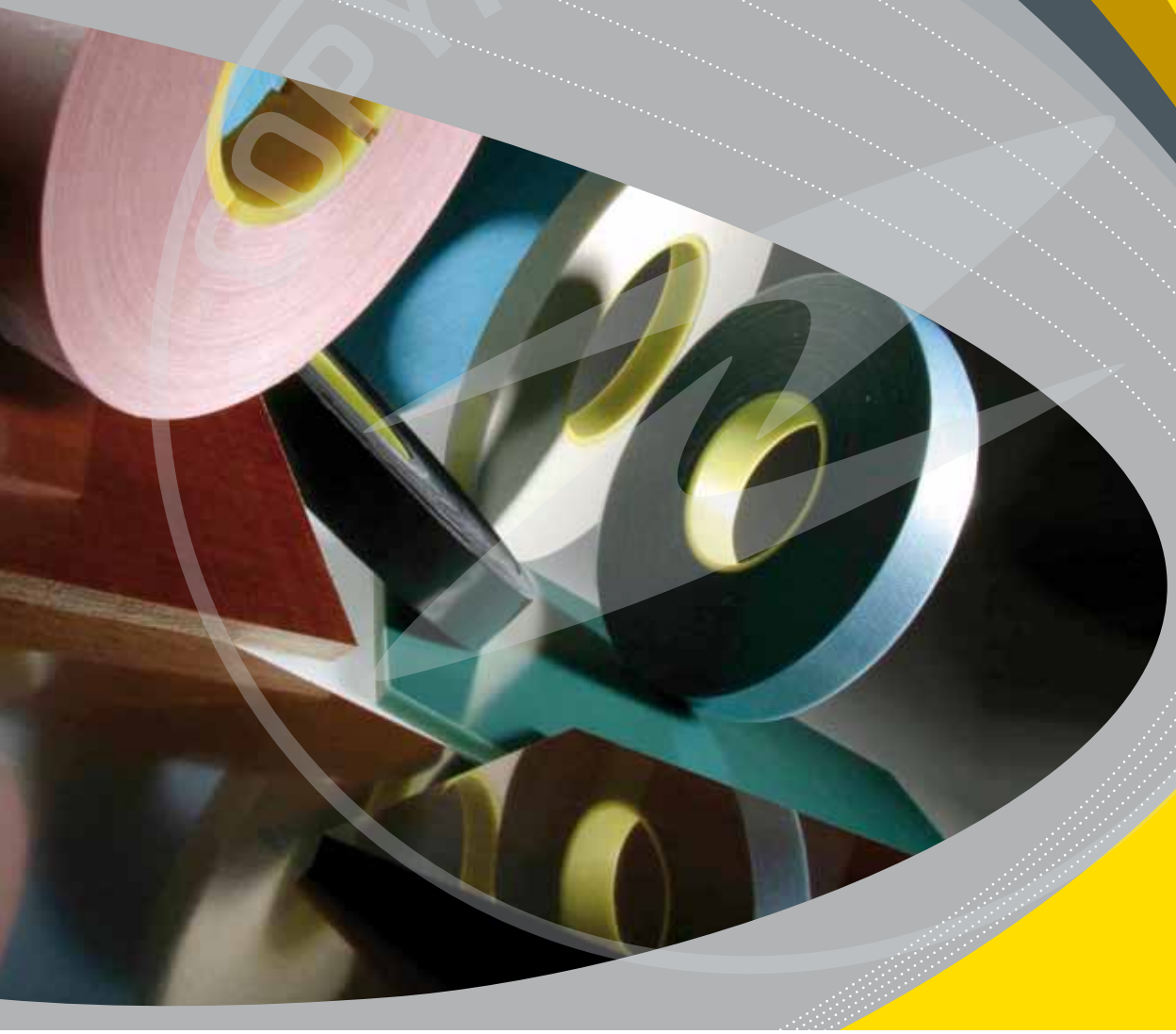
isovolta GROUP



DELIVERY PROGRAMME ELECTRICAL INSULATION


isovolta

ENERGY

ENERGY

COMPOSITE MATERIALS

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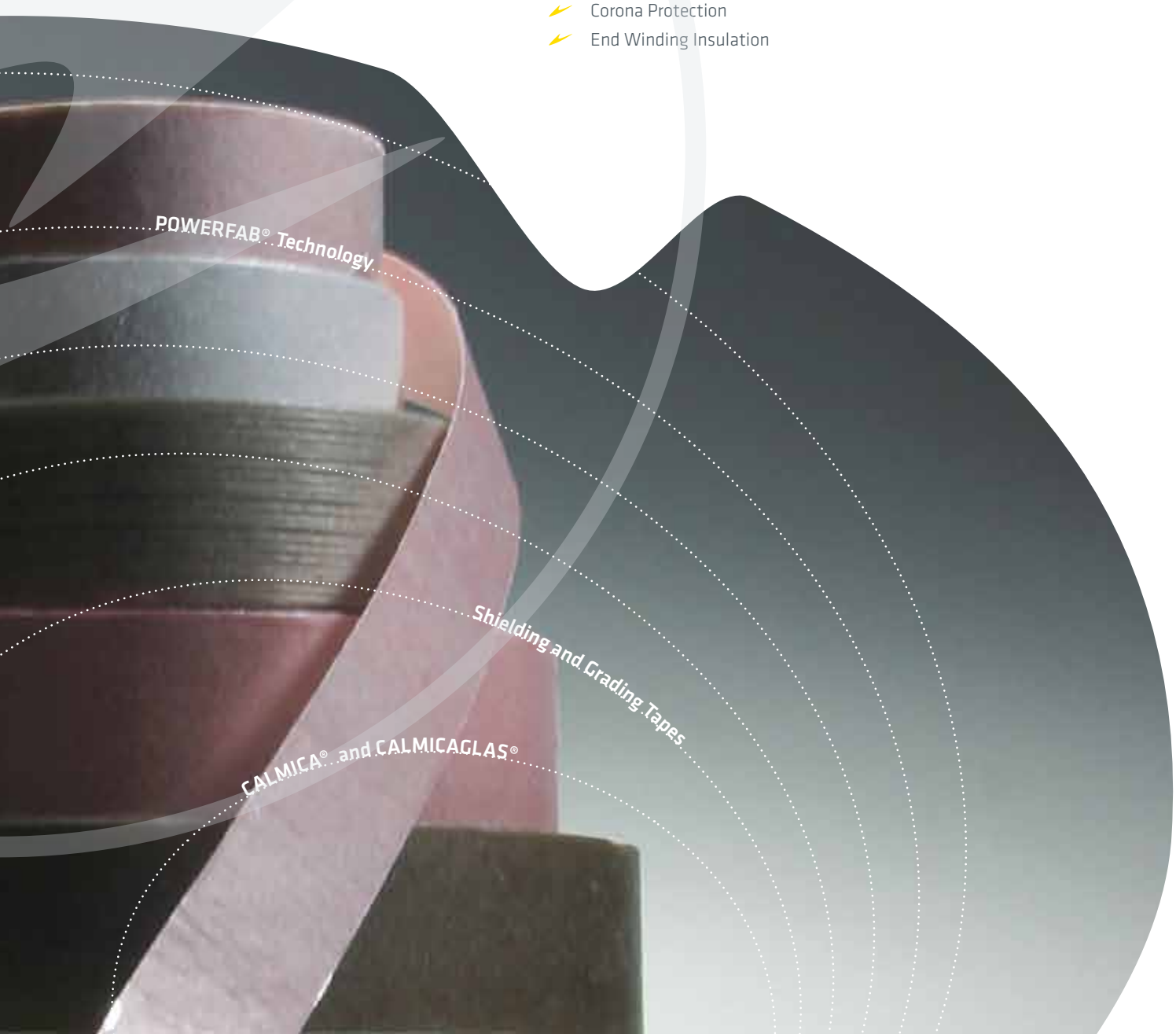
ENERGY

HIGH VOLTAGE

- Single Conductor Insulation
- Preconsolidation and Auxiliary Materials
- VPI Technology
- Resin Rich Technology
- Corona Protection
- End Winding Insulation



SINGLE CONDUCTOR INSULATION

CONDUCTOFOL®

Flexible calcined mica paper tapes with modified epoxy resin (Type K 2011 with silicone resin) on a PET or polyimid film carrier, for single conductor insulation in medium and high-voltage machines

CONDUCTOFOL® 2009	Standard type with PET film. Thermal class F (155 °C)
CONDUCTOFOL® 0264	As 2009, but coated with a special melting adhesive. Thermal class F (155 °C)
CONDUCTOFOL® 2371	With PET film on both sides. Thermal class F (155 °C)
CONDUCTOFOL® 2159	As 2371, additionally coated with a special melting adhesive on one side. Thermal class F (155 °C)
CONDUCTOFOL® K 2010	With polyimide film for high thermal stress, Thermal class H (180 °C)
CONDUCTOFOL® K 2011	With polyimide film and silicone resin for high thermal stress. Thermal class H (180°C)

PRINOM®

PRINOM® E 2084	Thermosetting Nomex® (Type 410) prepreg, one side coated with modified epoxy resin. Thermal class H (180 °C)
PRINOM® B 2083	Thermosetting Nomex® (Type 410) prepreg, both sides coated with modified epoxy resin with release film. Thermal class H (180 °C)

PRECONSOLIDATION AND AUXILIARY MATERIAL

VOTAFIX® E 2102	Resin-rich epoxy glass cloth prepreg, to preconsolidate high voltage machine coils
VOTAFIX® TGB 0941	Rigid epoxy glass layer, covered on both sides with epoxy glass fleece prepreg, as compressible separator in rows of roebel bars
VOTAFIX® NGB 2268	As 0941 but with Nomex® layer, as interlayer under the transpositions in roebel bars
VOTASTOP® 2235	Mica paper prepreg to fill cavities and as a filler in coils and bars of high voltage machines
VOTAFILM® TPB 2101	Silicone release paper, coated on both sides for use in the curing process of thermo-setting resins
VOTAFILM® 2646	Release film coated with silicone on both sides for use with thermosetting resins
VOTAFILM® 2645	As 2646, thermo shrinking type
FLEXIBELMICANIT 2240	Flexible phlogopite mica paper laminate on a silicon resin basis for cover plates for heating elements, in induction furnaces, as a cavity filler, for gaskets and seals or for insulating spacers machines subject to high thermal stress. Used up to a range of 900 °C - 1100 °C. It remains flexible even after thermal stress.

VPI TECHNOLOGY

POWERFAB® Technology

Ultra thin tape technology

POROFAB® 3292	Uncalcined muscovite mica paper with ultra-thin glass carrier
POROFAB® ME 3434	Uncalcined muscovite mica paper with ultra-thin glass carrier containing metallic salt accelerator

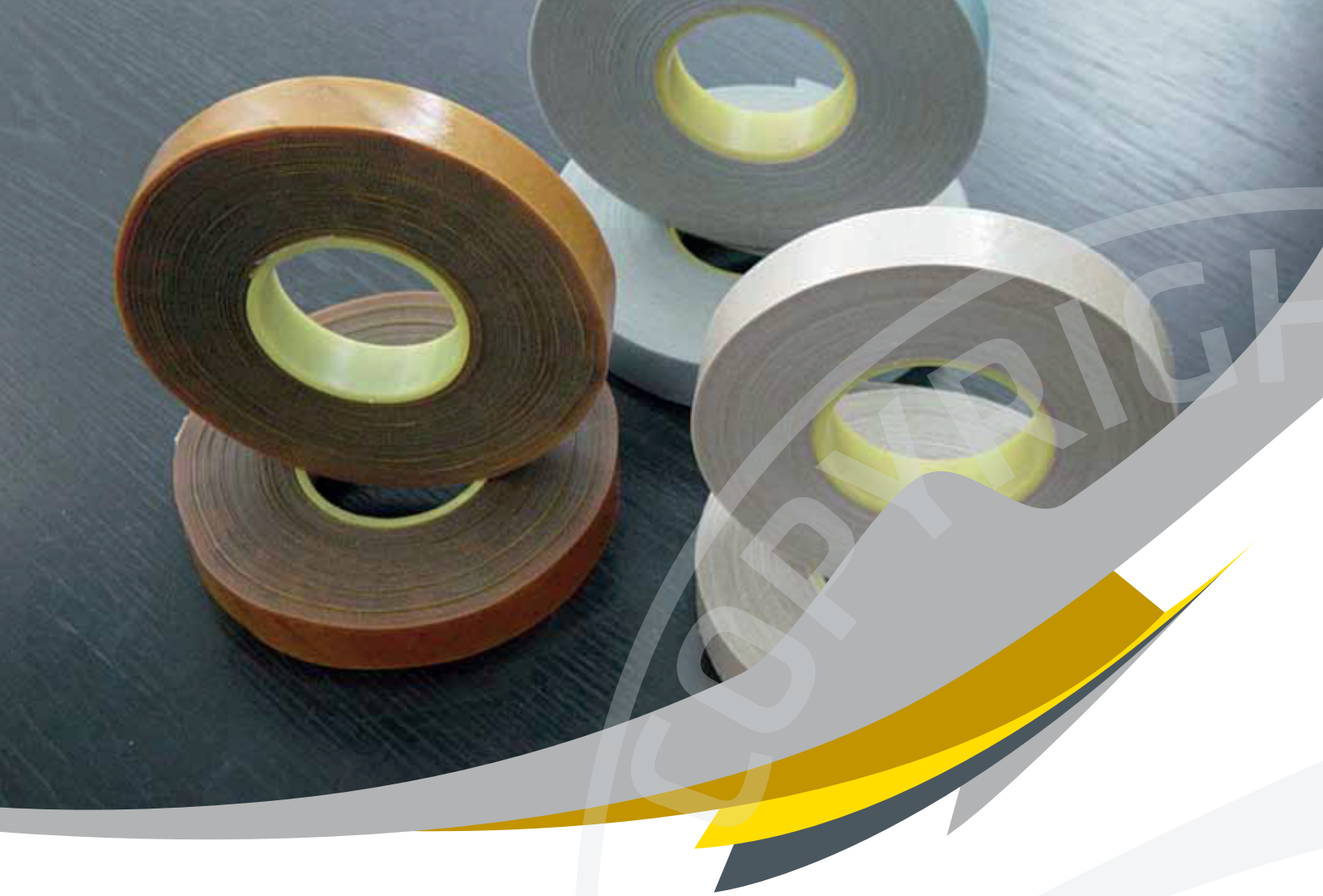
POROBAND® and POROFOL®

Porous mica paper tapes with low resin content having a glass cloth (POROBAND®) or film (POROFOL®) carrier for continuous main insulation up to the highest voltages

POROBAND® 0410	Standard type with uncalcined muscovite mica paper
POROBAND® ME 2072	Standard type with accelerator for epoxy resin-anhydride systems
POROBAND® ME 4020	As ME 2072, for highest insulation thicknesses and rated voltages
POROBAND® SI 0790	With calcined mica paper reinforced by aramid fibres for silicone-based systems
POROBAND® SI 2577	Consists of calcined muscovite mica paper with aramid fibre content on glass cloth as carrier, a modified silicone resin is used as binder. Thermal class C (240 °C), for insulation of coils or bars of traction machines
POROFOL® 2076	Standard type with uncalcined mica paper and PET film
POROFOL® ME 2075	Standard type with accelerator for epoxy resin-anhydride systems
POROFOL® SR 0554	As 2076, with thermo-shrinking PET carrier film
POROFOL® 0546	As 2076, with additional PET fleece top layer

ISOSEAL®

ISOSEAL® MF 0611	Thermo-shrinking polyester glass fabric / PET film tape, used as top-sealing layer, red-brown colour
ISOSEAL® MF ME 2411	Same as MF 0611 but with accelerator



POROMAT®

Swellable porous epoxy laminate, used as interlayer, spacer and filling material

POROMAT® 2248	Swellable porous epoxy glass mat, both sides covered with PET fleece, as inter-layer, spacer and filling material
POROMAT® ME 2242	As 2248, but contains accelerator for epoxy resin-anhydride systems, for highest mechanical stress
POROMAT ME 2203	Same as 2242 but with polyester mat

POROFILZ

POROFILZ 2074	Highly absorbent and soft PET felt, for use as spacer and filling material
POROFILZ ME 2070	Same as 2074, but contains accelerator for epoxy resin-anhydride systems

VOTASTAT® VPI-Resin

Low-viscose impregnating epoxy resins for vacuum pressure impregnation of coils and bars as well as for the global impregnation of electrical machines

VOTASTAT® 2110	2-component impregnating resin, consisting of a bisphenol-A epoxy resin and a liquid acid-anhydride hardener with very long pot life and shelf life, also available ready mixed as VOTASTAT VP 1168
VOTASTAT® 100K/XD4150	Solvent-free one-component epoxy resin with a very long pot life
VOTASTAT® XD4159	Solvent-free thixotropic one-component resin with a very long pot life, excellent cavity-filling ability
VOTASTAT® SI	Silicon resin for traction motor applications

RESIN RICH TECHNOLOGY

POWERFAB® Technology

Ultra-thin tape technology

CALMICAFAB® 3293	Calcined muscovite mica paper with ultra-thin glass carrier for high performance main wall insulations
CALMICAFAB® 3294	As type 3293, interleaved
CALMICAFAB® 3417	As type 3294, higher resin flow for easier processing
CALMICAFAB® 3450	As type 3293 with enhanced mechanical performance

CALMICA® and CALMICAGLAS®

Thermal class F-H (155 °C - 180 °C), thermosetting materials for main insulations, based on a mica paper fully impregnated with high temperature resistant epoxy resin, on a film (CALMICA®) or glass cloth (CALMICAGLAS®) carrier

CALMICA® 70 0900	PET film carrier with calcined mica, for coils and bars of high voltage machines
CALMICA® 0867	PET film carrier with uncalcined mica paper, for coils and bars of high voltage machines
CALMICA® S100 3052	Calcined mica paper on shrinkable PET film carrier, for coils and bars of high voltage machines
CALMICAGLAS® 0409	Standard type with calcined mica for highest output and voltage
CALMICAGLAS® 2005	As 0409, interleaved
CALMICAGLAS® 0893	With uncalcined mica, for coils and bars of low- and high-voltage machines

CONDUCTIVE MATERIALS

Shielding and Grading Tapes

CONTAFEL H 0865	Highly flexible, absorbent, conductive PET fleece for corona protection on high voltage coils
CONTAFEL 2716	Conductive PET / glass fabric for corona protection
CONTAFEL 3080	Conductive PET / glass fabric, ultra-thin
CONTAFELPREG 2564	Conductive thermosetting PET fleece, for RR-film applications
CONTAGLAS 2912	Conductive glass cloth for high performance corona protection
EGSB 2709, 2969	Semi conductive thermosetting tape as endgrading, for VPI-applications (2709) and RR-applications (2969)
CONTAVAL® 2017	Conductive epoxy glass laminate, as slot filler. Thermal class F (155 °C)

END WINDING INSULATION

FEINMICAGLAS

Tapes made of mica paper backed with glass cloth (-threads), flexible and fully cured. For insulation of end windings, pole coils and connections

FEINMICAGLAS 2596	Mica glass tape, two-ply
FEINMICAGLAS 0986	With PET film on both sides, also suitable for single conductors and rotor coils of medium voltage traction motors, four-ply
FEINMICAGLAS 2128	Four-ply with unidirectional glass threads and PET film on both sides, for overhangs and connections with tight bends

CALMICA-FLEX®

Thermosetting mica paper glass cloth (-threads) composite, cures to a semi flexible state, for insulation of end windings, pole coils and connections

CALMICA-FLEX® 0917	Glass / mica tape, two-ply
CALMICA-FLEX® 0919	PET / glass / mica / PET tape, four-ply
CALMICA-FLEX® 0421	Four-ply with unidirectional glass threads and PET film on both sides
CALMICA-FLEX® 0824	Glass / mica / film, good resistance to humidity and extreme ambient conditions, three-ply
CALMICA-FLEX® SI 2726	Flexible silicone based / mica / glass tape. Thermal class >H (>180°C), two-ply

ISOSEAL®

ISOSEAL® P 0713	Red-brown, thermosetting epoxy / PET cloth sealing tape, suitable for the final layer covering on end windings

ENERGY

LOW VOLTAGE & TRANSFORMER

- Flexible Insulation Materials
- Nomex®
- Kapton®
- Varnished Fabrics
- Prepregs
- CAT-Film®
- ISOAD Tapes
- Silicon Coated Materials
- Resins and varnishes

FLEXIBLE INSULATION MATERIALS

ISOSPAN®

Laminates with cellulose or cotton paper and PET film. Thermal class B (130 °C), for slot and phase insulation in low voltage motors or as interlayer insulation in choke coils and small dry type transformers

2 Layers with Cellulose Paper / PET Film

ISOSPAN® KM 3623	Kraft paper / PET film; paper of high mechanical strength
ISOSPAN® PM 3624	Presspaper / PET film. Multilayer paper of high chemical purity, smoothened surface. Paper in green and brown colour available

3 Layers with Cellulose Paper / PET Film

ISOSPAN® KMK 3625	Kraft paper / PET film / Kraft paper; paper of high mechanical strength
ISOSPAN® PMP 3626	Presspaper / PET film / Presspan Multilayer paper of high chemical purity. Smoothened surface
ISOSPAN® MPM 3627	PET film / Presspan / PET film. Multilayer paper of high chemical purity. Smoothened surface

2 Layers with Cotton Paper / PET Film

ISOSPAN® RM 3631	Rag cotton paper / PET film Paper made entirely from cotton or cotton-linters

3 Layers with Cotton Paper / PET Film

ISOSPAN® RMR 3633	Rag cotton paper / PET film / Rag cotton paper Paper made entirely from cotton or cotton-linters
ISOSPAN® MRM 3632	PET film / Rag cotton paper / PET film Paper made entirely from cotton or cotton-linters

PET Films

We carry a large selection of different PET films (polyethylene terephthalate) from leading manufacturers and can offer customised solutions for just about any application.

VOLTAFLEX®

DM (2-Layers) or DMD (3-Layers) laminates with PET film and PET fleece, for slot, layer and phase insulation for electrical motors, generators and transformers

2-Layers with 50µm/2mil PET Fleece

VOLTAFLEX® E 0936	Unsaturated, white. Thermal class B-F (130 °C - 155 °C)
VOLTAFLEX® E 0951	70% saturated, white. Thermal class B-F (130 °C - 155 °C)
VOLTAFLEX® 6644	100% saturated, blue. Thermal class B-F (130 °C - 155 °C)

3-Layers with 50µm/2mil PET Fleece

VOLTAFLEX® 2598	70% saturated, white. Thermal class B-F (130 °C - 155 °C)
VOLTAFLEX® F 6642	100% saturated, blue. Thermal class F (155 °C)
VOLTAFLEX® F 0768	100% saturated, blue, smoothened surface. Thermal class F (155 °C)

3-Layers with 80µm/3mil PET Fleece

VOLTAFLEX® 3 6641	70% saturated, white. Thermal class B-F (130 °C - 155 °C)
VOLTAFLEX® 3F 6641	100% saturated, blue. Thermal class F (155 °C)
VOLTAFLEX® 3F 0367	100% saturated, blue, smoothened surface. Thermal class F (155 °C)
VOLTAFLEX® DMD3 0180	100 % saturated, white. Thermal Class F-H (155°C - 180°C)

3-Layers with 125µm/5mil PET Fleece

VOLTAFLEX® F 2931	70% saturated, white. Thermal class B-F (130 °C - 155 °C)
VOLTAFLEX® F 2917	100% saturated, blue. Thermal class F (155 °C)
VOLTAFLEX® DMD5 0180	100% saturated, white. Thermal class F-H (155 °C - 180 °C)
VOLTAFLEX® ME 2761	Unsaturated, highly absorbent fleece, red, contains accelerator. Thermal class B-F (130 °C - 155 °C)

3-Layers with 180µm/7mil PET Fleece

VOLTAFLEX® 2526	Unsaturated, embossed, highly absorbent fleece, white.
VOLTAFASE T	Thermal class B-F (130 °C - 155 °C)

Multilayer Laminates

Laminates for wedges, strips and punched pieces in electrical machines and for e.g. barrier insulation in transformers

VOLTABOARD 2906	Based on VOLTAFLEX® 0768, bonded with a temperature resistant resin. Thermal class F (155 °C). Supplied in sheets, available thicknesses 1 - 6 mm
VOLTAFLEX® 2983	Multilayer PET fleece and PET film laminate. Supplied in rolls or sheets, thickness up to 1.5 mm
KOMBIMAT 2339	PET / PEN film laminate. Thermal class F (155 °C)
KOMBIMAT 2450	Multilayer PET film laminate. Thermal class B (130 °C)
KOMBIMAT 2822	Multilayer PET film laminate with improved adhesion properties

ISONOM®

NM and NMN Laminates of Nomex® with PET Film

Thermal class F-H (155 °C -180 °C), for slot, layer and phase insulation for electrical motors, generators and transformers

2-Layers with calendered Nomex®

ISONOM® NM 0880	Nomex® Type 464/050µm/2mil
ISONOM® NM 8 0882	Nomex® Type 416/080µm/3mil
ISONOM® NM 13 0950	Nomex® Type 416/130µm/5mil
ISONOM® NM 18 2883	Nomex® Type 410/180µm/7mil
ISONOM® NM 25 2882	Nomex® Type 410/250µm/10mil

2-Layers with uncalendered Nomex®

ISONOM® NM 2041	Nomex® Type 411/130µm/5mil
ISONOM® NM PH 2682	Nomex® Type 411/130µm/5mil, PSA coating on one side (PET film)

3-Layers with calendered Nomex®

ISONOM® NMN 0881	Nomex® Type 464/050µm/2mil
ISONOM® NMN 3211	Nomex® Type 464/050µm/2mil, smoothened surface
ISONOM® NMN PH 2045	Nomex® Type 464/050µm/2mil, adhesive coating on one side
ISONOM® NMN 2796	Nomex® Type 416/050µm/2mil
ISONOM® NMN 8 0883	Nomex® Type 416/080µm/3mil
ISONOM® NMN ME 2459	Nomex® Type 416/080µm/3mil, lacquered with an accelerator
ISONOM® NMN 13 0967	Nomex® Type 416/130µm/5mil
ISONOM® NMN 8 2800	Nomex® Type 418/080µm/3mil, contains mica

3-Layers with uncalendered Nomex®

ISONOM® NMN 2035	Nomex® Type 411/130µm/5mil

4-Layers with calendered Nomex®

ISONOM® NMNM 3266	Nomex® Type 464/050µm/2mil, 12µm PET film on one side
ISONOM® NMNM 2298	Nomex® Type 464/050µm/2mil, 23µm PET film on one side
ISONOM® NMNM 3330	Nomex® Type 416/130µm/5mil, 12µm PET film on one side
ISONOM® NMNM 2798	Nomex® Type 416/080µm/3mil, 23µm PET film on one side

NX and NXN laminates of Nomex® and PEN Film (polyethylene naphthalate film)

Thermal class F-H (155 °C - 180 °C), for applications which are exposed to high thermal stress

ISONOM® NX 2750	Nomex® Type 464/50µm/2mil laminated with PEN film on one side. Thermal class F-H (155 °C - 180 °C)
ISONOM® NXN 2751	Nomex® Type 464/50µm/2mil laminated with PEN film as core layer. Thermal class H (180 °C)

NK and NKN laminates of Nomex® and Polyimide Film

Thermal class H-N (180 °C - 200 °C), for slot, layer and phase insulation for electrical motors, generators and transformers exposed to high thermal stress

2-Layers with calendered Nomex®

ISONOM® NK 2530	Nomex® Type 464/050µm/2mil
ISONOM® NK 8 2261	Nomex® Type 416/080µm/3mil
ISONOM® NK 13 3008	Nomex® Type 416/130µm/5mil
ISONOM® NK 18 2563	Nomex® Type 410/180µm/7mil

3-Layers with calendered Nomex®

ISONOM® NKN 0885	Nomex® Type 464/050µm/2mil
ISONOM® NKN 8 0886	Nomex® Type 416/080µm/3mil
ISONOM® NKN 13 0887	Nomex® Type 416/130µm/5mil
ISONOM® NKN 18 2281	Nomex® Type 410/180µm/7mil
ISONOM® NKN 25 2664	Nomex® Type 410/250µm/10mil
ISONOM® NKN 2558	Nomex® Type 416/080µm/3mil and 130µm/5mil, asymmetric
ISONOM® KNK 2711	Nomex® Type 410, 416 or 464 laminated with PI film on both sides

3-Layers with uncalendered Nomex®

ISONOM® NKN 2039	Nomex® Type 411/130µm/5mil

2- and 3-Layer Laminates of Nomex® and Glass Cloth or Glass Fleece

Thermal class H-N (180 °C - 200 °C), for applications which are exposed to high thermal stress

ISONOM® NG 0888	Nomex® Type 411 with glass cloth on one side
ISONOM® NGN 3543	Nomex® Type 416 or 464 with glass cloth as a core layer
ISONOM® NMG 2042	Nomex® Type 411 with PET film as a core layer and glass cloth on one side
ISONOM® BNB 0582	Nomex® Type 410, 416 or 464 laminated with glass fleece on both sides

Laminates of Nomex® and Mica Paper

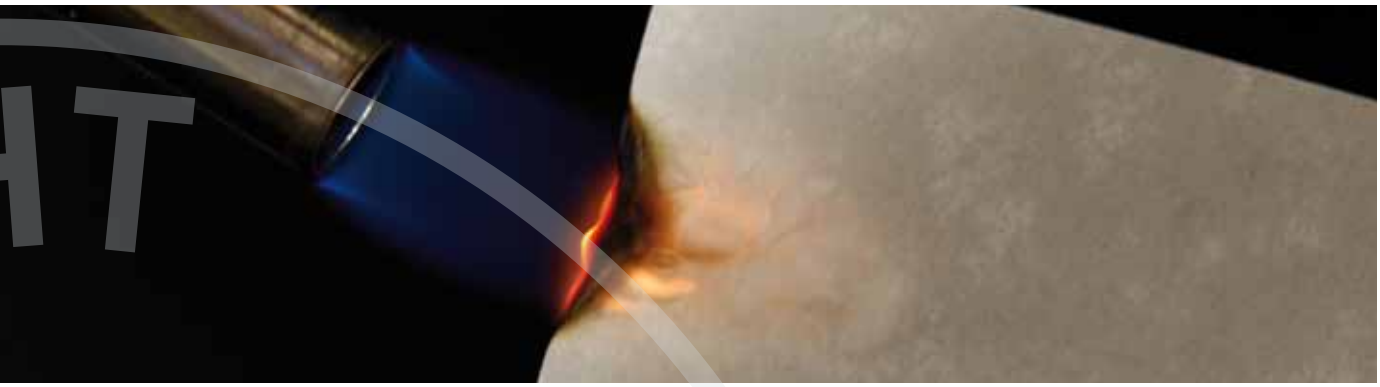
Thermal class H-N (180 °C - 200 °C), for slot, layer and phase insulation for electrical motors, generators and transformers exposed to high thermal stress, especially where corona resistant and flame retardant properties are required

ISONOM® NMiN 3209	Nomex® Type 416 or 464 with mica paper as a core layer
ISONOM® NMMiG 3467	Nomex® Type 416 or 464 with PET film and mica paper as a core layer and glass cloth on the outside
ISONOM® NMMiN 3419	Nomex® Type 464/50µm/2mil on the outside and PET film and mica paper as a core layer

GK and GKG Laminates of Glass Cloth and Polyimide Film

Thermal class H-N (180 °C - 200 °C), for slot, layer and phase insulation for electrical motors, generators and transformers exposed to high thermal stress

VOLTAFLEX® GK 2797	PI film with glass cloth 25 g/m2 on one side
VOLTAFLEX® GK 2799	PI film with glass cloth 50 g/m2 on one side
VOLTAFLEX® GKG 2064	PI film with glass cloth 25 g/m2 on both sides



NOMEX®

We are an authorized distributor of DuPont™ Nomex® throughout Africa, Andean countries, China, Europe, Hong Kong, Middle East, North and Central America, Russia and other parts of the world for many years and can offer the complete range of products. We will be happy to supply technical information and datasheets.

KAPTON®

We are an authorized distributor of DuPont™ Kapton® throughout Africa and Mexico. We will be happy to supply technical information and datasheets.

VARNISHED FABRICS

DEGLAS® FG 0932	Electrical grade glass cloth impregnated with a polyurethane resin with very high tensile strength. For phase insulation for motors and generators, for ground, barrier and layer insulation for transformers, wrapping applications. Thermal class F (155 °C)
DEGLAS® DNL 2019	As DEGLAS® FG 0932 but bias cut and seamless, designed for taping tight bends. Thermal class F (155 °C)
DEGLAS® FG 2949	Electrical grade glass cloth impregnated with a modified polyester resin. For phase insulation for motors and generators, for ground, barrier and layer insulation for transformers, wrapping applications. Thermal class H (180 °C)
SILGLAS FG 2090	Alcali free glass cloth impregnated with a special silicon rubber, parallel warp threads to the edges. For phase insulation for motors and generators, for ground, barrier and layer insulation for transformers, high temperature wrapping applications. Thermal class H (180 °C)
TRAFOGITTER	Impregnated and fully cured wide-meshed glass fabric. For use as a spacer and reinforcement in transfomercastings. Thermal class F (155 °C)

PREPREGS

Various materials impregnated with epoxy or polyester resins in B-stage. The material is shaped by the user and cured under pressure and temperature

ISOGLAS / VITROGLAS	Banding tape, consisting of unidirectional glass fibres coated with thermosetting polyester resin in B-stage. For end winding bracing or banding of transformer cores
PRINOM® E 2084	Thermosetting Nomex® (Type 410) prepreg, one side coated with modified epoxy resin. Thermal class H (180 °C)
PRINOM® E 3573	Thermosetting Nomex® (Type 410) prepreg, one side coated with modified epoxy resin. Fast curing. Thermal class H (180 °C)
PRINOM® B 2083	Thermosetting Nomex® (Type 410) prepreg, both sides coated with modified epoxy resin. Supplied with release film. Thermal class H (180 °C)
PRINOM® B 3537	As PRINOM® B 2083 but with increased resin content. Thermal class H (180 °C)
PRINOM® B 3574	Thermosetting Nomex® (Type 410) prepreg, both sides coated with modified epoxy resin. Fast curing. Supplied without release film. Thermal class H (180 °C)
PRINOM® U 0622	Thermosetting uncalendered Nomex® (Type 411) prepreg, both sides coated with modified epoxy resin. Thermal class H (180 °C)
ISOPREG® PET 0876	Thermosetting PET film prepreg, both sides coated with modified epoxy resin. Thermal class B (130 °C)
ISOPREG® EP 1069	Fast curing glass cloth prepreg with long shelf life. For L - and U-channels of turbogenerators. Thermal class F (155 °C)
ISOPREG® EP 2047	Glass cloth prepreg with high mechanical and chemical strength at high temperatures. Used to produce e.g. tubes, plates, angles and sections. Thermal class H (180 °C)
ISOPREG® EP 2701	Thermosetting glass cloth-prepreg, exhibits very good thermal and chemical resistance as well as very good mechanical properties also at elevated operating temperatures. Thermal class H (180 °C)
ISOPREG® FR 1179	E-glass filament-prepreg, halogen-free, low-smoke and flame-resistant. Shows good adhesion and is suitable for low pressure curing. Thermal class H (180 °C)
ISOPREG® PET F 2659	PET felt, impregnated with a high active epoxy resin. Designed e.g. for insulation of transformers
VLIESPREG 0740/2870	Thermosetting PET fleece prepreg, impregnated with modified epoxy resin. 0740 containing interlayer, 2870 without interlayer.
VOLTAFLEXPREG® 2694	Thermosetting DMD prepreg, both sides coated with modified epoxy resin. Thermal class F (155 °C)
VOLTAFLEXPREG® 3660	Thermosetting DMD prepreg with improved adhesion and increased shelf life. Thermal Class F (155°C).
ISONOM® NMN PREG	Thermosetting NMN prepreg, both sides coated with modified epoxy resin. Thermal class H (180 °C)

Flame Retardant Insulation Materials

The combination of flame retardant (FR) properties of glass, mica, Nomex®, PET-FR and a variety of recently developed flame retardant resin systems give us the possibility to offer a range of FR products. FR laminates and FR prepregs are the solution, when combination of electrical insulation and flame retardancy is needed.

Oil Filled Transformers

Within this application we offer a wide range of adhesive tapes, crepped materials, diamond dotted products, pressboards, rods, spacers, strips, tubes, various papers, a.s.o. Please let us know your needs and we will be happy to provide you with more detailed information.

Fabrication Services

In China, Europe and North America we are fabricating and converting flexible materials to your request. Our capabilities include cold and hot forming, feathering, printing, punching, slitting a.s.o.

CAT-FILM® EME 3634

Coated paper / PET film laminates used e.g. for graphic applications and labeling systems. Resistant to common chemical compounds, high temperature; enhanced mechanical properties.

ISOAD TAPES

Different carriers with acrylic (thermosetting or non curing) or polysiloxane (silicone) adhesive coatings.

ISOAD Tape 1000 Series	PE (polyethylene) or PP (polypropylene) film carrier
ISOAD Tape 2000 Series	PET film carrier
ISOAD Tape 3000 Series	Paper carrier
ISOAD Tape 4000 Series	Nomex® paper carrier
ISOAD Tape 5000 Series	Glass fabric carrier
ISOAD Tape 6000 Series	Textile fabric carrier
ISOAD Tape 7000 Series	PI film carrier
ISOAD Tape 9000 Series	Metalfoil carrier

SILICON COATED MATERIALS

Accurate and stable silicone release coatings on all types of papers and films

Silicon Coated Films

FES 1025	LD PE hazy, medium release
FES 1225	HD PE hazy, medium release
FES 1230	HD PE hazy, medium release, blue colour
FOS 1525	PP hazy, medium release
FPS 2000	PET transparent, medium release
FPS 2010	PET (Mylar®), medium release
FPS 2100	PET thermo shrinkable MD, medium release
FPS 2125	PET thermo shrinkable TD, medium release

Silicon Coated Papers

PLS 3000	Cellulose paper, white colour, medium-high release
PGS 3025	Glassine paper, white colour, medium-high release
PKS 3200	Kraft paper, brown colour, low release
PES 3900	Coated paper, white colour, high release

RESINS AND VARNISHES

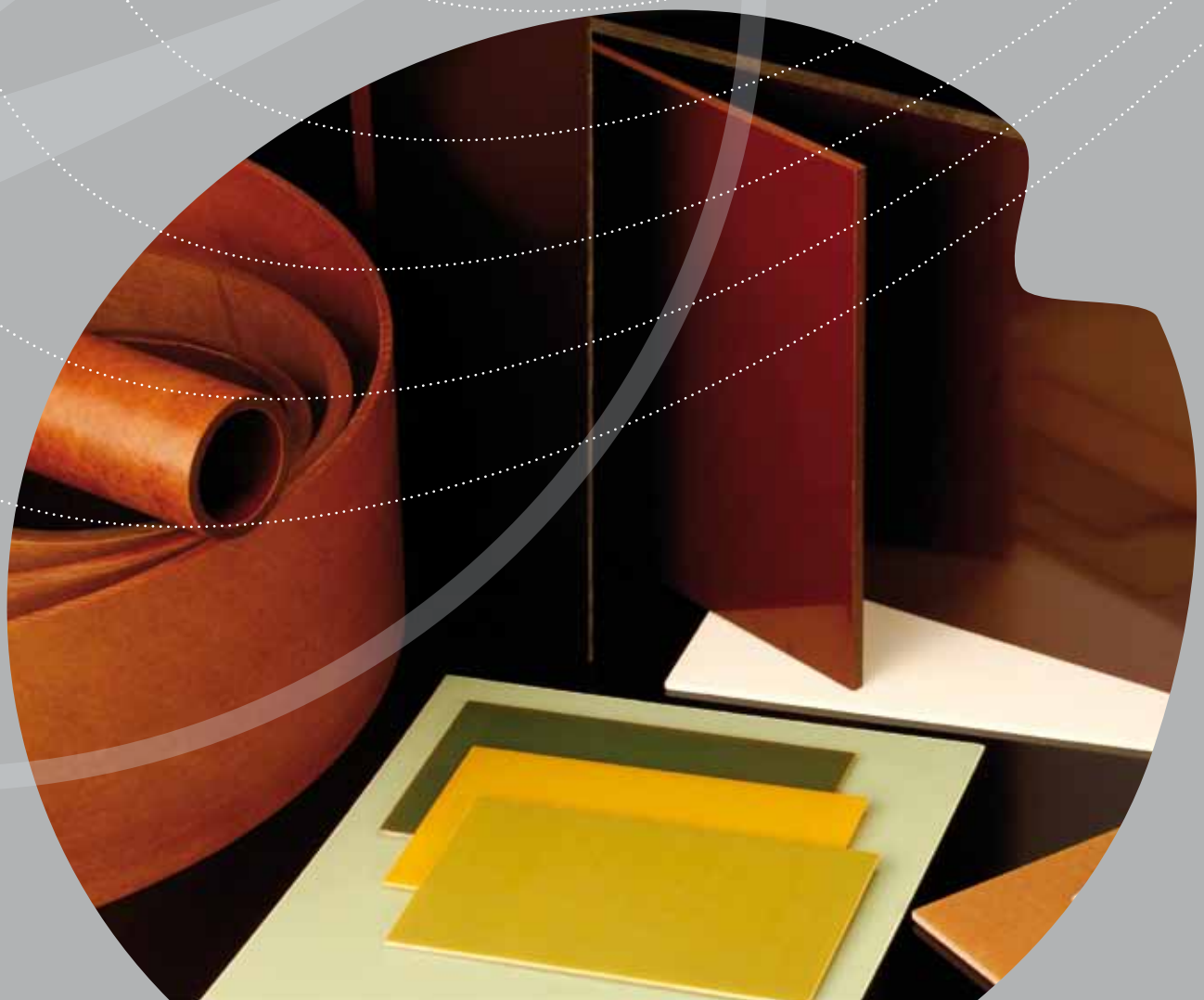
Insulating Impregnation Varnishes

L.I.S.A. 1	Water borne ovendrying impregnating varnish based on modified alkyd resin, environmentally compatible water dilutable impregnating varnish. For motor and transformer coils that permit oven drying at temperatures between 120 °C and 150°C

COMPOSITE MATERIALS

PREPREGS & LAMINATES

- Paper and Cotton Fabric based Laminates
- Glass fibre based Laminates
- Carbon fibre based Laminates
- Tubes and Rods



PAPER AND COTTON FABRIC BASED LAMINATES

VOLTIS® HP

Phenolic paper laminates

VOLTIS® Hp 2061 (PF CP 201)	Highest mechanical strength, good electric properties at normal humidity
VOLTIS® Hp 2061.5 (PF CP 202)	High electric strength in oil, used in high voltage range at power frequencies

VOLTIS® Hgw

Phenolic cotton laminates

VOLTIS® Hgw 2082 (PF CC 201)	Viscoplastic material for mechanical application
VOLTIS® Hgw 2082.5 (PF CC 202)	CE Viscoplastic material for mechanical and electrical application
VOLTIS® Hgw 2083 (PF CC 203)	Viscoplastic material for mechanical application and finely machined parts

VOLTIS® LC

Rubber clad laminates

VOLTIS® LC 141	Also with PTFE or PP film, best solvent resistance
VOLTIS® LC 205	Also with PTFE or PP film, easier to punch

BORD

Special laminates

S-BORD®	Phenolic paper laminate for punched pieces for the lighting industry
K-BORD®	Special paper laminate with glass fabric on both sides for countermatrices in card box production

INBORD®

Laminates with melamine surface

INBORD® E	Tracking index CTI 600 for switchgear and electric appliances
INBORD® M	Tracking index CTI 200 for mechanical applications and punched pieces
INBORD® EGS	Tracking index CTI 600 for switchgear with improved safety in case of arcing, with additional glass fabric reinforcement

Table of Standards for paper and cotton fabric based laminates

Comparable Standards to IEC 60893 (= EN 60893)

IEC 60893	DIN 7735	NEMA LI 1	BS 2572	JIS K6912 >3 mm	JIS K6912 <3 mm
PF CP 201	Hp 2061	X, XP	P1	PL-PM	PL-P-P
PF CP 202	Hp 2061.5	-	-	-	-
PF CP 206	Hp 2062.8	XXP	P3	PL -PEM	PL-PES-P
PF CP 204	Hp 2063	XXXP	P4	PL-PEV	PL-PEV
PF CC 201	Hgw 2082	C	F2	PL-FCM	-
PF CC 202	Hgw 2082.5	CE	F4	PL-FCE	-
PF CC 203	Hgw 2083	L	F1	PL-FLI	-

GLASS FIBRE BASED LAMINATES

ISOVAL®

Epoxy glass fibre laminates with the high-performance and temperature resistant ISOVAL® resin system

ISOVAL® A
(EP GC 201)
With glass filament fabric for test adapters in printed circuit testing equipment

ISOVAL® 10 R
With glass roving fabric, high-quality thermal insulation for mechanical engineering and plant engineering and construction where high working temperatures (up to 300°C) and high pressure loads combined, Thermal Class H (180°C)

ISOVAL® 11
(EP GC 203 & 308)
With glass filament fabric, for electric appliances and transformers, high flexural strength at elevated operating temperatures, Thermal Class H (180°C)

ISOVAL® 11 HKB
(EP GC 306 & 308)
High tracking resistance (CTI 600) glass filament fabric, construction material in electric appliances and switchgear, especially for applications where surface contamination occurs, Thermal Class H (180°C)

ISOVAL® TM
(EP GC 308)
With glass filament fabric, high-quality construction material for a wide variety of high-temperature applications, Thermal Class H (180°C)

ISOVAL® FR4-HF
(EP GC 202)
Flame-resistant, halogen-free glass fabric laminate Type FR4, without any toxic flame retardants, UL 94 listed, Thermal Class H (180°C)

ISOVAL® R
(EP GC 205)
With glass roving fabric, similar to ISOVAL 11, but for larger parts, Thermal Class H (180°C)

ISOVAL® RKB-FR
(SIMILAR TO EP GC 202)
Tracking resistance of CTI 600, glass roving fabric laminates, for insulating partitions in switchgear, flame resistant, Thermal Class F (155°C)

Special Glass Laminates

CONTAVAL® 2017	Glass filament fabric for conductive corona protection for slot packing in high voltage machines, Thermal Class H (180°C)
MAGNOVAL®	For magnetic slot wedges in high voltage machines, Thermal Class F (155°C) and Thermal Class H (180°C)
VOLTIS® ME (MF GC 201)	Tracking resistant laminate with melamine-resin-impregnated glass fabric for mechanical and electrical applications. Low flammability
ISOCARBON®	Carbon epoxy laminates with a wide range of applications and a long-term thermal stability of up to 200°C, 3K or 12K carbon cloth with 0/90° or quasi isotropic fibre orientation
VOLTACOMP®	Multi-functional epoxy-resin-system impregnated glass roving fabric laminate with high mechanical resilience and excellent thermal properties
VOLTIS® SI (SI GC 202)	Silicone glass filament fabric, insulation material for high-frequency applications, Thermal Class H (180 °C)
VOLTIS® Hgw 2072 (PF GC 201)	Phenolic/glass filament fabric for electrical applications under high temperatures, flame resistant

Table of Standards for Glass fibre laminates

Comparable Standards to IEC 60893 (= EN 60893)

IEC 60893	DIN 7735	NEMA LI 1	BS 3953	JIS K 6912
EP GC 201	Hgw 2372	G 10	EP -3	EL-GEM
EP GC 202	Hgw 2372.1	FR 4	EP-4	EL-GEF
EP GC 203	Hgw 2372.4	G 11	EP-5	EL-GEH
EP GC 204	Hgw 2372.2	FR 5	EP-5	EL-GEHF
EP GC 205	Hgw 2370.4	-	-	(EL-GEH)
EP GC 306	-	-	-	-
EP GC 308	-	-	EP-7	-
UP GM 201	Hm 2472	GPO 1	-	T -GEM
SI GC 202	Hgw 2572	G 7	SI 5	SL-GSE
PF GC 201	Hgw 2072	G 3	-	PL-GH

TUBES AND RODS

VOLTIS® and ISOVAL®

Round rolled and molded tubes and rods

VOLTIS® Hp TU 21
(PF CP 21)
Round rolled phenolic paper laminate tube for mechanical and electrical applications

VOLTIS® Hgw TU 21
(PF CC 21)
Round rolled phenolic fine weave cotton cloth tube with high toughness and excellent machinability for mechanical applications

VOLTIS® Hgw TU 22
(PF CC 22)
Round rolled phenolic cotton cloth tube with high toughness for mechanical applications

VOLTIS® Hgw RO 41
(PF CC 41)
Round moulded phenolic fine weave cotton cloth rod with high toughness and excellent machinability for mechanical applications

VOLTIS® Hgw RO 42
(PF CC 42)
Round moulded phenolic cotton fabric laminate rod with high toughness for mechanical applications

ISOVAL® TU 21/FR4
(EP GC 21)
Round rolled epoxy glass fabric tube with high strength for mechanical and electrical applications

ISOVAL® TU 22
(EP GC 22)
Round rolled epoxy glass fabric tube with high strength even at elevated temperature for mechanical and electrical applications

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