



Insulation That Can Take It

3M™ ThermaVolt AR Electrical Insulation Paper

3M™ ThermaVolt AR Electrical Insulation Paper combines the best of two technologies – inorganic and aramid – to offer the excellent thermal conductivity and voltage endurance of inorganic insulation plus the strong mechanical and thermal properties you expect of aramid insulation.

Known globally for long-standing innovation and quality, 3M offers advanced insulation solutions that are performance engineered to meet some of the most rigorous applications.

An Innovative Insulation Solution

3M ThermaVolt AR (TVAR) Electrical Insulation Paper is a significant advancement in the development of electrical insulation used in electrical equipment, such as dry type transformers and motors. This premium-performance insulation is a cost-effective alternative to higher-temperature insulation materials.

TVAR paper, a proprietary 3M technology, is a high-temperature, stable insulating paper that offers:

- Toughness: tensile strength and tear resistance, even in single-ply form
- Dielectric strength
- Conformability
- Long-term thermal stability
- High thermal conductivity
- Retains electrical strength even at operating temperatures
- Approved for use in Electrical Insulation Systems rated through Class 220°C per UL 1446

“When under time and cost pressures, look to 3M for confidence and peace of mind that comes from relying on its broad line of quality product solutions with exceptional service.”

With good mechanical strength – particularly tensile and tear strength – 3M™ ThermaVolt AR Electrical Insulation Paper maintains its integrity while remaining conformable. (Shown here after two weeks aging at 260°C)



Exceptional Properties of 3M™ ThermaVolt AR Electrical Insulation Paper

		ASTM Test Method	ThermaVolt AR 3 mil	ThermaVolt AR 4 mil	ThermaVolt AR 5 mil	ThermaVolt AR 7 mil	ThermaVolt AR 11.5 mil	ThermaVolt AR 15 mil	ThermaVolt AR 20 mil	ThermaVolt AR 30 mil
Nominal Thickness	mm	D-645	0.08	0.1	0.13	0.18	0.29	0.38	0.51	0.71
	mil		3	4	5	7	11.5	15	20	30
Basis Weight	g/m ²	D-202	87	105	168	244	429	501	668	1032
	lb/yd ²		0.16	0.19	0.31	0.45	0.79	.94	1.2	1.9
Tensile Strength, MD	lb/inch	D-828	25	52	72	81	135	190	234	319
	N/cm		44	91	126	142	236	333	410	559
Tensile Strength, CD	lb/inch	D-828	10	20	30	34	65	82	102	152
	N/cm		18	35	53	60	114	144	179	266
Tensile Elongation, MD	%	D-828	1.9	2.5	3.5	2.9	3.0	4.7	4.5	3.9
Tensile Elongation, CD	%	D-828	1.4	3.2	4.1	2.6	2.5	3.8	3.7	3.6
Elmendorf Tear, MD	g	D-689	146	173	312	416	505	824	1276	1718
	N		1.4	1.7	3.1	4.1	4.9	8.1	12.5	16.8
Elmendorf Tear, CD	g	D-689	362	530	780	1050	1110	2184	2752	>3200
	N		3.5	5.2	7.7	10.3	10.9	21.4	27.0	>31.4
Dielectric Breakdown Voltage	kV	D-149	0.85	0.98	1.5	2.8	6.5	7.4	8.6	14.8

A Solution for Multiple Challenges

TVAR paper can be used for a variety of electrical insulation applications that require high-temperature systems up to Class 220(R) and input voltages less than 1000 volts, including:

- Core wrap
- Turn insulation
- Interwinding insulation
- Layer insulation
- Outer wrap insulation
- Window insulation

Why Inorganic Paper Insulation?

As the demands on electrical components increase, 3M™ Flexible insulation overcomes some shortcomings of traditional insulation materials. 3M products offer:

- Voltage endurance
- Thermal conductivity
- Low moisture absorption
- Excellent varnish absorption

3M is a trademark of 3M Company.

Important Notice

Before using this product, you must evaluate it and determine if it is suitable for your intended application. You assume all risks and liability associated with such use.

Warranty; Limited Remedy; Limited Liability.

This product will be free from defects in material and manufacture at the time of purchase. **3M MAKES NO OTHER WARRANTIES INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.** If this product is defective within the warranty period stated above, your exclusive remedy shall be, at 3M's option, to replace or repair the 3M product or refund the purchase price of the 3M product. **Except where prohibited by law, 3M will not be liable for any indirect, special, incidental or consequential loss or damage arising from this 3M product, regardless of the legal theory asserted.**



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