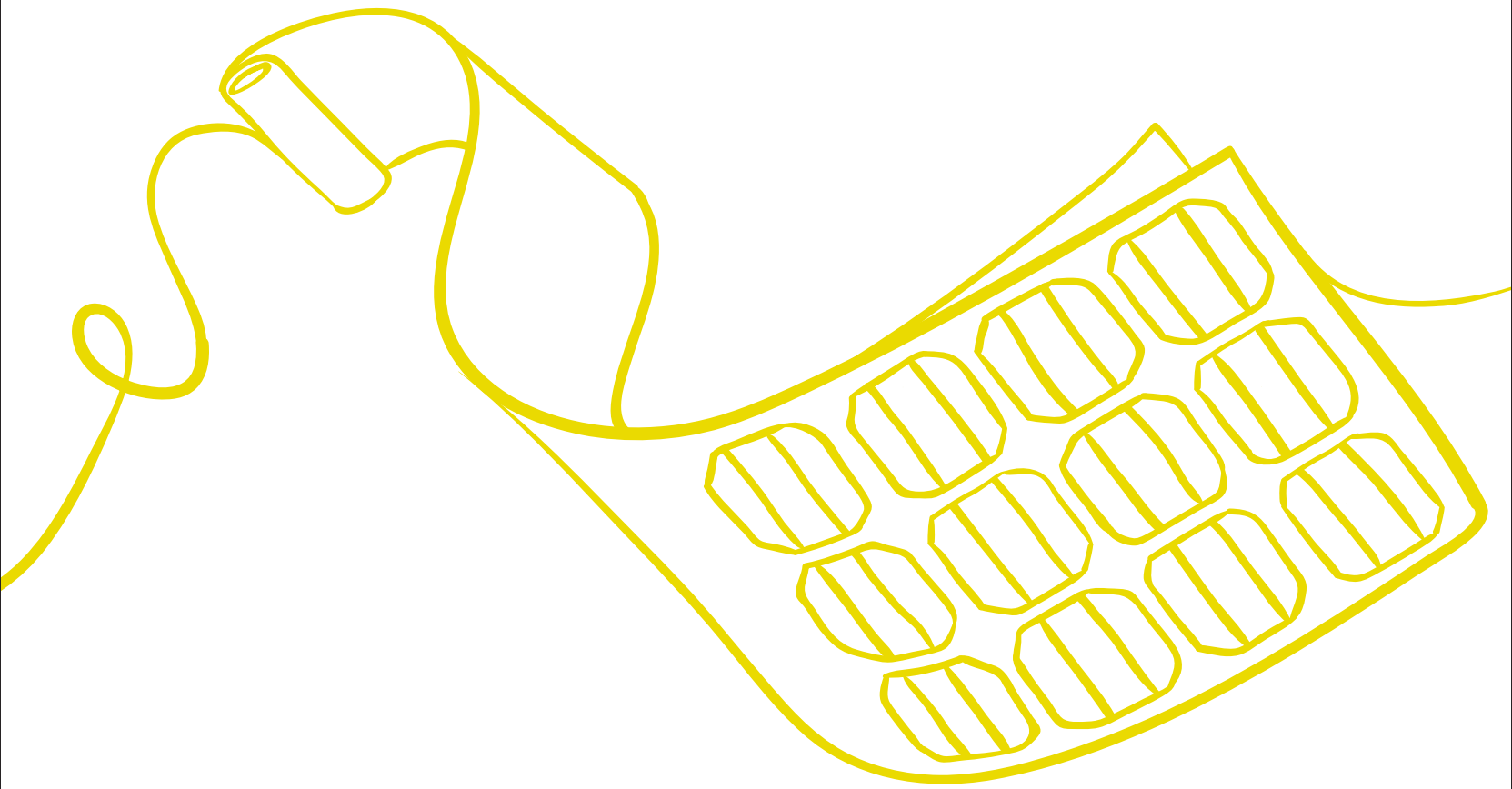
COVEME **PHOTOVOLTAIC**

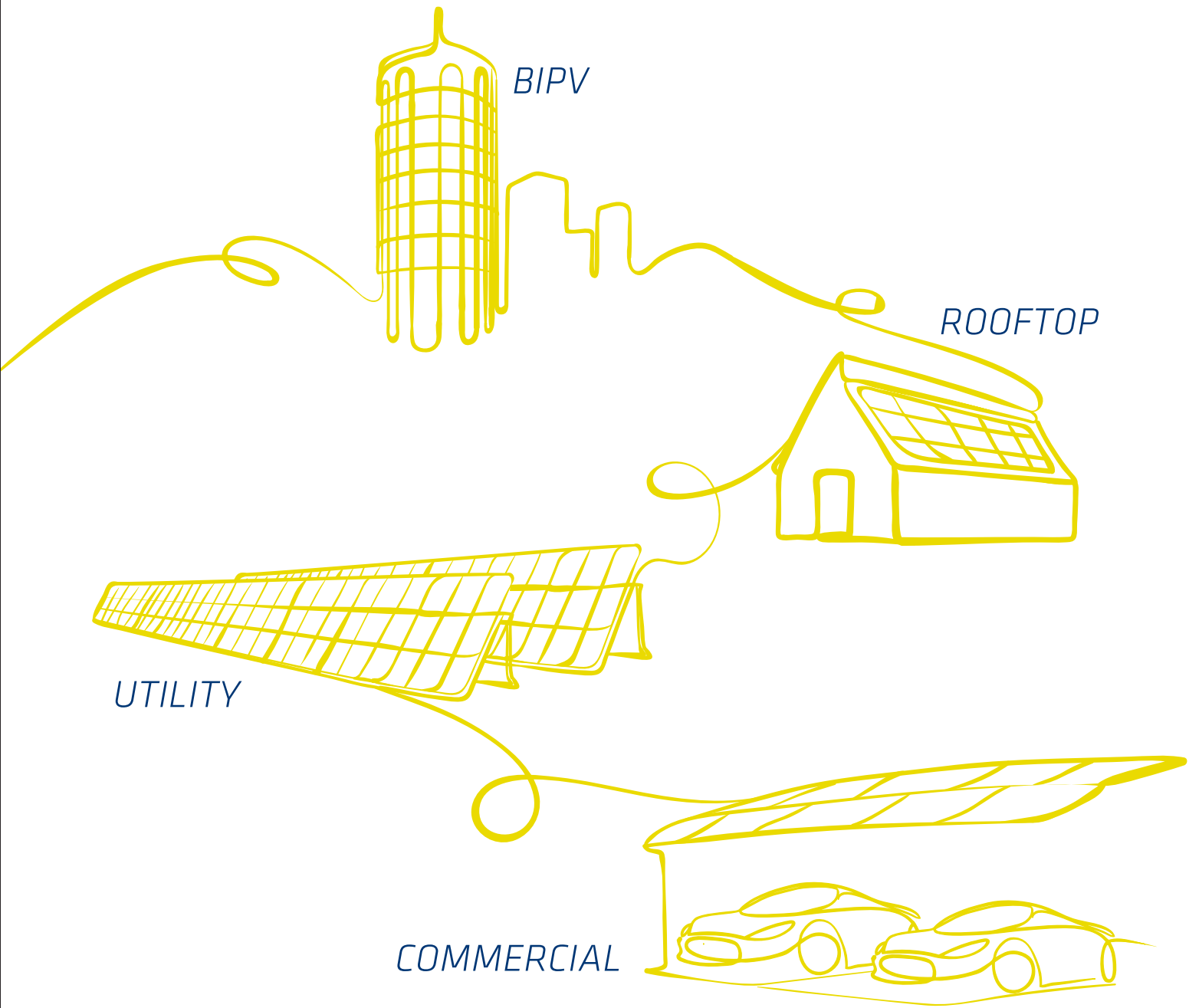


Backsheet for PV modules

coveme

THE VALUE OF INNOVATION

HIGH QUALITY BACKSHEETS FOR:



INDEX

COVEME TODAY 2

PRODUCTION 4

RESEARCH & DEVELOPMENT 5

QUALITY 6

CORPORATE SOCIAL RESPONSIBILITY 7

GREEN PHOTOVOLTAICS 8

MEMBERSHIPS 9

PRODUCT RANGE 10

dyMat® BACKSHEETS 12

EBfoil® BACKCONTACT 13

1000 VDC PET BASED - BESTSELLER 14
1000 VDC PET BASED - SPECIALTIES 16
1000 VDC PET BASED - MONOLAYER 18

1500 VDC PET BASED 20

TEDLAR BASED 22

EBfoil® BYS 24

EBfoil® SYS 26

ACCESSORIES 28

COVEME TODAY

BIGGEST IN HOUSE 18 GW BACKSHEET PRODUCTION CAPACITY WORLDWIDE

OVER 50 YEARS
of know-how in converting polyester film.

OVER 40 GW OF BACKSHEET
sold worldwide.

Worldwide
COMMERCIAL AND LOGISTIC NETWORK

HIGH TECH R&D LABS
in Europe and Asia.

CERTIFIED QUALITY, SAFETY AND ENVIRONMENTAL
standards.

PRODUCTION

Coveme has been converting polyester film for over 20 years and has successfully developed sophisticated technologies in the production of high-tech films for various industries. Clients' specifications are defined individually and monitored throughout the whole production chain, including suppliers, logistics and service process.

- **18 GW BACKSHEET** proprietary production capacity
- **FULLY AUTOMATED** processes
- **CUSTOMIZED** rolls, sheets and **PUNCHED** formats
- **12** production lines
- **LAMINATION, SURFACE TREATMENT, HEAT STABILIZATION, COATING, SLITTING**

RESEARCH & DEVELOPMENT

Our laboratories have always been one of the most advanced and strong points of the company, where our technological and operative know how is at complete disposal of the clients' needs. Coveme's research in photovoltaics focuses on products that guarantee our customers higher productivity, maximum module output and the best cost efficiency.

- Strong academic and industrial **PARTNERSHIPS**
- Proprietary **R&D LABS** in Europe and Asia.
- Dedicated **INNOVATION TEAM**
- **STATE-OF-THE-ART** equipment
- **CUSTOMIZED RESEARCH PROJECTS** for clients

QUALITY

The value for money of a PV investment is strongly influenced by initial cost (investment) and the return of the investment (profit) which depends on performances (energy output), time and costs for maintenance. The right choice of the backsheet material strongly influences all these parameters, which is why Coverme does not compromise in quality.

- **LONG HISTORY OF HIGH QUALITY** standard backsheet
- **SEVERE QUALITY INSPECTION** and production control in each critical phase of the process
- **QUALITY INDICATORS SHOW BETTER PERFORMANCE Y/Y**
- High quality backsheets means **HIGH ROI**
- **CONSTANT INVESTMENT** in new machinery - new technology - new process - dedicated and highly skilled personnel

CORPORATE SOCIAL RESPONSIBILITY

Coveme is well aware of its responsibility in terms of environment and social wellbeing. This is reflected not only in what we produce but also how we produce, which means a lean and green production technology and strategic partnerships with our customers and suppliers. The company continuously optimizes its emission treatments, waste disposal and energy resources and actively pushes forward sustainability and social issues inside and outside the company.

- **WHITE CERTIFICATES** achievement
- Active **CARBON FOOTPRINT** balancing
- Long-standing **SPORTS SPONSORSHIPS**
- Regular **CHARITY** donations
- **ROHS** and **REACH** compliance

GREEN PHOTOVOLTAICS

PV panel waste presents an environmental challenge which can be transformed into an economic opportunity if addressed seriously and on time. Upcoming global and restrictive laws might determine PV module components and consider the chemical composition of backsheet for its impact on disposal costs and environment. Coveme firmly believes in the values of a green economy and continuously invests in End of Life (EOL) and Life Cycle Assessment (LCA) activities.

- Coveme backsheets **100% ECO-FRIENDLY** high grade polyester based
- **COMPLIANT WITH ALL EXISTING REGULATIONS**
- In house **R&D ACTIVITY FOR EOL AND LCA** value creation
- Participation in **SCIENTIFIC AND INSTITUTIONAL TASK FORCES** worldwide
- **PARTNERSHIPS WITH RENOWN RESEARCH INSTITUTES** for new studies

MEMBERSHIPS

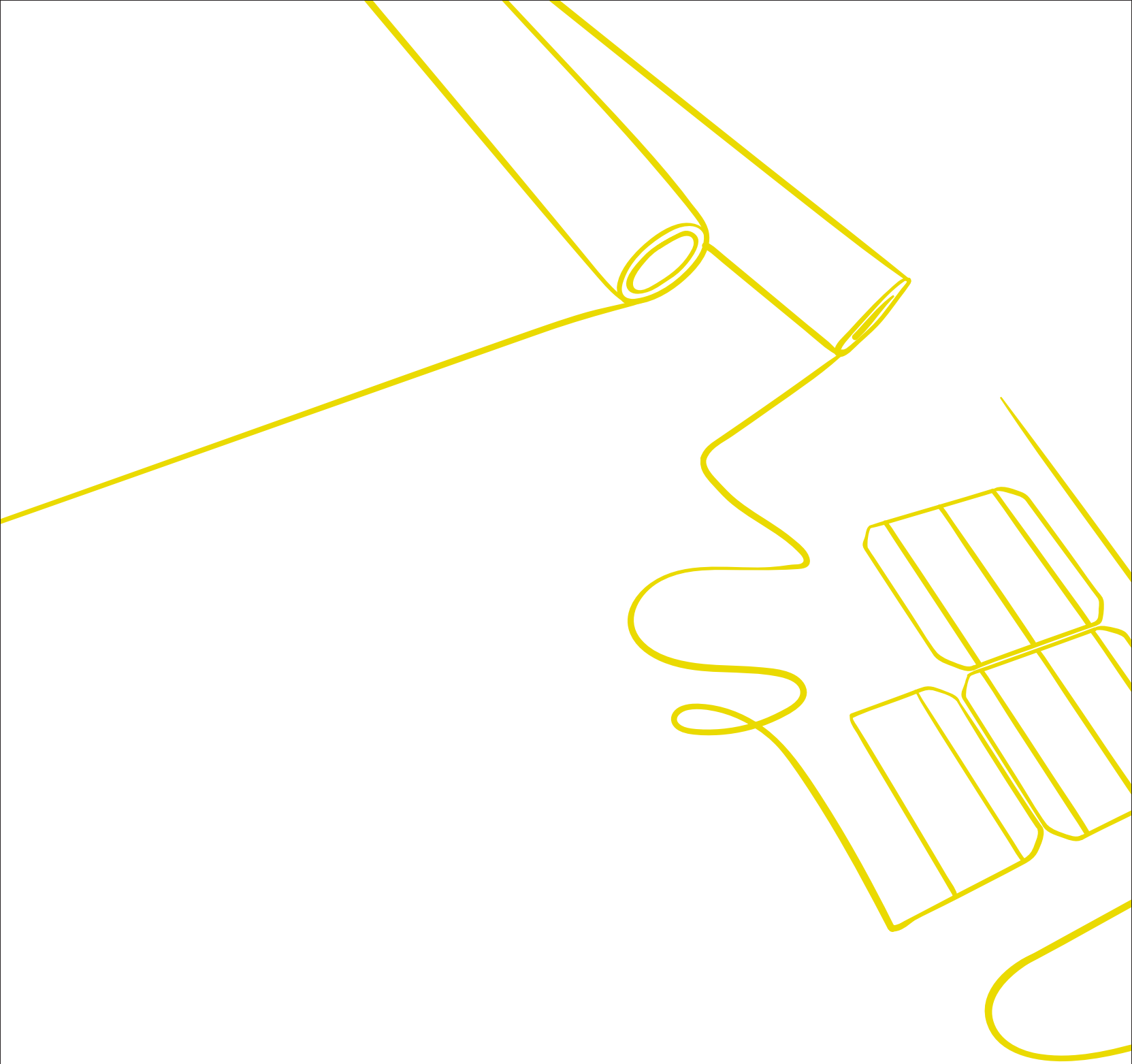
Coveme is honoured to be member of the most prestigious associations in the photovoltaic industry around the globe. With its deep know-how in specialty films and its long-standing presence in the PV market Coveme is pleased to give its contribution to the growth of these associations, believing strongly in the benefit of a continous cross-fertilization among peers.

SolarPower Europe

SEIA™

CPIA 中国光伏行业协会 China Photovoltaic Industry Association

SOLARUNITED



PRODUCT RANGE

dyMat® 1000 VDC BESTSELLER **14**
PYE SPV - SPV-L
PYE SPV L 305
PYE SPV L SHR 305
PYE 3000 - 3000L

dyMat® 1000 VDC SPECIALTIES **16**
APYE
APYE SHR
BK PYE SPV L

dyMat® 1000 VDC MONOLAYER **18**
PYE MONO L
PYE MONO LD
PYE MONO L SHR
CLRPYE MONO

dyMat® 1500 VDC **20**
HDPYE SPV L
CLR HDPYE L

dyMat® TEDLAR BASED **22**
TSL 50/250
TSL 50/350

EBfoil® BACKCONTACT **24**
BYS
SYS

dyMat® ACCESSORIES **28**
EPE
E

DYMAT® BACKSHEETS

Coveme has a long history of high quality standard backsheet and can assist in the right choice to maximize the profit and minimize the risk. To choose the proper high quality backsheet, with the best balance in performances and price means getting high ROI.

HIGHLY PERFORMING
in hydrolysis and UV resistance

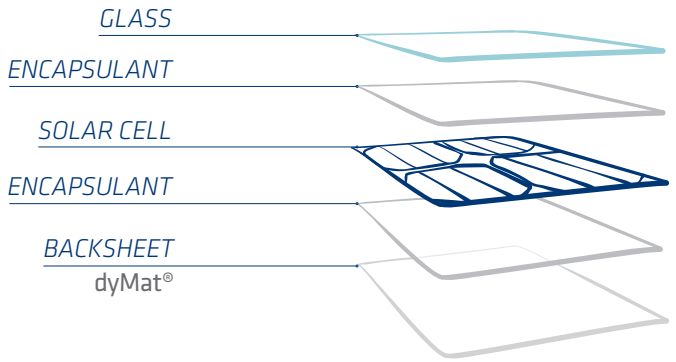
MAXIMUM PROTECTION FOR SOLAR CELLS
from humidity and harsh physical and chemical environments.

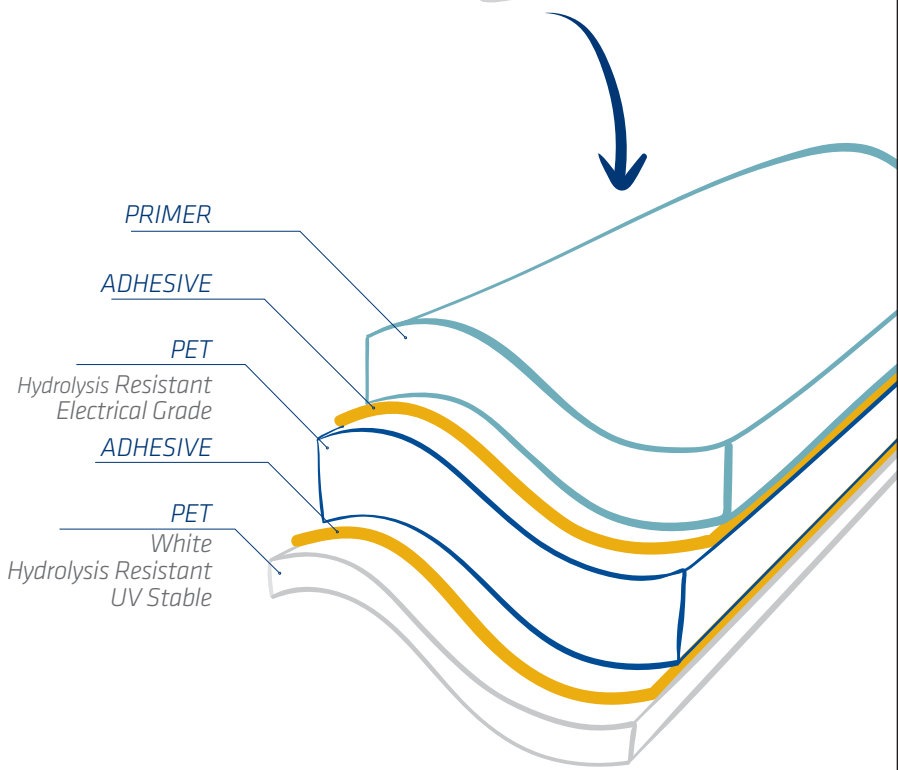
SOLUTIONS for 1500 VDC, BIPV, HIT, IBC, Bifacial and PERC technology.

SPECIAL FEATURES
for extra high module output.

CERTIFIED RELIABILITY AND DURABILITY
by major authorities in the photovoltaic business and beyond (TÜV, UL, JET etc)

PV MODULE STRUCTURE



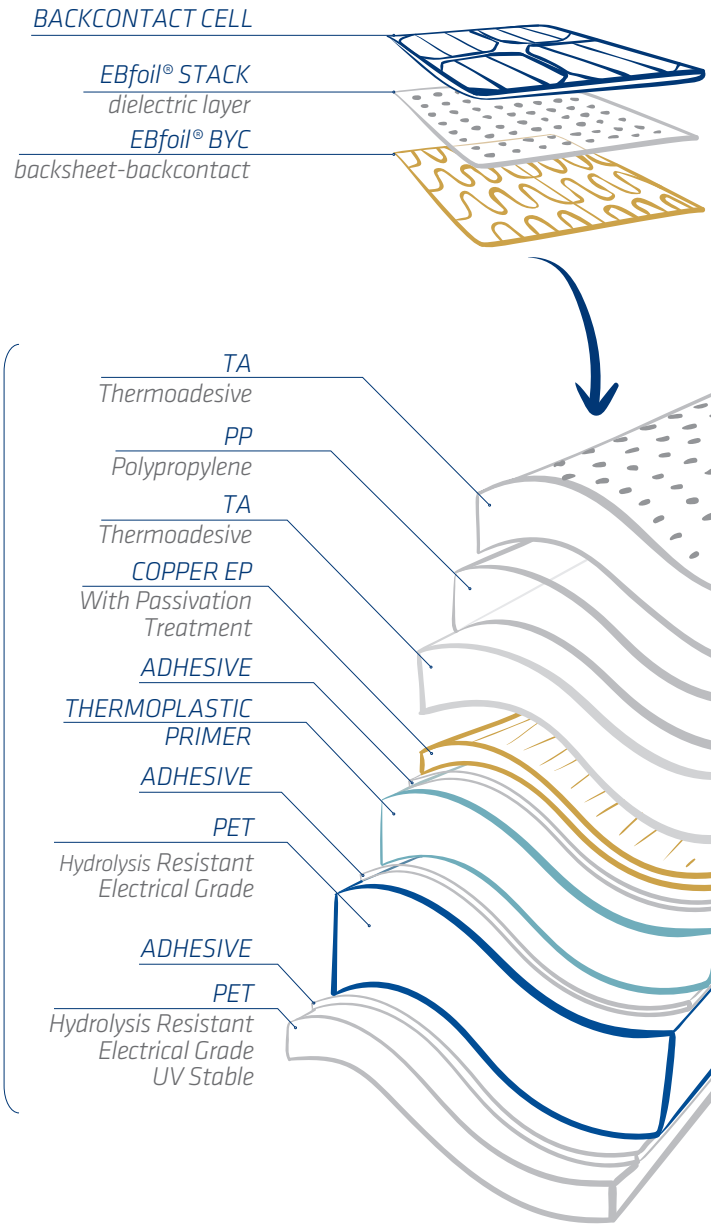


EB-FOIL® BACKCONTACT

Coveme's EBfoil® is a highly innovative laminate that features a flexible electronic circuit printed according to the customer's pattern and functions as a conductive element between the backcontact cells (MWT, EWT, IBC).

- **SOLUTIONS FOR BOTH** backsheet based (EBfoil® BYS) and glass-glass modules (EBfoil® SYS)
- **REDUCTION OF PRODUCTION COST** through innovative module production process and high-efficiency cells
- Near to zero cells breakage thanks to **AUTOMATION OF PRODUCTION PROCESS**
- **NEAR TO ZERO CELL TO MODULE LOSS.** Higher output of the panel.
- Available in **BLACK, WHITE OR TRANSPARENT** version

BACKCONTACT MODULE STRUCTURE

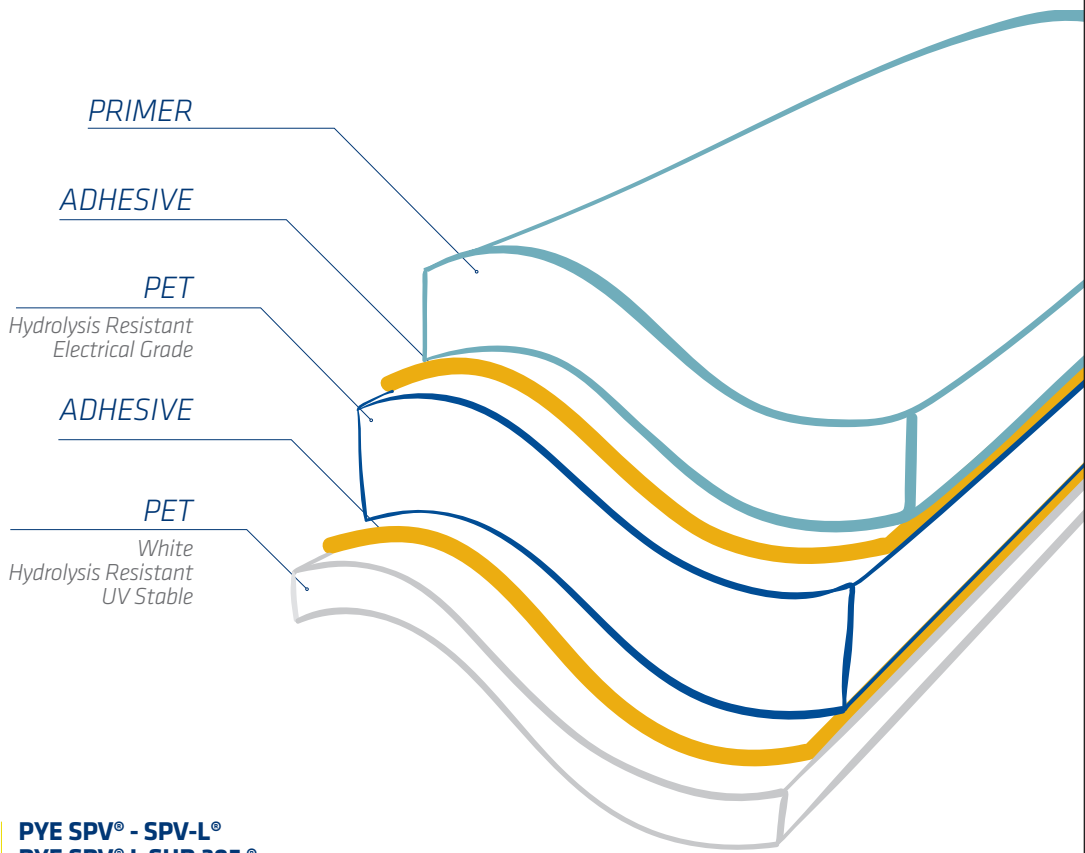


1000 VDC PET BASED

HIGH GRADE PET

ECO FRIENDLY PRODUCT

CERTIFIED QUALITY



PYE SPV® - SPV-L®
PYE SPV® L SHR 305 ®
PYE SPV® L 305

PYE 3000®
PYE 3000 L®

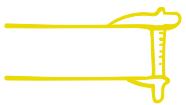
dyMat® BESTSELLER

These are Coveme's strongest selling backsheets, with an unbeaten price-quality ratio. They are all guaranteed for 2500h of DHT, 72h PCT and over 400 kwh/sqm of UV irradiation resistance, snail trail free, and feature excellent hydrolysis resistance and enhanced adhesion with encapsulants.

200M m² sold worldwide

No 1 selling backsheet

PYE SPV® - SPV-L®



UL Type 1 > 300µ

PYE SPV® L 305

Extra high reflectance

PYE SPV® L SHR 305 ®

DHT > 3000h

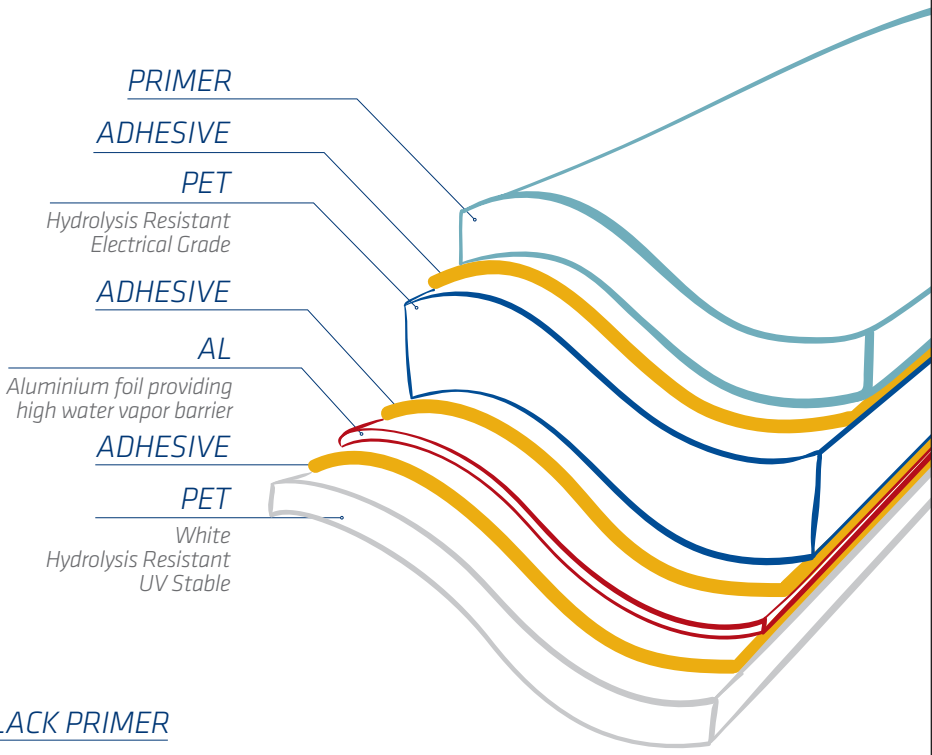
PYE 3000® - 3000L®

1000 VDC PET BASED

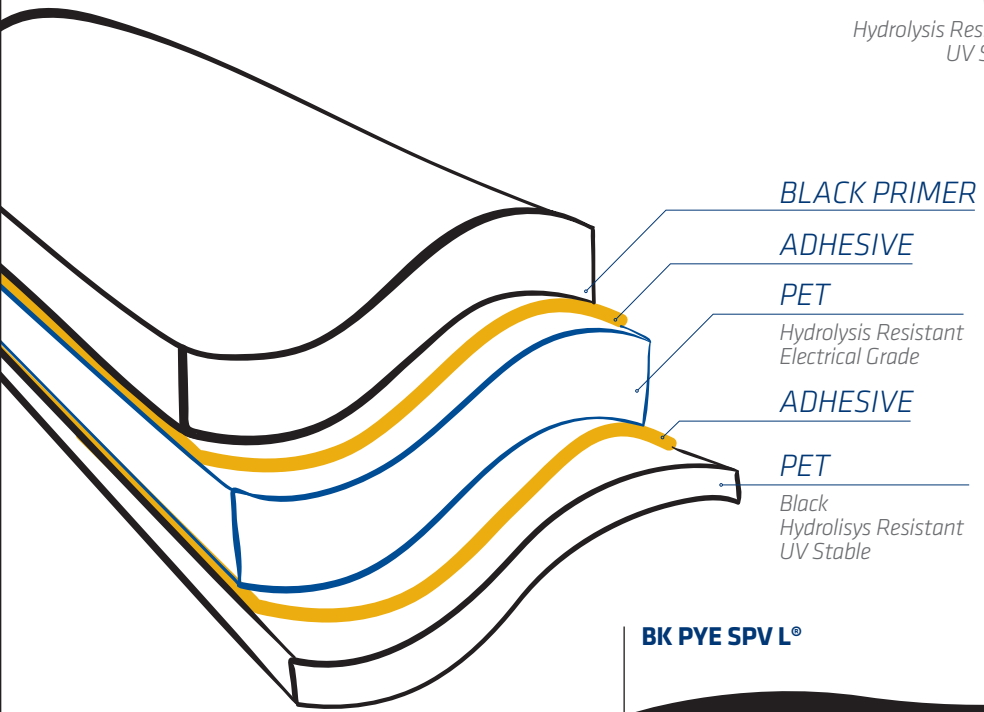
HIGH GRADE PET

CERTIFIED QUALITY

ECO FRIENDLY PRODUCT



APYE®
APYE® SHR



BK PYE SPV L®

dyMat® SPECIALITIES

These are Coveme's backsheets for specific applications and modules, such as BIPV, Thin Film and HIT-IBC-PERC. They are all guaranteed for 2500h of DHT, 72h PCT and over 400 kwh/sqm of UV irradiation resistance, and feature excellent hydrolysis resistance and enhanced adhesion with encapsulants.

Extra low WVTR

APYE®

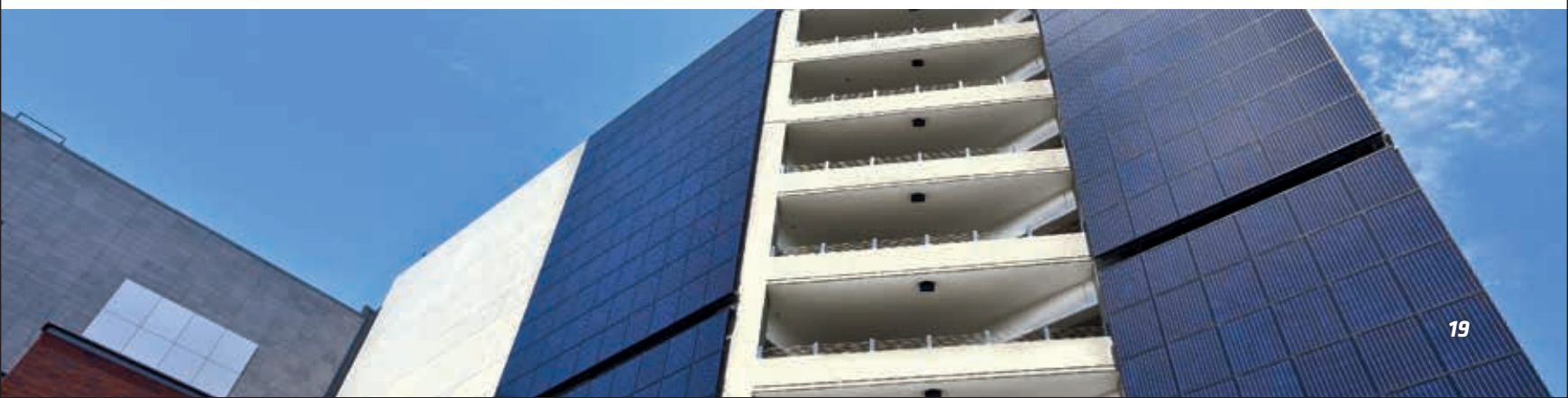
Totally black

BK PYE® SPV L

Extra low WVTR

Extra high reflectance

APYE® SHR

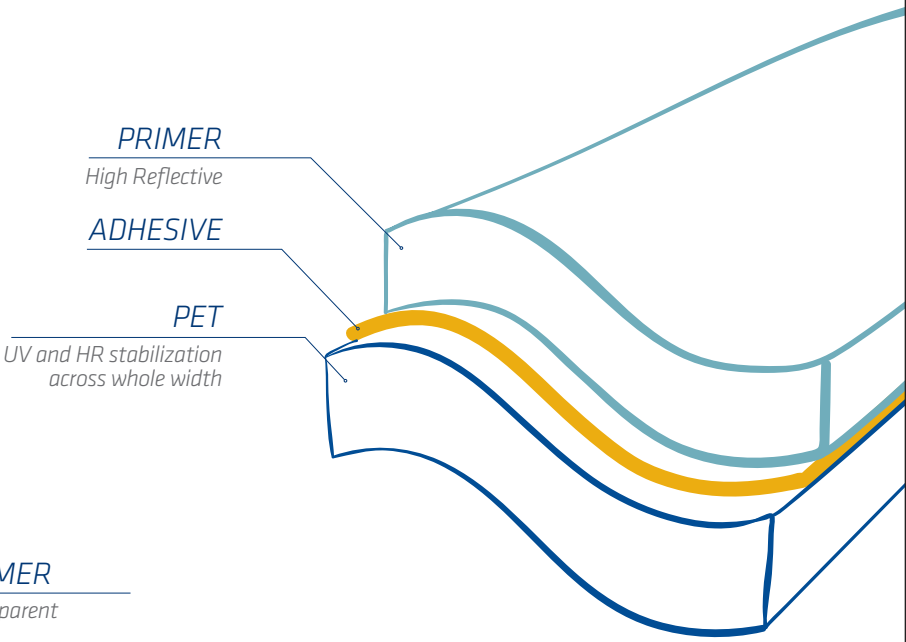


1000 VDC PET BASED

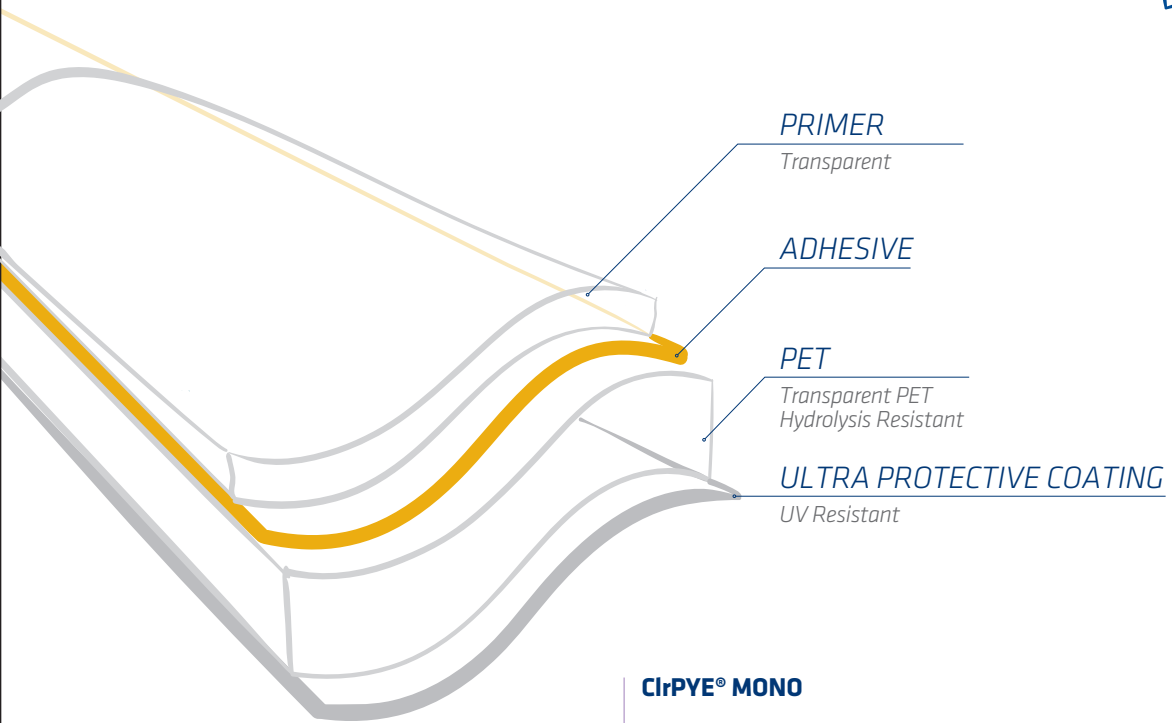
HIGH GRADE PET

CERTIFIED QUALITY

ECO FRIENDLY PRODUCT



PYE® MONO L
PYE® MONO L SHR
PYE® MONO LD



ClrPYE® MONO

dyMat® MONOLAYER

A new generation of backsheet developed by Coveme to fulfill the request of the market for a low cost and high reflective solution using a different structure. They are all guaranteed for 2500h of DHT, 72h PCT and over 400 kwh/sqm of UV irradiation resistance, snail trail free, and feature excellent hydrolysis resistance and enhanced adhesion with encapsulants.

High reflectance

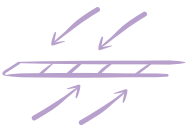
PYE® MONO L

Extra low WVTR

PYE® MONO LD

Extra high reflectance

PYE® MONO L SHR

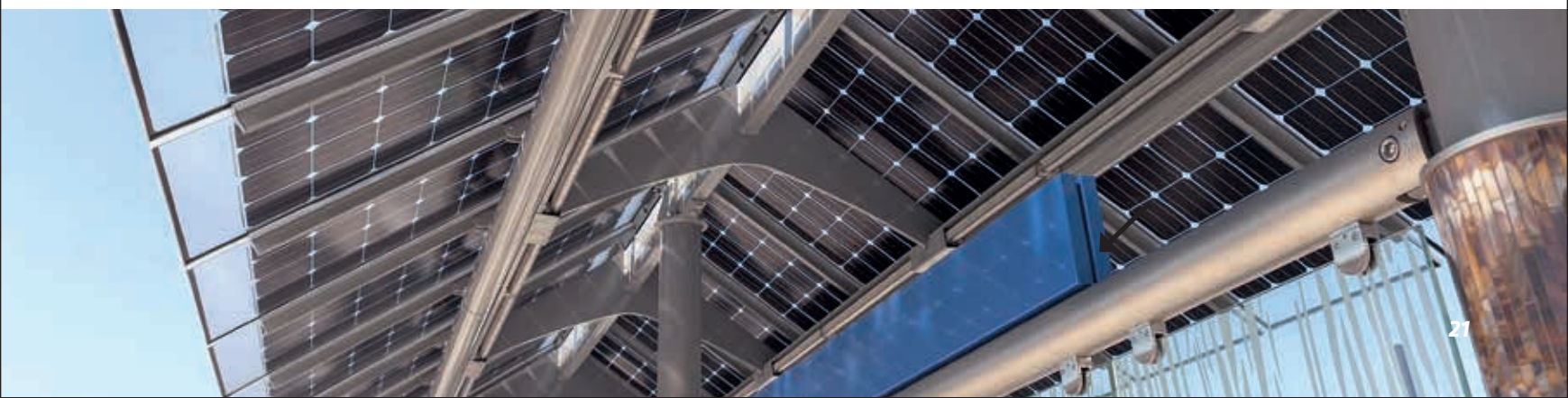


Bifacial Cells

Totally Transparent

ClrPYE® MONO

1000 VDC Monolayer

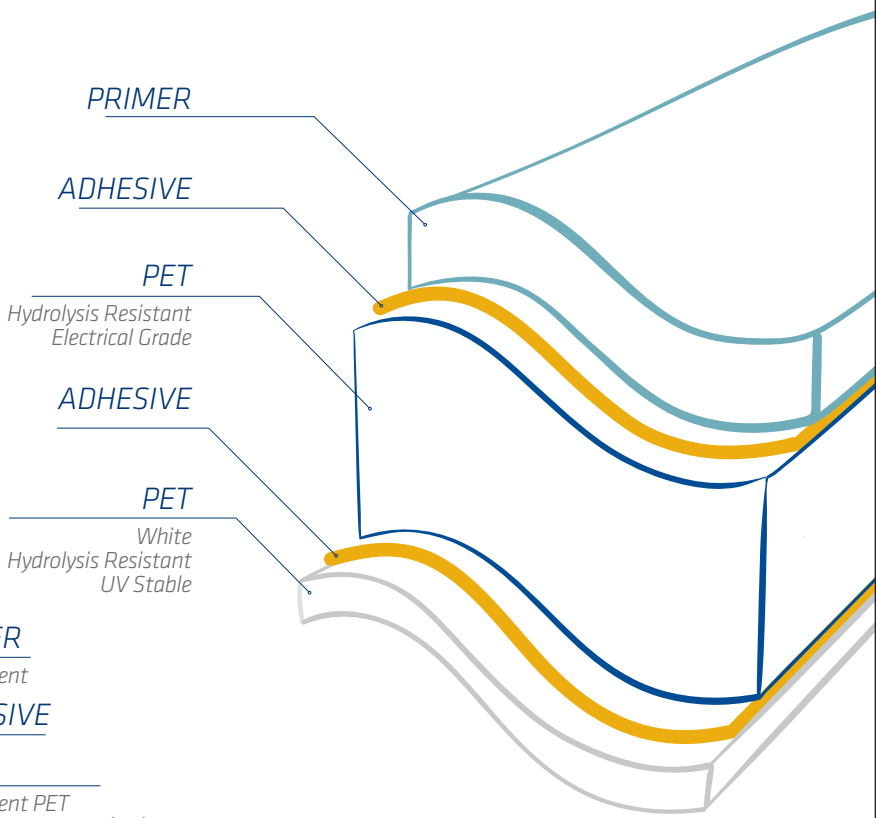


1500 VDC PET BASED

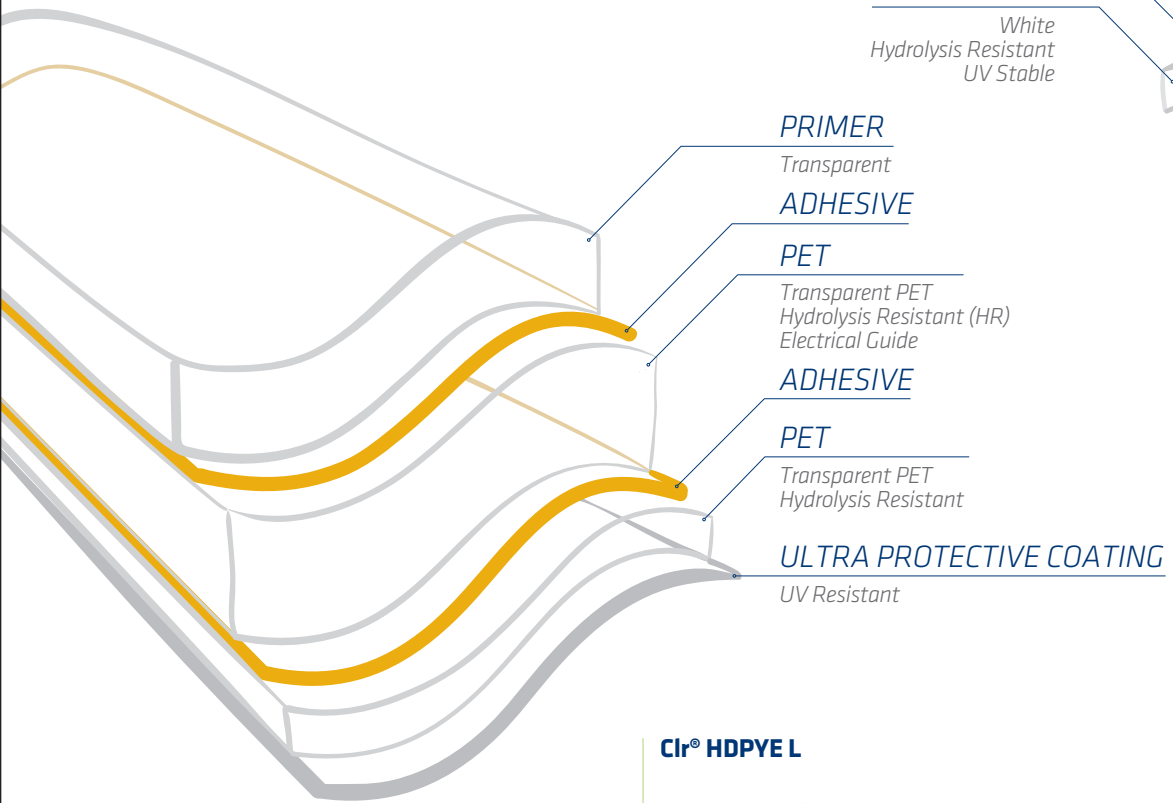
HIGH GRADE PET

CERTIFIED QUALITY

ECO FRIENDLY PRODUCT



HDPYE® SPV L



Clr® HDPYE L

dyMat® 1500 VDC

These Coveme backsheets have a proven track being employed in the world's first 1500 VDC project and further major ongoing 1500 VDC plants. They are specifically designed for this purpose and contribute to the high ROI of this application. They are all guaranteed for 2500h of DHT, 72h PCT and over 400 kwh/sqm of UV irradiation resistance, snail trail free, and feature excellent hydrolysis resistance and enhanced adhesion with encapsulants.

Extra low WVTR

PDT > 1500 VDC (in oil)

HDPYE® SPV L

Bifacial Cells

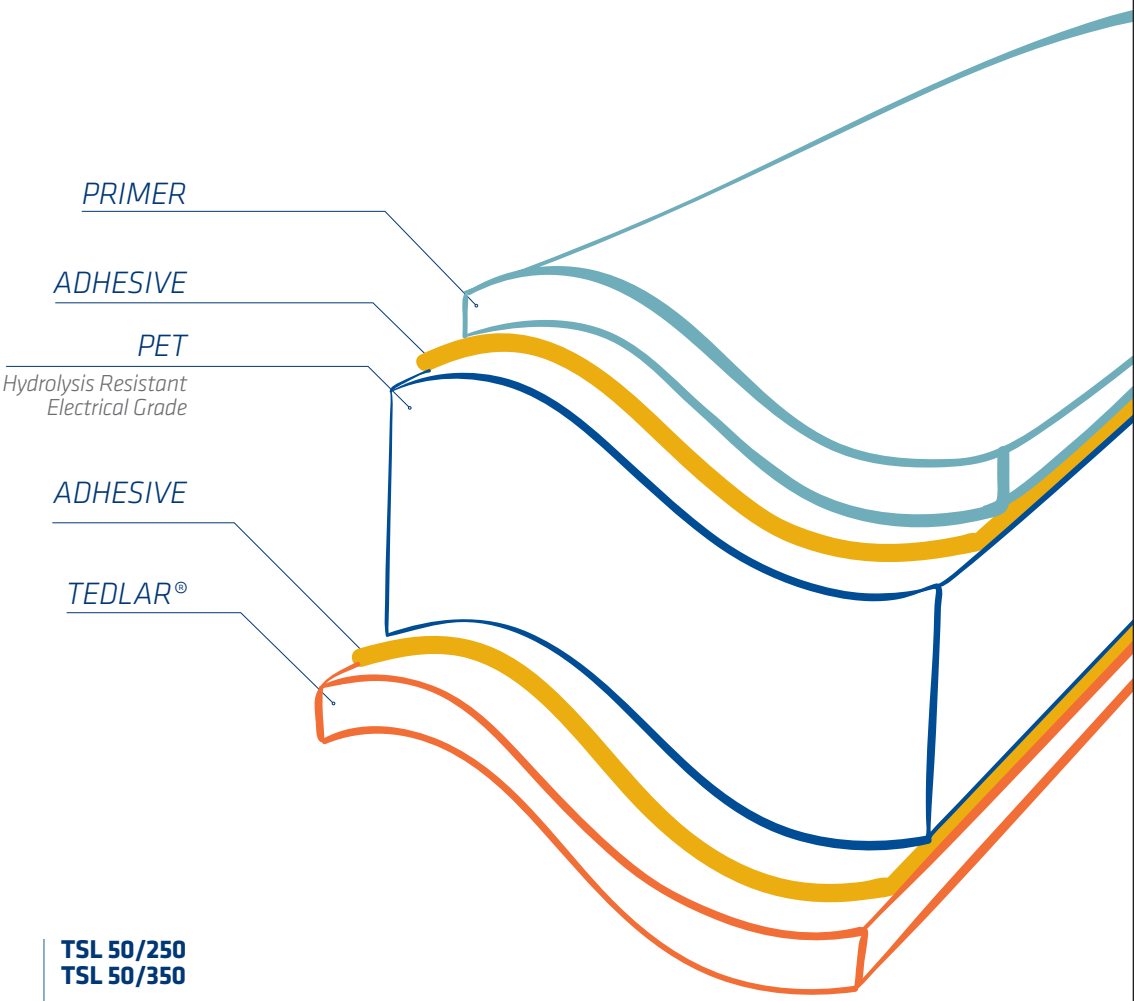
Totally Transparent

PDT > 1500 VDC (in oil)

Clr® HDPYE L

TEDLAR BASED

CERTIFIED QUALITY



TSL 50/250
TSL 50/350

TEDLAR BASED

Coveme's Tedlar based backsheets feature excellent resistance to atmospheric agents, a strong barrier to oxygen and humidity, high voltage insulation and long term resistance to the hydrolysis of adhesives.
Tedlar® film is available in 38µ thickness and 25µ thickness. Also the inner PET layer is available in several thickness: 125/190/250µ.
The thickness of the laminate is designed to guarantee the best combination in terms of electrical insulation and weathering resistance.

PDT > 1000 VDC

TSL 50/250

PDT > 1500 VDC (in oil)

TSL 50/350

EBfoil® BYS

EBfoil® STACK

TA
Thermoadesive

PP
Polypropylene

TA
Thermoadesive

EBfoil® BYC

COPPER EP
With Passivation Treatment

ADHESIVE

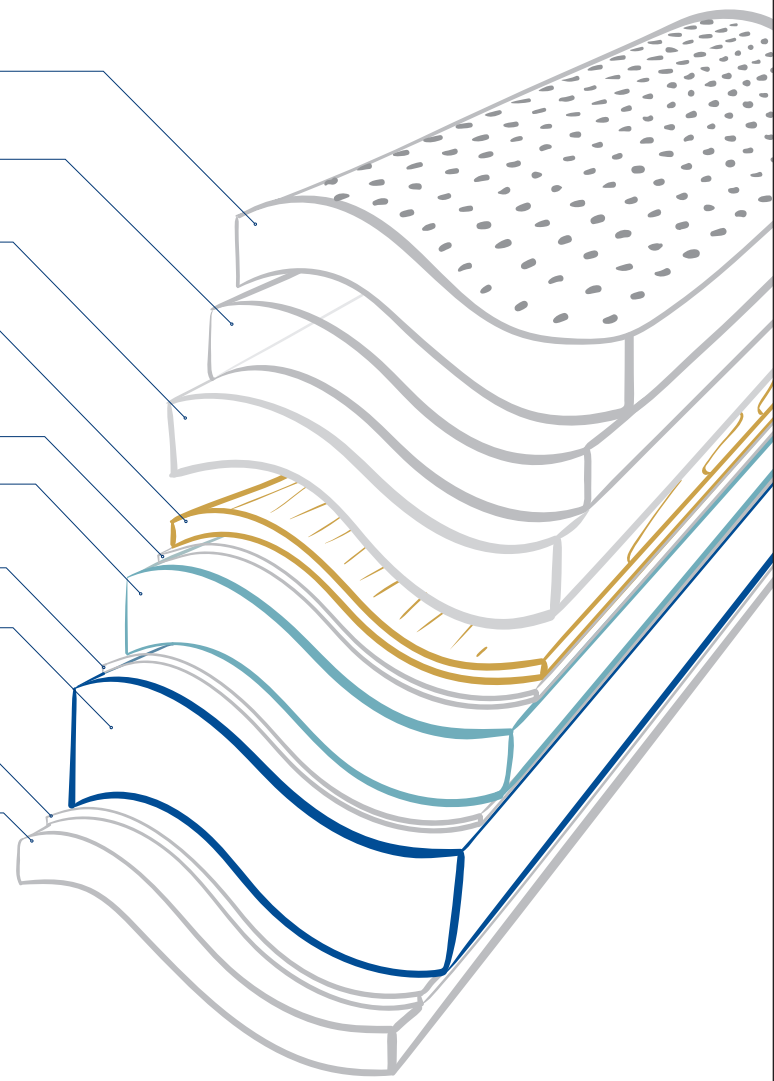
THERMOPLASTIC PRIMER

ADHESIVE

PET
Hydrolysis Resistant
Electrical Grade

ADHESIVE

PET
Hydrolysis Resistant
Electrical Grade
UV Stable



BACKCONTACT BACKSHEET

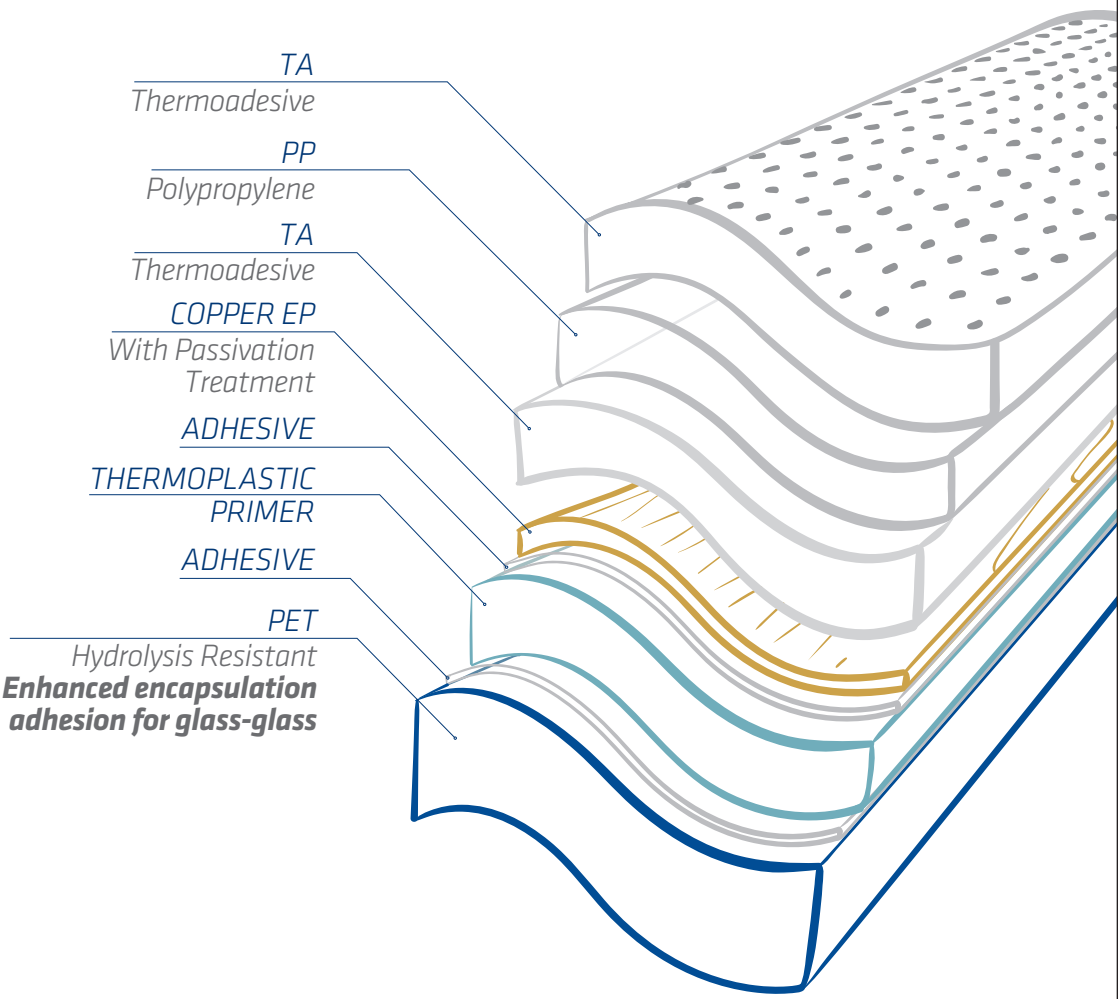
To allow easy module assembly EBfoil BYS® consists of the back-contact backsheet EBfoil® BYC preassembled with the suitable dielectric encapsulant EBfoil® STACK. EBfoil® BYC is a multilayer laminate of high perfomance Polyester layers, a primer layer and an electroplated copper conductive layer.
The copper conductive layer is passivation treated for enhanced conductivity and adhesion, and ensures corrosion protection and high solderability with conductive pastes or adhesives. EBfoil® STACK is a dielectric encapsulant that guarantees a strong and stable bonding to the substrate not covered by conductors, to the conductive layers itself and to the back of the cells. Its stable and stiff behaving makes handling easy, and maintains a dielectric property also after lamination thanks to the innovative inner layer.
Specifically designed process manufacturing in sheets, dry enviroment and at low temperatures guarantees superior planarity and dimensional stability of EBfoil® BYS.

- ***Two components, EBfoil® BYC and EBfoil® STACK are combined together as preassembly***
- ***Doesn't interfere with vacuum evacuation during lamination while is a precursor of the used pretagging to avoid ECA and cells floating***
- ***Connection is made pretagging the components one to the other***
- ***Fiducials can be made on both BYC and STACK, to allow camera alignment for ECA deposition***

EBfoil® SYS

EBfoil® STACK

EBfoil® SYC



BACKCONTACT GLASS-GLASS

To allow easy module assembly EBfoil SYS® consists of the Interconnection patterned foil EBfoil® SYC preassembled with the suitable dielectric encapsulant EBfoil® STACK. EBfoil® SYC is a laminate of high perfomance Polyester, and an electroplated copper conductive layer. The copper conductive layer is passivation treated for enhanced conductivity and adhesion, and ensures corrosion protection and high solderability with conductive pastes or adhesives. EBfoil® STACK is a dielectric encapsulant that guarantees a strong and stable bonding to the substrate not covered by conductors, to the conductive layers itself and to the back of the cells. Its stable and stiff behaving makes handling easy, and maintains a dielectric property also after lamination thanks to the innovative inner layer. The outer side of the SYC and SYS products includes a special surface treatment to guarantee an high and stable adhesion to the back encapsulant using standard lamination process for glass-glass modules. Specifically designed process manufacturing in sheets, dry enviroment and at low temperatures guarantees superior planarity and dimensional stability of EBfoil® SYS.

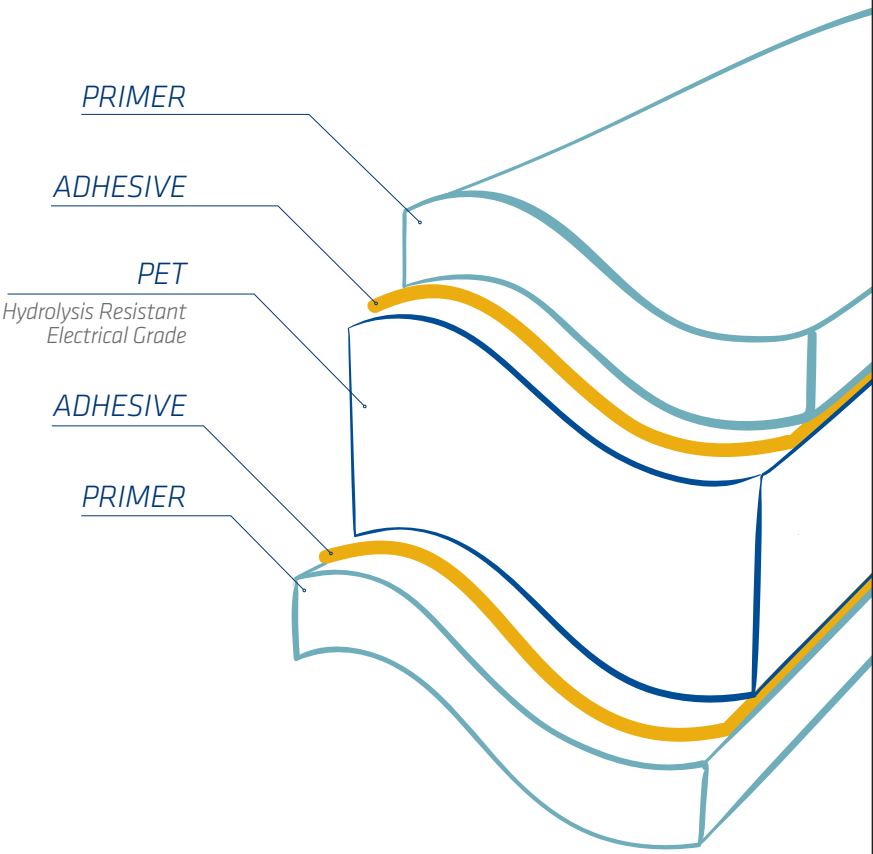
- ***Two components, EBfoil® SYC and EBfoil® STACK are combined together as preassembly***
- ***Doesn't interfere with vacuum evacuation during lamination while is a precursor of the used pretagging to avoid ECA and cells floating***
- ***Connection is made pretagging the components one to the other***
- ***Fiducials could be made on both SYC and STACK, to allow camera alignment for ECA deposition***

ACCESSORIES

dyMat EPE®

dyMat EPE® is designed to be used as electrical insulator in between ribbons and bus bars in PV module fabrication. The material has a perfect bonding with both encapsulation EVA and whichever backsheet, thanks to its structure with a double layer of Primer.

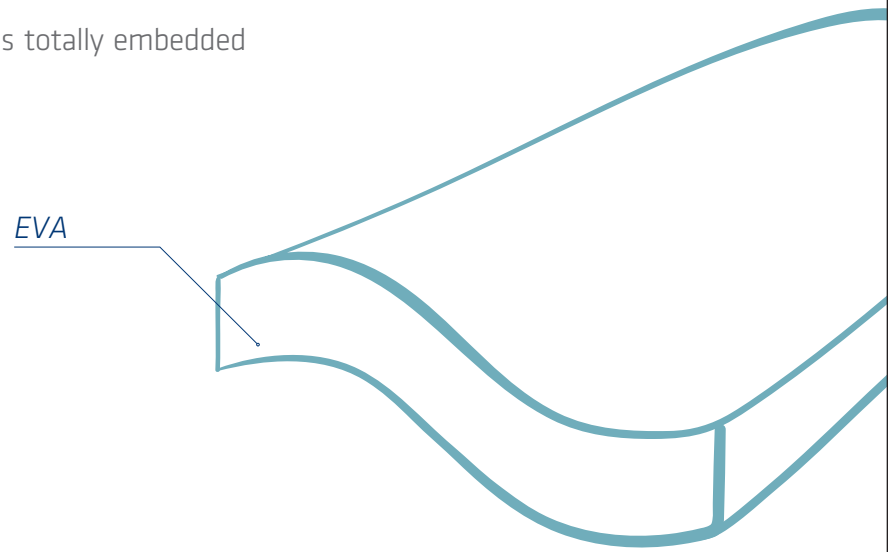
- ***Multilayer component made of PRIMER/PET/PRIMER***
- ***Enhanced adhesion with encapsulan thanks to a special primer***
- ***High reflectance***



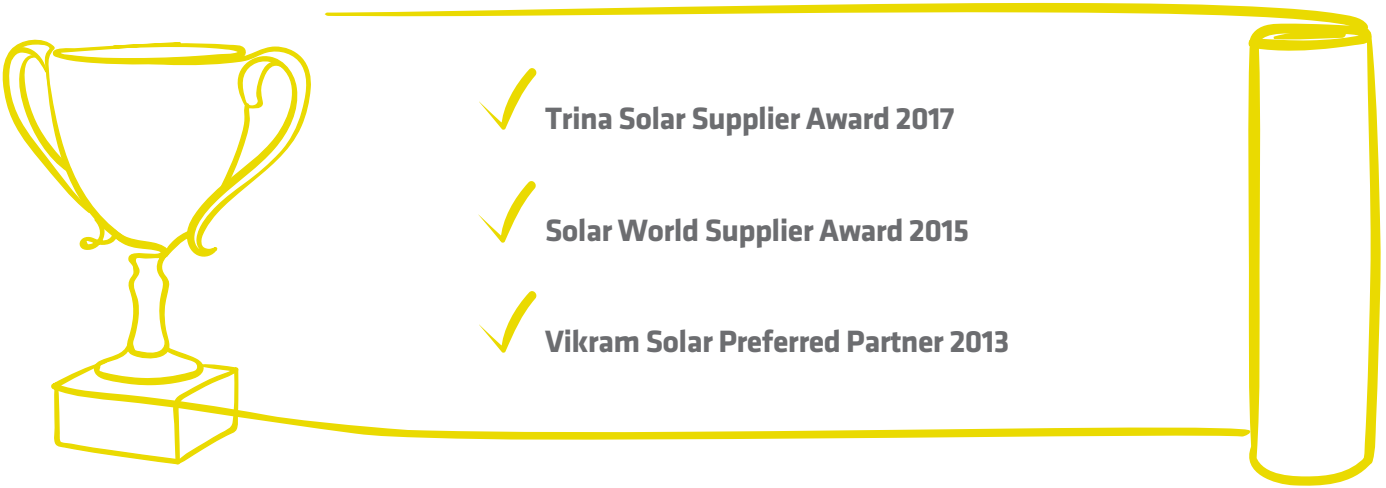
dyMat E®

Transparent adhesive tape made of EVA. It is used to fix components such as cells, ribbons etc. during PV module fabrication.
In the lamination process the substrate melts and becomes totally embedded with encapsulating EVA.

- ***Avana siliconised paper 90 g/m2***
- ***Transparent EVA***
- ***Modified acrylic emulsion adhesive***



Thank you!



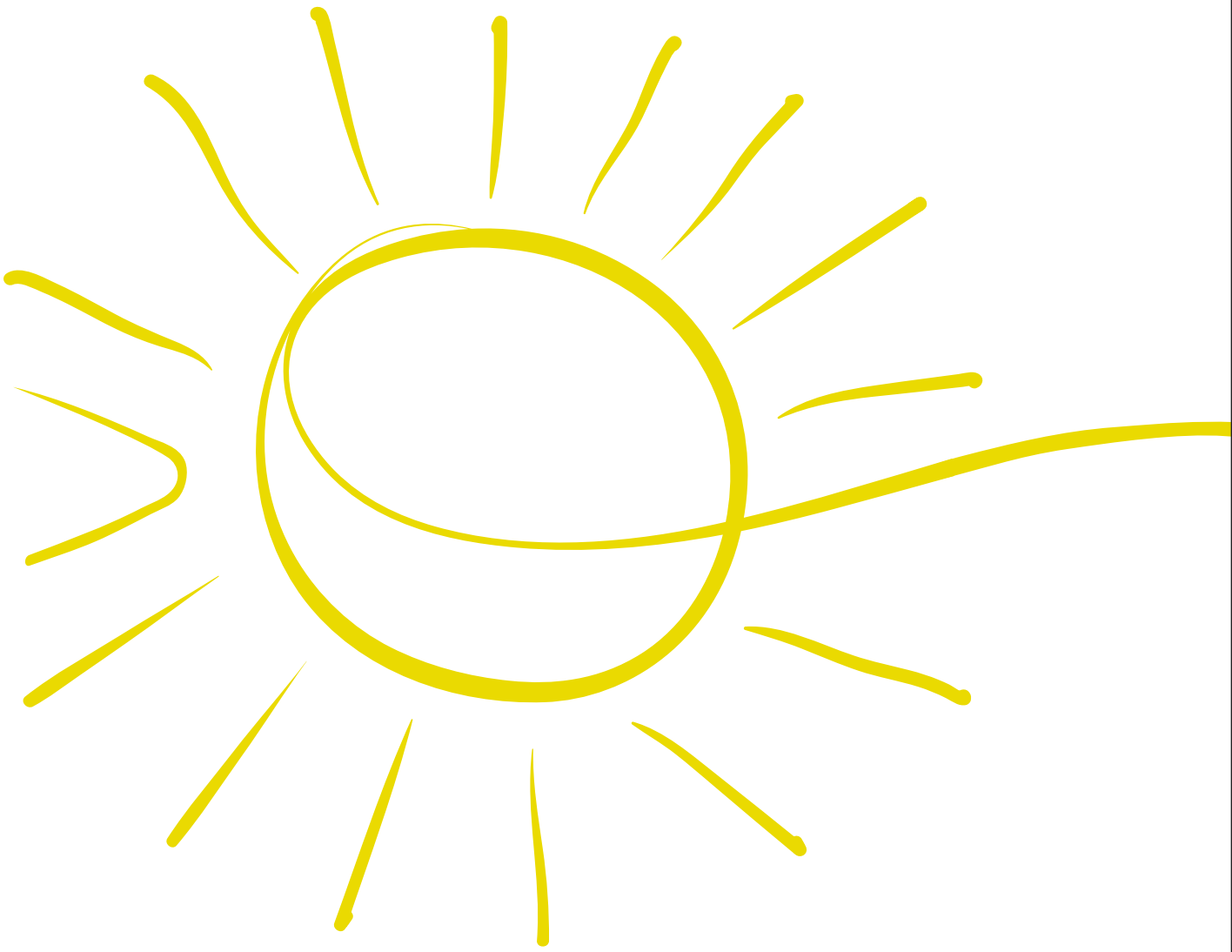
- Trina Solar Supplier Award 2017
- Solar World Supplier Award 2015
- Vikram Solar Preferred Partner 2013

Thanks to our outstanding international team, long-term partnerships with suppliers and last but not least thanks to our clients with whom we share new ideas and technologies in the light of a common quest:

To make photovoltaics an ever more efficient and profitable renewable energy resource

coveme

THE VALUE OF INNOVATION



coveme
THE VALUE OF INNOVATION

LEADER
IN BACKSHEET
WORLDWIDE

www.coveme.com

COVEME EUROPE

Italy
Headquarters:
Via Emilia, 288
40068 - S. Lazzaro di Savena (BO) - Italy
ph. +39 051 6226111
Production Plant and Registered Offices:
Via Gregorcic, 16
34170 - Z.I. S. Andrea - Gorizia - Italy
ph.+39 0481 579911

COVEME ASIA

China
Production Plant:
Zhangjiagang Co., Ltd.
No. 4, Yuefeng road, Zhangjiagang,
Jiangsu Province, China P.C. 215600
ph. +86 512 82559911
Coveme Office:
12F 1201 Nikos Plaza - N° 528 Hongxu rd,
Minhang District - Shanghai 201103 PRC
ph. +86 021 5438 6951 / fax. +86 021 5438 6961

India
Coveme Office:
(Unit 249) Golden City Center,
API Corner, Before Prozone Mall,
Chikalthana, MIDC, Aurangabad
431210, India
ph. +91 955 2526 848