

MIL-I-631D
AMENDMENT - 3
19 July 1963
SUPERSEDING
INTERIM AMENDMENT - II (SHIPS)
6 November 1962

MILITARY SPECIFICATION
INSULATION, ELECTRICAL, SYNTHETIC-RESIN
COMPOSITION, NONRIGID

This amendment forms a part of Military Specification MIL-I-631D, 15 November 1961, and has been approved by the Department of Defense and is mandatory for use by the Departments of the Army, the Navy and the Air Force.

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 3.3.1.1, 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, title: Delete "0.002" and substitute "0.010".

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 0.010 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 constant (form S only) At 1 kilo-cycle At 1 mega-cycle	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	{2.5}	4.0	4.5	4.0	5.0	7.0	3.5
						{2.7}	{2.5}	5.0	8.7	5.0	8.0	3.7
Volume resistivity (form S only)	4.6.4.1	{C-96/23/0} {C-96/23/96}	{Ohm-centi-meters (min.)}	1017 1016	1013	1013	1014	1013	1013	1011	1015
						1012	1010	1212	1012	1010	1010	1015
Tensile strength	4.6.5.1	C-96/23/50	P.s.i. (min.)	..... .014	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	
						.....	50	100	.....	450	100
Elongation		E-400/130	Percent change (max.)	..... .010 .014	..... ..... ..... .....	..... ..... ..... .....	..... ..... ..... .....	..... ..... ..... .....	..... ..... ..... .....	..... ..... ..... .....	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

"Table II - Property values of synthetic-resin electrical insulation—forms S and T
(greater than 0.010 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	
Lengthwise shrinkage	4.6.8	E-2/100 E-2/150	Percent (max.)	.....	2.0	3.0	3.0	2.0	2.0	5.0	10.0	.....
			Percent (max.)
Dielectric strength ^{1/}	4.6.2	C-96/23/0	Volts per mil (minimum)	Inch	.....	.....	.....	.....	.....	.....	.....	.....
					0.003	1,900	1,900	2,600	1,200	.....	.....	2,450
					.005	1,550	1,550	2,150	1,070	.....	.....	2,000
					.0075	.....	.....	.....	.....	.....	.....	1,600
					.008	1,300	1,250	1,800	960	.....	.....	.....
					.010	1,200	1,150	1,550	920	.....	.....	.....
					.012	.....	.....	.....	.....	.....	.....	.....
					.014	.....	.....	.....	.....	.....	.....	.....
					.016	1,000	950	1,200	940	.....	.....	.....
					.020	1,100	840	1,050	790	.....	.....	.....
					.025	960	760	920	740	.....	.....	.....
					.030	870	760	830	700	.....	.....	.....
					.040	740	640	700	600	.....	.....	.....
.050	660	550	610	530	.....	.....	.....		
.060	600	490	540	450	.....	.....	.....		
Dielectric strength ^{1/}		C-96/23/96	Percent of dry value obtained on test (min.)	All thicknesses	75	85	75	55	90	90	.....
Dielectric strength ^{1/}		C-96/23/96	Percent of dry value obtained on test (min.)	Inch	.....	.....	.....	.....	.....	.....	.....	85
					0.003	.....	.....	.....	.....	.....	.....	90
					.005	.....	.....	.....	.....	.....	.....	90
					.0075	.....	.....	.....	.....	.....	.....	90
												90
												90

^{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 0.010 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		
Dissipation factor (form S only) At 1 kilo-cycle At 1 mega-cycle	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	{ 0.0006 } { .0008 } { .0006 } { .0008 }	{ 0.0025 } { .0040 } { .0025 } { .0040 }	0.02	0.035	0.015	0.08	0.14	0.006
								.03	.070	.03	.08	.16	.0065
								.045	.05	.028	.....	.....	.....
								.055	.07	.045	.....	.....	.....

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
.086 - .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."

Custodians:
Army - EL
Navy - Ships
Air Force - SGEES

Preparing activity:
Navy - Ships
(Project 5970-0122)