

IEEE Std 45-1998
(Revision of IEEE Std 45-1983)

Corrections to **IEEE Recommended Practice for** **Electrical Installations on Shipboard**

Sponsor
IEEE Industry Applications Society

Correction Sheet

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The following corrections need to be made:

Page 4: Clause 2 should include the following reference:

NEMA WC 57-1995 (REV-1 1997), Standard for Control Cables (ICEA S-73-532).

Page 5: In Clause 2, the following reference is a UL standard only (it is not an approved ANSI standard):

UL 1309-1995, Standard for Safety Marine Shipboard Cable.

Page 55: The numbering of the conditions at the bottom of the table in subclause 7.1 has been changed. The word *Exception* has also been added. The table should now read as follows:

Working clearances			
Nominal voltage to ground	Condition	Clearance	Reduced clearance in way of stiffeners and frames
0-150	1	0.91 m (3 ft)	0.61 m (2 ft)
0-150	2	0.91 m (3 ft)	0.76 m (2.5 ft)
0-150	3	0.91 m (3 ft)	0.91 m (3 ft)
151-600	1	0.91 m (3 ft)	0.76 m (2.5 ft)
151-600	2	1.07 m (3.5 ft)	0.91 m (3 ft)
151-600	3	1.22 m (4 ft)	1.07 m (3.5 ft)
601-2500	1	0.91 m (3 ft)	0.76 m (2.5 ft)
601-2500	2	1.22 m (4 ft)	1.07 m (3.5 ft)
601-2500	3	1.52 m (5 ft)	1.22 m (4 ft)
2501-9000	1	1.22 m (4 ft)	1.07 m (3.5 ft)
2501-9000	2	1.52 m (5 ft)	1.22 m (4 ft)
2501-9000	3	1.82 m (6 ft)	1.52 m (5 ft)
9001-25 000	1	1.52 m (5 ft)	1.22 m (4 ft)
9001-25 000	2	1.82 m (6 ft)	1.52 m (5 ft)
9001-25 000	3	2.74 m (9 ft)	1.82 m (6 ft)
25001-35 000	1	1.82 m (6 ft)	1.52 m (5 ft)
25001-35 000	2	2.44 m (8 ft)	1.82 m (6 ft)
2501-35 000	3	3.05 m (10 ft)	2.44 m (8 ft)

Where the "conditions" are as follows:

- 1) Exposed live parts on one side and no live or grounded parts on the other side of the working space, or exposed live parts on both sides effectively guarded by suitable insulating materials. Insulated wire or insulated busbars operating at not over 300 V shall not be considered live parts.
- 2) Exposed live parts on one side and grounded parts on the other side.
- 3) Exposed live parts on both sides of the work space (not guarded as in condition 1) with the operator between.

Exception: Working space shall not be required in back of assemblies such as dead front switchboards where there are no renewable or adjustable parts such as fuses or switches on the back and where all connections are accessible from locations other than the back.

Page 75: In the last sentence of subclause 8.1.3, change "flexible stranded conductors" to *extra flexible stranded conductors*. Delete the words *or portable cables*. Also, delete the word respectively at the end of subclause 8.1.3. The subclause should now read as follows:

8.1.3 Stranding

The construction requirements and nominal resistances of standard Class B concentric conductors may be found in Table 8-1. Combination stranded, compressed stranded to a reduction in diameter of 3% maximum of concentric stranded conductors, or flexible rope stranded conductors may be substituted for concentric stranded conductors. The construction requirements of extra flexible stranded conductors for portable cords (see 9.6.1) should conform to ANSI/UL 62-1991 or Table 8-2.

Page 79: The subclause references for *Flammability* and *Cable immersion in oil* in the table in subclause 8.13 have been corrected. The table should now read as follows:

Test to be performed	Test categories		
	Type test (TT)	Production sample test (PST)	Routine test (RT)
Insulation (Tables 8-3, 8-4, and 8-5)	X	X	—
Jacket (Tables 8-9 and 8-10)	X	X	—
Dimensional tolerance (8.12)	X	X	—
High voltage (8.13.1)	—	X	X
Conductor resistance (8.13.2)	—	—	X
Insulation resistance (8.13.3)	—	—	X
Flammability (8.13.4)	X	X (b1)	—
Ease of stripping (8.13.5)	—	X	—
Salt-water immersion (8.13.6)	X	—	—
Cable immersion in oil (8.13.7)	X	—	—
Pull-through metal plates (8.13.8)	X	—	—
Bending endurance (8.13.9)	X	—	—

Page 83: The heading for subclause 8.14 should read: IEEE cable types T, T/N, E, X, LSE, LSX, P, and S.

Page 99: The LSE for the insulation resistance constant (column 2, row 1) of Table 8-4 has been corrected to read 10 000 rather than 2000. The table now should read as follows:

Table 8-4—Insulation, electrical, and physical requirements types LSX and LSE

Insulation material	Low-smoke ethylene propylene rubber	Low-smoke cross-linked polyethylene
Insulation-type designation	LSE	LSX
Voltage rating	0–600 V	
Insulation resistance constant (K) at 15.6 °C, min.	10 000	10 000
Physical requirements:		
Unaged		
Tensile strength, min. PSI	1200	1500
Elongation at rupture, min., %	150	150
Aging requirements		
After air oven test		
@ °C	121	121
Hours	168	168
Tensile strength		
Percent of unaged, min.	75	80
Elongation at rupture		
min., % of unaged value	75	80
Heat distortion, 121 °C		
max., % of unaged value		
4/0 AWG & smaller	30	30
Larger than 4/0 AWG	10	10
Cold bend, –30 °C (–22 °F)	No cracks	No cracks
Acid gas equivalent ^a		
Percent, max.	5	2
Smoke Index, max. ^b	45	25
Toxicity Index, max.	1.5	1.5
Hot creep test		
Per ICEA T-28-562		
Temperature of air oven	150 °C ± 2 °C	
Hot creep elongation, max.	50%	50%
Hot creep set, max.	5%	5%
VW-1 flame test ^c	pass	pass
NEMA test procedure reference	NEMA WC 8	NEMA WC 7

^aFor test procedures refer to MIL-C-24643A.

^bFor test procedures refer to NES 711 and MIL-C-24643, which should be used in conjunction with ASTM E662-97.

^cFor test procedures, refer to ANSI/UL 1581-1991.

Page 103: The thermosetting neoprene column (column 4) has been corrected in four places and table footnotes d and e have been corrected in Table 8-9. The table should now read as follows:

Table 8-9—Jacket properties; types T, CP, and N

Jacket material	Thermoplastic polyvinyl chloride	Thermosetting chlorosulfonated polyethylene	Thermosetting neoprene
Jacket-Type			
Designation	T ^a	CP ^b	N ^c
Physical requirements			
Unaged:			
Tensile strength, min, lb/in ²	1500	1800	1800
Elongation at rupture, min., %	100	300	300
Set, max., %	—	30	20
Aging requirements: After air oven at			
°C	100 ± 1	100 ± 1	100 ± 1
hours	120	168	168
Tensile strength % of unaged, min.	85	85	50
Elongation at rupture, % of unaged, min.	60	65	50
After oil immersion			
at °C	70 ± 1	121 ± 1	121 ± 1
hours	4	18	18
Tensile strength % of unaged, min.	80	60	60
Elongation at rupture, % of unaged, min.	60	60	60
Heat distortion			
121 °C ± 1, max %	50	—	—
Heat shock, 121°C±/-1	No cracks	—	—
Cold Bend, no cracks, °C ^d	-25	-40	-40
Cold Impact, °C ^d	—	-35	-35
Mechanical water absorption, mg/in ²	25	100	130
Weatherometer test ^e	Pass	Pass	Pass
Tear—lb/in thickness, min ^f	35	35	35

^aFor test procedures, refer to NEMA WC 5-1992.

^bFor test procedures, refer to NEMA WC 3-1992.

^cFor test procedures, refer to NEMA WC 8-1988.

^dFor test procedures, refer to CSA C22.2 No. 38-1995, clause 6.4.15. Cables intended for arctic or severe cold application should be capable of passing both cold bend at -40 °C and cold impact at -40 °C.

^eFor test procedures, refer to ANSI/UL 62 or ANSI/ASTM G23-96, type D.

^fFor test procedures, refer to ANSI/ASTM D470-93.