Backsheet for PV modules
COVEME TODAY

ITALY
HEADQUARTER & PRODUCTION PLANT

CHINA
COVEME BRANCH & PRODUCTION PLANT

INDIA
COVEME BRANCH

USA
warehouse

GERMANY
warehouse

TURKEY
warehouse

MALAYSIA
warehouse

SINGAPORE
warehouse

SHANGHAI
warehouse

KOREA
warehouse

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.
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.

**PRODUCTION**

- 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 Coveme 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.

THE GREEN BACKSHEET

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 continuous cross-fertilization among peers.
PRODUCT RANGE

DYMAT® OVERVIEW

1000 VDC PET BASED BACKSHEETS

- dyMat® Double Layer Pet
- dyMat® SPV SPV L
- dyMat® SPV L 305
- dyMat® SPV 3000-3000 L

- dyMat® Black Layer
- dyMat® P Bk PVE
- dyMat® Aluminium Layer
- dyMat® APYE

- dyMat® Monolayer
- dyMat® PVE MONO L
- dyMat® PVE MONO LT
- dyMat® PVE MONO L PLUS
- dyMat® Clr PVE MONO L

1000 VDC FLUOROPOLYMER BASED BACKSHEETS

- dyMat® TsL 50/250
- dyMat® TsL 75/150
- dyMat® TsL 100/190

- dyMat® KL 50/285
- dyMat® KL 50/350

1500 VDC PET BASED BACKSHEETS

- dyMat® 1500 VDC
- dyMat® HD PVE SPV L
- dyMat® Clr HD PVE L
- dyMat® HD PVE L MONO

1500 VDC FLUOROPOLYMER BASED BACKSHEETS

- dyMat® TsL 50/285
- dyMat® TsL 75/330

- 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

FUNCTION
- DYMAT® BACKSHEETS ARE EFFICIENT MATERIAL COMBINATIONS FOR HIGHLY PERFORMING MODULES:
  - Electrical insulation up to 1500 VDC
  - High humidity resistance
  - Strong UV protection
  - Chemical and physical durability

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
  - CPV - Concentrator Photovoltaics
  - Backcontact technology
  - Flexible, printed and organic PV
  - Retro-fitting PV plants
  - CSP - Concentrating Solar Power

QUALITY
- DYMAT® PRODUCTS ARE CERTIFIED BY THE WORLD’S MAJOR CERTIFICATION BODIES:
  - UL registered
  - TÜV Rheinland certified
  - JET certified
  - CQC certified
  - TÜV Sud certified
  - CSP - Concentrating Solar Power
  - Backcontact technology
  - Flexible, printed and organic PV
  - Retro-fitting PV plants
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.
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, the highest resistance to sand abrasion in the market, and an excellent resistance to salt mist, ammonia and chemical solvents corrosion.
 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.
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.
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.
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.

**Additional upgrades**
- Special primer for extra UV protection on cell side
- Low water vapour transmission rate
- Super high reflectivity
- Black primer on cell side

**TsL 50/250**
- Primer 50µm & PET 250µm

**TsL 75/150**
- Primer 75µm & PET 150µm

**TsL 100/190**
- Primer 100µm & PET 190µm
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.

**Additional upgrades**
- **LO** Special primer for extra UV protection on cell side
- **F** Special coating for extra UV protection on cell side
- **LD** Low water vapour transmission rate
- **LDO** Low water vapour transmission rate + UV stable primer
- **SHR** Super high reflectivity
- **LBK** Black primer on cell side
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.

**TEDLAR® BASED**

1500 VDC FLUOROPOLYMER BASED BACKSHEETS

**Additional upgrades**

- **LO** Special primer for extra UV protection on cell side
- **F** Special coating for extra UV protection on cell side
- **LD** Low water vapour transmission rate
- **LDO** Low water vapour transmission rate + UV stable primer
- **SHR** Super high reflectivity
- **LBK** Black primer on cell side

**TsL 50/285**

- > 1500 VDC
- Extra Thick PET 350µ

**TsL 50/350**

- > 1500 VDC
- Extra Thick PET 350µ

Black primer on cell side
1500 VDC FLUOROPOLYMER BASED BACKSHEETS

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.

**KL 50/250**
- >1500 VDC (in oil)

**KL 50/285**
- >1500 VDC
- Bifacial Cells
- Totally Transparent
- LO
- LD
- LDO
- SHR
- LBk

**Clr® KL 50/285**
- >1500 VDC
- NEW IEC Standard Compliant
- Totally Transparent
- Bifacial Cells
- UV Stable
- Primeimer
- Transparent PET
- Transparent PVDF
- Low water vapour transmission rate
- Super high reflectivity
- Black primer on cell side (not for Clr KL 50/285)

**Additional upgrades**
- Special primer for extra UV protection on cell side
- Special coating for extra UV protection on cell side
- Low water vapour transmission rate
- Low water vapour transmission rate + UV stable primer
- Super high reflectivity
- Black primer on cell side (not for Clr KL 50/285)
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® innovations

GLASS OR FRONTSHEET
dyMat® Clr FRONT

BIFACIAL CELLS

GLASS OR FRONTSHEET
dyMat® Clr FRONT

BIFACIAL CELLS

dymat® SELECTIVE

dymat® Clr FRONT

The products dyMat® Clr PYE MONO L, dyMat® Clr HDPYE L, dyMat® Clr KL 50/285 and dyMat® Selective are designed for the back protection of the module, whereas dyMat® Clr FRONT is a frontsheet solution. Coveme has developed two innovative solutions for bifacial modules, the dyMat® Selective backsheet and the totally transparent frontsheet dyMat® Clr 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.
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® Clr 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.
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
- Lower material and installation costs
- Flexible material adaptable to any design and application
- 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

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.
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**

**dyMat® FOR BACKCONTACT TECHNOLOGY**

dyMat® BYC and SYC are innovative backsheets 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.
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 sunlight 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
- No temperature increase on module side

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 retrofitting 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.

- **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**
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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