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TECHNICAL DATA

3M™ THERMAVOLT™ TvPITv

High Temperature Flexible Laminates

DESCRIPTION

ThermaVolt™ TvPITv is a triplex laminate consisting of 3 mil (0.076mm) or 5 mil (0.125mm) 3M™ ThermaVolt™ mineral insulating paper bonded to both sides of polyimide (PI) film. Thermal rating 220°C (Class C Europe, Class R USA).

ADVANTAGES

TvPITv laminates combine the high thermal ageing resistance and dielectric strength of polyimide film with the excellent thermal aging and dielectric properties of 3M™ ThermaVolt™ papers.
The high thermal conductivity of TvPITv laminates promotes cooler running of equipment, leading to longer insulation life, better reliability and more efficient use of power.
Additionally, the inorganic content of ThermaVolt™ provides excellent corona resistance and resistance to hot cut-through in high temperature applications.
ThermaVolt™ has an extremely high limiting oxygen index and UL94 V0 rating that allows the laminates to pass the most demanding fire safety regulations. Certifications, e.g. EN 45545 are available on request.
Polyimide film does not soften with increasing temperature and has improved thermal ageing resistance compared to standard PET film. Due to the central polyimide-ply, TvPITv has good memory shape and snap-back even at high temperatures. TvPITv laminates have excellent resistance to tear initiation and tear propagation in both the machine and direction and cross direction.
TvPITv laminates are non-hydroscopic and exhibit low moisture absorption characteristics thus reducing the need for extended drying cycles prior to varnish or resin impregnation. As the laminates do not absorb ambient humidity the material will remain dimensionally stable once the packaging is opened. Especially long profiles do not display deformation, swelling or shrinkage.

CERTIFICATION

ThermaVolt™ TvPITv laminates are qualified for use as major ground insulation in electrical insulation systems rated up to 220°C (Class C/R) per UL 1446 and IEC standard 61857; UL File E65007.

APPLICATIONS

ThermaVolt™ TvPITv laminates find use as slot insulation, phase insulation and slot closures in electric motors, as well as inter-layer insulations in transformer and magnet coils.
TvPITv laminates are well suited for producing punched parts and for automatic insertion processing.



CONVERTED PARTS

As well as standard rolls, ThermaVolt™ TvPITv can be converted to customer requirements as follows:

→ Slit tapes from 6mm wide upwards
→ Creased/formed parts, including pre-formed slot closures
→ Stampings/punched parts
→ Cut parts

THERMAVOLT TvPITv3 TECHNICAL DATA

PROPERTIES		UNIT	THERMAVOLT™ TvPITv3				
Composition, IEC 60626-2/4		mil	**3/1/3**	**3/2/3**	**3/3/3**	**3/4/3**	**3/5/3**
Thickness, IEC 60626-2/4		mm	0.18	0.20	0.23	0.25	0.28
ThermaVolt™ paper thickness, IEC 60626-2/4		mil	3	3	3	3	3
PI film thickness, IEC 60626-2/4		mil	1	2	3	4	5
Area weight, IEC 60626-2/5		g/m^2	254	286	327	356	391
Elongation, IEC 60626-2/7	MD	%	> 15	> 15	> 15	> 15	> 15
	CMD	%	> 15	> 15	> 15	> 15	> 15
Tensile strength, IEC 60626-2/7	MD	N/cm	> 160	> 160	> 200	> 200	> 280
	CMD	N/cm	> 120	> 120	> 180	> 180	> 220
Shrinkage, IEC 60626-2/10	MD	%	1.5	1.5	1.5	1.5	1.5
	CMD	%	1.1	1.1	1.1	1.1	1.1
Breakdown voltage, IEC 60626-2/10		kV	7	9	11	13	15
Maximum moisture content, IEC 60626-2/12		%	1	1	1	1	1
Temperature class, IEC 61857		°C	220	220	220	220	220

THERMAVOLT TvPITv5 TECHNICAL DATA

			THERMAVOLT™ TvPITv5				
Composition, IEC 60626-2/4		mil	**5/1/5**	**5/2/5**	**5/3/5**	**5/4/5**	**5/5/5**
Thickness, IEC 60626-2/4, ± 15%		mm	0.28	0.30	0.33	0.35	0.38
ThermaVolt™ paper thickness, IEC 60626-2/4		mil	5	5	5	5	5
PI film thickness, IEC 60626-2/4		mil	1	2	3	4	5
Area weight, IEC 60626-2/5, ± 15%		g/m^2	434	442	508	546	584
Elongation, IEC 60626-2/7	MD	%	> 15	> 15	> 15	> 17	> 17
	CMD	%	> 15	> 15	> 15	> 17	> 17
Tensile strength, IEC 60626-2/7	MD	N/cm	> 160	> 160	> 300	> 390	> 390
	CMD	N/cm	> 120	> 120	> 210	> 250	> 250
Shrinkage, IEC 60626-2/10	MD	%	1.5	1.5	1.5	1.5	1.5
	CMD	%	1.1	1.1	1.1	1.1	1.1
18		kV	7	9	14	16	4
Maximum moisture content, IEC 60626-2/12		%	1	1	1	1	1
Temperature class, IEC 61857		°C	220	220	220	220	220

Other thicknesses & combinations available to order.