



# Properties of PFA and FEP Insulation

## General Properties of Neoflon, FEP and PFA

	Neoflon/ FEP	Neoflon/ PFA
Chemical Resistance: hydrocarbons, ethylene glycol, battery acid, brake fluids, other chemicals	NO EFFECT	NO EFFECT
Resistance to weathering	NO EFFECT	NO EFFECT
Water absorption (ASTM D570)	0.1%	0.1%
Flammability (UL 83, Vertical Wire Flame Test)*	NO AFTER BURN	NO AFTER BURN
Melting Point °F	518°F	590°F
Melting Point °C	270°C	300°C
Upper Service Temperature °C (°F) 1500 to 2000 hrs. estimated 20,000 hrs. Cold bend @ -65°C 2.5 K V for 5 min.	200°C (392°F) 177°C (350°F) PASS	288°C (550°F) 260°C (500°F) PASS
Specific gravity	2.15	2.15

The combination of chemical and physical properties of FEP, PFA and Neoflon is a result of its true fluorocarbon structure. This unusual structure leads to a material which has an almost universal chemical inertness; complete insolubility in all known solvents below 300°C (572°F); excellent thermal stability; and unsurpassed electrical properties including low dielectric loss, low dielectric constant and high dielectric strength. Furthermore, FEP, PFA and Neoflon does not embrittle at very low temperatures.

## Mechanical and Electrical Properties

	Neoflon/ FEP	Neoflon/ PFA
Tensile strength, psi 23°C (73°F) ASTM D638	3,000	4,000
Elongation, % 23°C (73°F) ASTM D638	300	300
Flexural modulus, psi 23°C (73°F) ASTM D790	95,000	95,000
Flex life, MIT (7 to 9 mils) 82°C (180°F) Flexes	100,000	200,000
Impact Strength, ft.lb/in.: ASTM D256 Room temperature	NO BREAK	NO BREAK
-54°C (-65°F)	10	10
Coefficient of friction, 10 fpm, 100 psi	0.3	0.2
Dynamic cut-through (lb) Instron 1/16" radius blade moving at 0.2"/min. (0.0031" insulation thickness) 23°C	118	
75°C	73	
Dielectric constant, ASTM D50	2.1	2.1
Volume resistivity, ohm-cm ASTM D257	10 <sup>18</sup>	10 <sup>18</sup>
Dissipation Factor, ASTM D150, 10 <sup>2</sup> - 10 <sup>6</sup> Hz	0.001	0.0004

**AVAILABLE  
IN PRE-  
SPOOLED  
LENGTHS**

## Resistance vs. Wire Diameter [Resistance in ohms per double foot @ 20°C (68°F)]

AWG No.	Diameter		Type K†† CHROMEQA <sup>®</sup> / ALOMEGA <sup>®</sup>	Type J Iron/ Constantan	Type T Copper/ Constantan	Type E CHROMEQA <sup>®</sup> / Constantan	Type S Pt/ Pt10%Rh	Type R Pt/ Pt13%Rh	Type RX/SX Copper Alloy11**	Type C† W5%Re/ W26%Re	Type CX Alloy 405/ Alloy 426	Type G† W/ W26%Re	Type D† W3%Re/ W25%Re	Type BX Copper/ Copper*
	inches	mm												
6	0.162	4.11	0.023	0.014	0.012	0.027	0.007	0.007	0.003	0.009	0.014	0.008	0.009	0.000790
8	0.128	3.25	0.037	0.022	0.019	0.044	0.011	0.011	0.004	0.015	0.023	0.012	0.015	0.001256
10	0.102	2.59	0.058	0.034	0.029	0.069	0.018	0.018	0.007	0.023	0.037	0.020	0.022	0.001998
12	0.081	2.06	0.091	0.054	0.046	0.109	0.028	0.029	0.011	0.037	0.058	0.031	0.035	0.003318
14	0.064	1.63	0.146	0.087	0.074	0.175	0.045	0.047	0.018	0.058	0.093	0.049	0.055	0.00505
16	0.051	1.30	0.230	0.137	0.117	0.276	0.071	0.073	0.028	0.092	0.146	0.078	0.088	0.00803
18	0.040	1.02	0.374	0.222	0.190	0.448	0.116	0.119	0.045	0.148	0.238	0.126	0.138	0.01277
20	0.032	0.81	0.586	0.357	0.298	0.707	0.185	0.190	0.071	0.235	0.371	0.200	0.220	0.02030
24	0.0201	0.51	1.490	0.878	0.7526	1.78	0.464	0.478	0.180	0.594	0.941	0.560	0.560	0.05134
26	0.0159	0.40	2.381	1.405	1.204	2.836	0.740	0.760	0.288	0.945	1.503	0.803	0.890	0.08162
30	0.0100	0.25	5.984	3.551	3.043	7.169	1.85	1.91	0.727	2.38	3.800	2.03	2.26	0.2064
32	0.0080	0.20	9.524	5.599	4.758	11.31	1.96	3.04	1.136	3.8	5.94	3.22	3.60	0.3282
34	0.0063	0.16	15.17	8.946	7.66	18.09	4.66	4.82	1.832	6.04	9.57	5.10	5.70	0.5218
36	0.0050	0.13	24.08	14.20	12.17	28.76	7.40	7.64	2.908	9.6	15.20	8.16	9.10	0.8296
38	0.0039	0.10	38.20	23.35	19.99	45.41	11.6	11.95	4.780	15.3	24.98	12.9	15.3	1.3192
40	0.00315	0.08	60.88	37.01	31.64	73.57	18.6	19.3	7.327	24.4	38.30	20.6	23.0	2.098
44	0.0020	0.051	149.6	88.78	76.09	179.20	74.0	76.5	18.18	60.2	95.00	51.1	56.9	5.134
50	0.0010	0.025	598.4	355.1	304.3	716.9	185	191	72.7	240	380.0	204	227	20.64
56	0.00049	0.012	2408	1420	1217	2816	740	764	302.8	1000	1583	850	945	86.38

\* Increase the resistance by 19% for nickel plated, Type RTD wire.  
† Not ANSI symbol.

\*\* Maximum Resistance of reviewed wire.  
†† Resistivity for N is 1.324 times Type K values.



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