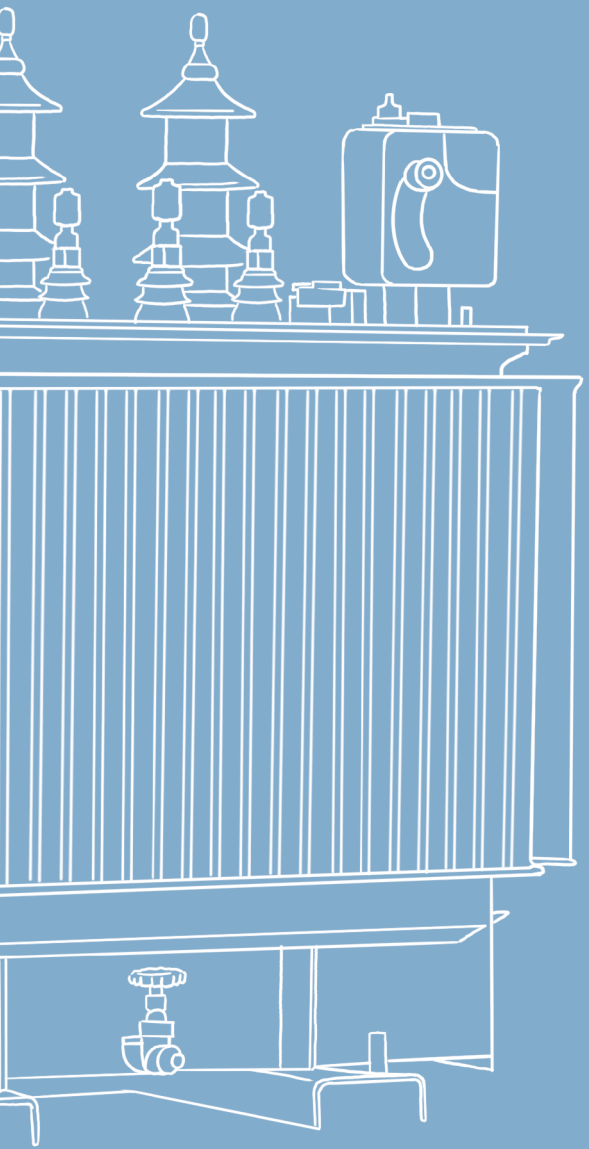
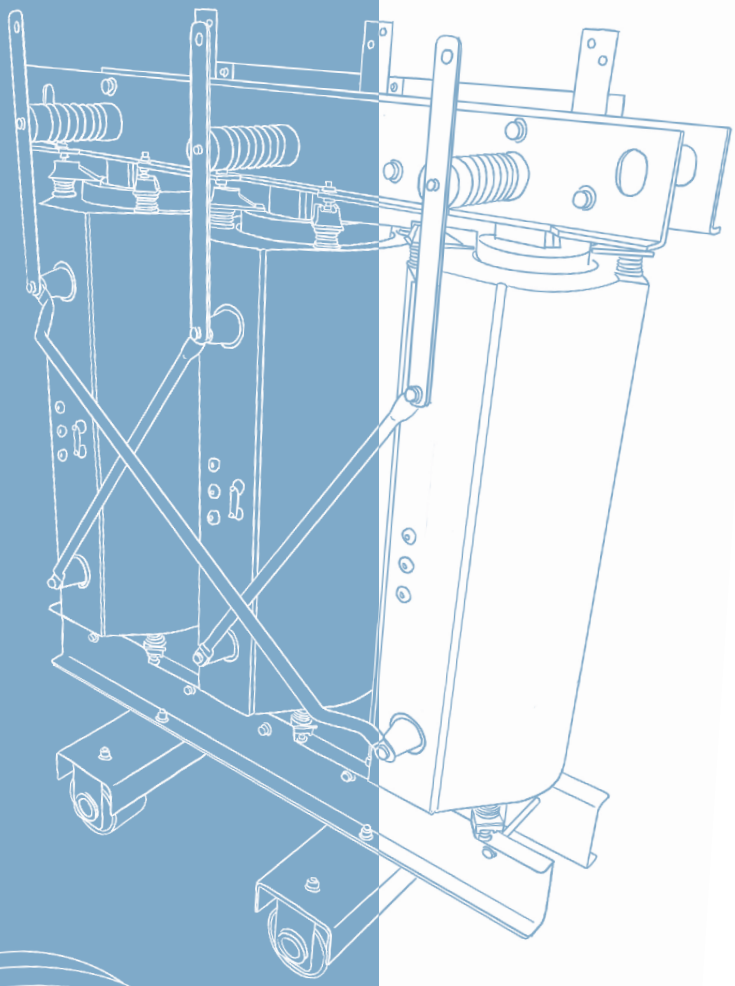
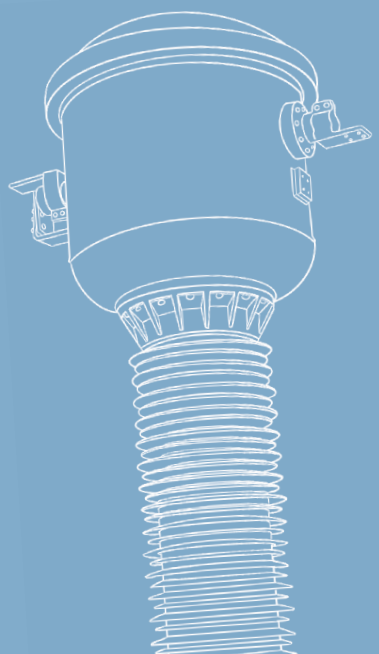
TRANSFORMERS

ELECTRICAL INSULATION







THE VALUE
OF INNOVATION
SINCE 1965

Transformers are central elements in electrical systems, converting energy in a wide range from power grid to small appliances.

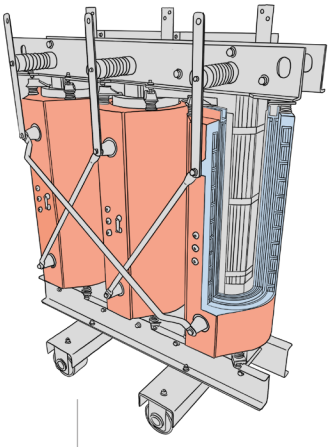
Coveme's flexible insulation materials aid manufacturers of transformers in addressing a broad spectrum of needs, encompassing performance, longevity, manufacturing efficiency, and cost-effectiveness.

DRY TRANSFORMERS

CAST RESIN TRANSFORMERS

Cast resin transformers feature excellent reliability, improved safety, better resistance to environmental conditions while offering easier installation process and cost-effective operation. Today they are extensively used in industries, data centers, buildings, renewable energy plants, marine and transportation applications.

Coveme's product portfolio offers a range of flexible insulation materials specifically designed for the construction of low and medium voltage cast resin transformers. These materials cater to all sizes of transformers, from hundreds of kVA to tens of MVA, in the various thermal classes, with a focus on Class F 155°C and Class H 180°C.



FOCUS

Layer insulation high voltage

DyFilm® PET, HB, HBB, HCC
DyFilm® PEN
DyFlex® unsaturated DMD*
DyFlex® saturated DMD**
DyTerm® NM
DyTerm® NMN
Nomex®

LOW VOLTAGE WINDING

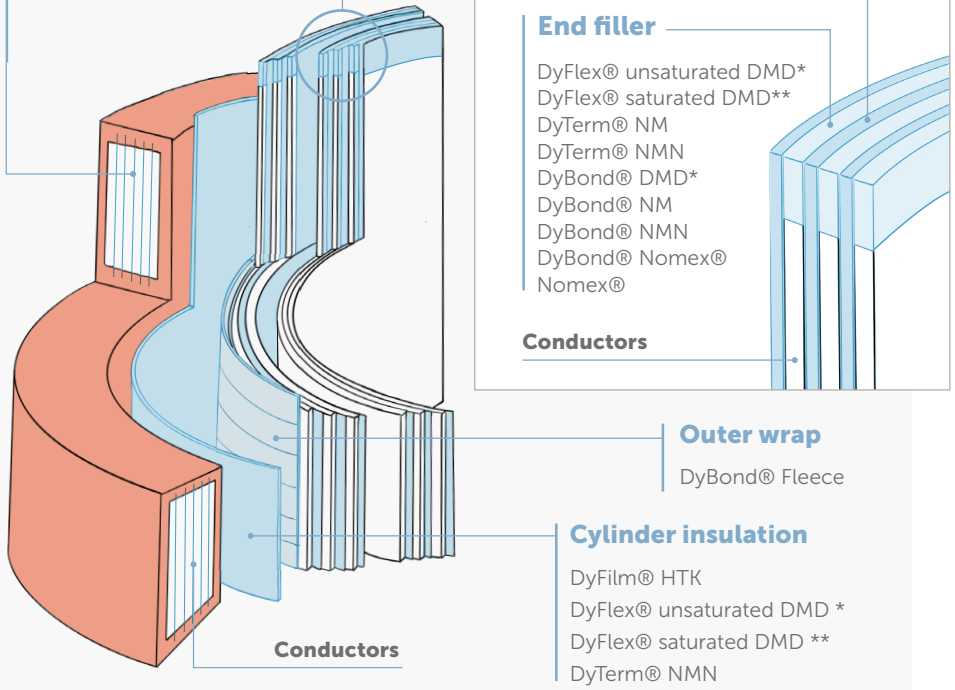
Layer insulation low voltage

DyFlex® saturated DMD**
DyTerm® NMN
DyBond® DMD*
DyBond® NMN
DyBond® Nomex®
Nomex®

End filler

DyFlex® unsaturated DMD*
DyFlex® saturated DMD**
DyTerm® NM
DyTerm® NMN
DyBond® DMD*
DyBond® NM
DyBond® NMN
DyBond® Nomex®
Nomex®

Conductors



Outer wrap

DyBond® Fleece

Cylinder insulation

DyFilm® HTK
DyFlex® unsaturated DMD *
DyFlex® saturated DMD **
DyTerm® NMN

*IDF
**SDF

RECOMMENDED PRODUCTS

DyFilm®
monolayer or multilayer plain PET or with different surface treatments

DyFlex®
non-woven fleece PET laminates, saturated and unsaturated (DMD)

DyTerm®
Nomex® with PET laminates (NM/NMN)

DyBond®
pre-preg with B-stage resin (full surface)

In Coveme's laminates, the individual layers are firmly bonded together using high performance adhesives. In prepregs, the B-stage resin is specifically engineered to ensure an optimal curing process, leading to uniform and solid end results. All the products have been designed to reach the highest dielectric, mechanical and thermic capability. They are compliant with IEC standards, certified by UL Underwriters Laboratories and approved by all major certification bodies worldwide. Coveme's experience in the field allows to provide tailored solutions to meet customers' specific needs.

FOCUS

Pre-preg products with B-Stage resin (full surface)

DyBond® pre-impregnated products are coated with a partially cured (B-stage) epoxy-based resin that remains stable yet not fully polymerized, resulting in a dry-to-the-touch condition. These products offer significant advantages in the production of dry-type transformers:

- The final **curing process is activated by heat**, causing the resin to melt and adapt to any surface irregularities before solidifying into a fully cross-linked stage.
- This ensures a uniform insulation layer, forming a strong bond with **excellent adhesion to the conductors**.
- The **controlled resin content** guarantees stable and consistent properties across the entire surface, ensuring reliable mechanical and electrical performance.
- By simplifying or even **eliminating the need for additional impregnation steps**, DyBond® prepregs contribute to a more efficient manufacturing processes, reducing processing time and improving overall quality.

RECOMMENDED PRODUCTS APPLICATION CHART

End-fillers:
Products (>300µm thick) providing mechanical support, insulation, and stability at insulation borders or between turns/layers.

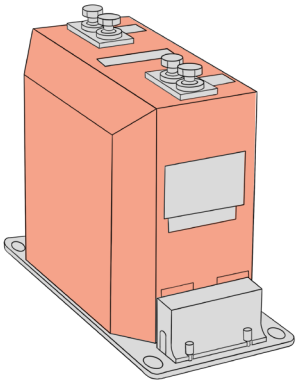
Insulation cylinders:
Roll-supplied products (>500µm thick) enabling tailored transformer production. They are an optimal alternative to heavy fiberglass or hard paper cylinders, which instead require custom procurement.

Outer-wrap:
Reinforces and protects the LV coil as an outer banding layer.

APPLICATION	CATEGORY	COVEME PRODUCTS			
Layer insulation high voltage	Thermal class B 130°	DyFilm® PET, HB, HBB, HCC	DyFlex® (unsaturated DMD)*		
	Thermal class F 155°	DyFlex® (saturated DMD)**	DyTerm® (NM)		
	Thermal class H 180°	DyTerm® (NMN)	DyFilm® (with PEN)		
	Thermal class 220°	Nomex®			
Layer insulation low voltage	Thermal class B 130°	DyFlex® (unsaturated DMD)*			
	Thermal class F 155°	DyFlex® (saturated DMD)**	DyBond® (pre-peg DMD)*	DyTerm® (NM)	DyBond® (pre-peg NM)
	Thermal class H 180°	DyTerm® (NMN)	DyBond® (pre-peg NMN)		
	Thermal class 200°	DyBond® (pre-peg Nomex®)			
	Thermal class 220°	Nomex®			
End filler	Thermal class F 155°	DyFlex® (saturated DMD)**	DyBond® (pre-peg DMD)*		
	Thermal class H 180°	DyTerm® (NMN)	DyBond® (pre-peg NMN)		
	Thermal class 200°	DyBond® (pre-peg Nomex®)			
	Thermal class 220°	Nomex®			
Cylinder insulation	Thermal class B 130°	DyFilm® HTK	DyFlex® (unsaturated DMD)*		
	Thermal class F 155°	DyFlex® (saturated DMD)**			
	Thermal class H 180°	DyTerm® (NMN)			
Outer wrap	Thermal class F 155°	DyBond® (pre-peg Fleece)			

*IDF
**SDF

CAST RESIN INSTRUMENT TRANSFORMERS



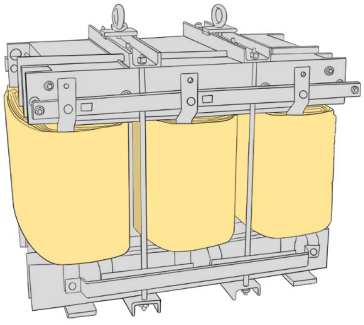
Instrument transformers in the medium-voltage (MV) range are typically fully encapsulated in cast resin, providing robust construction capable of sustaining both indoor and outdoor environments.

RECOMMENDED PRODUCTS

DyBond® HCC (Electrical grade polyester film corona treated)
Class B 130°C, with its diamond-dotted pattern of B-stage epoxy resin, it is suitable as interlayer insulation for the winding.

DyBond® HBB (Electrical grade polyester film chemically treated)
Class B 130°C, with its diamond-dotted pattern of B-stage epoxy resin, it is suitable as interlayer insulation for the winding.

VPI TRANSFORMERS



VPI transformers, along with other open-wound constructions, often offer distinct advantages in terms of cooling, flexibility and cost-effectiveness.

These designs incorporate interlayer insulation materials and wrapped conductors, for both of which easy impregnation and saturability are required.

RECOMMENDED PRODUCTS

Nomex® (Aramid paper)
Class 220°C, it is ideal for interlayer insulation or for wrapping conductors. The compliance to EN 45545-2:2020 requirements R22-R23 for HL1 and HL2, allows for use in railway applications.

DyTerm® (Nomex® with PET laminates)
Class H 180°C, combines excellent dielectric and mechanical properties of PET film with the excellent impregnation characteristics of Nomex paper.

GAS AND OIL FILLED TRANSFORMERS

GAS INSULATED HV INSTRUMENT TRANSFORMERS

Gas-insulated voltage and current transformers for HV systems traditionally use SF6 gas, allowing to achieve compact designs. Recently SF6-free solutions, employing alternative gas mixtures, are pushed by requirements of reduction of greenhouse gases.

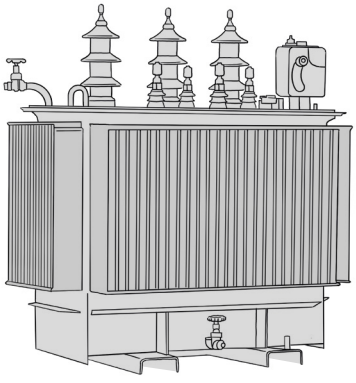
In both scenarios, solid materials to support the winding are required.

RECOMMENDED PRODUCT

DyBond® HBB (Electrical grade polyester film chemically treated)

Class B 130°C, with its diamond-dotted pattern of B-stage epoxy resin, it is ideal for creating bobbins that allow the insulating gas to flow evenly throughout the structure. This material is easily cured and features a chemically treated PET surface, resulting in strong and durable bonding.

OIL FILLED TRANSFORMERS



Oil filled transformers have long been a cornerstone of electrical power distribution, using mineral oil or ester fluid as both an insulating and heat transfer medium.

Coveme focuses on high-temperature and hybrid/mixed insulation systems.

Such systems, described in IEEE Std. C57.154-2012 or IEC 60076-14, operate at higher temperatures both on system and fluid level, allowing for a more compact transformers design.

RECOMMENDED PRODUCTS

Nomex® (Aramid paper and pressboard)

Class 220°C, the full range of Nomex papers (356, 410, 910, 926 grades) and pressboards (992, 993, 994 grades) enables compact designs operating at higher temperatures, while ensuring long-term reliability and efficiency.

DyBond® (Pre-preg Nomex®)

Class H 180°C, it features diamond-dotted pattern of B-stage epoxy resin. Such design ensures strong adhesion between the conductors and insulation while simultaneously creating channels that facilitate drying, impregnation, and oil flow.

DyBond® (Pre-preg paper with PET laminates)

Class B 130°C, there diamond-dotted pattern of B-stage epoxy resin on paper-PET laminates offer enhanced dielectric strength, mechanical durability while facilitating adhesion, drying, impregnation and oil flow.

THE VALUE OF INNOVATION
SINCE 1965

ISO 9001: 2015 | ISO 14001: 2015 | UNI EN ISO 45001:2023

Coveme is certified ISO 9001: 2015 for quality management standards, ISO 14001: 2015 for environmental management and UNI EN ISO 45001:2023 for occupational health and safety.

Nomex Distributor | Nomex Laminator

Coveme is Nomex® official distributor e laminator

Coveme insulating materials are UL Underwriters Laboratories certified and recognized by all major certification bodies worldwide.

Coveme has received the Bronze Medal Ecovadis certification as the result of a corporate sustainability performance evaluaton.

Coveme is IATF (International Automotive Task Force) certified as supplier to the automotive industry.

COVEME.COM

ELECTRICAL INSULATION

FOLLOW US ON

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 Gregoric, 16 - 34170 - Z.I S.Andrea - Gorizia - Italy
ph. +39 0481 579911

COVEME ASIA

CHINA / Coveme Engineered Films Zhangjiagang Co., Ltd.

Production Plant and Office:
No. 16, Yuefeng road, Yangshe Town, Zhangjiagang City,
Jiangsu Province, China P.C. 215600
Ph. +86 512 82559911

COVEME AMERICA

USA / Coveme America INC

Registered Office:
65 N River Lane, Suite 209 Geneva, IL 60134 (USA)
Tel: +1 (630) 578-6671
Operation Office:
1817 N Shawano Street, New London, WI 54961 (USA)
Tel: +1 (847) 867-1272