommended to use within 24 months from the date of manufacture

The above properties are a typical range of properties and are not to be used for designing or establishing the limits of specification.