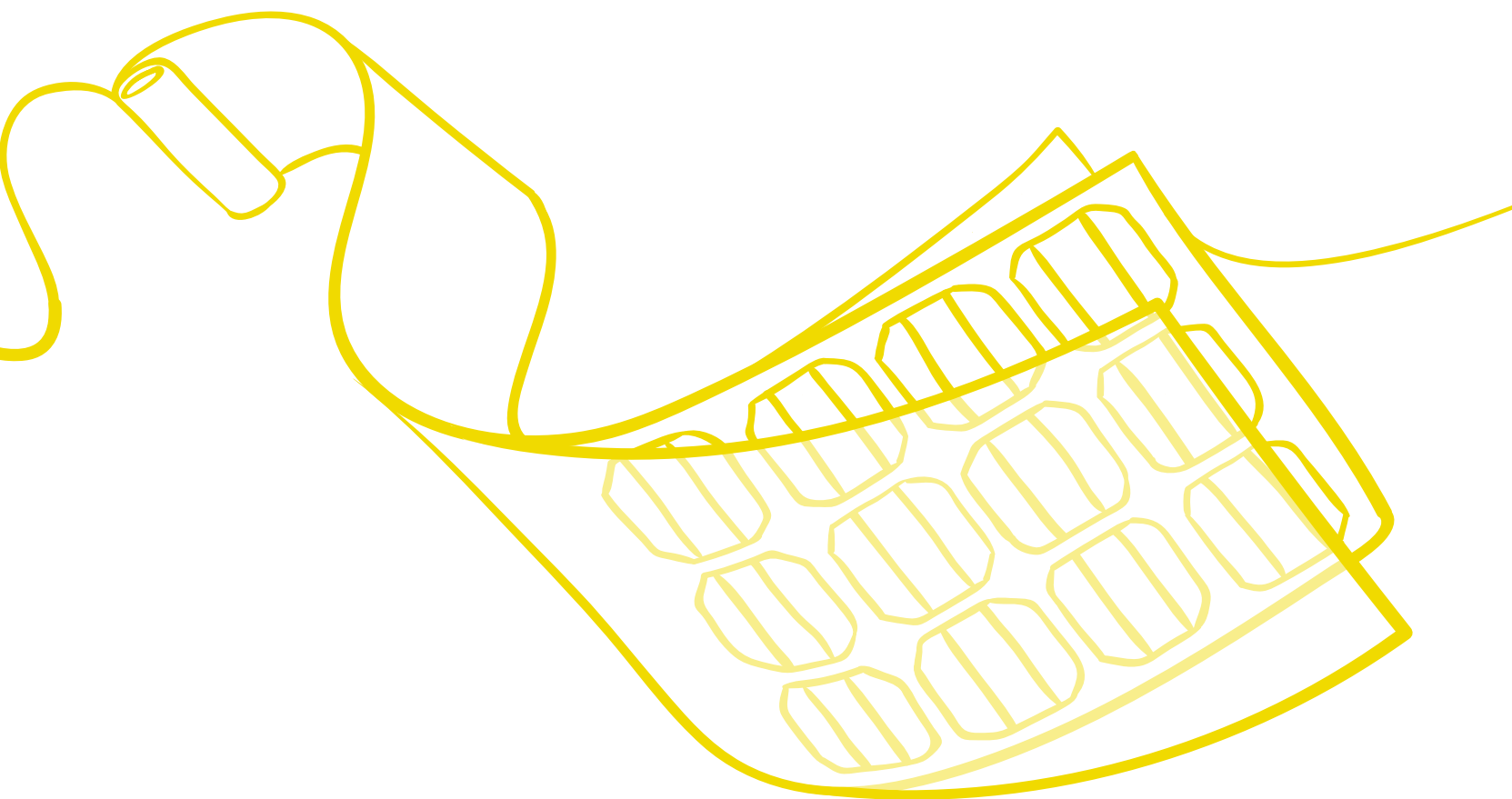


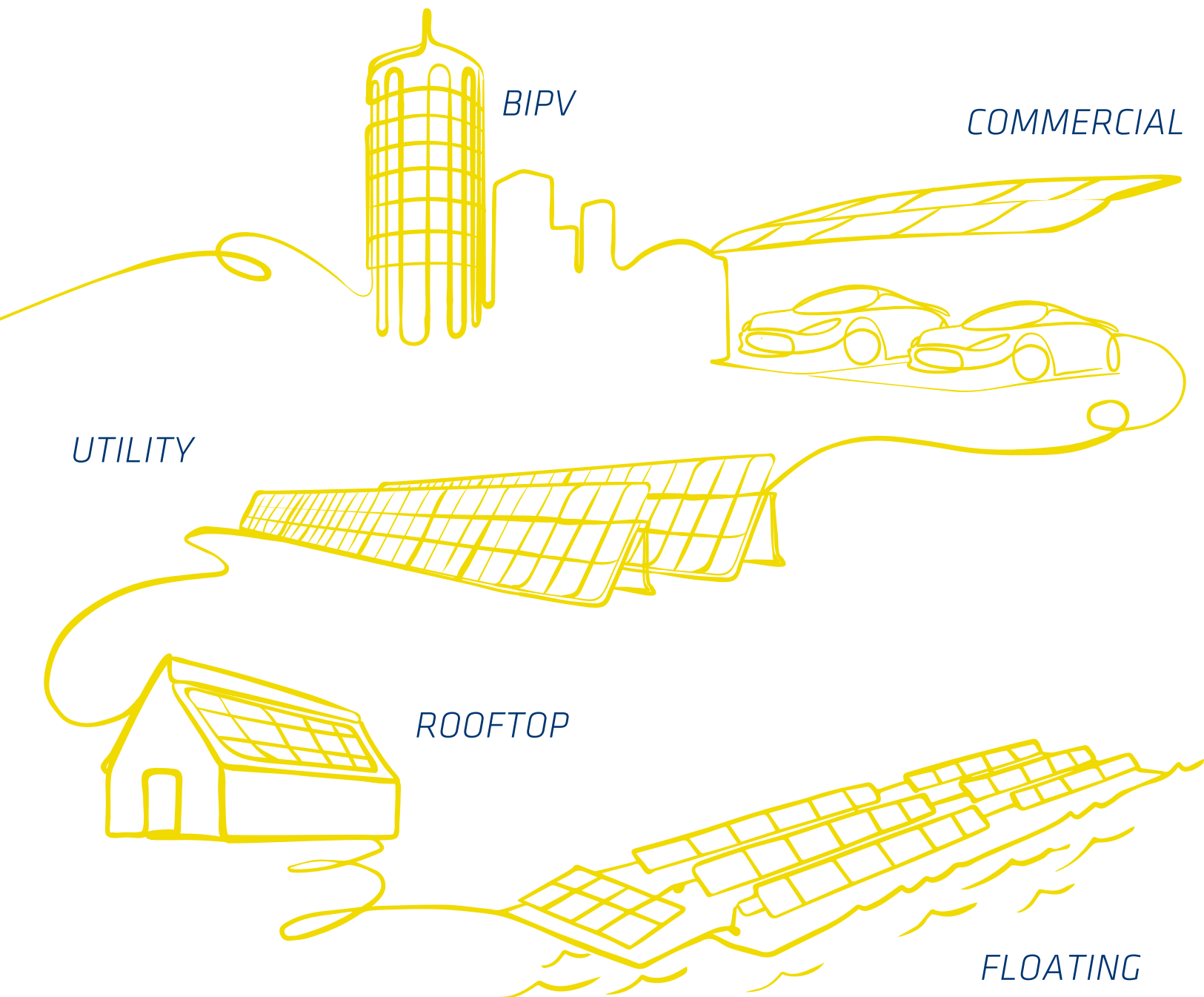
COVEME **PHOTOVOLTAIC**

2020

Backsheets and Frontsheets for PV modules



HIGH QUALITY BACKSHEETS FOR:



INDEX



| | |
|------------------------------------|-----------|
| COVEME TODAY | 2 |
| PRODUCTION | 4 |
| RESEARCH & DEVELOPMENT | 5 |
| QUALITY | 6 |
| SUSTAINABILITY | 7 |
| GREEN PHOTOVOLTAICS | 8 |
| MEMBERSHIPS | 9 |
| PHOTOVOLTAIC DIVISION | 11 |
| OVERVIEW | 12 |
| PRODUCT RANGE | 15 |
| BACKSHEETS | 16 |
| FRONTSHEETS | 40 |
| SPECIALITIES | 42 |
| ACCESSORIES | 52 |
| AWARDS & CERTIFICATIONS | 54 |

COVEME TODAY



OVER 50 GW OF INSTALLATIONS WORLDWIDE IN 20 YEARS OF ACTIVITY AS BACKSHEET AND FRONTSHEET PRODUCER

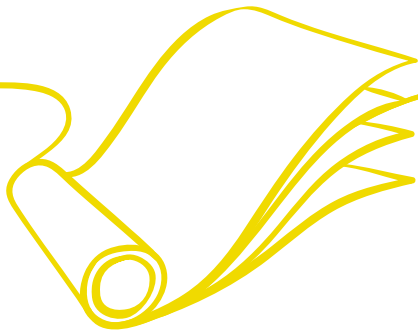
- ✓ **OVER 50 YEARS**
of know-how in converting polyester film.
- ✓ **15 GW BACKSHEET AND FRONTSHEET PRODUCTION**
capacity per year
- ✓ Worldwide
COMMERCIAL AND LOGISTIC NETWORK

- ✓ **HIGH TECH R&D LABS**
in Europe and Asia.
- ✓ **CERTIFIED QUALITY, SAFETY
AND ENVIRONMENTAL**
standards.



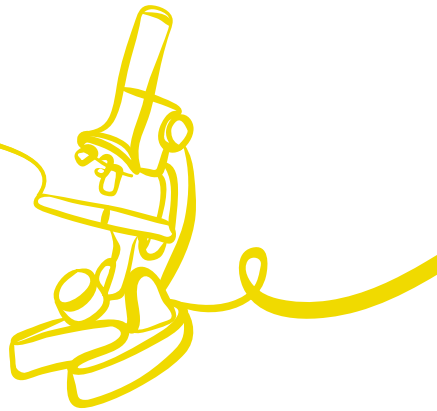
PRODUCTION

Coveme has been converting polyester film for over 50 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.



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 the reliability of our products that guarantee our customers higher productivity, maximum module power output and the best cost efficiency.

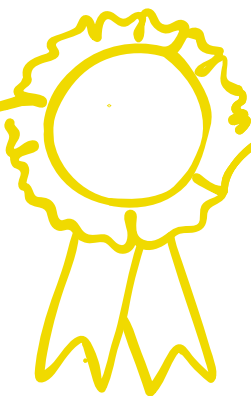


- ✓ **15 GW LAMINATION AND COATING** proprietary production capacity
- ✓ **FULLY AUTOMATED** processes
- ✓ **CUSTOMIZED** rolls, sheets and **PUNCHED** formats
- ✓ **14** production lines
- ✓ **LAMINATION, SURFACE TREATMENT, HEAT STABILIZATION, COATING, SLITTING**

- ✓ **3 R&D LABORATORIES** in Europe and Asia
- ✓ Highly **SOPHISTICATED EQUIPMENT**
- ✓ **CUSTOMIZED RESEARCH PROJECTS** for clients
- ✓ Dedicated **INNOVATION TEAM**
- ✓ Strong academic and industrial **PARTNERSHIPS**

QUALITY

The choice of a quality backsheet or frontsheet is fundamental for the performance and durability of a PV module. Coveme's dyMat® products are made of specifically developed polymers, adhesives and coatings to guarantee full protection and insulation of the module during its entire lifetime. Coveme's production processes are subject to rigid and well defined quality protocols and are ISO 9001:2015 certified. 20 years of continuous investments in product and process innovation dedicated to the photovoltaic industry make Coveme the most reliable and longstanding supplier of quality materials in the market today.



SUSTAINABILITY

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.



- ✓ **LONG HISTORY OF HIGH QUALITY** backsheets and frontsheets
- ✓ Guaranteed **DURABILITY AND PERFORMANCE**
- ✓ **SPECIFIC AND EFFICIENT** base materials
- ✓ International **CERTIFIED STANDARDS** through **ISO 9001:2015**
- ✓ **CONSTANT INVESTMENT** in product and process innovation

- ✓ **ENERGY SELF-CONSUMPTION** through installed solar panels
- ✓ **PARTIAL SELF-POWERING** production lines
- ✓ **RECYCLING AND REUSE** of packaging material
- ✓ **REPLACEMENT OF SINGLE-USE** plastic materials
- ✓ **TREATMENT AND CLEANING** of harmful fumes and water
- ✓ **TAKE BACK SCHEME OF CORES AND END CAPS** with clients
- ✓ **DIFFERENTIATION AND RECYCLING** of production scrap and office waste
- ✓ **ZERO-MILE CANTEEN** with organic food

GREEN PHOTOVOLTAICS



PV panel waste presents an environmental challenge which can be transformed into an economic opportunity if addressed seriously and on time. Global legislation moves more and more towards a restriction of PV module components and consider the chemical composition of backsheet for its impact on disposal costs and environment. Coveme is at the forefront investing continuously into green production, the use of recycled raw materials and environmental friendly disposal processes with a special focus on circular economy.



MEMBERSHIPS

Coveme is honoured to be member of the most prestigious associations and bodies 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 continuous cross-fertilization among peers.



- ✓ **GREEN PRODUCT:** The polyester film inside dyMat® backsheets and frontsheets can be fully recycled 
- ✓ **RECYCLED PRODUCT :** All dyMat® products can be supplied with the polyester component(s) made of recycled PET (rPET) 
- ✓ **CRADLE-TO-CRADLE PROJECT :** Scrap is converted into new PET for the manufacturing of backsheets and frontsheets
- ✓ **EOL AND LCA:** Close collaboration with official bodies to promote scientific studies and findings
- ✓ **ECODESIGN AND ECOLABELLING:** 100% Compliance with all existing regulations





COVEME PHOTOVOLTAIC DIVISION

Coveme develops and manufactures multilayer polymer laminates for solar panels which provide electrical insulation and protect solar cells from humidity and other atmospheric agents. This guarantees the duration and correct functioning of the solar module for up to 30 years.

With an internal production capacity of 15GW and a 20 year long experience in supplying the photovoltaic industry, Coveme is today one of the top three suppliers of backsheets and frontsheets for pv modules in the market. The company's dyMat® range of solar panel films offers solutions for all types of pv modules in any installation environment. dyMat® photovoltaic laminates feature a wide choice of polyester and fluorinated materials, mono and multilayer structures and several output enhancing options. The use of recyclable materials as well as the recent introduction of recycled polyester film (rPET) as base materials are the result of specific research projects in collaboration with suppliers and scientific institutes and complete the range from a sustainable point of view.

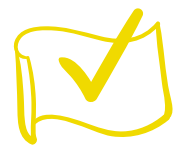
Today over 50 GW of solar panels installed worldwide are protected by dyMat® pv backsheet and frontsheet and confirm the guaranteed and certified product performance of Coveme's photovoltaic materials.

- ✓ **BACKSHEET AND FRONTSHEET SOLUTIONS** for any module type
- ✓ **20 YEARS OF EXPERIENCE** in supplying the PV industry
- ✓ **15 GW** current internal **PRODUCTION CAPACITY**
- ✓ Certified insulation and protection for **UP TO 30 YEARS**
- ✓ **50 GW OF SOLAR PANELS INSTALLED** worldwide protected by dyMat®

dyMat® OVERVIEW

BACKSHEETS AND FRONTSHEETS FOR PV MODULE SOLUTIONS

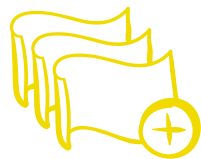
FUNCTION



DYMAT® BACKSHEETS AND FRONTSHEETS ARE EFFICIENT MATERIAL COMBINATIONS FOR HIGHLY PERFORMING MODULES:

- Electrical insulation **UP TO 1500 VDC**
- STRONG UV** protection
- HIGH HUMIDITY RESISTANCE**
- CHEMICAL AND PHYSICAL** durability

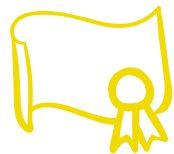
ADDED VALUE



DYMAT® IS A VAST RANGE OF DIFFERENT MATERIALS FOR A TOTALLY CUSTOMIZABLE BACKSHEET AND FRONTSHEET:

- POLYESTER AND FLUORINATED** based versions
- MONO AND DOUBLE LAYER** solutions
- SPECIAL COATINGS** for extra protection
- SPECIAL PRIMERS** for higher module performance
- TRANSPARENT VERSIONS** as alternative for glass
- LARGE RANGE OF WIDTHS** for rolls and sheets
- EXTENDED LIFE TIME** up to 30 years available
- RECYCLABLE AND RECYCLED** products

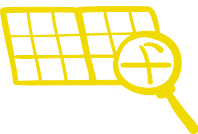
QUALITY



DYMAT® PRODUCTS ARE CERTIFIED BY THE WORLD'S MAJOR CERTIFICATION BODIES:

- TÜV RHEINLAND CERTIFIED** 
- TÜV SÜD CERTIFIED** 
- UL REGISTERED** 
- JET CERTIFIED** 

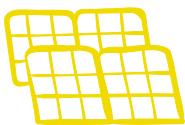
MODULE TECHNOLOGIES



DYMAT® SOLUTIONS SATISFY THE SPECIFIC REQUIREMENTS OF ALL KIND OF MODULE TYPES:

- STANDARD**
- SEMI-FLEXIBLE**
- BIFACIAL**
- THIN FILM**

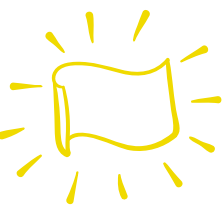
APPLICATIONS



DYMAT® BACKSHEETS AND FRONTSHEETS ARE SPECIFICALLY DESIGNED FOR DIFFERENT TYPES OF INSTALLATION:

- UTILITY POWER PLANTS**
- RESIDENTIAL ROOFTOP**
- COMMERCIAL AND INDUSTRIAL** buildings
- FLOATING SYSTEMS**
- BUILDING INTEGRATED** photovoltaics
- Integrated PV in **AUTOMOTIVE AND NAUTICAL**

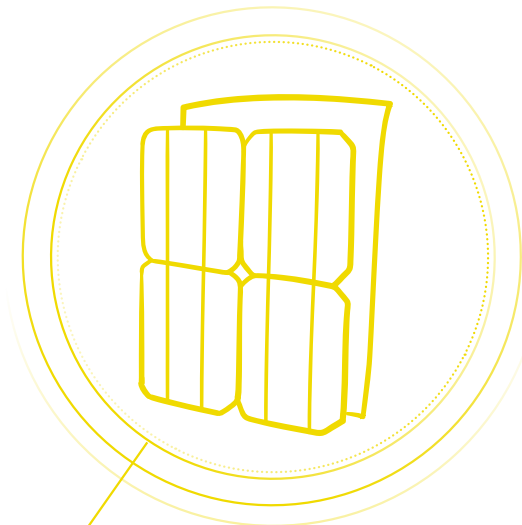
SPECIALITIES



COVEME DEVELOPS MATERIALS WITH HIGHLY INNOVATIVE FILMS AND COATINGS FOR LEADING-EDGE APPLICATIONS:

- CPV -** Concentrator Photovoltaics
- BACKCONTACT** Technology
- FLEXIBLE, PRINTED** and **ORGANIC PV**
- RETRO-FITTING** PV plants
- CSP -** Concentrating Solar Power

PRODUCT RANGE



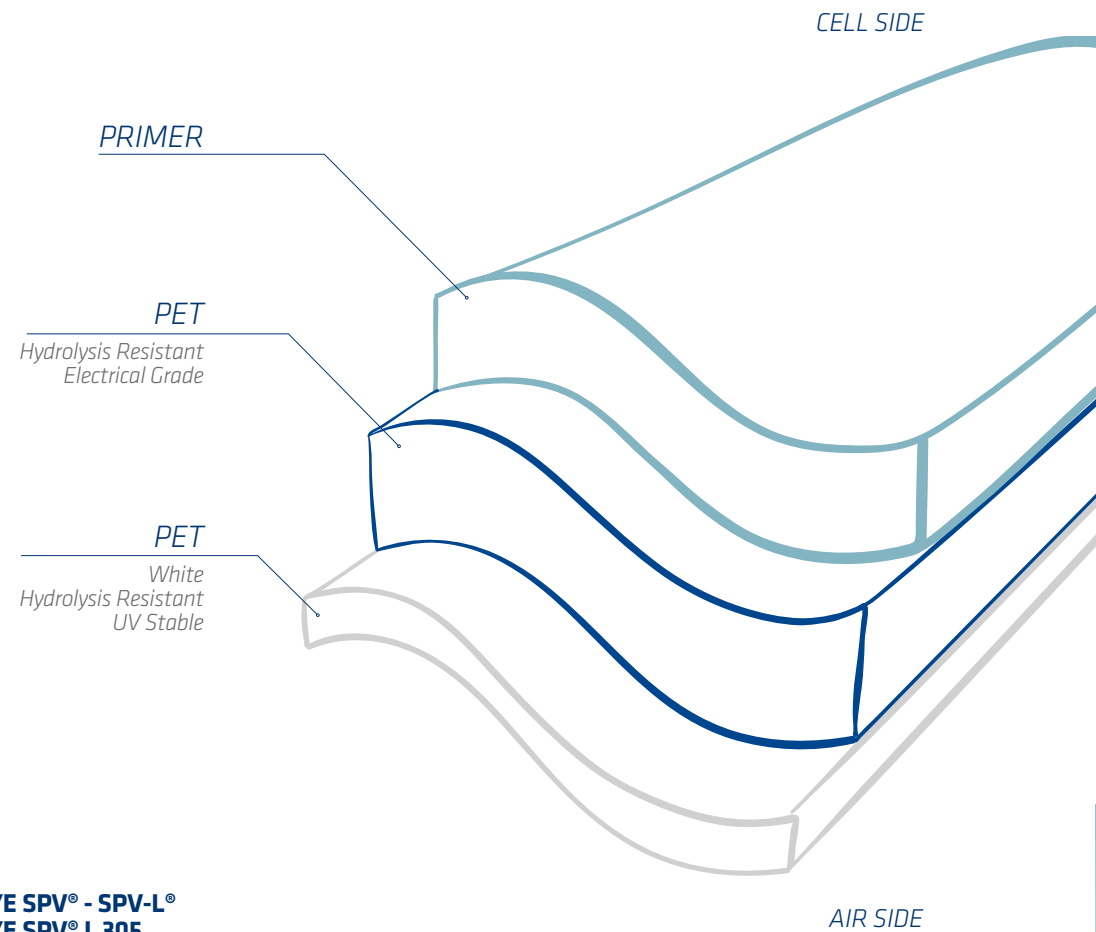
| | |
|--|-----------|
| 1000 VDC PET BASED BACKSHEETS | 16 |
| dyMat® White Double Layer Pet | 17 |
| dyMat® PYE SPV-SPV L | |
| dyMat® SPV L 305 | |
| dyMat® PYE 3000-3000 L | |
| dyMat® Monolayer White Pet | 19 |
| dyMat® PYE MONO L | |
| dyMat® PYE MONO LT | |
| dyMat® PYE MONO L PLUS | |
| dyMat® Clear Monolayer Pet | 21 |
| dyMat® Clr PYE MONO CX | |
| dyMat® Black Double Layer Pet | 23 |
| dyMat® Bk PYE SPVL | |
| 1500 VDC PET BASED BACKSHEETS | 24 |
| dyMat® White Double Layer Pet | 25 |
| dyMat® HDPYE SPV C | |
| dyMat® HDPYE SPV L | |
| dyMat® Clear Double Layer Pet | 27 |
| dyMat® Clr HDPYE CX | |
| 1000/1500 VDC TEDLAR BASED BACKSHEETS | 28 |
| dyMat® White Tedlar Based 1000 VDC | 29 |
| dyMat® TsL 50/250 | |
| dyMat® TsL 75/150 | |
| dyMat® TsL 100/190 | |
| dyMat® Clear Tedlar Based 1000 VDC | 31 |
| dyMat® TsL 50/158 | |

| | |
|--|-----------|
| dyMat® White Tedlar Based 1500 VDC | 33 |
| dyMat® TsL 50/285 | |
| dyMat® TsL 50/350 | |
| dyMat® Clear Tedlar Based 1500 VDC | 35 |
| dyMat® Clr TsL 50/285 | |
| 1000/1500 VDC PVDF BASED BACKSHEETS | 36 |
| dyMat® PVDF Based 1000 VDC | 37 |
| dyMat® KL 50/250 | |
| dyMat® KL 75/150 | |
| dyMat® KL 100/190 | 39 |
| dyMat® PVDF Based 1500 VDC | |
| dyMat® KL 50/250 | |
| dyMat® KL 50/285 | |
| 1000 - 1500 VDC DYMAT® FRONTSHEETS | 40 |
| dyMat® Clear Frontsheets | 41 |
| dyMat® ClrFS PYE MONO CXG (1000VDC) | |
| dyMat® ClrFS HDPYE CXG (1500VDC) | |
| DYMAT® SPECIALITIES | 42 |
| dyMat® Floating PV Systems | 43 |
| dyMat® Flexible, printed, organic PV | 45 |
| dyMat® CPV - CSP | 47 |
| dyMat® Backcontact technology | 49 |
| dyMat® Retro fitting laminates | 51 |
| DYMAT® ACCESSORIES | 52 |
| dyMat® EPE | |
| dyMat® E | |

1000 VDC PET BASED BACKSHEETS



>>pag.8



PYE SPV® - SPV-L®
PYE SPV® L 305

PYE 3000® - 3000 L®

dyMat® WHITE DOUBLE LAYER PET

Coveme's most selling backsheet, with over 250 million m² sold worldwide and successfully proven in the market for more than 10 years. It features a special high-grade PET able to guarantee more than DHT 2500 hrs, PCT(HAST) 72 hrs and more than 400 kWh/m² of UV irradiation resistance. Additionally, the dyMat® PYE series provides a high adhesion strength to all types of encapsulants, excellent resistance to sand, salt mist, ammonia and chemical solvents corrosion.

Bestseller

PYE SPV® - SPV L®

Extra Thick > 300µm

PYE SPV® L 305

DHT > 3000h

PYE 3000® - 3000L®

Additional upgrades

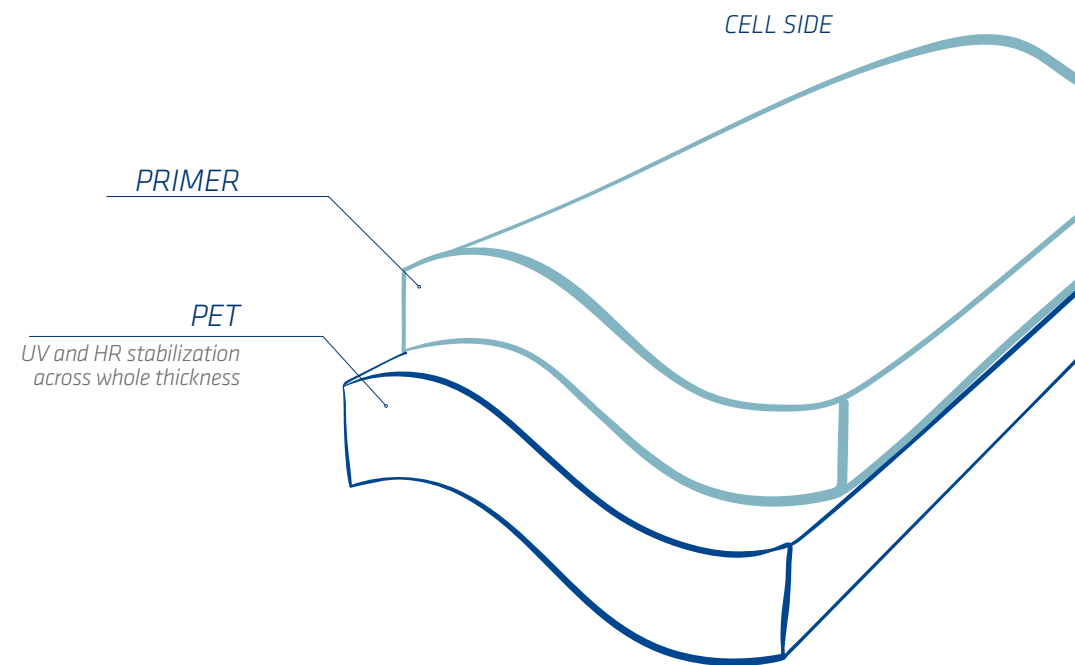
- LO** Extra UV protection on cell side
- LD** High humidity barrier
- LDO** High humidity barrier + UV protection
- SHR** Super high reflectivity
- LBk** Black on cell side
- Bkhr** Black high reflectivity



1000 VDC PET BASED BACKSHEETS



>>pag.8



PYE® MONO L
PYE® MONO LT
PYE® MONO L PLUS

dyMat® MONOLAYER WHITE PET

This new generation of backsheet from Coveme is based on a single PET layer (Mono Layer) that features superior resistance to UV and hydrolysis thanks to its bulk technology. Contrarily to the co-extrusion technology, the bulk technology features the UV protection all across the whole thickness of the single PET layer. Coveme's monolayer backsheet shows excellent performances in the combined UV+DHT tests, and features an intrinsic high reflectivity.

High Reflectance
PYE® MONO L

600 VDC
PYE® MONO LT

Best Performance Price/Ratio
PYE® MONO L PLUS

Additional upgrades

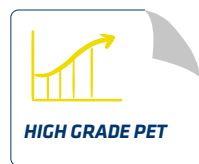
- LO** Extra UV protection on cell side
- LD** High humidity barrier
- LDO** High humidity barrier + UV protection
- SHR** Super high reflectivity
- LBk** Black on cell side
- Bkhr** Black high reflectivity



1000 VDC PET BASED BACKSHEETS



>>pag.8



CLEAR UV PRIMER

PET COEX

Transparent PET
UV Stable
Hydrolysis Resistant

CELL SIDE

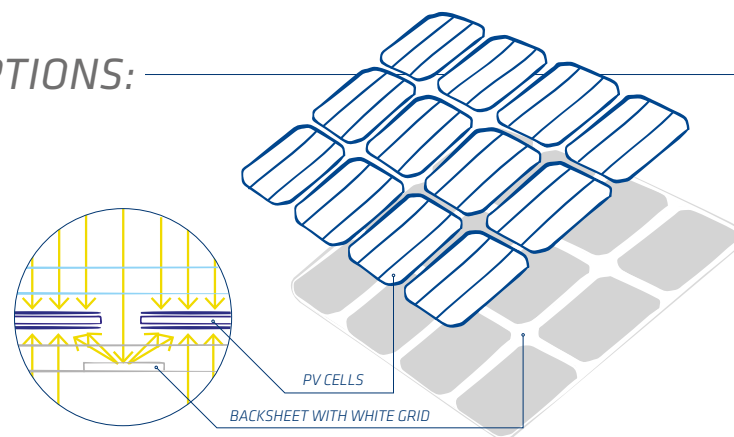
AIR SIDE

ClrPYE® MONO CX

OUTPUT INCREASING OPTIONS:

DYMAT® SELECTIVE

Optional white grid incorporated in the backsheet that turns the space in between the cells and the borders into a highly reflective area for significant output improvement. The grid layout is defined according to customer's cell shape and size.

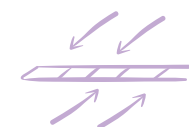


DYMAT® HMIRROR LR >>pag. 50

It is possible to use dyMat®HMirror LR reflective laminates for retro-fitting of PV installations to increase the final output.

dyMat® CLEAR MONOLAYER PET

Totally transparent high grade polyester backsheets for bifacial or standard modules in BIPV, utility, greenhouse, commercial installations, and grid or off grid application. This new generation of clear backsheets with special UV primer allows to replace standard backsheets for high transparency solutions. dyMat® Clear Monolayer for 1000 VDC features superior resistance to UV and hydrolysis thanks to its bulk technology which features UV protection all across the whole thickness.



Bifacial
Cells

Totally
Transparent

ClrPYE® MONO CX

✓ Features

- UV stable
- Hydrolysis resistant
- Engineered adhesive
- Higher output
- High mechanical resistance
- Extended life time up to 30 years

PRIMER TYPES



Extra UV protection
on cell side



High humidity barrier



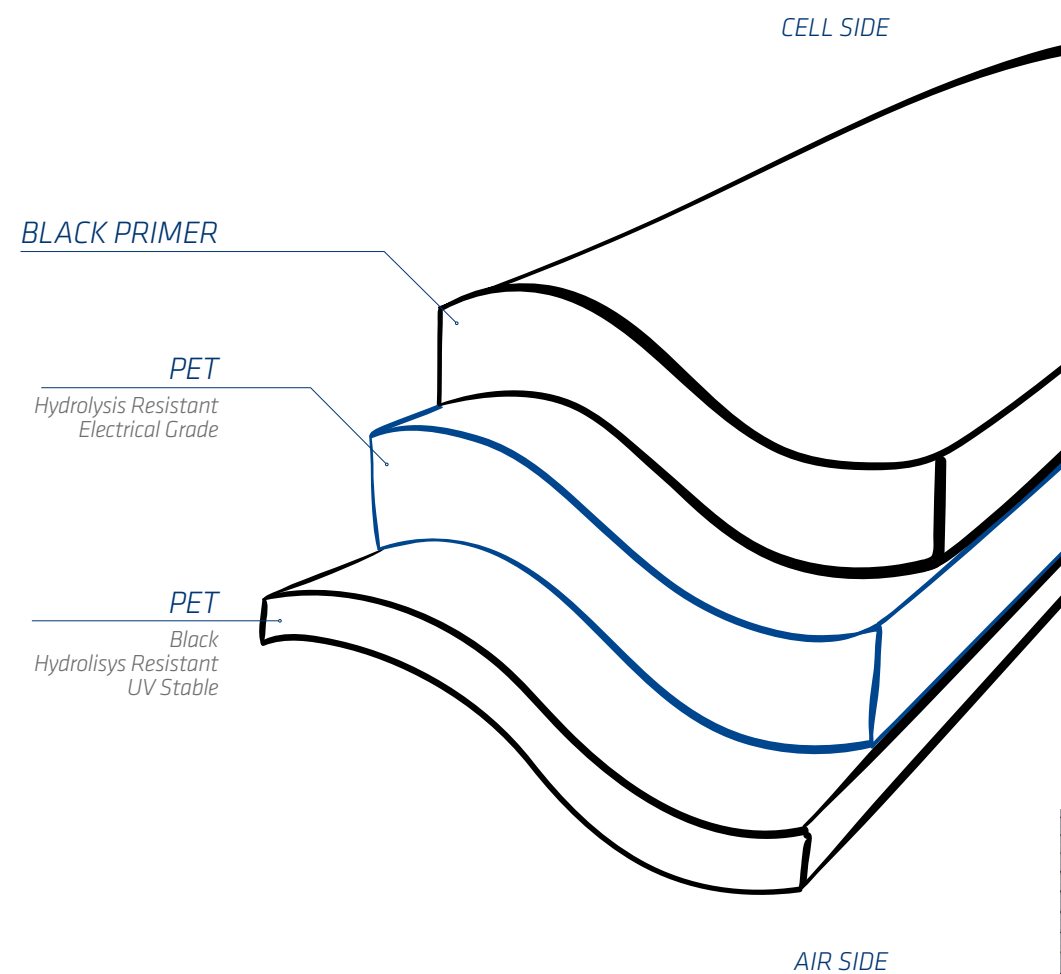
High humidity barrier
+ UV protection



1000 VDC PET BASED BACKSHEETS



>>pag.8



dyMat® BLACK DOUBLE LAYER PET

Coveme's black backsheet is the most suitable solution for the best color fit of all-black PV modules, mainly applied for roof-top and facades installations. It features a black primer on the cell side and a black PET on the air side of the backsheet and it is based on special high-grade PET able to guarantee more than DHT 2500 hrs, PCT(HAST) 72 hrs and more than 400 kWh/m2 of UV irradiation resistance. Additionally, the dyMat® Bk PYE series provides a high adhesion strength to all types of encapsulants, excellent resistance to sand, salt mist, ammonia and chemical solvents corrosion.



Additional upgrades

- LO** Extra UV protection on cell side
- LD** High humidity barrier
- LDO** High humidity barrier + UV protection
- Bkhr** Black high reflectivity



1000 VDC PET based backsheets

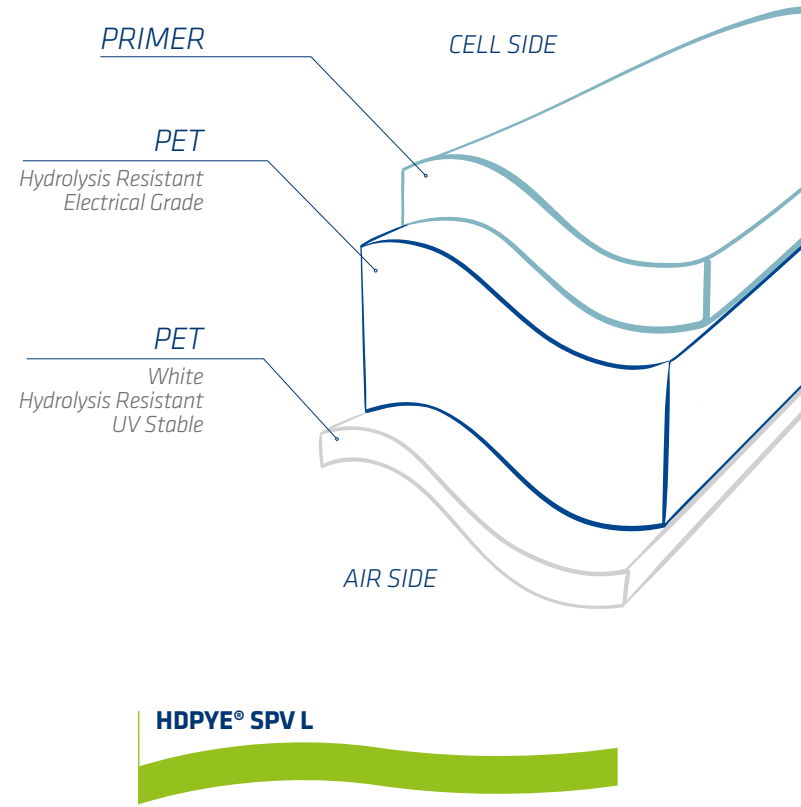
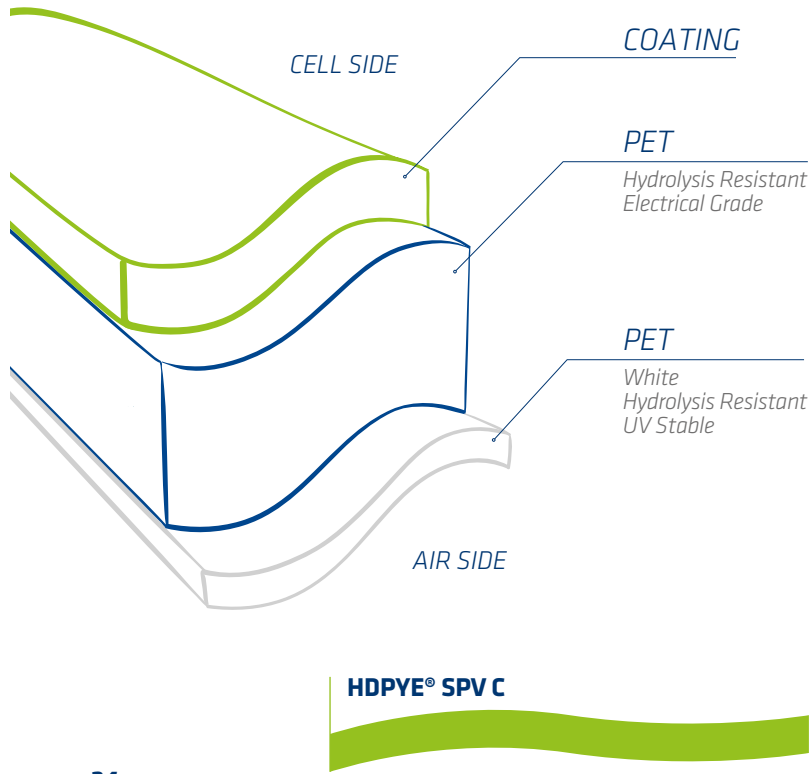
1500 VDC PET BASED BACKSHEETS

THE GREEN BACKSHEET

>>pag.8

HIGH GRADE PET

CERTIFIED QUALITY



dyMat® WHITE DOUBLE LAYER PET

Coveve's PET backsheets for 1500V have a proven track record being employed in the world's first 1500V project and further major ongoing 1500V plants. It features thicker inner PET layers in order to comply with the new IEC rules for 1500V insulation. It guarantees more than DHT 2500 hrs, PCT(HAST) 72 hrs and more than 400 kWh/m2 of UV irradiation resistance. Additionally, the dyMat® HDPYE series provides a high adhesion strength to all types of encapsulants, excellent resistance to sand, salt mist, ammonia and chemical solvents corrosion.

Extra UV protection

High Reflectance

1500 VDC (in oil)

HDPYE® SPV C

Extra Low WVTR

1500 VDC (in oil)

HDPYE® SPV L

Additional upgrades

- LO** Extra UV protection on cell side
- LD** High humidity barrier
- LDO** High humidity barrier + UV protection
- SHR** Super high reflectivity
- Bk** Black polyester on air side and black on cell side
- LBk** Black on cell side
- Bkhr** Black high reflectivity

1500 VDC PET based backsheets



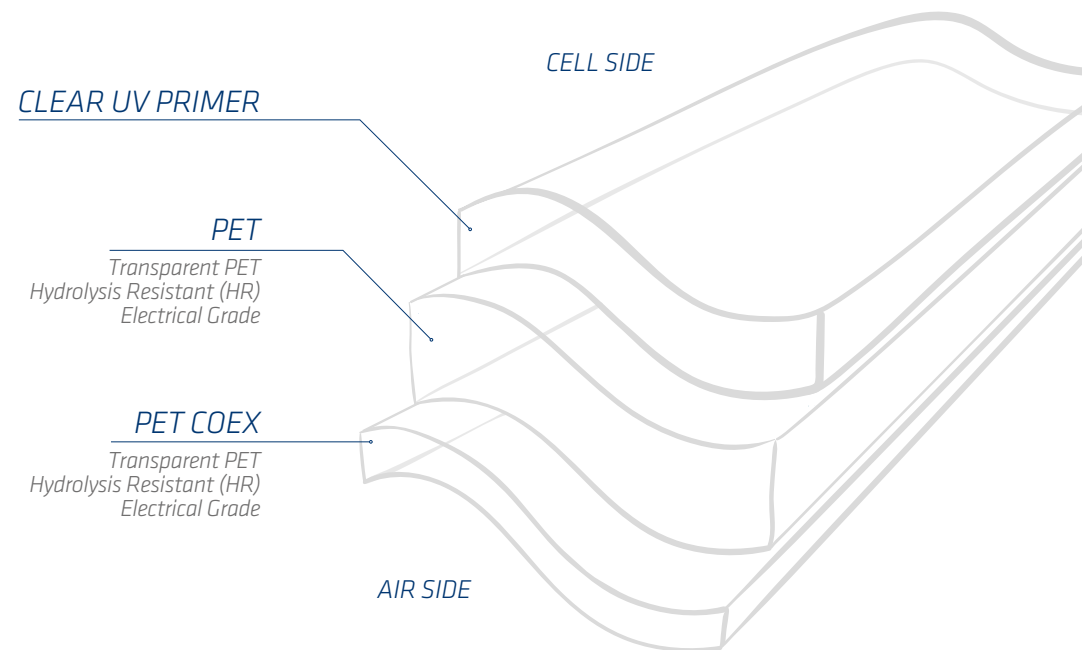
1500 VDC PET BASED BACKSHEET



>>pag.8



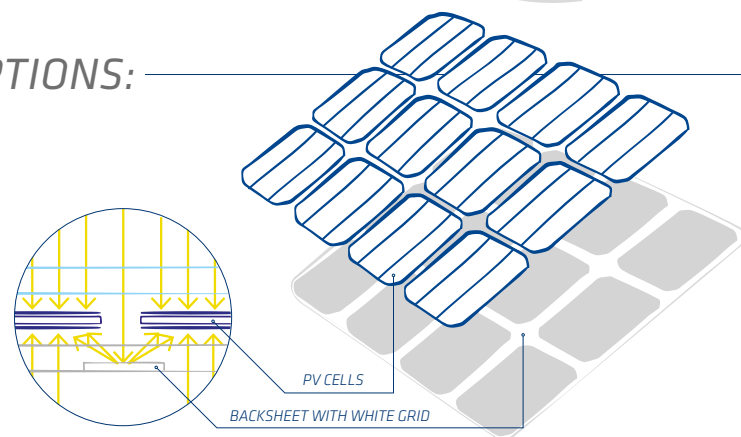
Clr® HDPYE CX



OUTPUT INCREASING OPTIONS:

DYMAT® SELECTIVE

Optional white grid incorporated in the backsheet that turns the space in between the cells and the borders into a highly reflective area for significant output improvement. The grid layout is defined according to customer's cell shape and size.

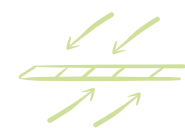


DYMAT® HMIRROR LR >>pag. 50

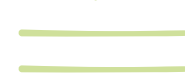
It is possible to use dyMat®HMirror LR reflective laminates for retro-fitting of PV installations to increase the final output.

dyMat® CLEAR DOUBLE LAYER PET

Totally transparent high grade polyester based backsheets for bifacial or standard modules in BIPV, utility, greenhouse, commercial installations, and grid or off grid application. This new generation of clear backsheets with special UV primer allows to replace standard backsheets for high transparency solutions. dyMat ® Clear Double Layer for 1500 VDC features a thicker inner PET layers in order to comply with the new IEC rules for 1500V insulation and has a proven track record being employed in the world's first bifacial 1500V installation.



Bifacial Cells



Totally Transparent



1500 VDC (in oil)

Clr® HDPYE CX



Features

- UV stable
- Hydrolysis resistant
- Engineered adhesive
- Higher output
- High mechanical resistance
- Extended life time up to 30 years

PRIMER TYPES



Extra UV protection on cell side



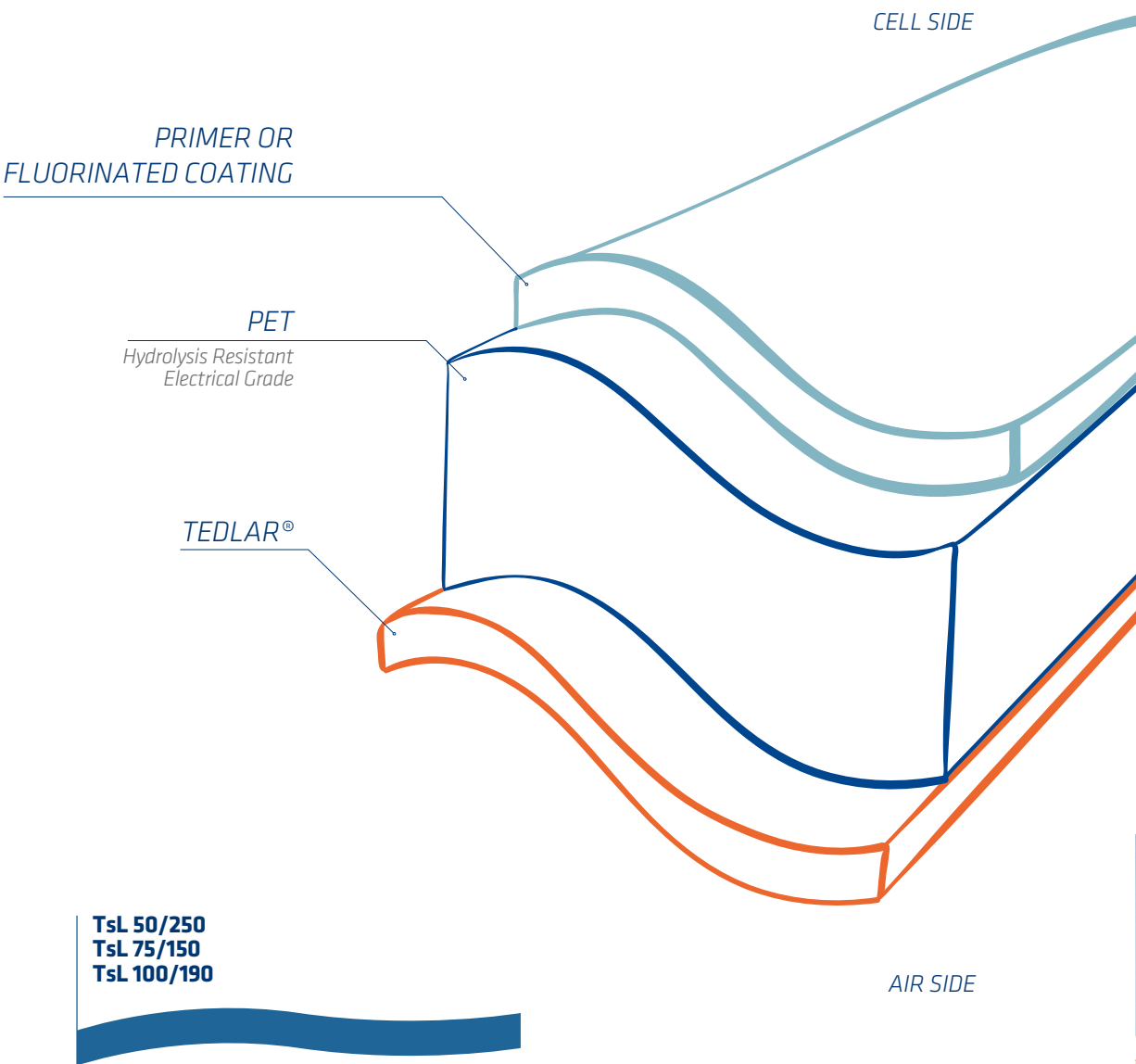
High humidity barrier



High humidity barrier + UV protection



1000 VDC TEDLAR BASED BACKSHEETS



dyMat® WHITE TEDLAR® BASED

Coveme's Tedlar® based backsheet for 1000 VDC features a PVF layer of 25µm thickness combined with several options of inner PET thickness ranging from 150µm up to 250µm. As for the excellent Tedlar® weatherability properties, Coveme dyMat® TsL series exhibits outstanding resistance to UV irradiation. Fluorinated coating on cell side available.

**Primer 50µm
or fluorinated
coating
/ PET 250µm**

TsL 50/250

**Primer 75µm
or fluorinated
coating
/ PET 150µm**

TsL 75/150

**Primer 100µm
or fluorinated
coating
/ PET 190µm**

TsL 100/190

Additional upgrades

- LO** Extra UV protection on cell side
- LD** High humidity barrier
- LDO** High humidity barrier + UV protection
- SHR** Super high reflectivity
- LBk** Black on cell side
- Bkhr** Black high reflectivity

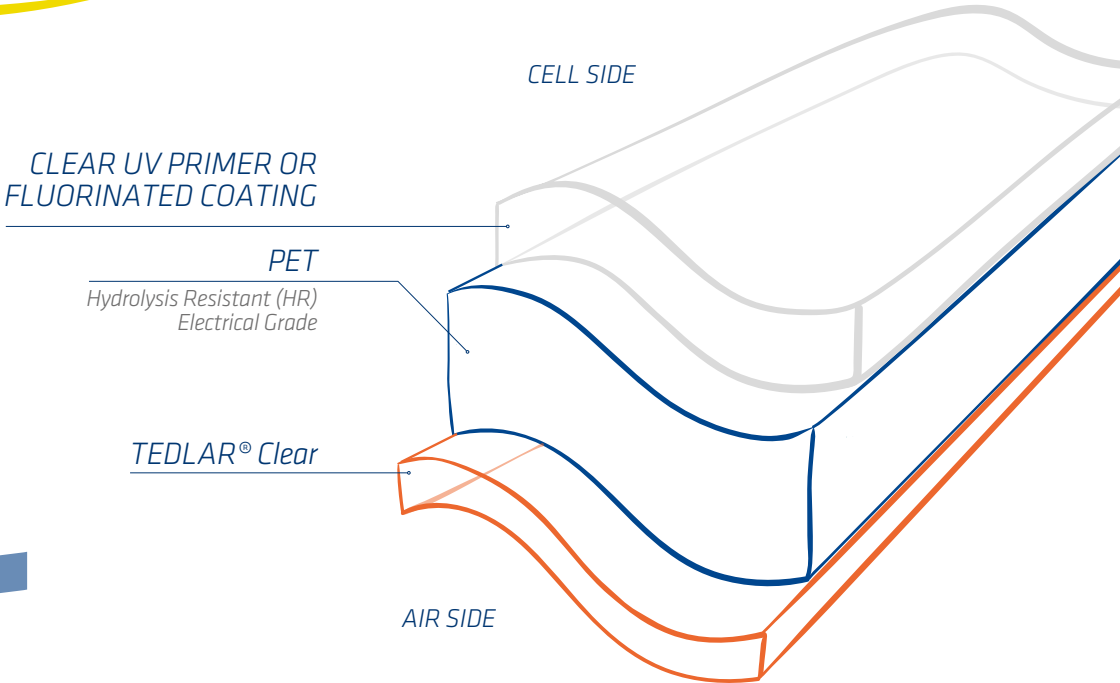
1000/1500 VDC TEDLAR based backsheets



1000 VDC TEDLAR BASED BACKSHEETS

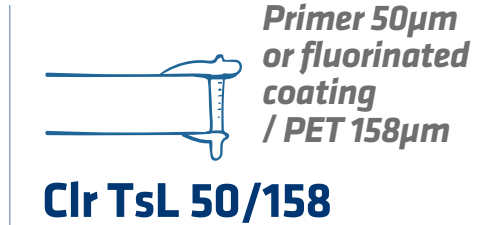


Clr TsL 50/158



dyMat® CLEAR TEDLAR® BASED

Totally transparent Tedlar® based backsheets for bifacial or standard modules in BIPV, utility, greenhouse, commercial installations, and grid or off grid application. This new generation of clear backsheets with special UV primer allows to replace standard backsheets for high transparency solutions. The primer and adhesives specifically developed for these products provide an extra high resistance to UV and humidity. Fluorinated coating on cell side available.

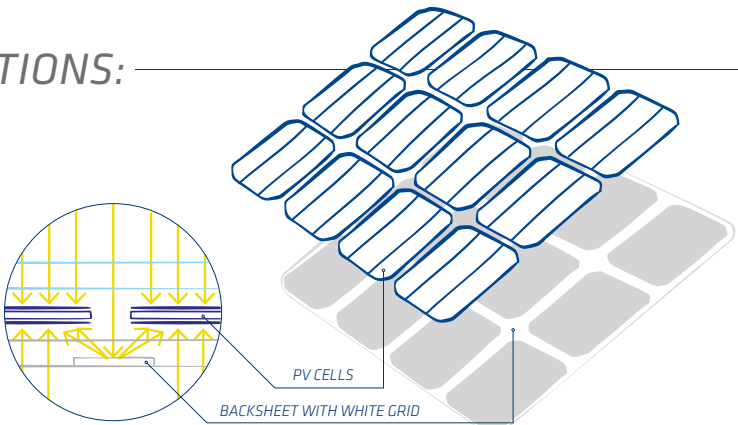


- Features**
- UV stable
 - Hydrolysis resistant
 - Engineered adhesive
 - Higher output
 - High mechanical resistance
 - Extended life time up to 30 years

1000/1500 VDC TEDLAR based backsheets

OUTPUT INCREASING OPTIONS:

DYMAT® SELECTIVE
Optional white grid incorporated in the backsheet that turns the space in between the cells and the borders into a highly reflective area for significant output improvement. The grid layout is defined according to customer's cell shape and size.



DYMAT® HMIRROR LR >>pag. 50
It is possible to use dyMat®HMirror LR reflective laminates for retro-fitting of PV installations to increase the final output.

PRIMER TYPES

- LO** Extra UV protection on cell side
- LD** High humidity barrier
- LDO** High humidity barrier + UV protection



1500 VDC TEDLAR BASED BACKSHEETS



CLEAR UV PRIMER OR
FLUORINATED COATING

PET
Hydrolysis Resistant
Electrical Grade

TEDLAR®

TsL 50/285
TsL 50/350



CELL SIDE

AIR SIDE

dyMat® WHITE TEDLAR® BASED

Coveme's Tedlar® based backsheet for 1500 VDC features a PVF layer of 25µm thickness combined with two options of inner PET thickness, 285µm or 350µm. As for the excellent Tedlar® weatherability properties, Coveme dyMat® TsL series exhibits outstanding resistance to UV irradiation. Fluorinated coating on cell side available.

 > 1500 VDC
TsL 50/285

 Extra Thick
PET 350µm
 > 1500 VDC
TsL 50/350

Additional upgrades

- LO** Extra UV protection on cell side
- LD** High humidity barrier
- LDO** High humidity barrier + UV protection
- SHR** Super high reflectivity
- LBk** Black on cell side
- Bkhr** Black high reflectivity

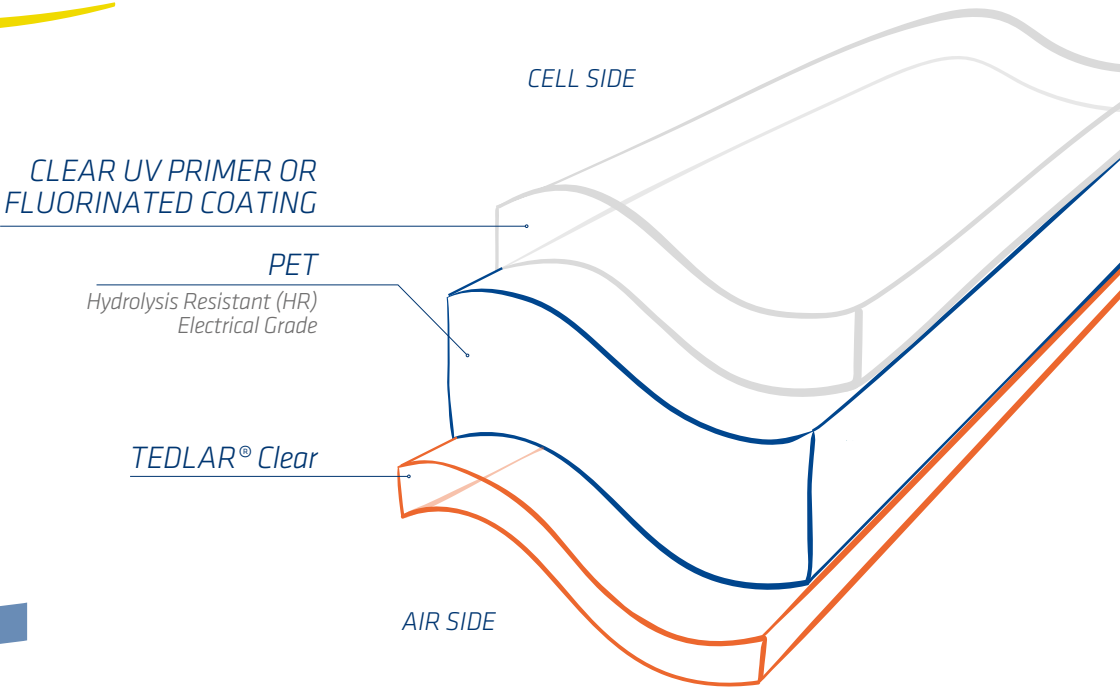
1000/1500 VDC TEDLAR
based backsheets



1500 VDC TEDLAR BASED BACKSHEETS



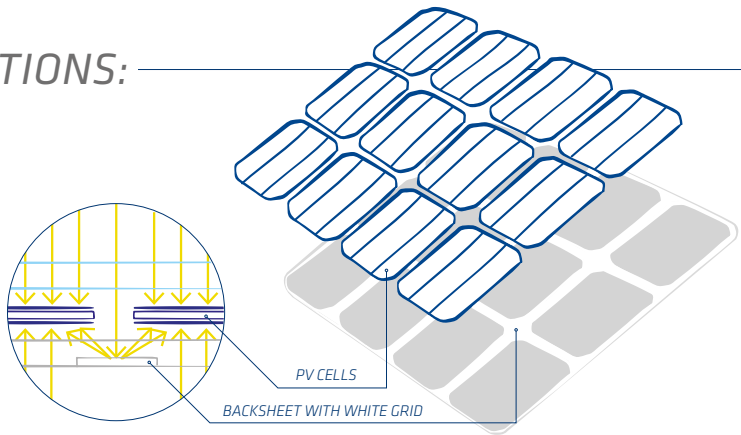
Clr TsL 50/285



OUTPUT INCREASING OPTIONS:

DYMAT® SELECTIVE

Optional white grid incorporated in the backsheet that turns the space in between the cells and the borders into a highly reflective area for significant output improvement. The grid layout is defined according to customer's cell shape and size.



DYMAT® HMIRROR LR >>pag. 50

It is possible to use dyMat®HMirror LR reflective laminates for retro-fitting of PV installations to increase the final output.

dyMat® CLEAR TEDLAR® BASED

Totally transparent Tedlar® based backsheets for bifacial or standard modules in BIPV, utility, greenhouse, commercial installations, and grid or off grid application. This new generation of clear backsheets from Coveme with special UV primer allows to replace standard backsheets for high transparency solutions. dyMat® Tedlar® Clear for 1500 VDC features a thicker inner PET layer in order to comply with the new IEC rules for 1500 VDC insulation. Fluorinated coating on cell side available.

 > 1500 VDC
Clr TsL 50/285

- ✓ **Features**
- UV stable
 - Hydrolysis resistant
 - Engineered adhesive
 - Higher output
 - High mechanical resistance
 - Extended life time up to 30 years

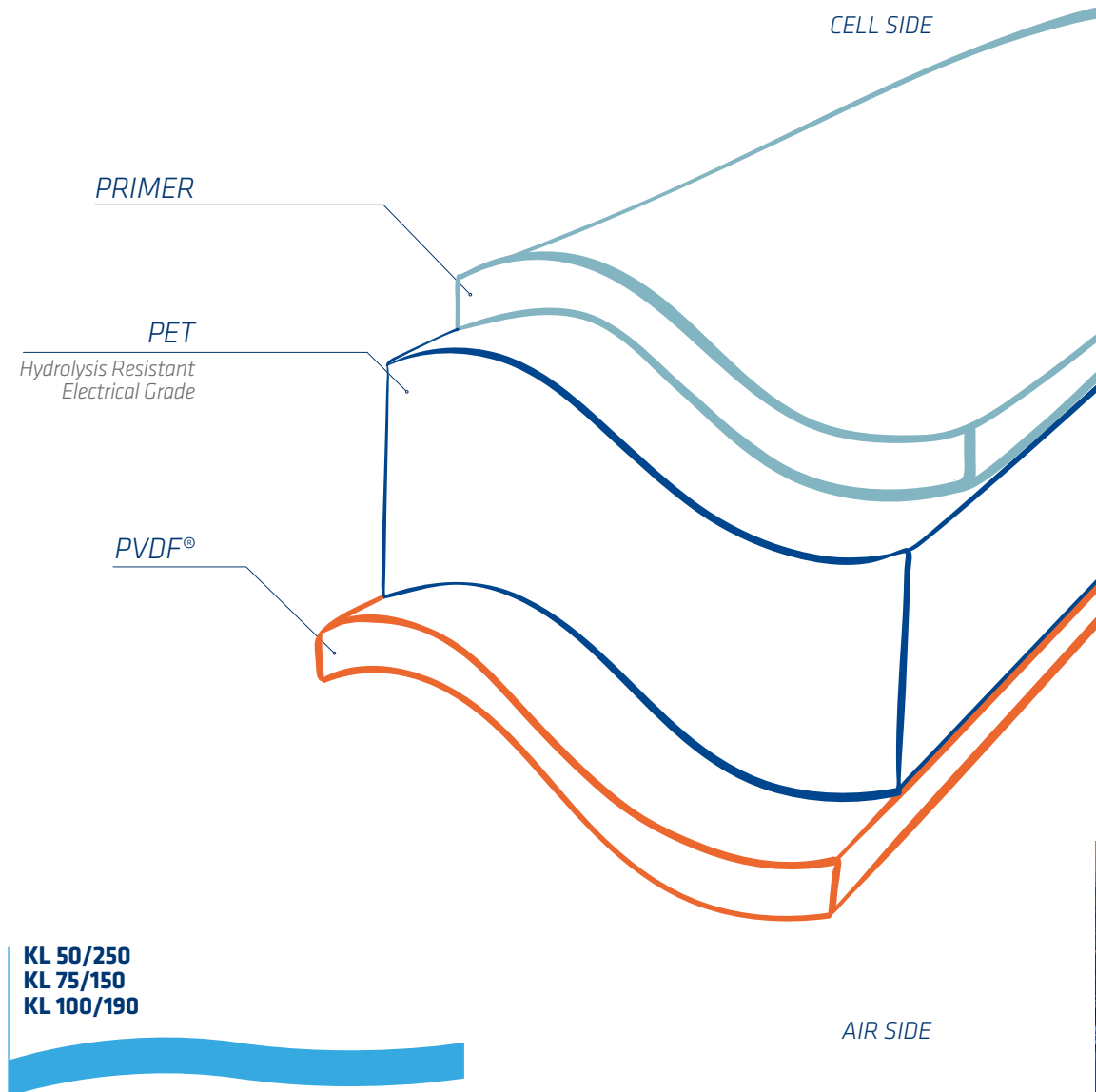
PRIMER TYPES

- LO** Extra UV protection on cell side
- LD** High humidity barrier
- LDO** High humidity barrier + UV protection



1000/1500 VDC TEDLAR based backsheets

1000 VDC PVDF BASED BACKSHEETS



dyMat® PVDF BASED

Coveme's PVDF based backsheet for 1000 VDC features a PVDF layer combined with several options of inner PET thickness ranging from 150µm up to 250µm. This Coveme fluoro-based backsheet, dyMat® KL series, features a superior resistance to UV irradiation. Clear version available upon request.

KL 50/250

KL 75/150

KL 100/190

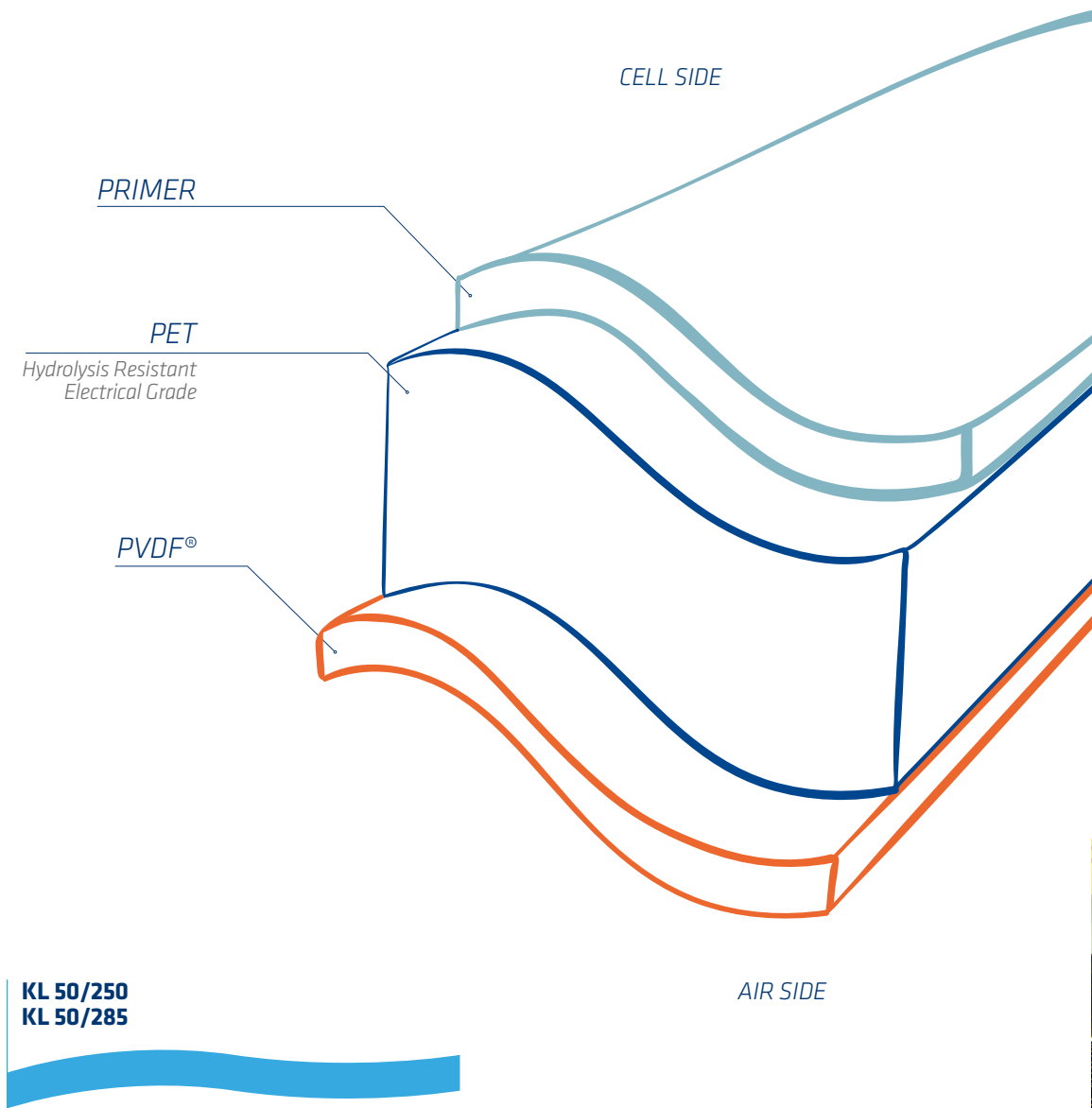
Additional upgrades

- LO** Extra UV protection on cell side
- LD** High humidity barrier
- LDO** High humidity barrier + UV protection
- SHR** Super high reflectivity
- LBk** Black on cell side
- Blkhr** Black high reflectivity

1000/1500 VDC PVDF based backsheets




1500 VDC PVDF BASED BACKSHEETS



dyMat® PVDF BASED

Coveme's PVDF based backsheet for 1500 VDC features a PVDF layer combined with a thicker inner PET layer. This Coveme fluoro-based backsheet, dyMat KL series, features a superior resistance to UV irradiation. Clear version available upon request.



>1500
VDC (in oil)

KL 50/250



>1500 VDC
NEW IEC
Standard
Compliant

KL 50/285

Additional upgrades

- LO** Extra UV protection on cell side
- LD** High humidity barrier
- LDO** High humidity barrier + UV protection
- SHR** Super high reflectivity
- LBk** Black on cell side
- Bkhr** Black high reflectivity

1000/1500 VDC PVDF
based backsheets



1000 - 1500 VDC dyMat® FRONTSHEETS

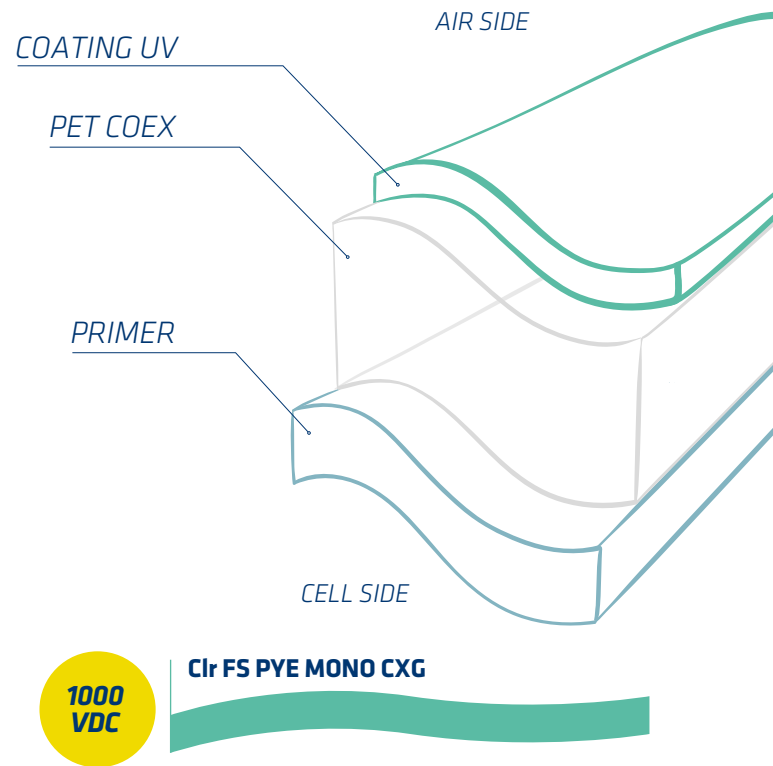
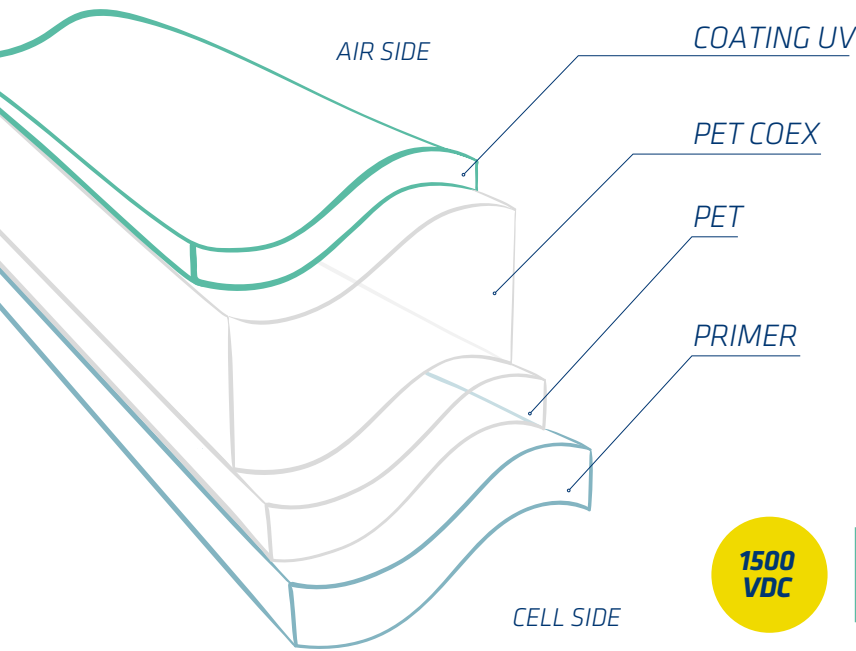
THE GREEN FRONTSHEET

CERTIFIED QUALITY

HIGHLY TRANSPARENT

HIGH GRADE PET

>>pag.8



dyMat® CLEAR FRONTSHEETS

This new generation of clear frontsheets developed by Coveme features an extra high UV and hydrolysis resistant polymer and is employed instead of glass, in semi-flexible and lightweight module. These highly transparent front-sheets are characterized by a specific coating with outstanding anti-scratch and anti-abrasion properties. dyMat® frontsheets are designed for up to 1500 VDC for pv modules in rooftop, automotive or nautical installations and grid or off grid application. Matt anti-glare versions are available.

> 1500 VDC

Anti Scratch

Extra High UV Resistance

ClrFS PYE MONO CXG

1000 VDC

> 1500 VDC

Anti Scratch

Extra High UV Resistance

ClrFS HDPYE CXG

1500 VDC

✓ Features

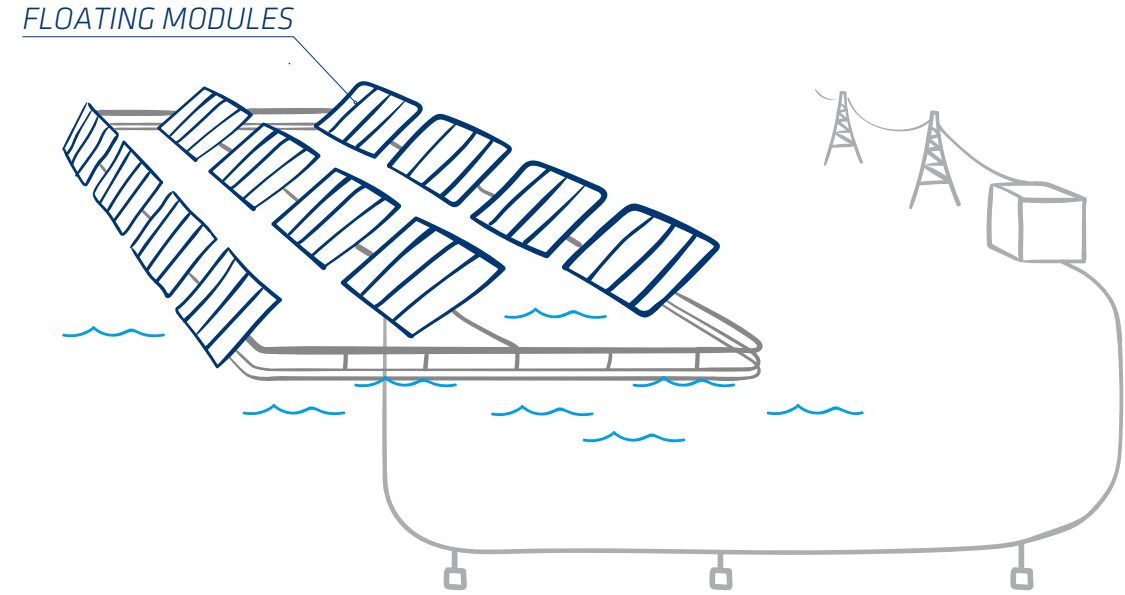
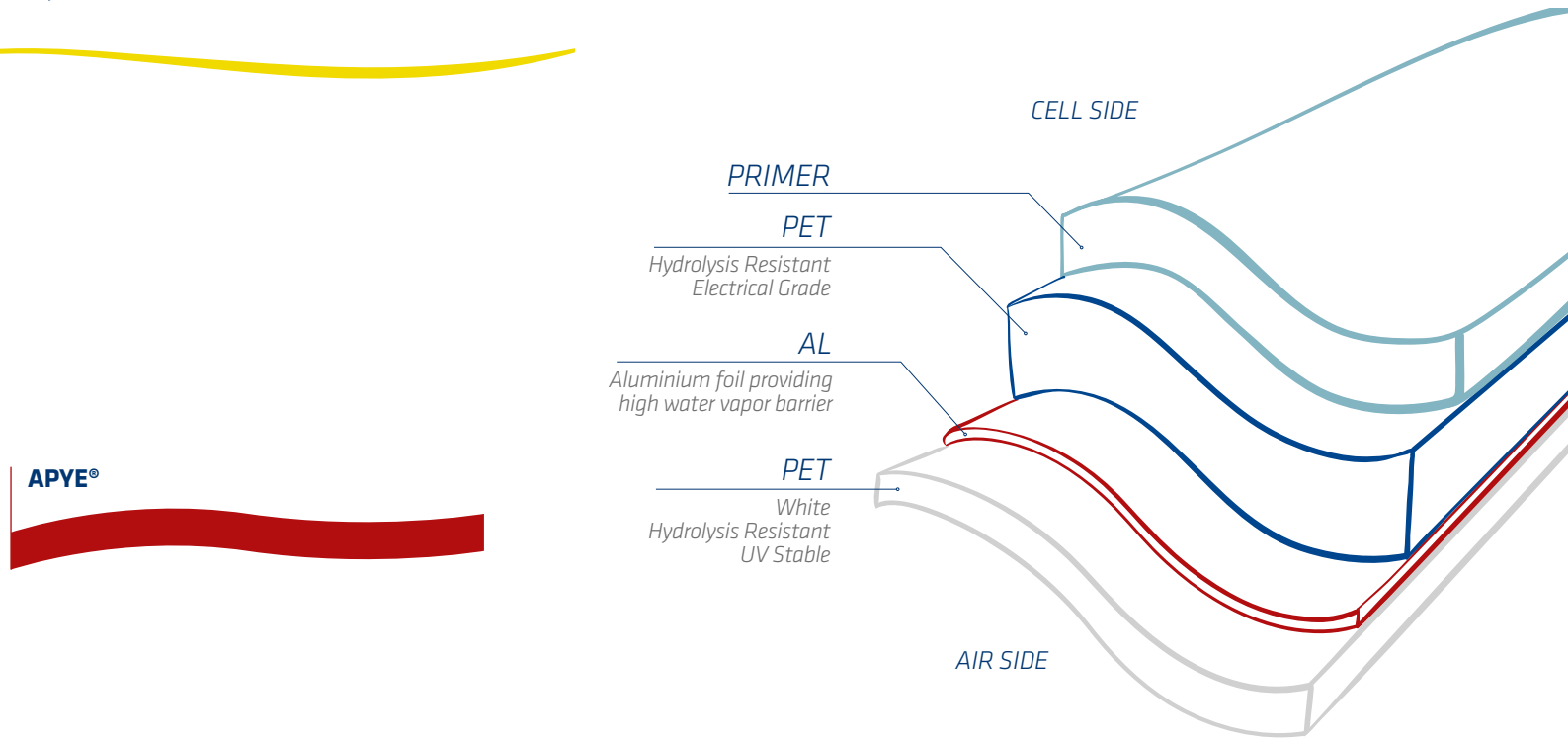
- Anti scratch
- Anti abrasion
- Hydrolysis resistant
- Engineered adhesive
- Highly UV resistant
- Extended life time up to 30 years

COATING TECHNOLOGY

dyMat® ClrFS PYE MONO CXG and ClrFS HDPYE CXG feature an innovative coating, proprietary of Coveme, that has been developed by the company's R&D departments. It is applied in an ultra- modern coating process that guarantees an elevated standard and combines the latest UV coating and EB curing technologies for dyMat® backsheets and frontsheets of constant and reproducible quality.



dyMat® SPECIALITIES



dyMat® FOR FLOATING PV SYSTEMS

Coveme's Aluminum backsheet features a special Al layer of thickness variable between 9µm up to 50µm. The special backsheet construction allows an extra low WVTR and a superior moisture protection for humidity sensitive solar cells. Therefore, it is the most suitable solution for thin film (CIGS and a-Si) flexible PV modules and also for c-Si PV modules used in floating installations where high humidity and high temperature can easily deteriorate the module power output.



Additional upgrades

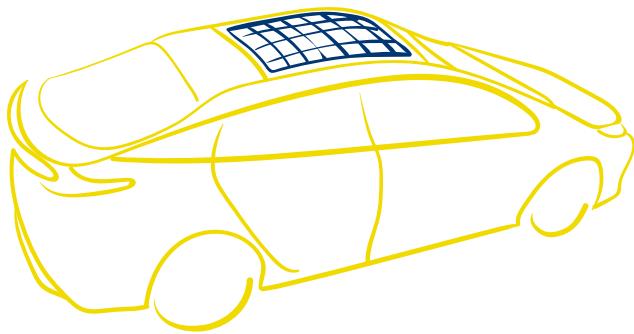
- LO** Extra UV protection on cell side
- SHR** Super high reflectivity
- Bk** Black polyester on air side and black on cell side
- LBk** Black on cell side
- Bkhr** Black high reflectivity



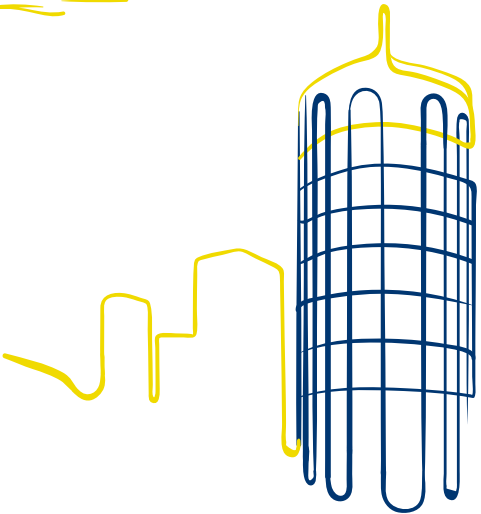
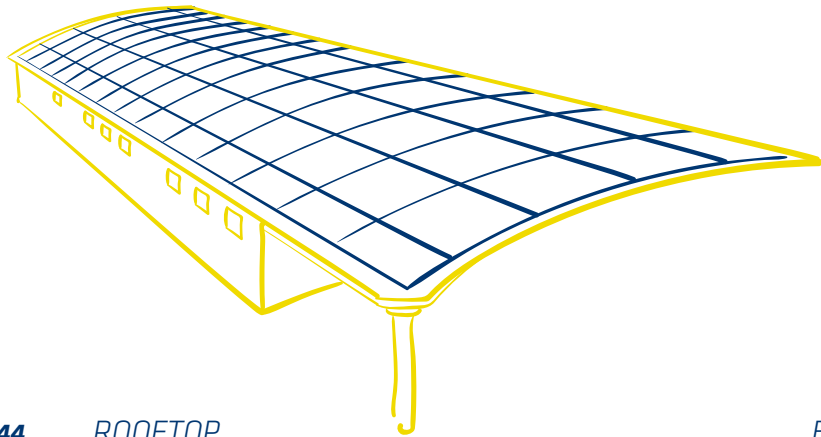
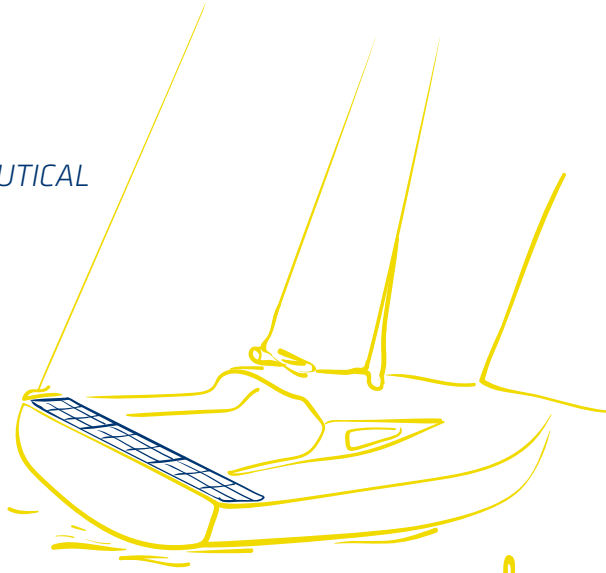
dyMat® SPECIALITIES

Coveme has developed specific dyMat® films and laminates that are employed as frontsheet or backsheet in flexible lightweight photovoltaic modules. For printed solar cells Coveme offers special films with printable coatings and high dimensional stability. Applications include rooftop, building integrated , automotive , nautical and all surfaces with limited loading capacity.

AUTOMOTIVE




NAUTICAL




BUILDING INTEGRATED

dyMat® FOR FLEXIBLE, PRINTED AND ORGANIC PV


dyMat® Clr Frontsheet is a totally transparent laminate with a special coating for enhanced UV and scratch resistance combined with UV filtering properties. These characteristics make it particularly suitable to be employed as a frontsheet in flexible photovoltaics. For the back protection of these modules Coveme offers a range of high performance dyMat® Backsheets in different colours that guarantees durability over the years, electrical insulation and high resistance to weathering agents such as moisture and extreme temperatures . In the field of printable and organic photovoltaics Coveme offers its dyMat® Printable, a heat stabilized and surface treated polyester film suitable for roll to roll and sheet printing processes.



Totally Transparent




Enhanced UV Resistance




Scratch Resistance

dyMat® Frontsheets




Dimensionally Stable




Printable

dyMat® Printable



Low WVTR



PDT > 1500 VDC

dyMat® Backsheets

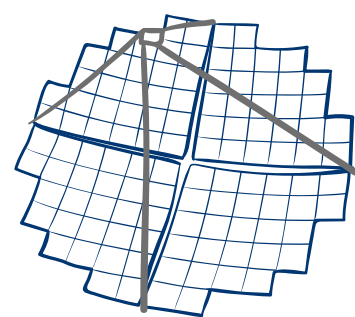


dyMat® SPECIALITIES

Coveme has developed a dyMat® laminate with mirror functions for photovoltaic concentrators and concentrating solar power plants. Compared to standard glass dyMat® Mirror HR that has several advantages in the functioning and for the energy output of these installations:

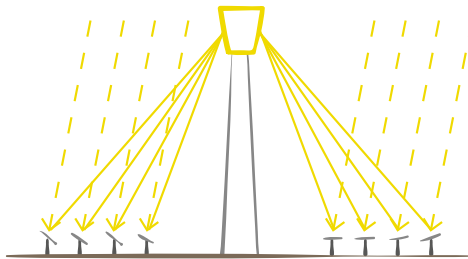
- ✓ Lower weight due to thinner components
- ✓ Flexible material adaptable to any design and application
- ✓ Lower material and installation costs
- ✓ Easier handling and shipping

CONCENTRATOR PHOTOVOLTAICS - CPV

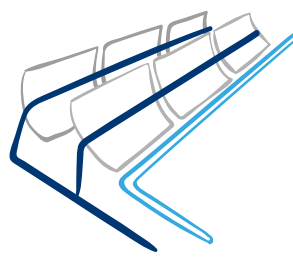


Concentrator Photovoltaics

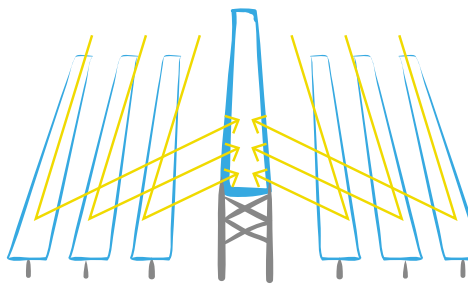
CONCENTRATING SOLAR POWER - CSP



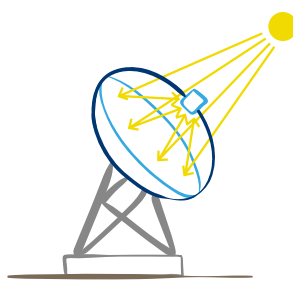
Solar Power Tower



PT - Parabolic Through



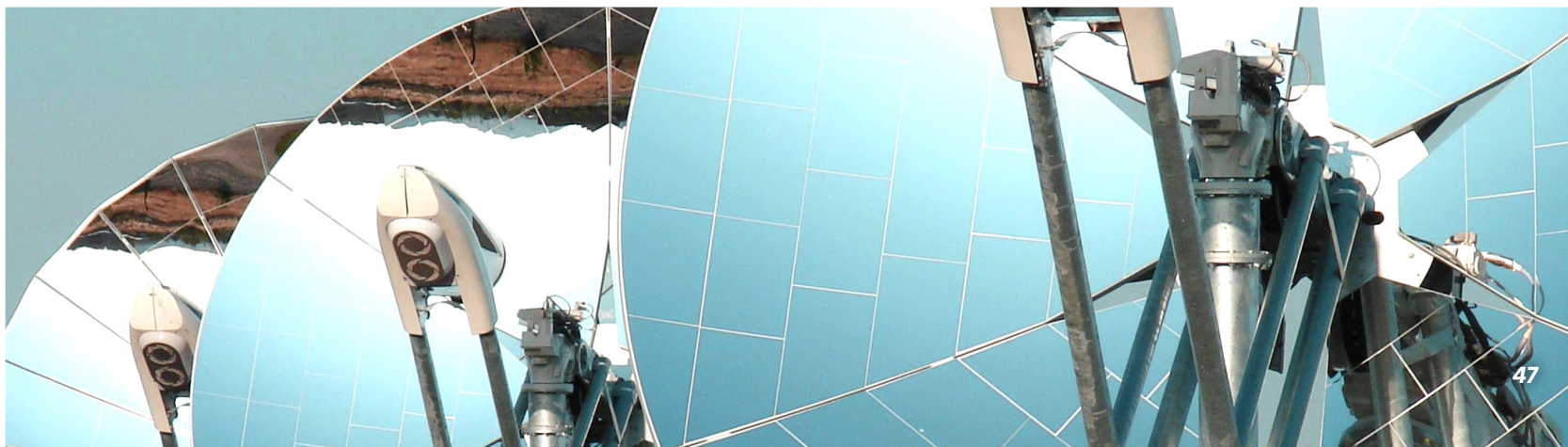
Linear Fresner Reflector



Parabolic Disc Reflector

dyMat® FOR CONCENTRATOR PHOTOVOLTAICS (CPV) AND CONCENTRATING SOLAR POWER (CSP)

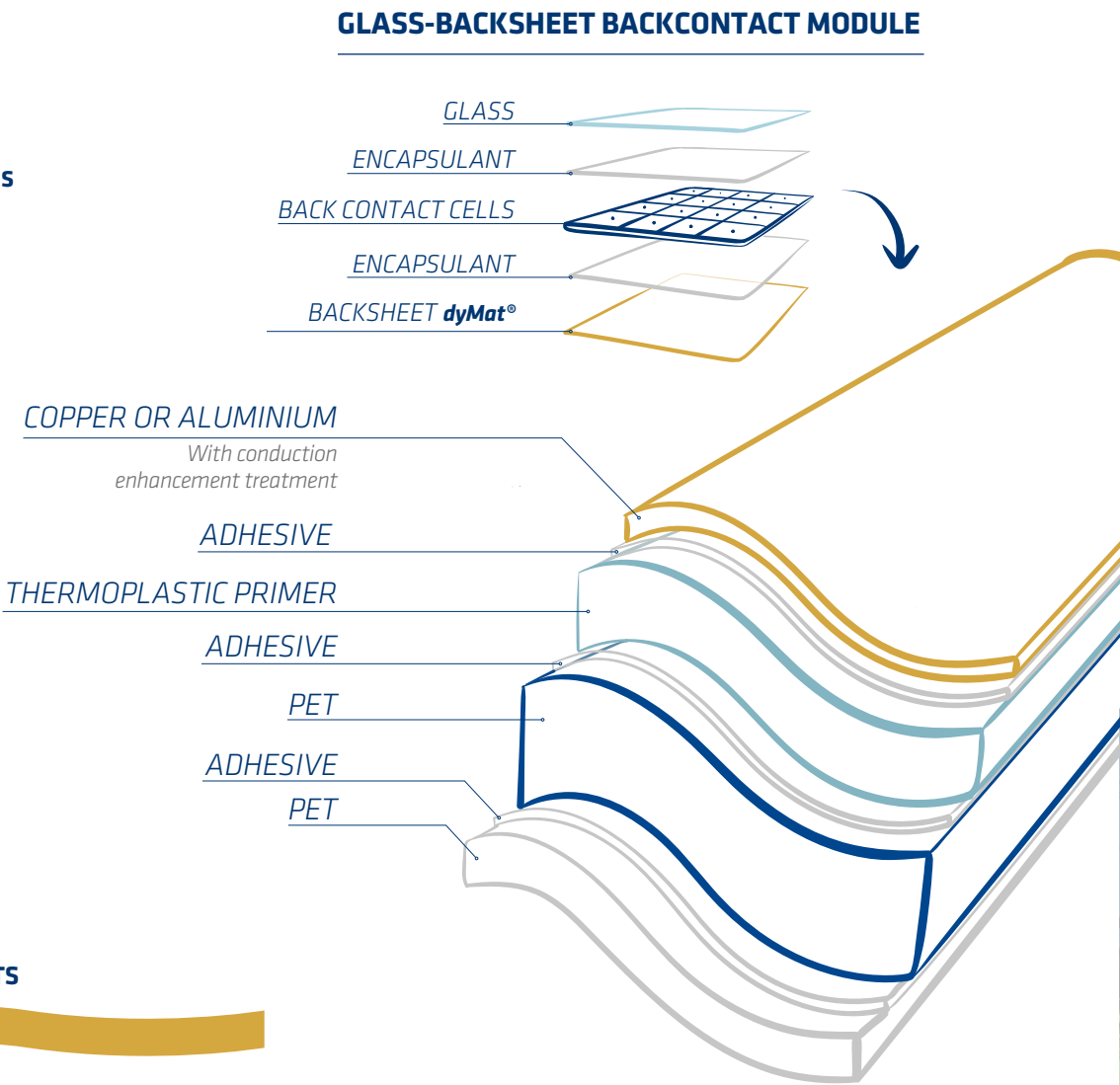
Coveme dyMat® Mirror HR is a multilayer substrate, made of two layers of polyester film with a metallization in between. The front side is an ultra clear polyester film coated with a UV resin, the backside is heat sealable, suitable for coil lamination on galvanized steel. The metallized layer guarantees the high performance and durability of solar concentrators. The surface coating provides resistance to abrasion scratch, and has been designed by our engineers for high durability to UV exposure.



dyMat® SPECIALITIES

Coveame has been a pioneer in the development of special backsheets with an integrated conductive layer for PV modules made with backcontact PERC-MWT and IBC cells. There are specific solutions for glass-backsheet and glass-glass modules that guarantee a higher manufacturing yield.

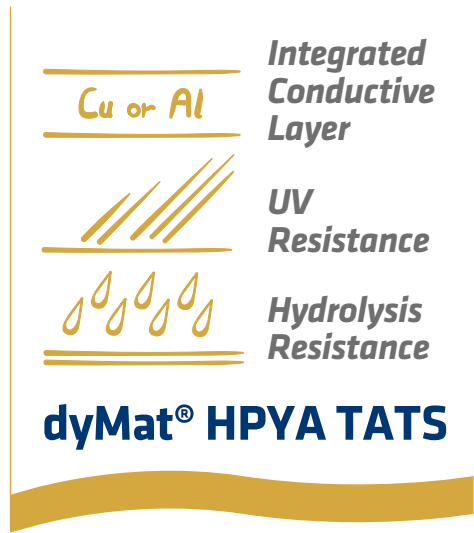
- ✓ High-efficiency cells
- ✓ Higher output of the panel
- ✓ Near to zero cell to module loss



dyMat® HPYA TATS

dyMat® FOR BACKCONTACT TECHNOLOGY

dyMat® H PYA TATS is an innovative backsheet made of high performance polyester, a thermoplastic primer and a copper or aluminium conductive layer for the manufacturing of backcontact photovoltaic modules. The passivation treated conductive layer is designed to become the electrical circuit for the back connection of the cells, whereas the pet film functions as back protection for the module.

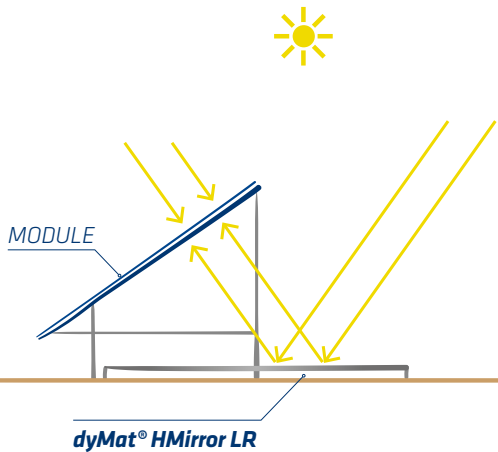


dyMat® SPECIALITIES

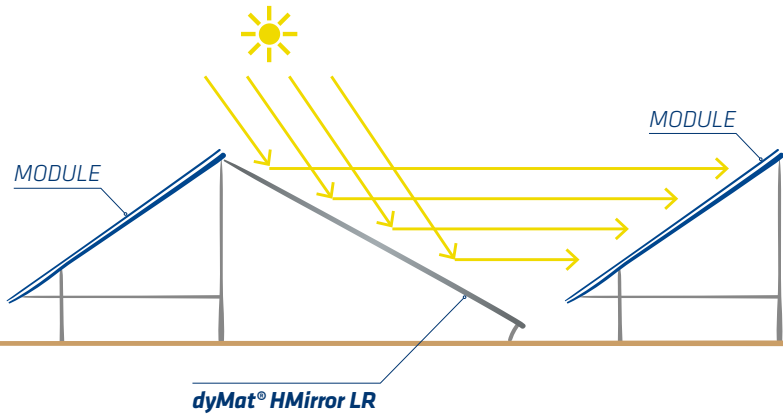
Coveme has developed a highly reflective laminate developed for the retrofitting of Bifacial and standard PV modules. dyMat® HMirror LR is installed between the module rows and reflects the sun light back onto the module, thus increasing the average energy output of the installation.

- ✓ Significant average energy output gain +10-15%
- ✓ Works within plant peak power
- ✓ Set-up possible in already existing installations
- ✓ No temperature increase on module side

RETRO-FITTING OF BIFACIAL MODULES

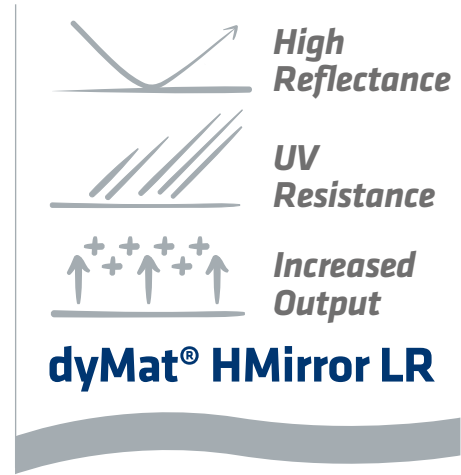


RETRO-FITTING FOR STANDARD MODULES



dyMat® FOR RETRO-FITTING OF PV INSTALLATIONS

dyMat® HMirror LR polymeric mirror film is a multilayer metallized laminate with a special scratch abrasion and UV resistant coating. The product is specifically designed for retro-fitting and features strong durability and high reflectance.



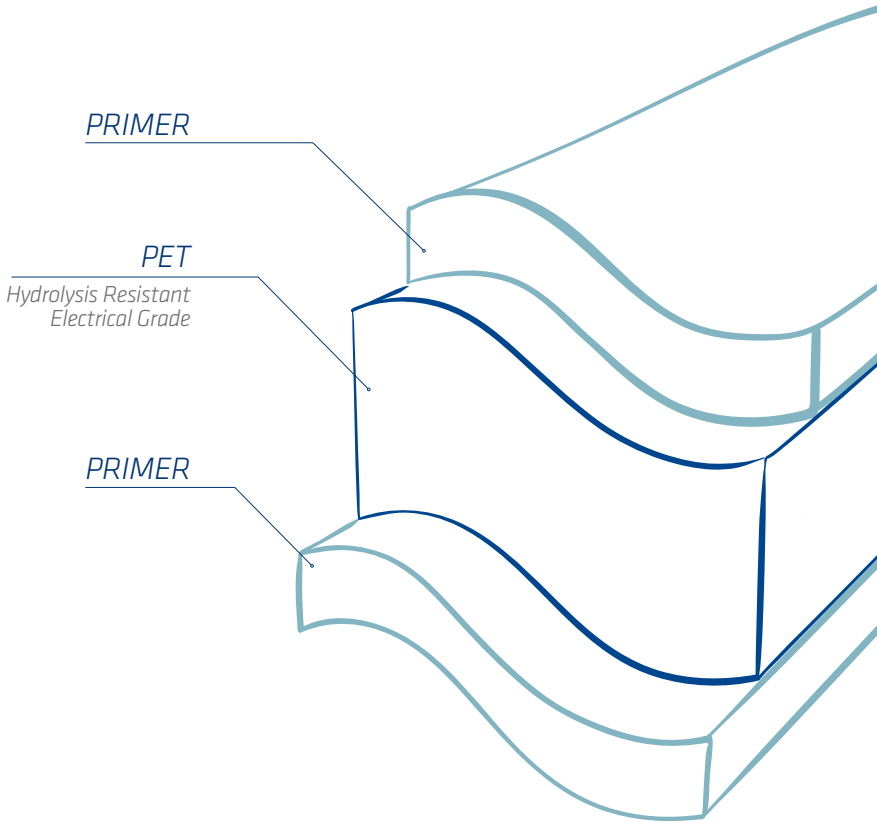
ACCESSORIES

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 encapsulant**
- ✓ **White, black and transparent versions available.**

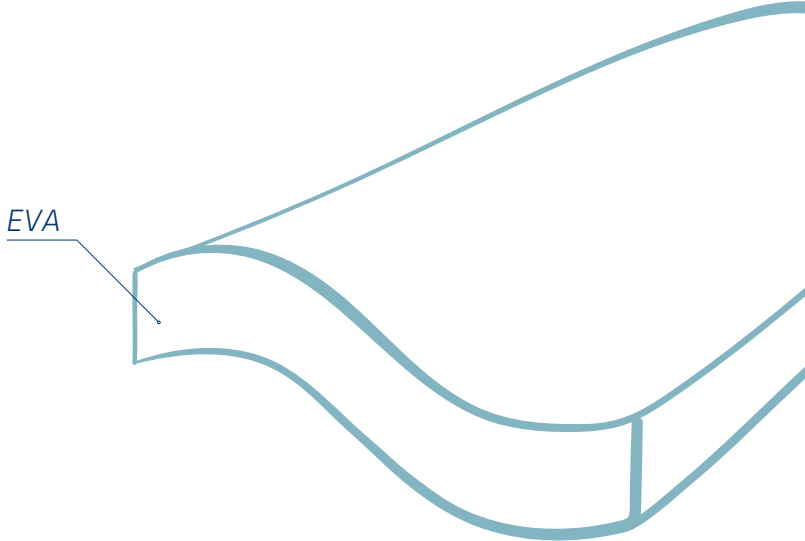


dyMat E®

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.



- ✓ **Transparent EVA**
- ✓ **Modified acrylic emulsion adhesive**



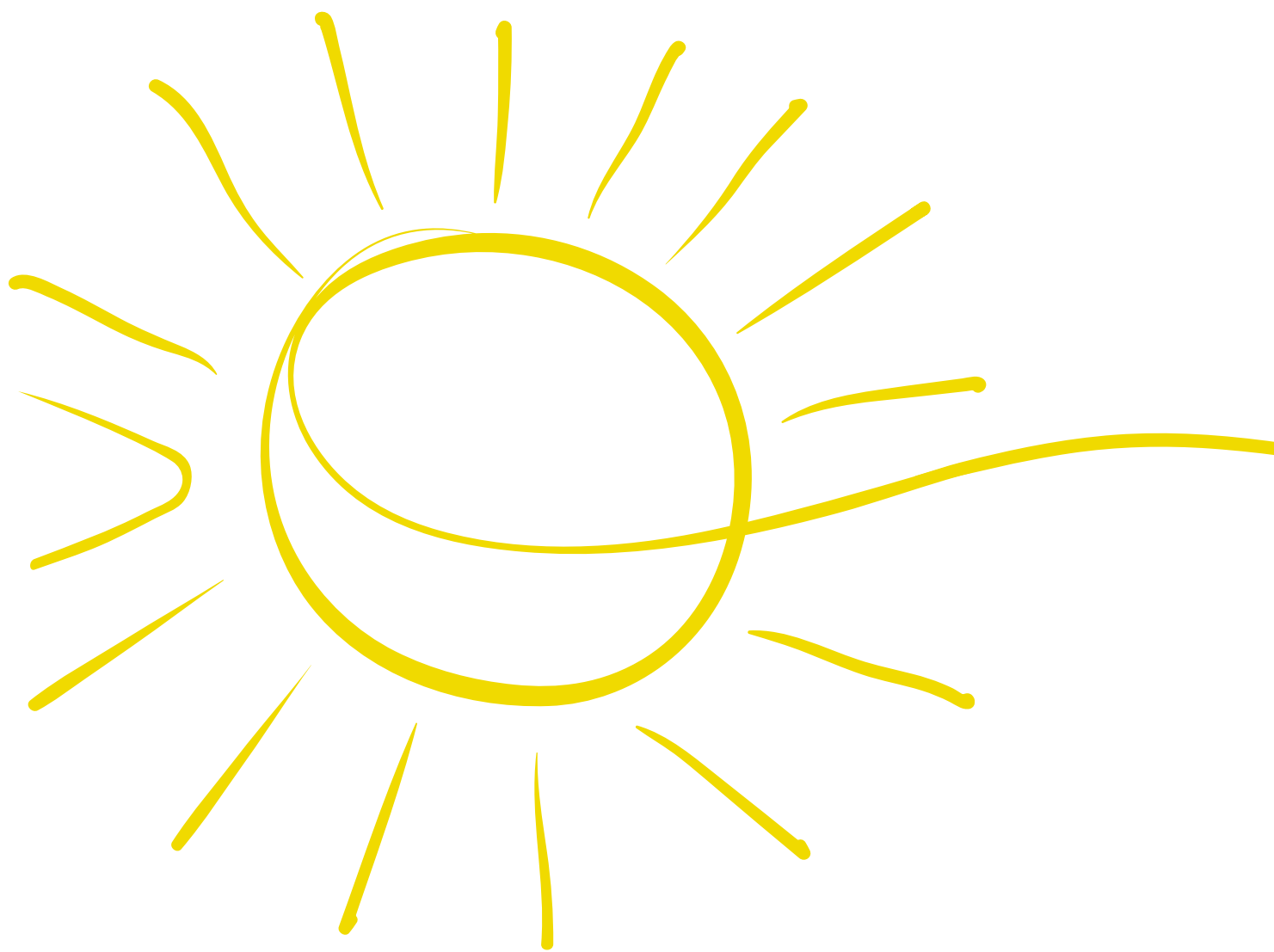
AWARDS & CERTIFICATIONS



- ✓ **China Awards for Innovation Technology 2019**
- ✓ **Hanwha Solar Supplier Award 2018**
- ✓ **Trina Solar Supplier Award 2017**
- ✓ **Solar World Supplier Award 2015**
- ✓ **Vikram Solar Preferred Partner 2013**

Coveme's is certified ISO 9001: 2015 for quality management standards, ISO 14001: 2015 for environmental management and ISO 45001:2018 for occupational health and safety.







COVEME EUROPE

Italy

Coveme S.p.A.

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

Coveme Engineered Films Zhangjiagang Co. Ltd

Production Plant & Office:

No. 4, Yuefeng road, Zhangjiagang,
Jiangsu Province, China P.C. 215600

ph. +86 512 82559911