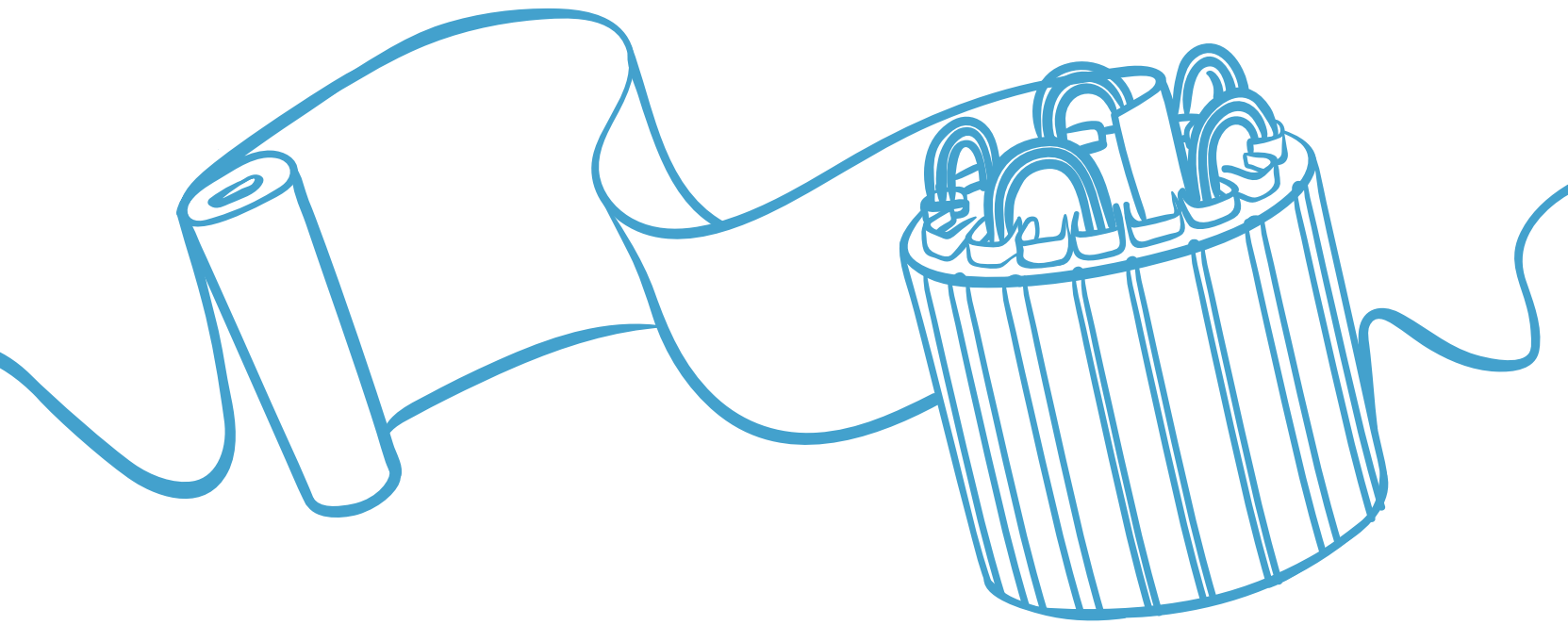
COVEME **ELECTRICAL INSULATION**

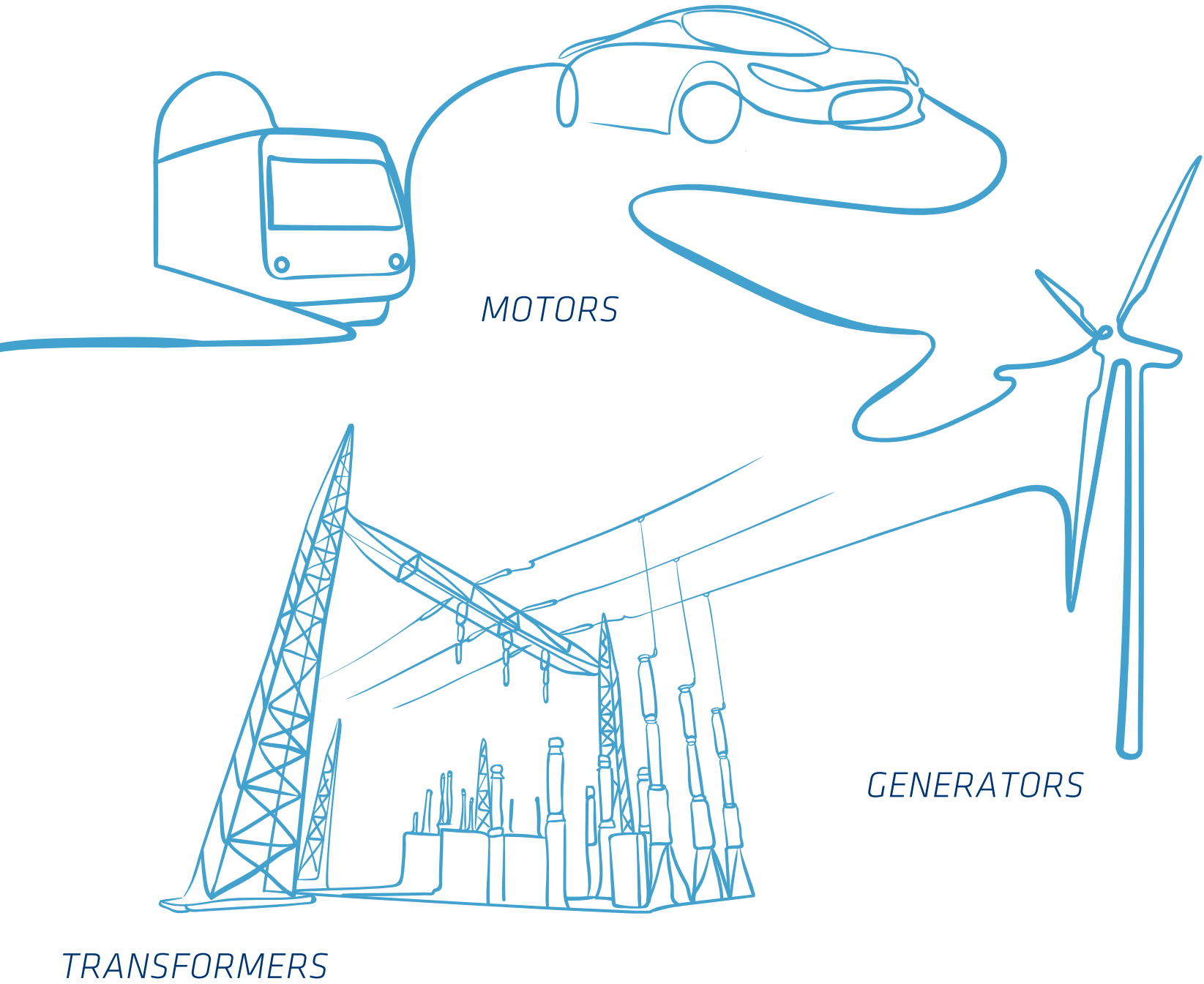
2021



coveme

THE VALUE OF INNOVATION

HIGH QUALITY INSULATION MATERIALS FOR:



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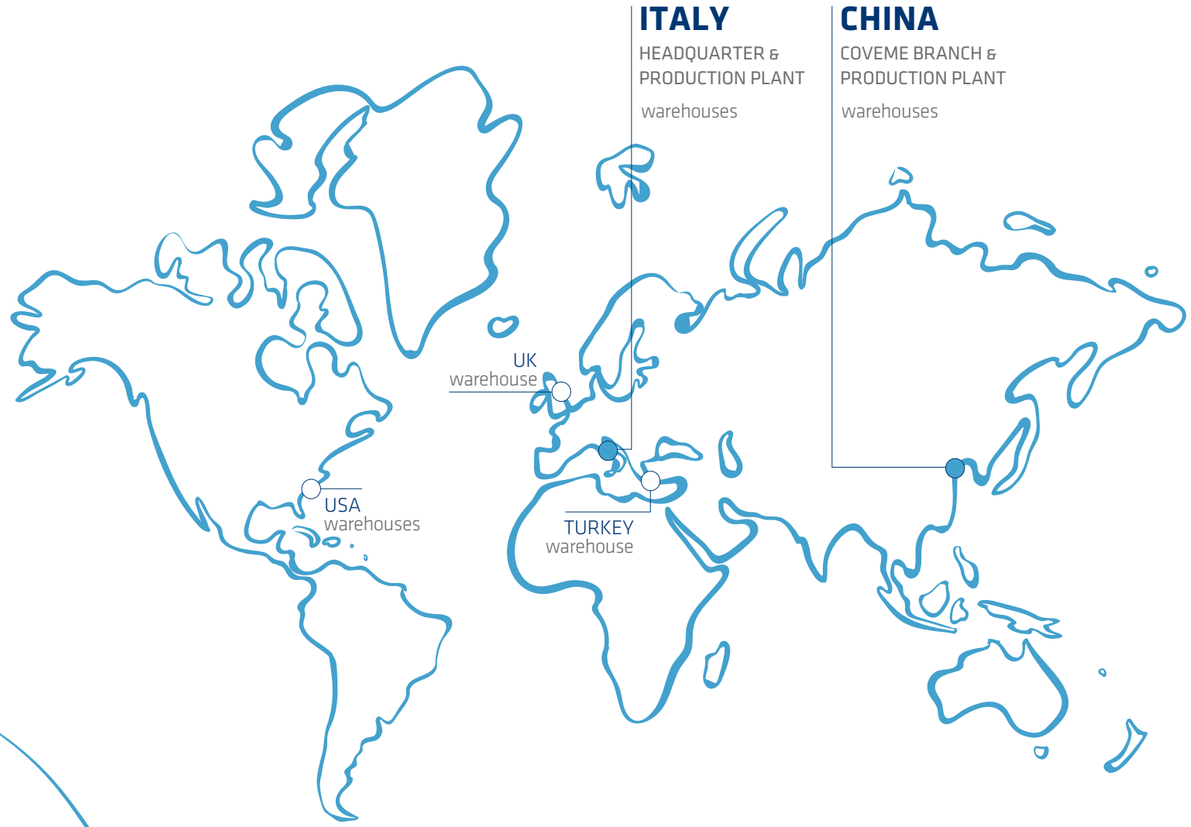
COVEME TODAY



OVER 60 YEARS OF KNOW-HOW IN ELECTRICAL INSULATION MATERIALS

- **2 PROPRIETARY MANUFACTURING SITES** in Italy and China
- **3,3 MILLION LM/MONTH EXPANDABLE IN-HOUSE LAMINATION CAPACITY** of which 1,8 M in Coveme Italy and 1,5 M in Coveme China
- Worldwide **DISTRIBUTION AND SERVICE**
- **THREE R&D HUBS** in Italy, Germany and China.
- **QUALIFIED DUPONT NOMEX®** distributor and laminator
- **COVEME IS** UNI EN ISO 9001, ISO 14001 and ISO 45001 **CERTIFIED**

PRODUCTION & SLITTING

Strong investments in production capacity and technology are the core of Coveme's strategy. The company has successfully developed sophisticated automated processes for polyester film conversion to meet the requirements of its fast-evolving target markets. Clients' specifications are defined individually and monitored throughout the whole production chain, including suppliers, logistics and service process.

- Production plants **IN EUROPE AND ASIA**
- **FULLY AUTOMATED** slitting department
- **CUSTOMIZED** rolls, sheets and **PUNCHED** formats
- **WIDTH RANGE** 4mm - 2000mm, **THICKNESS RANGE** 12µm - 1400µm
- **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 for the development of tailored products. Coveme's research in the field of electrical insulation focuses on products that guarantee our customers higher productivity, maximum reliability 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 quality of base materials and the reliability of our coated and laminated insulation products are vital for Coveme's clients who work themselves with sophisticated and demanding technologies. This is why Coveme has engaged with DuPont already back in the 1970's, and is today one of the very few companies worldwide to have both the official distribution and lamination certificate by DuPont. All our products have a proven traceability and are certified by major homologation bodies.

- **QUALIFIED** DuPont Nomex® distributor and laminator
- **UL** certified products and base materials
- **SEVERE QUALITY INSPECTION** and production control in each critical phase of the process
- **INNOVATIVE TECHNOLOGIES** ensure limited pre-processing customer operations
- **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.

- **ENERGY PRODUCTION FOR SELF-CONSUMPTION** through installed solar panels.
- **TREATMENT AND CONVERTING** of harmful fumes into clean emissions.
- **TREATMENT AND CLEANSING** of water coming production processes.
- **POST-COMBUSTION SYSTEM** as part of autothermal process for reduced gas consumption.
- **REGENERATIVE THERMO OXIDIZER** for thermal energy recovery of gases and solvents.
- **TREATMENT AND REGENERATION** of solvents to be reused in production.
- **DIFFERENTIATION FOR RECYCLING** of production and office waste.
- **REPLACEMENT OF SINGLE-USE** plastic materials with recycled and recyclable ones.
- **COLLECTION, TAKE BACK AND REUSE** of packaging, pallets, cores and end caps.
- **STUDY OF CLOSED LOOP RECYCLING SCHEME** through product design and recyling innovations.

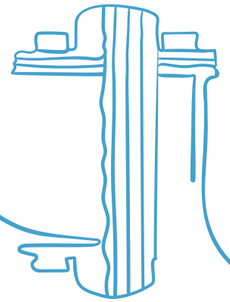
ELECTRICAL INSULATION DIVISION

Electrical insulation materials have been Coveme's very first commercial activity back in the 1960's when the company was founded in Italy. Then, in the early '70s Coveme became official distributor for DuPont Nomex® and Kapton®.

The tight collaboration of the two companies led Coveme to invest and set up its own manufacturing site in Gorizia, Italy, producing technologically advanced laminates for the insulation of electrical machines (rotating and static) that require maximum performance in a small space and under high temperatures.

Coveme's range of products for flexible electrical insulation includes plain materials (polyester, Nomex®, Kapton®, Tedlar®), laminates (DyTerm® and DyFlex®) and pre-preg products (DyBond®).They are employed for the insulation in electric motors, alternators, generators, transformers (dry, cast resin or oil) and electronic circuits with final applications in wind turbines, automotive and railway, power stations, home appliances and industrial automation. A special attention is paid by the company to the renewable energy and e-mobility sector by developing high performance materials that help save energy and reduce the size of electric machines.

Today Coveme combines product development and innovation through new materials, coatings and resins with constant investments in its production lines and slitting department to meet specific customer requirements. With the opening in 2011 of a second production site in Zhangjiagang, China, today producing also for the electrical insulation market, Coveme offers maximum reliability, lean logistics and local service to the industry, appreciated by the major global players manufacturing in Europe and Asia.



PRODUCT RANGE

DyFilm®

Electrical grade polyester film

DyFilm® is a polyester film obtained by the condensation between ethylene-glycol and terephtalic acid. Thanks to its excellent physical, chemical and electrical properties, DyFilm® is universally accepted and requested in all markets, industries and applications where a polyester film is required. DyFilm® is a film with excellent dielectric properties which make it particularly suitable for applications in the field of electrical insulation in machines up to class B (130°C). It is available as hazy (medium transparency) or milky white film, featuring high slipperiness and tear strength.

DyFilm® is a Coveme registered trademark

Thermal Class B

Widths 4-2190mm

Thickness 12-350µm

DyFilm® HB - HBB

Electrical grade polyster film treated on the surface

DyFilm® HB-HBB is a polyester film of electric grade chemically treated on one side (HB) or two sides (HBB) with a special process giving the material a higher surface tension (over 58 dynes). This guarantees a perfect adhesion of resins and varnishes used in the industry of electric insulation. These films are suitable for the insulation of electric motors, transformers, capacitors and cables, and the manufacturing of tapes and laminates.

DyFilm® is a Coveme registered trademark

Thermal Class B

Widths 4-1830mm

Thickness 12-350µm

DyFlex®

non woven fleece and polyester laminates (DM and DMD)

Coveme DyFlex® insulating products derive from the coupling of a polyester non woven fleece with a polyester plastic film (DM and DMD). The non woven polyester fleece employed is made out of short fibers strongly calendered to the polyester film by appropriate adhesives.

Coveme DyFlex® laminates are available as two plies polyester fleece/pet DM laminate (DyFlex® ISF and SF) and three plies DMD version polyester fleece/pet/fleece (DyFlex® IDF and SDF). Further improvements in the overall performance of the laminate are achieved by saturating the non woven polyester fleece (SF and SDF).

The unsaturated versions are natural white, the saturated ones are pink (other colours available upon request).

Coveme DyFlex® laminates DM and DMD are designed for the insulation of electric motors, transformers and electrical equipment of class B 130°C or F 155°C. In electrical motors or, in general, in rotating machines, these laminates are used in slot closure and insulation as well as to separate phases on the heads of the windings. In transformers and electrical static equipment DyFlex® is used as interlay insulator.

UL Certified

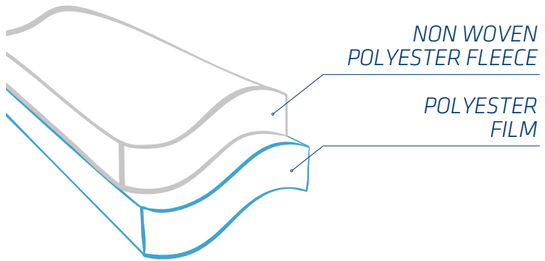
Thermal Classes B & F

Widths 4-1830mm

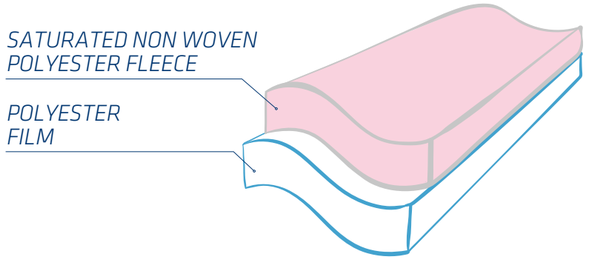
Thickness 50-900µm

DyFlex® is a Coveme registered trademark

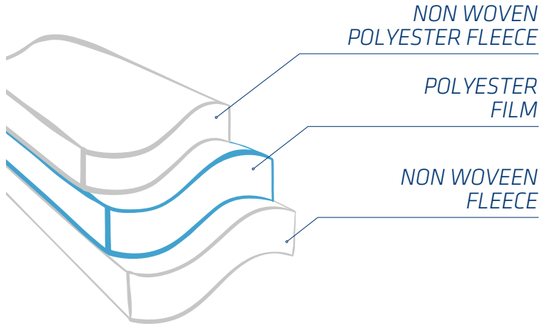
DyFlex® ISF (DM)



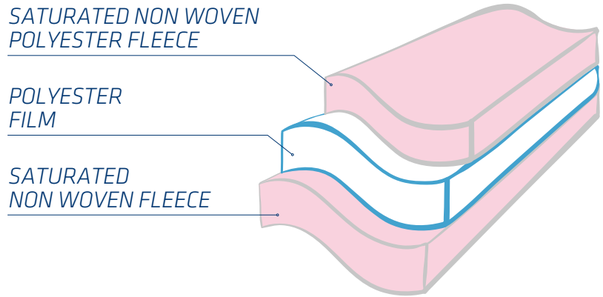
DyFlex® SF (DM)



DyFlex® IDF (DMD)



DyFlex® SDF (DMD)



Samples:

DyFlex® ISF 125
fleece/pet laminate
180 µm

DyFlex® IDF 125
fleece/pet/fleece laminate
230 µm

DyFlex® SF 125
fleece/pet laminate, saturated
180 µm

DyFlex® SDF 50
fleece/pet/fleece laminate, saturated
160 µm

DyFlex® is a Coveme registered trademark

DyTerm®

Nomex® with polyester film laminates (NM and NMN)

Coveme DyTerm® insulating products are produced by the coupling of Nomex® aramid paper with polyester films (NM and NMN). Nomex® layers stick firmly to the plastic films by appropriate adhesives. DyTerm® laminates area highly performing solution for the insulation of electric motors, transformers and electrical machines with working temperatures up to class F 155°C (Dyterm® NM types N1S, N2S and N3S) and class H 180°C (DyTerm® NMN types N1D, N2D, N3D).

The presence of films enhances the mechanical, physical and dielectrical properties of the laminate. In rotating machines, DyTerm® is used in slot closure and insulation, as well as to separate phases on the heads of the windings. In transformers DyTerm® is used as interlayer insulating material. Coveme DyTerm® laminates are available as two plies Nomex®/pet laminate (NM) and three plies version Nomex®/pet/Nomex® laminate (NMN). For both versions different thicknesses of Nomex® and polyester film are available.

DyTerm® is a Coveme registered trademark
Nomex® is a DuPont registered trademark

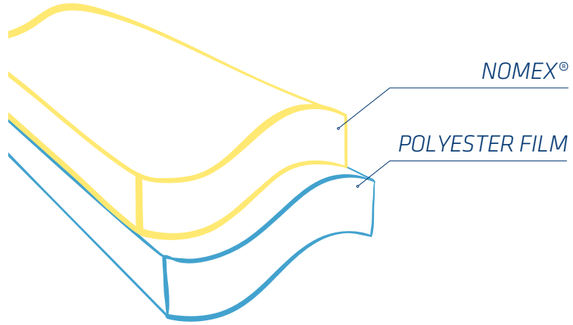
UL Certified

Thermal Classes F & H

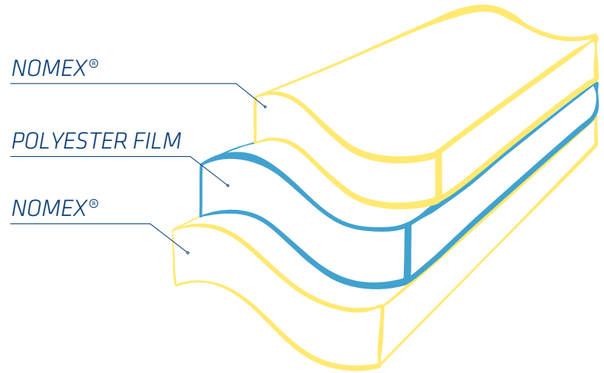
Widths 4-1830mm

Thickness 50-1400µm

DyTerm® (NM) N1S N2S N3S



DyTerm® (NMN) N1D N2D N3D



DyTerm® K

Nomex® with Kapton® laminates (NK and NKN)

Coveme DyTerm® K insulating products are produced by the coupling of Nomex® aramid paper with Kapton® polyimide. Nomex® layers stick firmly to the Kapton® by appropriate adhesives. DyTerm® K laminates are a highly performing solution for the insulation of electric machines with working temperatures up to 200°C. The presence of films enhances the mechanical, physical and dielectrical properties of the laminate. In rotating machines, DyTerm® K is used in slot closure and insulation, as well as to separate phases on the heads of the windings. In transformers and electrical static equipments, DyTerm® K is used as interlayer insulating material.

Coveme DyTerm® laminates are available as two plies Nomex® /Kapton® (NK) and three plies version Nomex® / Kapton®/ Nomex® (NKN) laminate. For both versions different thicknesses of Nomex® and Kapton® are available.

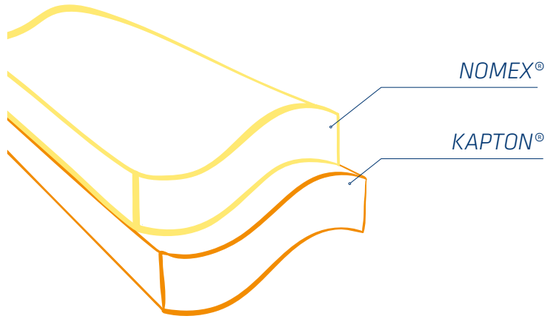
UL Certified

Thermal Class 200°C

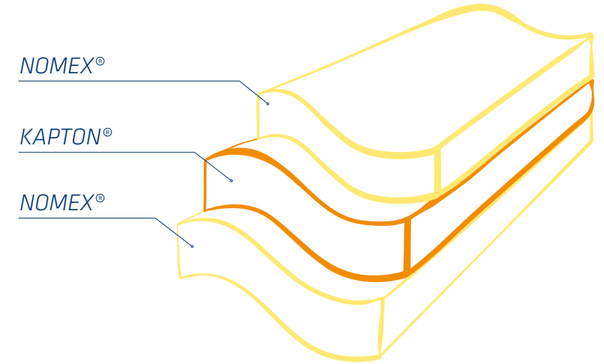
Widths 4-1830mm

Thickness 70-500µm

DyTerm® NSK (NK)



DyTerm® NDK (NKN)



Samples:

DyTerm® N1S
Nomex®/pet laminate
240 µm

DyTerm® N2S
Nomex®/pet laminate
180 µm

DyTerm® N3S
Nomex®/pet laminate
280 µm

DyTerm® N1D
Nomex®/pet/ Nomex® laminate
220 µm

DyTerm® N2D
Nomex®/pet/ Nomex® laminate
150 µm

DyTerm® N3D
Nomex®/pet/ Nomex® laminate
300 µ

DyTerm® N2D
Nomex®/pet/ Nomex® laminate
240 µm (with Nomex® type 864)

DyTerm® N5DK
Nomex®/Kapton®/ Nomex® laminate
300 µm

DyBond®

Pre-preg laminates with B-stage resin

Coveme DyBond® products are flexible insulating materials with a B-Stage (semi polymerized) resin. During our coating process the resin is first applied onto the substrate then, by controlled heating, the polymerization is started bringing the resin to the so called B-Stage, where free to the touch, reasonably stable but not fully polymerized. The final product depends on the substrate used for the resin coating.

The final product depends on the substrate used for the resin coating:

DyBond® PET: electric grade polyester film substrate (DyFilm®)

DyBond® HBB: TCA surface treated polyester film substrate (DyFilm® HBB)

DyBond® HCC: Corona treated polyester film substrate (DyFilm® HCC)

DyBond® ISF/IDF: polyester fleece / Pet / polyester fleece substrate (DyFlex®)

DyBond® NS/ND: Nomex® / Pet / Nomex® (DyTerm®)

DyBond® 410/356/818: Nomex® substrate

The resin can be of various colours, applied in various grammages, on one or both sides, and on the full surface or with a diamond pattern.
DyBond® B-Stage pre-pregs can be used by the manufacturer as any conventional insulating material. After the manufacturing operations the final equipment is exposed to heat. The resin will initially melt, creating a uniform distribution and filling any possible non uniformity, before polymerizing to its final solid stage cementing the DyBond® products to the conductors to be insulated. DyBond® is used as electrical insulator in mainly in electrical transformers (dry, oil filled, or SF6 gas), generators and electrical motors. Depending on the substrate used DyBond® is suitable for working temperatures up to class H 180°C.

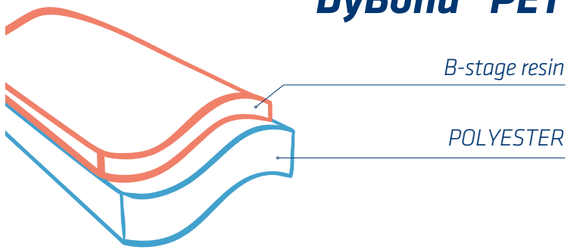
UL Certified

Thermal Classes up to H

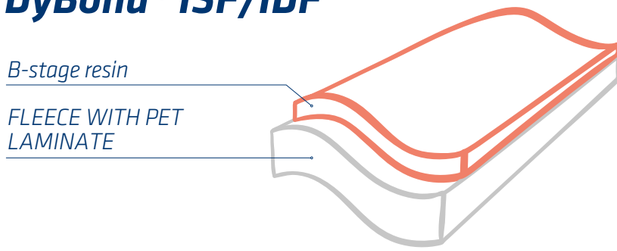
Widths 4-1830mm

Thickness 80-530µ

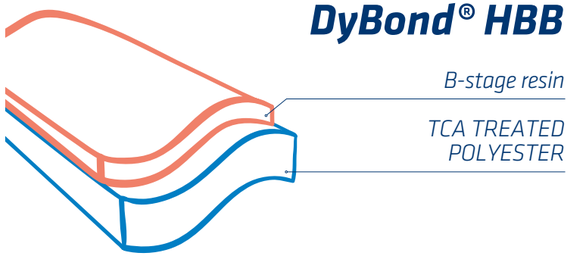
DyBond® PET



DyBond® ISF/IDF

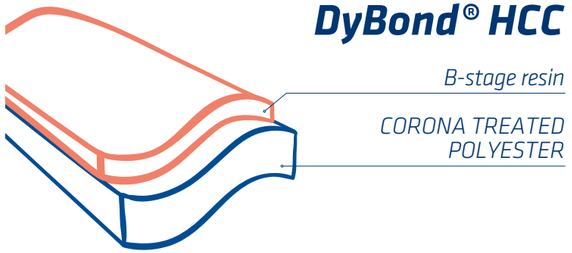


DyBond® HBB

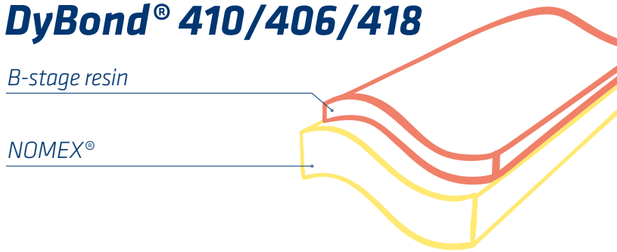


DyBond® NS/ND

DyBond® HCC



DyBond® 410/406/418



Samples:

DyBond®
(substrate: Nomex® aramid paper)
180 µm

DyBond®
(substrate: DyTerm® Nomex®-Pet-Nomex®)
140 µm

DyBond®
(substrate: DyFlex® Fleece-Pet-Fleece)
180 µm

DyBond®
(substrate: DyFilm® HBB - TCA treated Pet)
50 µm

DyBond®
(substrate: DyFilm® HCC - corona treated Pet)
50 µm

Nomex®

Aramid paper

Nomex® aramid paper is mainly employed as dielectric insulator for high temperature systems. It provides lightweight, durable, heat and flame-resistant performance for many applications and industries
Aging diagrams show that an insulation system based on Nomex® paper has a lifetime over 20.000 hours at 220°C. Apart from heightening the average lifetime of electrical appliances Nomex® reduces considerably the number and probability of damages and protects the machine in case of electrical overload and temperature peaks. Its superior mechanical toughness enables windings to withstand the most severe mechanical shocks. The resistance to cryogenic temperatures, humidity, radiation and fire and its non-toxic fumes complete the list of Nomex®'s unique characteristics. These improve the integrity and performance of everything from transformers and generators to wind turbine systems and hybrid electric vehicles.
Nomex® is classified as insulator class C 220°C by Underwriters Laboratories (file E34739) and all major certifying bodies worldwide.

Nomex® 410: is the original form and it is made up of a calendered paper available in different thicknesses.

Nomex® 411: is an uncalendered paper, so with lower electrical and machanical properties when compared to 410, but with a slight permeability to resins and varnishes.

Nomex® 414: is similar to 410, but is calendered under different conditions which produce a strong, more flexible and conformable sheet.

Nomex® 818: also called Nomex Mica is produced by adding 50% mica platelets to the floc and fibrids. 818 is a calendered product with high inherent dielectric strength and can also be impregnated with varnishes if required.

Nomex® 992: is a low-density pressboard produced in 2 thicknesses (1.6 and 3.2 mm).

Nomex® 993: is a medium-density pressboard produced in 6 thicknesses (1.0 to 4.0 mm).

Nomex® 994: is a high density pressboard available in 12 thicknesses (1.0 to 9.6 mm).

Nomex® 356: is a low-density type available in thicknesses from 0.13 to 0.51 mm.

Nomex® is a DuPont registered trademark

UL Certified

Thermal Class C

Widths 6-1828mm

Thickness 50-9600µm

Kapton®

Polyimide based film

Kapton® polyimide film is synthesized by polymerizing an aromatic dianhydride and an aromatic diamine. This material offers outstanding longevitiy and is hightly resistant to an extremely wide temperature range (-269°C to 400°C). Together Besides these excellent physical, chemical and electrical properties Kapton® polyimide film provides important weight and space savings and is suitable for variety of electrical and electronic insulation applications such as formed coil insulation, motor slot liners, magnet wire insulation, transformers and capacitors.

Kapton® is available in different versions according to the application.

The base type is Kapton® HN. It is mainly used for the insulation of electrical motors in class H and super H, in the production of adhesive tapes for dielectric uses and when resistance to extreme temperatures is required .

Kapton® FN is the HN type coated on one or both sides with Teflon® FEP, that enhances chemical resistance and imparts heat sealability. It is used for the covering of copper wires and cables in high temperature applications.

Kapton® CR (available also with a coating in Teflon®: FCR) was developed to withstand the damaging effects of corona.

Kapton® MT is appropriate for all applications where an high thermal conductivity is required.

Kapton® FPC, in its different versions, is suitable for the production of flexible circuits.

Kapton® is a DuPont registered trademark

UL Certified

Thermal Class -269°C to 400°C

Widths 6-1828mm

Thickness 25-125µm

CERTIFICATIONS

DyFlex®, DyTerm® and DyBond® are UL approved (file n° E209645)
Nomex® and Kapton® are UL Repackage Recognized Components (file n° E351391)

Coveme 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 Italy Certificates

ISO 9001:2015

ISO 14001:2015

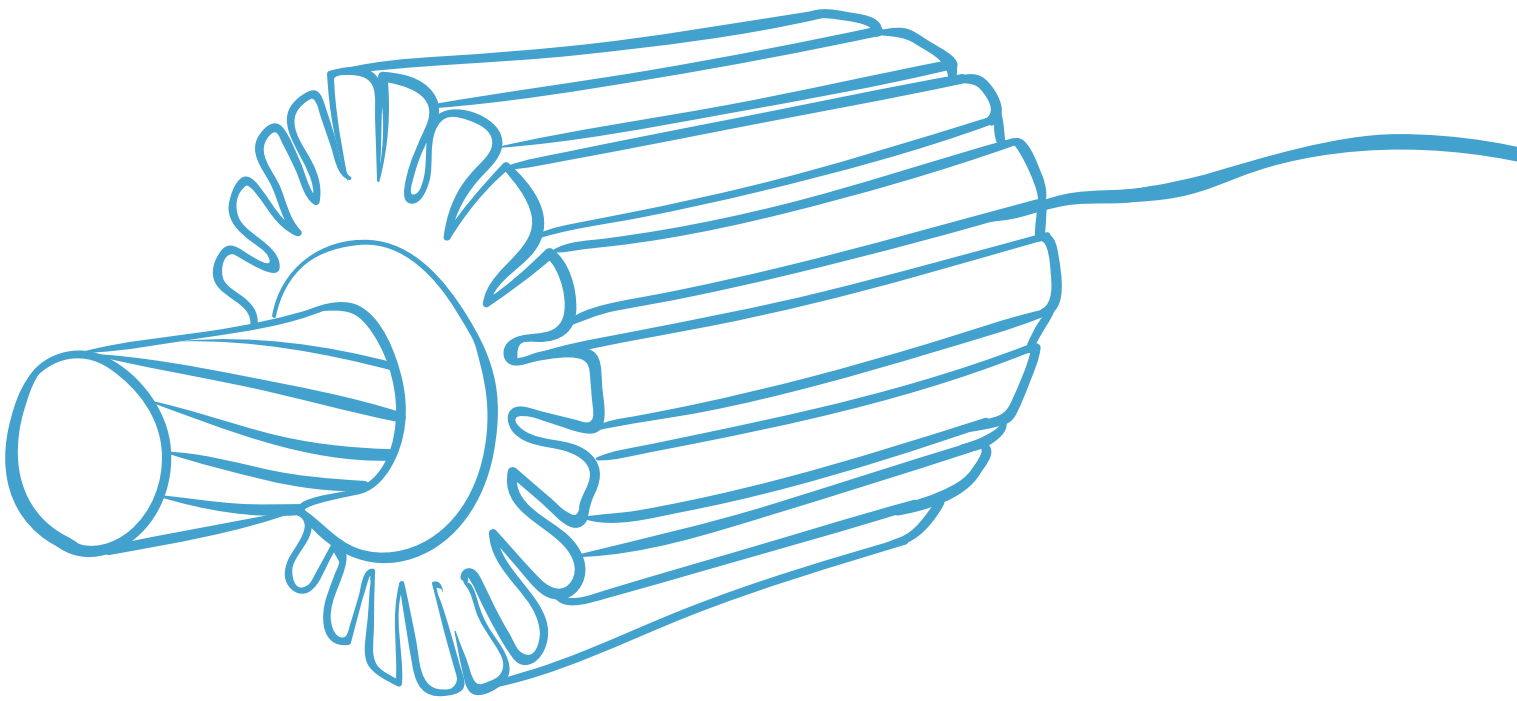
ISO 45001:2018

Coveme China Certificates

ISO 9001:2015

ISO 14001:2015

ISO 45001:2018



coveme
THE VALUE OF INNOVATION

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