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Dielectric Strength

The following is a summary of all dielectric breakdown data on Garlock sheet materials. Data is shown, where available, from both outside lab tests at US Testing and in house. Where style was tested more than once, the more recent data is shown. Tests at US Testing are performed in an insulating oil bath, which keeps the voltage from arcing through the air and around the gasket, and is the normal method for gaskets with high dielectric. We do not have that capability. Some results are, therefore, lower than the actual dielectric since the electricity did not pass through the sample. Voltage rate of rise is 500 volts/second with 2" diameter electrodes (except where noted). Voltage is AC.

The dielectric for gaskets tests after 96 hours at 100% relative humidity is considerably lower than tests done on dry samples. Styles 3565, 3504, and 3545 held up best against this loss of dielectric.

The ASTM D149 test method advises that test results for electrical properties be used as a guide when selecting a material for a particular service, and that the end user perform tests on the materials in the actual service to verify proper performance.

All dielectric values given are expressed in **volts/mil**.

Styles shown in **RED** have been cancelled.

Compressed Sheet Styles

<u>Style</u>	<u>Date</u>	<u>Thickness (inches)</u>	<u>US Testing¹ Oil Bath</u>	<u>Garlock 3 / 250°F</u>	<u>Garlock Unconditioned</u>	<u>Garlock 96 / 100% RH</u>
660	4-03	1/16			18	
681	4-03	1/8			21	
700	4-06, 5-07	1/32		597		<2
700	4-06, 5-07	1/8		290		<2
706	8-93	1/16		133		25
706	8-93	1/8		142		25
2400	12-03	1/32		500		
2400	12-03	1/16		475+		
2400	12-03	1/8		298+		
2550	7-00	1/32		589		
2550	7-00	1/16		492		
2550	7-00	1/8		285+		
2900	3-02	1/16		342+		26
2900	3-02	1/8		254 ³		28

<u>Style</u>	<u>Date</u>	<u>Thickness (inches)</u>	<u>US Testing¹ Oil Bath</u>	<u>Garlock 3 / 250°F</u>	<u>Garlock Unconditioned</u>	<u>Garlock 96 / 100% RH</u>
2910	5-94	1/32		625+		
2910	5-94	1/16		375+		
2920	5-94	1/32		678+		
2920	5-94	1/16		442+		
2950	7-04	1/8			294	
3000	8-87	1/16		832		
3000	11-93	1/16		450+		
3000	3-94	1/16		396+		271
3000	9-80	1/8		363		
3000	3-94	1/8		257+		142
3200	8-87	1/16		508		
3200	3-94	1/16		427+		116
3200	3-94	1/8		285+		140
3300	8-87	1/16		517		
3300	3-94	1/16		392+		78
3300	3-94	1/8		269+		73
3400	8-87	1/16		630		
3400	3-94	1/16		405+		101
3400	3-94	1/8		287+		58
3400	9-01	1/8		422		
3700	8-87	1/16		620		
3700	3-94	1/16		451+		134
3700	3-94	1/8		291+		71
3750	3-03	1/16		496		
3750	3-03	1/8		285		
3760	4-06	1/32		607		
3760	4-06, 11-07	1/16		385+		<10
3760	11-07	1/8				<10
CP-3900	12-94	1/16		209		
CP-3900	12-94	1/8		203		
CP-3920	12-94	1/16		333		
CP-3920	12-94	1/8		269		
5500	12-94	1/16		284		
5500	12-94	1/8		245		

<u>Style</u>	<u>Date</u>	<u>Thickness (inches)</u>	<u>US Testing¹ Oil Bath</u>	<u>Garlock 3 / 250°F</u>	<u>Garlock Unconditioned</u>	<u>Garlock 96 / 100% RH</u>
5507	12-94	1/16		396+		
9800	2-88	1/16	N/A ²			
9850	3-93	1/16			<2	
9900	3-93	1/16			<2	

GYLON and PTFE Styles

<u>Style</u>	<u>Date</u>	<u>Thickness (inches)</u>	<u>US Testing¹ Oil Bath</u>	<u>Garlock 3 / 250°F</u>	<u>Garlock Unconditioned</u>	<u>Garlock 96 / 100% RH</u>
3500	10-91	1/16	375			
3500	3-94	1/16		362		61
3500	9-80	1/8	327			
3504	10-91	1/16	310			
3504	3-94	1/16		318		245
3504	9-80	1/8	281			
3510	5-83	1/16	577			
3510	10-91	1/16	510			
3510	3-94	1/16		466+		59
3529	10-91	1/16	639			
3530	3-93	1/16			<2	
3540	3-94	1/16		86		16
3540	3-94	1/8		61		
3545	5-95	1/16		248		222
3545	5-95	1/8		244		264
3561	Unknown	1/16	449			
3565	3-94	1/16		301		221
3575	12-07	1/16		250		
3570	10-92	1/16			82	
3591	6-03	1/16			445	
3594	1-03	1/16			357	

Tephonic	7-06	1/8		120 ⁴
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Graph-Lock Styles

<u>Style</u>	<u>Date</u>	<u>Thickness (inches)</u>	<u>US Testing¹ Oil Bath</u>	<u>Garlock 3 / 250°F</u>	<u>Garlock Unconditioned</u>	<u>Garlock 96 / 100% RH</u>
3123	2-88	1/16	NA ²			

Rubber Styles³

<u>Style</u>	<u>Date</u>	<u>Thickness (inches)</u>	<u>US Testing¹ Oil Bath</u>	<u>Garlock 3 / 250°F</u>	<u>Garlock Unconditioned</u>	<u>Garlock 96 / 100% RH</u>
22	10-92	1/8			280	
7986	3-94	1/8			118	
8312	10-92	1/8			148	
8314	10-92	1/8			4	
8452	10-92	1/8			7	
8459	10-92	1/16			7	
8639	8-87	1/16			NA ²	
9075	3-94	1/8			108	
9122	10-09	1/8			4	
9518	4-07	1/8			66	
98206	10-09	1/8			NA ²	

STRESS SAVER 370	11-15	1/8			232	
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STRESS SAVER XP	4-09	1/8			104	
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Cloth-Inserted Rubber Styles³

<u>Style</u>	<u>Date</u>	<u>Thickness (inches)</u>	<u>US Testing¹ Oil Bath</u>	<u>Garlock 3 / 250°F</u>	<u>Garlock Unconditioned</u>	<u>Garlock 96 / 100% RH</u>
19	6-94	1/8			31	
159	6-94	1/8			34	
8798	2-93	1/8			128	
8798	2-93	1/8			128	
9200	2-04	1/8			8	

Conditioned 3 hr./250°F, Cooled 1 hr./Dessicator, 1/4" Electrodes

3500	3-94	1/16		424		
3504	3-94	1/16		425		
3510	3-94	1/16		569+		

The 1/4" electrodes were used since they are the recommended size for PTFE products. The results were higher with these electrodes than with the 2" electrodes. This may not be significant,

however, since these tests resulted in voltage discharges through the air and around the sample. The distance the arc has to travel is longer when using 1/4" electrodes. Testing in an oil bath may negate this difference

+ Indicates current arced around & not through gasket. Dielectric higher than indicated.

Notes:

1. Conditioning unknown.
2. No measurable voltage build up. Dielectric extremely low.
3. Values for elastomer (rubber) styles may change when alternate fillers are used, such as alternate types of carbon black. Values should be verified before use.
4. Gasket was pressed for 3 seconds at 350°F. This value was derived from the uncompressed voltage and the compressed thickness- conservative measurement.