INNOVATIVE PAPER TECHNOLOGIES, LLC

Technical Reference Sheet

TufQUIN® Inorganic-based Papers

Description

TufQUIN products are a hybrid inorganic/organic paper based upon advanced manufacturing techniques. TufQUIN offers the high-temperature capabilities of inorganic materials combined with the high mechanical strength gained by the use of organic fiber. TufQUIN is a flexible, conformable paper exhibiting physical toughness in the form of high tensile strength and excellent tear resistance

TufQUIN® 110 *			2.5 mil	3 mil	5 mil	10 mil
Typical Thickness		mm	0.07	0.08	0.13	0.25
		mil	2.5	3.0	5.0	10
Basis Weight		kg/m²	0.07	0.08	0.14	0.27
		lb/yd²	0.13	0.15	0.25	0.5
Tensile Strength	kN/m	MD	2.6	2.6	4.2	8.7
		CD	1	1	2.1	4.2
	lb/in	MD	15	15	24	50
		CD	6	6	12	24
Elongation to Break, MD		%	12	15	19	18
Elongation to Break, CD		%	3	3	8	12
Elmendorf Tear	grams	MD	60	110	280	640
Breakdown Voltage		kV	0.6	0.7	0.8	1.5
Dielectric Constant@ 23 °C		%	N/A	2.2	2.2	2.7
Dissipation Factor @ 23 °C		%	N/A	1.1	0.7	1.4
Thermal Conductivity @ 180 °C		W/m-°K	N/A	0.14	0.14	0.17
Moisture		%	<1	<1	<1	<1

* All data is for nominal product properties and is not for specification purposes
N/A=Not Available

TufQUIN® 120 *			7.5 mil	12 mil	15 mil	20 mil
Typical Thickness		mm	0.19	0.30	0.38	0.50
		mil	7.5	12	15	20
Basis Weight		kg/m²	0.2	0.35	0.42	0.57
		lb/yd²	0.37	0.64	0.77	1.05
Tensile Strength	kN/m	MD	6.3	9.6	13	19
		CD	2.5	N/A	5	N/A
	lb/in	MD	36	55	75	110
		CD	14	N/A	28	N/A
Elongation to Break, MD		%	14	14	14	15
Elmendorf Tear	grams	MD	340	N/A	N/A	N/A
Breakdown Voltage		kV	1	1.9	2.1	3.3
Dielectric Constant@ 23 °C		%	2.6	N/A	N/A	N/A
Dissipation Factor @ 23 °C		%	3.2	N/A	N/A	N/A
Thermal Conductivity @ 180 °C		W/m-°K	0.17	N/A	N/A	N/A

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Technical Reference Sheet

TufQUIN® Film Laminates

Description

TufQUIN TFT composites are a family of laminates based on IPT's advanced high performance TufQUIN inorganic-based papers combined with polyester film.

TufQUIN® TFT*		2-2-2	2-5-2	2.5-7.5-2.5
Typical Thickness	mm	0.15	0.23	0.32
	mil	6	9	12.5
Basis Weight	kg/m²	0.16	0.24	0.42
	lb/yd²	0.29	0.44	0.77
Breakdown Voltage	kV	7	N/A	N/A
Moisture	%	<1	<1	<1

TufQUIN® TFT*			3-1-3	3-3-3	3-5-3	3-7.5-3	3-10-3	3-14-3
Typical Thickness		mm	0.18	0.23	0.28	0.34	0.41	0.5
		mil	7	9	11	13.5	16	20
Basis Weight		kg/m²	0.22	0.28	0.35	0.44	0.51	0.66
		lb/yd²	0.4	0.52	0.64	0.82	0.94	1.22
Tensile Strength	kN/m	MD	12	18	23	30	38	47
		CD	9	15	30	34	51	61
	lb/in	MD	70	100	130	170	215	270
		CD	50	85	170	195	290	350
Elongation to Break		%	22	23	22	23	28	30
Elmendorf tear	grams	MD	160	320	320	990	540	750
		CD	580	960	1280	1180	1020	2100
Breakdown Voltage		kV	5	10	14	16	22	N/A
Moisture		%	<1	<1	<1	<1	<1	<1

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N/A=Not Available

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TufQUIN® TFT*			5-1-5	5-2-5	5-3-5	5-5-5	5-10-5	5-14-5
Typical Thickness		mm	0.28	0.30	0.33	0.38	0.51	0.61
		mil	11	12	13	15	20	24
Basis Weight		kg/m²	0.32	0.35	0.38	0.46	0.63	0.77
		lb/yd²	0.59	0.65	0.71	0.84	1.17	1.4
Tensile Strength	kN/m	MD	3	15	18	23	39	49
		CD	8	14	17	32	53	54
	lb/in	MD	75	85	105	134	220	49
		CD	45	80	100	134	220	49
Elongation to Break		%	35	19	40	46	50	64
Elmendof Tear	grams	MD	580	640	640	1100	1100	1200
		CD	2400	2400	2400	2400	N/A	N/A
Breakdown Voltage		kV	5	8	10	14	22	N/A
Dielectric Constant @ 23 °C		%	N/A	N/A	N/A	2.9	3	N/A
Dissipation Factor @ 23 °C		%	N/A	N/A	N/A	1	0.8	N/A
Thermal Conductivity @ 180 °C		W/m-°K	N/A	N/A	N/A	0.19	0.21	N/A
Moisture		%	<1	<1	<1	<1	<1	<1

TufQUIN®/Film Laminates			TFT		FTF
			7-3-7	7-14-7	1-5-1
Typical Thickness		mm	0.43	0.71	0.18
		mil	17	28	7
Basis Weight		kg/m²	0.5	0.92	0.22
		lb/yd²	0.92	1.7	0.4
Tensile Strength	kN/m	MD	22	53	10.5
		CD	N/A	N/A	9.5
	lb/in	MD	125	300	60
		CD	N/A	N/A	54
Elongation to Break		%	N/A	N/A	40
Elmendorf Tear	grams	MD	N/A	N/A	320
		CD	N/A	N/A	1040
Breakdown Voltage		kV	10	N/A	7
Moisture		%	<1	<1	<1

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CERTIFIED QUALITY MANAGEMENT SYSTEM ISO 9001:2000

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