



Global Thermoset Composite Solutions

Convolute Rolled Tube Products - Property Comparison

			RT130	RT130M	RT130X	RT500	RT500F	RT500M	RT500X	RT504	
			Glass Fabric								
			Epoxy							Phenolic	
PHYSICAL PROPERTIES											
Specific Gravity (0.750" ID x 1.000" OD)		-	1.84	1.86	1.96	1.80	1.90	1.86	1.90	1.80	
Rockwell Hardness (0.750" ID x 1.000" OD)	M Scale		110	105	115	110	110	105	110	105	
Moisture Absorption (0.750" ID x 1.000" OD)	Condition D ₁ -24/23	%	0.10	0.14	0.05	0.14	0.07	0.14	0.07	0.20	
Tensile Strength (0.750" ID x 1.000" OD)	Condition A	Axial	psi	39,500	--	61,000	39,500	50,000	39,000	50,000	38,500
Compressive Strength (0.750" ID x 1.000" OD)	Condition A	Axial	psi	40,000	30,500	50,500	42,500	44,000	35,000	44,000	38,000
Compressive Modulus (0.750" ID x 1.000" OD)	Condition A		kpsi	1,065	650	1,250	1,100	1,065	700	1,065	850
THERMAL PROPERTIES											
T _g by DMA		°C	--	--	--	≥ 170	≥ 170	≥ 170	≥ 170	≥ 170	
Temperature Index ¹	Electrical / Mechanical	°C	140 / 140	140 / 140	140 / 140	200 / 200	200 / 200	200 / 200	200 / 200	180 / 160	
Flammability Rating U.L. 94	Condition A	Class	V-0	V-0	V-0	HB	HB	HB	HB	HB	
ELECTRICAL PROPERTIES											
Dissipation Factor (0.750" ID x 1.000" OD)	Condition A	-	--	--	--	0.030	0.030	0.030	0.030	--	
	Condition D-24/23/50	-	--	--	--	0.040	0.040	0.040	0.040	--	
	Condition D-48/50	-	--	--	--	--	--	0.045	--	--	
Permittivity (0.750" ID x 1.000" OD)	Condition A	-	--	--	--	4.41	4.41	4.41	4.41	--	
	Condition D-24/23/50	-	--	--	--	4.48	4.48	4.48	4.48	--	
	Condition D-48/50	-	--	--	--	--	--	4.66	--	--	
Breakdown Voltage (0.750" ID x 1.000" OD)	Condition A		kV	--	--	--	60	65	55	65	--
	Condition D-48/50		kV	--	--	--	65	75	70	75	--
	Condition D-336/50		kV	--	--	--	--	--	--	--	--
Electric Strength (0.750" ID x 1.000" OD)	Condition A		V/mil	420	425	475	400	475	400	495	400
	Condition D-48/50		V/mil	540	440	500	380	500	380	500	350

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			RT504F	RT505	RT505F	RT507	RT507F	RT509	RT509F	
			Glass Fabric							
			Phenolic	Melamine		Silicone		Melamine		
PHYSICAL PROPERTIES										
Specific Gravity (0.750" ID x 1.000" OD)		-	1.78	1.88	1.88	1.93	1.87	1.95	1.88	
Rockwell Hardness (0.750" ID x 1.000" OD)	M Scale		120	120	120	95	100	115	120	
Moisture Absorption (0.750" ID x 1.000" OD)	Condition D ₁ -24/23	%	0.20	0.80	0.90	0.10	0.16	1.00	0.90	
Tensile Strength (0.750" ID x 1.000" OD)	Condition A	Axial	psi	45,000	37,000	26,500	23,500	--	26,500	26,500
Compressive Strength (0.750" ID x 1.000" OD)	Condition A	Axial	psi	43,000	26,500	31,250	12,000	11,000	33,500	31,250
Compressive Modulus	Condition A	Lengthwise / Crosswise	psi	1,115	1,000	600	290	295	1,000	600
THERMAL PROPERTIES										
T _g by DMA		°C	--	--	--	--	--	--	--	
Temperature Index ¹	Electrical / Mechanical	°C	180 / 160	150 / 150	150 / 150	170 / 220	170 / 220	150 / 150	150 / 150	
Flammability Rating U.L. 94	Condition A	Class	HB	V-0	V-0	V-0	V-0	V-0	V-0	
ELECTRICAL PROPERTIES										
Dissipation Factor (0.750" ID x 1.000" OD)	Condition A	-	--	--	--	--	--	--	--	
	Condition D-24/23//50	-	--	--	--	--	--	--	--	
	Condition D-48/50	-	--	--	--	--	--	--	--	
Permittivity (0.750" ID x 1.000" OD)	Condition A	-	--	--	--	--	--	--	--	
	Condition D-24/23//50	-	--	--	--	--	--	--	--	
	Condition D-48/50	-	--	--	--	--	--	--	--	
Breakdown Voltage (0.750" ID x 1.000" OD)	Condition A		--	--	--	--	--	55	70	
	Condition D-48/50	kV	--	--	--	--	--	30	40	
	Condition D-336/50		--	--	--	--	--	50	65	
Electric Strength (0.750" ID x 1.000" OD)	Condition A	V/mil	420	315	380	185	285	350	380	
	Condition D-48/50		400	315	335	120	--	340	335	

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Convolute Rolled Tube Products - Property Comparison

			RT511	RT511F	RT511H	RT511M	RT521M	RT571	
			Glass Fabric						
			Epoxy						
PHYSICAL PROPERTIES									
Specific Gravity (0.750" ID x 1.000" OD)		-	1.80	1.90	1.78	1.86	1.78	1.85	
Rockwell Hardness (0.750" ID x 1.000" OD)		M Scale	110	110	115	105	110	115	
Moisture Absorption (0.750" ID x 1.000" OD)	Condition D ₁ -24/23	%	0.14	0.07	0.10	0.14	0.05	0.07	
Tensile Strength (0.750" ID x 1.000" OD)	Condition A	Axial	psi	39,500	50,000	39,500	39,000	45,000	45,300
Compressive Strength (0.750" ID x 1.000" OD)	Condition A	Axial	psi	42,500	44,000	50,000	35,000	46,500	53,000
Compressive Modulus	Condition A	Lengthwise / Crosswise	psi	1,100	1,065	1,100	700	1,100	1,100
THERMAL PROPERTIES									
T _g by DMA		°C	≥ 170	≥ 170	≥ 170	≥ 170	--	≥ 170	
Temperature Index ¹	Electrical / Mechanical	°C	200 / 200	200 / 200	200 / 200	200 / 200	130 / 140	170 / 180	
Flammability Rating U.L. 94	Condition A	Class	HB	HB	HB	HB	HB	HB	
ELECTRICAL PROPERTIES									
Dissipation Factor (0.750" ID x 1.000" OD)	Condition A	-	0.030	0.030	--	0.030	--	--	
	Condition D-24/23/50	-	0.040	0.040	--	0.040	--	--	
	Condition D-48/50	-	--	--	--	0.045	--	--	
Permittivity (0.750" ID x 1.000" OD)	Condition A	-	4.41	4.41	--	4.41	--	--	
	Condition D-24/23/50	-	4.48	4.48	--	4.48	--	--	
	Condition D-48/50	-	--	--	--	4.66	--	--	
Breakdown Voltage (0.750" ID x 1.000" OD)	Condition A		60	65	55	55	85	65	
	Condition D-48/50	kV	65	75	60	70	--	--	
	Condition D-336/50		--	--	--	--	--	--	
Electric Strength (0.750" ID x 1.000" OD)	Condition A	V/mil	400	475	365	400	500	400	
	Condition D-48/50		380	500	--	380	600	425	

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Convolute Rolled Tube Products - Property Comparison

			RT310	RT310H	RT310S	RT315	RT342	RT342H	
			Cotton (Canvas)						
			Phenolic			Phenolic Graphite	Phenolic		
PHYSICAL PROPERTIES									
Specific Gravity (0.750" ID x 1.000" OD)		-	1.30	1.30	1.30	1.28	1.30	1.30	
Rockwell Hardness (0.750" ID x 1.000" OD)		M Scale	90	100	95	90	100	90	
Moisture Absorption (0.750" ID x 1.000" OD)	Condition D ₁ -24/23	%	2.00	1.80	1.40	2.10	1.80	1.70	
Tensile Strength (0.750" ID x 1.000" OD)	Condition A	Axial	psi	7,700	7,900	7,300	7,900	7,500	7,600
Compressive Strength (0.750" ID x 1.000" OD)	Condition A	Axial	psi	25,500	28,000	28,500	24,000	26,000	27,500
Compressive Modulus	Condition A	Lengthwise / Crosswise	psi	350	380	440	415	320	250
THERMAL PROPERTIES									
T _g by DMA		°C	--	--	--	--	--	--	
Temperature Index ¹	Electrical / Mechanical	°C	140 / 140	140 / 140	140 / 140	-- / 140	130 / 130	130 / 130	
Flammability Rating U.L. 94	Condition A	Class	HB	HB	HB	HB	HB	HB	
ELECTRICAL PROPERTIES									
Dissipation Factor (0.750" ID x 1.000" OD)	Condition A	-	--	--	--	--	--	--	
	Condition D-24/23//50	-	--	--	--	--	--	--	
	Condition D-48/50	-	--	--	--	--	--	--	
Permittivity (0.750" ID x 1.000" OD)	Condition A	-	--	--	--	--	--	--	
	Condition D-24/23//50	-	--	--	--	--	--	--	
	Condition D-48/50	-	--	--	--	--	--	--	
Breakdown Voltage (0.750" ID x 1.000" OD)	Condition A		--	--	--	--	--	--	
	Condition D-48/50	kV	--	--	--	--	--	--	
	Condition D-336/50		--	--	--	--	--	--	
Electric Strength (0.750" ID x 1.000" OD)	Condition A	V/mil	135	150	150	--	190	225	
	Condition D-48/50		--	--	--	--	--	--	

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Convolute Rolled Tube Products - Property Comparison

			RTB320	RTB320H	RTB320S	RTB320X	RTB320Z	RTB324	RTB324FR	RT325	
			Cotton (Fine Weave Linen)								
			Phenolic					Phenolic-PTFE	Phenolic-PTFE	Phenolic-Graphite	
PHYSICAL PROPERTIES											
Specific Gravity (0.750" ID x 1.000" OD)	-		1.33	1.31	1.29	1.29	1.34	1.27	--	1.30	
Rockwell Hardness (0.750" ID x 1.000" OD)	M Scale		110	105	100	100	105	100	100	90	
Moisture Absorption (0.750" ID x 1.000" OD)	Condition D ₁ -24/23	%	1.15	1.10	1.10	1.20	1.40	1.00	0.82	1.50	
Tensile Strength (0.750" ID x 1.000" OD)	Condition A	Axial	psi	10,000	9,800	9,300	10,000	11,000	8,000	8,800	10,500
Compressive Strength (0.750" ID x 1.000" OD)	Condition A	Axial	psi	30,000	31,000	28,500	30,000	33,000	22,500	26,200	23,500
Compressive Modulus	Condition A	Lengthwise / Crosswise	psi	380	400	440	425	400	--	--	--
THERMAL PROPERTIES											
T _g by DMA		°C	--	--	--	--	--	--	--	--	
Temperature Index ¹	Electrical / Mechanical	°C	135 / 135	135 / 135	135 / 135	125 / 125	125 / 125	- / 140	- / -	- / 125	
Flammability Rating U.L. 94	Condition A	Class	HB	HB	HB	HB	HB	HB	HB	HB	
ELECTRICAL PROPERTIES											
Dissipation Factor (0.750" ID x 1.000" OD)	Condition A	-	--	--	--	--	--	--	--	--	
	Condition D-24/23//50	-	--	--	--	--	--	--	--	--	
	Condition D-48/50	-	--	--	--	--	--	--	--	--	
Permittivity (0.750" ID x 1.000" OD)	Condition A	-	--	--	--	--	--	--	--	--	
	Condition D-24/23//50	-	--	--	--	--	--	--	--	--	
	Condition D-48/50	-	--	--	--	--	--	--	--	--	
Breakdown Voltage (0.750" ID x 1.000" OD)	Condition A		--	--	--	--	--	--	--	--	
	Condition D-48/50	kV	--	--	--	--	--	--	--	--	
	Condition D-336/50		--	--	--	--	--	--	--	--	
Electric Strength (0.750" ID x 1.000" OD)	Condition A	V/mil	285	275	275	190	200	175	190	--	
	Condition D-48/50		220	--	--	--	--	--	--	--	

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			RTB326	RTB326H	RTB329	RT610	RT628	RT628H	RT629	
			Cotton (Fine Weave Linen)			Paper				
			Epoxy		Melamine	Phenolic				
PHYSICAL PROPERTIES										
Specific Gravity (0.750" ID x 1.000" OD)		-	--	1.32	1.32	1.30	1.22	1.23	1.28	
Rockwell Hardness (0.750" ID x 1.000" OD)		M Scale	--	105	90	100	80	85	90	
Moisture Absorption (0.750" ID x 1.000" OD)	Condition D ₁ -24/23	%	--	0.70	3.20	1.20	1.25	1.30	1.00	
Tensile Strength (0.750" ID x 1.000" OD)	Condition A	Axial	psi	--	12,000	8,500	15,400	14,500	--	13,250
Compressive Strength (0.750" ID x 1.000" OD)	Condition A	Axial	psi	--	30,000	24,500	23,000	21,000	19,000	22,500
Compressive Modulus	Condition A	Lengthwise / Crosswise	psi	--	400	400	480	430	360	550
THERMAL PROPERTIES										
T _g by DMA		°C	--	≥ 150	--	--	--	--	--	
Temperature Index ¹	Electrical / Mechanical	°C	-- / --	140 / 140	140 / 130	140 / 140	130 / 130	130 / 130	140 / 130	
Flammability Rating U.L. 94	Condition A	Class	--	HB	V-0	HB	HB	HB	HB	
ELECTRICAL PROPERTIES										
Dissipation Factor (0.750" ID x 1.000" OD)	Condition A	-	--	--	--	--	--	--	--	
	Condition D-24/23/50	-	--	--	--	--	--	--	--	
	Condition D-48/50	-	--	--	--	--	--	--	--	
Permittivity (0.750" ID x 1.000" OD)	Condition A	-	--	--	--	--	--	--	--	
	Condition D-24/23/50	-	--	--	--	--	--	--	--	
	Condition D-48/50	-	--	--	--	--	--	--	--	
Breakdown Voltage (0.750" ID x 1.000" OD)	Condition A		--	75	--	--	--	--	--	
	Condition D-48/50	kV	--	30	--	--	--	--	--	
	Condition D-336/50		--	--	--	--	--	--	--	
Electric Strength (0.750" ID x 1.000" OD)	Condition A	V/mil	--	300	115	400	400	360	400	
	Condition D-48/50		--	280	--	--	200	330	270	

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			RT630	RT630H	RT630S	
			Paper			
			Phenolic			
PHYSICAL PROPERTIES						
Specific Gravity (0.750" ID x 1.000" OD)	-		1.31	1.33	1.28	
Rockwell Hardness (0.750" ID x 1.000" OD)	M Scale		100	110	110	
Moisture Absorption (0.750" ID x 1.000" OD)	Condition D ₁ -24/23	%	0.80	0.70	0.70	
Tensile Strength (0.750" ID x 1.000" OD)	Condition A	Axial	psi	13,500	15,500	13,000
Compressive Strength (0.750" ID x 1.000" OD)	Condition A	Axial	psi	23,500	24,000	23,000
Compressive Modulus	Condition A	Lengthwise / Crosswise	psi	415	375	440
THERMAL PROPERTIES						
T _g by DMA		°C	--	--	--	
Temperature Index ¹	Electrical / Mechanical	°C	140 / 130	140 / 130	140 / 130	
Flammability Rating U.L. 94	Condition A	Class	HB	HB	HB	
ELECTRICAL PROPERTIES						
Dissipation Factor (0.750" ID x 1.000" OD)	Condition A	-	0.013	--	--	
	Condition D-24/23//50	-	--	--	--	
	Condition D-48/50	-	--	--	--	
Permittivity (0.750" ID x 1.000" OD)	Condition A	-	4.28	--	--	
	Condition D-24/23//50	-	--	--	--	
	Condition D-48/50	-	--	--	--	
Breakdown Voltage (0.750" ID x 1.000" OD)	Condition A		60	80	80	
	Condition D-48/50	kV	23	29	23	
	Condition D-336/50		--	--	--	
Electric Strength (0.750" ID x 1.000" OD)	Condition A	V/mil	450	500	450	
	Condition D-48/50		265	350	380	

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