COVEME **PHOTOVOLTAIC**



2018

Backsheet for PV modules

THE VALUE OF INNOVATION





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BIGGEST IN HOUSE 18 GW BACKSHEET PRODUCTION CAPACITY WORLDWIDE



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
14 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 the reliability of our products that guarantee our customers higher productivity, maximum module power 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 Coverne 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

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 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 continuously invests in End of Life (EOL) and Life Cycle Assessment (LCA) activities with a special focus on backsheet carbon footprint.



Coveme backsheets 100% RECYCLABLE high grade polyester based
 LOWEST CARBON FOOTPRINT backsheet on the market
 NON TOXIC VOC EMISSION in case of fire
 In house R&D ACTIVITY FOR EOL AND LCA value creation
 COMPLIANT WITH ALL EXISTING ECO REGULATIONS



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.









PRODUCT RANGE

DYMAT®OVERVIEW	1
1000 VDC PET BASED BACKSHEETS	1
dyMat® Double Layer Pet	1
dyMat® PYE SPV-SPV L	
dyMat® SPV L 305	
dyMat® PYE 3000-3000 L	
dyMat® Black Layer	1
dyMat® Bk PYE	
dyMat® Aluminium Layer	2
dyMat® APYE	
dyMat® Monolayer	Z
dyMat® PYE MONO L	
dyMat® PYE MONO LT	
dyMat® PYE MONO L PLUS	
dyMat [∞] CIr PYE MONO L	
1500 VDC PET BASED BACKSHEETS	2
dyMat® 1500 VDC	Ź
dyMat® HDPYE SPV L	
dyMat® Clr HDPYE L	
dvMat® HDPYET MONO	

BASED BACKSHEETS	
Tedlar® Based	
dyMat® TsL 50/250	
dyMat® TsL 75/150	
dyMat® TsL 100/190	
PVDF Based	
dyMat® KL 50/250	
dyMat® KL 75/150	
dyMat® KL 100/190	
1500 VDC FLUOROPOLYMER	
BASED BACKSHEETS	
Tedlar® based	
dyMat® TsL 50/285	
dyMat® TsL 50/350	
PVDF based	
dyMat® KL 50/250	
dyMat® KL 50/285	
dyMat® Clr KL 50/285	
DYMAT [®] INNOVATIONS	
dyMat® Bifacial modules	
dyMat® Flexible, printed, organic PV	
dyMat® CPV - CSP	
dyMat® Backcontact technology	
dyMat® Retro fitting laminates	
DYMAT [®] ACCESSORIES	
dyMat® EPE	

dyMat® E

dyMat® OVERVIEW BACKSHEETS AND SPECIAL FILMS FOR PV AND SOLAR



ADDED VALUE

DYMAT[®] IS A VAST RANGE OF DIFFERENT MATERIALS FOR A TOTALLY CUSTOMIZABLE BACKSHEET:



 POLYESTER AND FLUORINATED based backsheets

MONO AND DOUBLE LAYER versions

 100% RECYCLABLE (The Green Backsheet)

 DOUBLE UV PROTECTION on air side and cell side

APPLICATIONS

DYMAT[®] SOLUTIONS SATISFIES SPECIFIC REQUIREMENTS OF ALL KIND OF INSTALLATIONS:



- RESIDENTIAL ROOFTOP

UTILITY POWER PLANTS

BUILDING INTEGRATED photovoltaics

- FLOATING SYSTEMS

 COMMERCIAL AND INDUSTRIAL buildings NEW FRONTIERS

COVEME OFFERS HIGHLY INNOVATIVE FILMS AND NEW DEVELOPMENTS FOR LEADING-EDGE APPLICATIONS :



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

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









1000 VDC PET BASED BACKSHEETS



dyMat[®] 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, the highest resistance to sand abrasion in the market, and an excellent resistance to salt mist, ammonia and chemical solvents corrosion.



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1000 VDC PET BASED BACKSHEETS



dyMat[®] BLACK LAYERS

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 dvMat[®] Bk PYE series provides a high adhesion strength to all types of encapsulants, the highest resistance to sand abrasion in the market, and an excellent resistance to salt mist, ammonia and chemical solvents corrosion.



BK PYE® SPV L



Additional upgrades



for extra UV protection on cell side

Low water vapour transmission rate

Low water

vapour transmission rate + UV stable primer



1000 VDC PET BASED BACKSHEETS





dyMat[®] ALUMINIUM LAYER

Coveme's Aluminum backsheet features a special AI 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.





primer on cell side

1000 VDC PET BASED BACKSHEETS



dyMat[®] MONOLAYER 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. Available also in transparent version for bifacial modules.





1500 VDC PET BASED BACKSHEETS



dyMat[®] 1500 VDC

Coveme'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, the highest resistance to sand abrasion in the market, and an excellent resistance to salt mist, ammonia and chemical solvents corrosion. Available also in transparent version for bifacial modules.





1000 VDC FLUOROPOLYMER BASED BACKSHEETS



CERTIFIED QUALITY

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TEDLAR® BASED

Coveme's Tedlar[®] based backsheet for 1000V 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.





1000 VDC FLUOROPOLYMER BASED BACKSHEETS



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PVDF® BASED

Coveme's PVdF based backsheet for 1000V 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.





1500 VDC FLUOROPOLYMER BASED BACKSHEETS



TEDLAR® BASED

Coveme's Tedlar[®] based backsheet for 1500V 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.



1500 VDC FLUOROPOLYMER BASED BACKSHEETS



PVDF® BASED

Coveme's PVdF based backsheet for 1500V 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. Additionally, a specific transparent backsheet with fluoro UV resistance and 1500V insulation has been developed for bifacial modules.





dyMat[®] INNOVATIONS

Coveme offers innovative solutions for bifacial cell modules with backsheet-glass structure or backsheet-front sheet structure . All these specifically designed dyMat[®] laminates combine ultra transparency with extra UV resistance.



dyMat[®] FOR BIFACIAL MODULES

The products dyMat[®] CIr PYE MONO L, dyMat[®] CIr HDPYE L, dyMat[®] CIr KL 50/285 and dyMat[®] Selective are designed for the back protection of the module, wheras dyMat[®] CIr FRONT is a frontsheet solution. Coveme has developed two innovative solutions for biafacial modules, the dyMat[®] Selective backsheet and the totally transparent frontsheet dyMat[®] CIr FRONT with a special coating for enhanced UV and scratch resistance. In the case of dyMat[®] Selective Coveme has set up a new manufacturing technology for the incorporation of a special grid in the backsheet that turns the space in between the cells and the boarder into a highly reflective area. Through the combination of high reflectance from the front and high transparency from the bottom dyMat[®] Selective improves the modules output significantly.





dyMat[®] INNOVATIONS

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.



dyMat® FOR FLEXIBLE, PRINTED AND ORGANIC PV

dyMat[®] CIr FRONT 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[®] PYE 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[®] PRINT, a heat stabilized and surface treated polyester film suitable for roll to roll and sheet printing processes.





dyMat[®] INNOVATIONS

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:



CONCENTRATOR PHOTOVOLTAICS - CPV C

CONCENTRATING SOLAR POWER - CSP



Concentrator Photovoltaics





PT - Parabolic Through

Solar Power Tower





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[®] INNOVATIONS

Coveme 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

GLASS-BACKSHEET BACKCONTACT MODULE

GLASS-GLASS BACKCONTACT MODULE



dyMat[®] FOR BACKCONTACT TECHNOLOGY

dyMat[®] BYC and SYC are innovative backsheets made of high perfomance 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[®] INNOVATIONS

Coveme has developed a highly reflective laminate developed for the retrofitting of 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%

Set-up possible in already existing installations

Works within plant peak power



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.







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.





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.





AWARDS & CERTIFICATIONS



Coveme's is certified ISO 9001 for quality management standards, ISO 14001 for environmental management and OHSAS 18001 for occupational health and safety.













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