

MIL-I-631D
INTERIM AMENDMENT - II (SHIPS)
6 November 1962

SUPERSEDING
INTERIM AMENDMENT - I (SHIPS)
9 March 1962

MILITARY SPECIFICATION

INSULATION, ELECTRICAL, SYNTHETIC-RESIN
COMPOSITION, NONRIGID

(This interim amendment forms a part of Military Specification MIL-I-631D dated 15 November 1961. It was developed by the Department of the Navy, Bureau of Ships, for immediate use pending the inclusion of its contents in a coordinated document.)

Page 2, paragraph 2.2: Delete reference to "D150" and "D876" and substitute:

"D150 - Methods of Test for A-C Capacitance, Dielectric Constant and Loss Characteristics of Electrical Insulating Materials.
"D876 - Methods of Testing Nonrigid Vinyl Chloride Polymer Tubing."

Page 3, paragraph 3.1.1.1, first sentence: Delete and substitute "Film is defined as material with a thickness of 0.010 inch or less, in widths greater than 3 inches."

Page 4, table I, column 9: For dielectric strength, delete "3,500" through "85" inclusive and substitute "3,500", "3,200", "3,000", "80", "80", and "85". For elongation, insert "50" between "50" and "35".

Pages 5 and 6, table II: Delete and substitute:

FSC 5970

"Table II. —Property values of synthetic-resin electrical insulation—forms S and T (greater than 0.002 inch in thickness).

Property to be tested	Test reference	Conditioning procedure (see 4.4)	Unit of value	Nominal thickness	Value required for each type of material							
					A	B	C	D	E	F Grade a	G	
Dielectric strength ^{1/}	4.6.2	C-96/23/0	Volts per mil (minimum)	Inch	0.003	3,100	1,900	1,900	2,600	1,200	.....	2,450
					0.005	2,400	1,550	1,550	2,150	1,070	.....	2,000
					0.0075	.....	.....	.....	.....	.....	.....	1,600
					0.008	1,800	1,300	1,250	1,800	960	1,045	.....
					0.010	1,600	1,200	1,150	1,550	920	.....	1,500
					0.012	.....	.....	.....	.....	.....	950	.....
					0.014	.....	.....	.....	.....	.....	.....	1,400
					0.016	1,300	1,000	950	1,200	940	820	.....
					0.020	1,100	900	840	1,050	790	700	.....
					0.025	960	820	760	920	740	630	.....
					0.030	870	760	700	830	700	570	.....
					0.040	740	640	620	700	600	480	.....
					0.050	660	550	550	610	530	430	.....
0.060	600	490	490	540	450	400	.....				
Dielectric strength ^{1/}		C-96/23/96	Percent of dry value obtained on test (min.)	All thicknesses	75	85	75	55	90	90	90	
Dielectric strength ^{1/}		C-96/23/96	Percent of dry value obtained on test (min.)	Inch	0.003	.....	.....	.....	.....	.....	85	
					0.005	.....	.....	.....	.....	.....	90	
					0.0075	.....	.....	.....	.....	.....	90	
					0.010	.....	.....	.....	.....	.....	90	
					0.014	.....	.....	.....	.....	.....	90	
Dissipation factor (form S only)	4.6.3	C-96/23/0	Maximum	.....	Natural colors	Other colors	0.02	0.035	0.015	0.08	0.14	0.006
		C-96/23/96	Maximum	.....	{ 0.0006 }	{ 0.0025 }	0.03	0.070	0.03	0.08	0.16	0.0065
		C-96/23/0	Maximum	.....	{ 0.0008 }	{ 0.0040 }	0.045	0.05	0.028	.....	.....	0.020
		C-96/23/96	Maximum	.....	{ 0.0006 }	{ 0.0025 }	0.055	0.07	0.045	.....	.....	0.025

^{1/}For thickness not shown, the dielectric strength shall be that given for the nearest thickness shown. "

"Table II. - Property values of synthetic-resin electrical insulation-forms S and T
(greater than 0.002 inch in thickness) (cont'd)

Property to be tested	Test reference	Conditioning procedure (see 4.4)	Unit of value	Nominal thickness	Value required for each type of material							
					A	B	C	D	E	F Grade a	G	
Dielectric constant (form S only) At 1 kilocycle At 1 megacycle	4.6.3	C-96/23/0 C-96/23/96 C-96/23/0 C-96/23/96	Maximum Maximum	Natural colors	Other colors	4.0 5.0 4.0 5.0	4.5 8.7 4.3 7.0	4.0 5.0 4.0 5.0	5.0 6.0	7.0 8.0	3.5 3.7 3.3 3.5
					{2.5} {2.7} {2.5}	{2.5} {2.7} {2.5}						
Volume resistivity (form S only)	4.6.4.1	C-96/23/0 C-96/23/96	{Ohm-centi- meters (min.)}	.....	10 ¹⁷ 10 ¹⁶ 10	10 ¹³ 10 ¹² 10	10 ¹³ 10 ¹⁰ 10	10 ¹⁴ 10 ¹² 12	10 ¹³ 10 ¹² 10	10 ¹¹ 10 ¹⁰ 10	10 ¹⁵ 10 ¹⁵ 10
Tensile strength	4.6.5.1	C-96/23/50	P. s. i. (min.)	.....	1,400	5,000	6,000	3,500	3,500	1,800	17,000 16,000
Elongation	4.6.5.1	C-96/23/50 C-96/23/50 E-400/100	Percent (min.) Percent (max.) Percent change (max.)	.010 .014 .014	350	25	10	25	15	200	80 100	
					..... ..... .....	100	50	100	100	450	.....
Elongation		E-400/130	Percent change (max.)	.....	.....	.....	.....	.....	.....	25 25 30	
Percent return	4.6.5.2	C-96/23/50	Percent (min.)	.....	.....	.....	.....	.....	80	.....	
Softening temperature (penetration)	4.6.7	C-96/23/50	Degrees centigrade (min.)	.....	65	120	160	110	120	75	200
Lengthwise shrinkage	4.6.8	E-2/100 E-2/150	Percent (max.) Percent (max.)	2.0	3.0	3.0	2.0	5.0	10.0 5.0	
					

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Page 10, table IV, column 2: Opposite ".0015" insert ".0004".

Page 10, table V: Opposite ".010" insert ".0016" under type G. Between ".012" and ".016" insert ".014" under nominal thickness and ".0020" under type G.

Page 11, table VII: Delete and substitute:

"Table VII - Tubing lengths.

Nominal inside diameter	Minimum length
Inch	Feet
0.022 - 0.027	1,200
.034 - .059	1,000
.066 - .166	500
.186 - .330	200
.360 - .600	100
.600 and over	50

Page 14, paragraph 4.3.1: Delete and substitute:

"4.3.1 Samples. - Separate samples for each type, form, and subform of material for which approval is requested shall be furnished in sizes and quantities shown in table X (see 4.3.2.2). Qualification for forms U_a and U_b may be obtained separately because of the large number of sizes in these subforms. The same applies to both subforms (T_f and T_g) under form T. If all of the thicknesses or sizes shown in table X are not tested, the qualification will apply only to the thickness or size tested."

Preparing activity:
Navy - Ships
(Project 5970-N043Sh)