

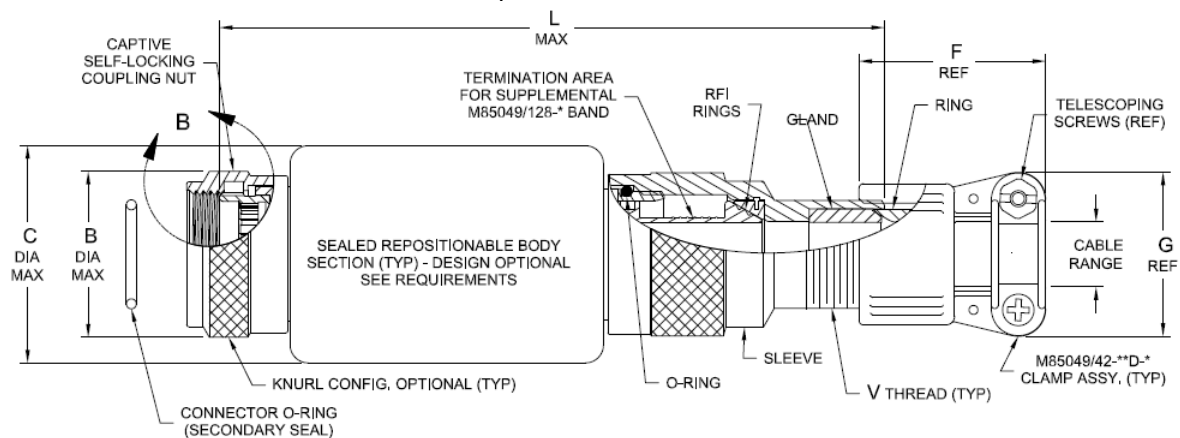
INCH-POUND
MIL-DTL-28840/31
w/AMENDMENT 1
1 September 2026
SUPERSEDING
MIL-DTL-28840/31
16 January 2023

DETAIL SPECIFICATION SHEET

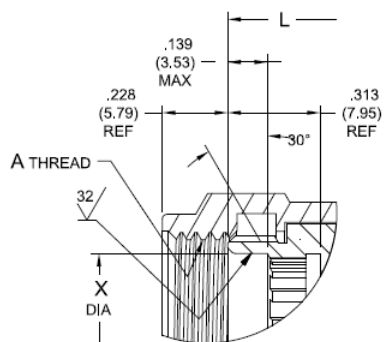
CONNECTORS, ELECTRICAL, CIRCULAR, THREADED, HIGH SHOCK, HIGH DENSITY, SHIPBOARD, BACKSHELL, SELF-LOCKING, REPOSITIONABLE TO STRAIGHT, 45 DEGREE AND 90 DEGREE, CABLE SEALING AND SHIELD TERMINATION

This specification is approved for use by all Departments and Agencies of the Department of Defense.

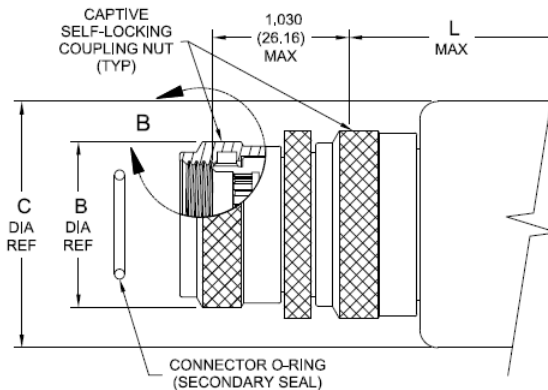
The requirements for acquiring the product described herein shall consist of this specification sheet and MIL-DTL-28840.



STYLE 1
STRAIGHT ORIENTATION



DETAIL B



STYLE 2
STRAIGHT ORIENTATION
OVERSIZE CABLE ACCOMMODATION

FIGURE 1. Dimensions and configuration.



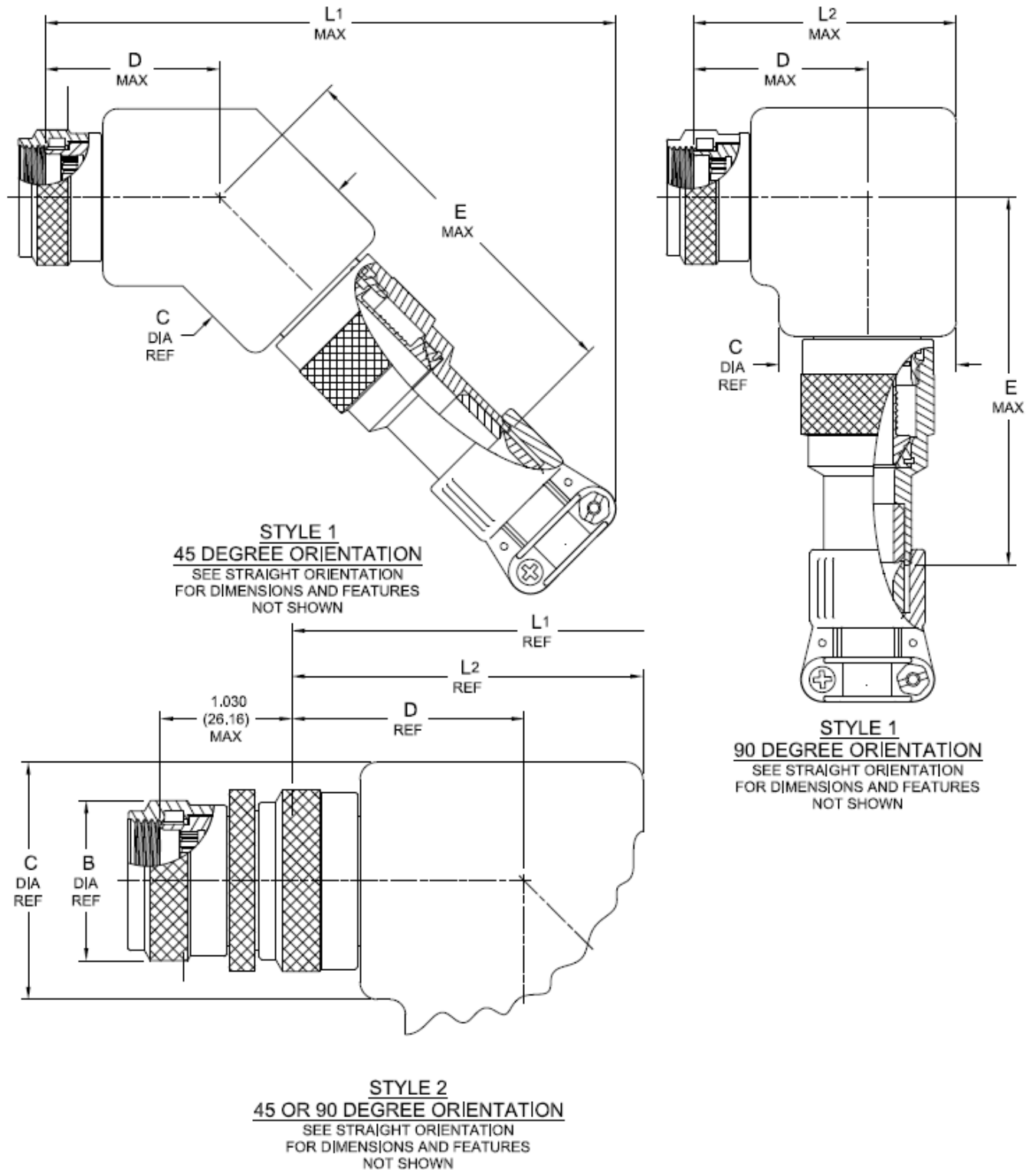


FIGURE 1. Dimensions and configuration – Continued.

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Dash Number	Shell Size Designator (see note 1)	A THREAD CLASS 2B	Clamp Size (REF)	Cable Range		Style 1 or 2	B DIA MAX	C DIA MAX	X DIA $\pm .005$ (± 0.13)	O-ring size REF
				MIN	MAX					
01	A (11)	.750-20 UNEF	4	0.188 (4.77)	0.312 (7.92)	1	1.058 (26.87)	1.429 (36.30)	0.636 (16.15)	2-014
02			6	0.281 (7.14)	0.357 (9.07)	1		1.429 (36.30)		
03			6	0.281 (7.14)	0.438 (11.13)	2		1.564 (39.73)		
04			8	0.344 (8.74)	0.562 (14.27)	2		1.709 (43.41)		
05	B (13)	.875-20 UNEF	4	0.188 (4.77)	0.312 (7.92)	1	1.180 (29.97)	1.564 (39.73)	0.751 (19.08)	2-016
06			6	0.281 (7.14)	0.438 (11.13)	1		1.564 (39.73)		
07			8	0.344 (8.74)	0.492 (12.50)	1		1.564 (39.73)		
08			10	0.375 (9.53)	0.625 (15.88)	2		1.709 (43.41)		
09	C (15)	1.00-20 UNEF	4	0.188 (4.77)	0.312 (7.92)	1	1.308 (33.22)	1.709 (43.41)	0.886 (22.50)	2-018
10			6	0.281 (7.14)	0.438 (11.13)	1		1.709 (43.41)		
11			10	0.375 (9.53)	0.625 (15.88)	1		1.709 (43.41)		
12			12	0.500 (12.70)	0.750 (19.05)	2		1.938 (49.23)		
13	D (17)	1.125-18 UNEF	10	0.375 (9.53)	0.625 (15.88)	1	1.430 (36.32)	1.806 (45.87)	0.993 (25.22)	2-020
14			12	0.500 (12.70)	0.734 (18.64)	1		1.806 (45.87)		
15			16	0.625 (15.88)	0.938 (23.83)	2		2.135 (54.23)		
16	E (19)	1.250-18 UNEF	10	0.375 (9.53)	0.625 (15.88)	1	1.560 (39.62)	1.938 (49.23)	1.128 (28.65)	2-022
17			12	0.500 (12.70)	0.750 (19.05)	1		1.938 (49.23)		
18			16	0.625 (15.88)	0.938 (23.83)	2		2.135 (54.23)		
19	F (23)	1.438-18 UNEF	10	0.375 (9.53)	0.625 (15.88)	1	1.745 (44.32)	2.135 (54.23)	1.315 (33.40)	2-025
20			12	0.500 (12.70)	0.750 (19.05)	1		2.135 (54.23)		
21			16	0.625 (15.88)	0.938 (23.83)	1		2.135 (54.23)		
22			20	0.875 (22.23)	1.250 (31.75)	2		2.504 (63.60)		

FIGURE 1. Dimensions and configuration – Continued.

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Dash Number	Shell Size Designator (see note 1)	A THREAD CLASS 2B	Clamp Size (REF)	Cable Range		Style 1 or 2	B DIA MAX	C DIA MAX	X DIA $\pm .005$ (± 0.13)	O-ring size REF
				MIN	MAX					
23	G (25)	1.562-18 UNEF	16	0.625 (15.88)	0.938 (23.83)	1	1.880 (47.75)	2.267 (57.58)	1.451 (36.86)	5-291
24			20	0.875 (22.23)	1.195 (30.35)	1		2.267 (57.58)		
25			24	1.000 (25.40)	1.380 (35.05)	2		2.504 (63.60)		
26	H (29)	1.875-16 UN	16	0.625 (15.88)	0.938 (23.83)	1	2.225 (56.51)	2.504 (63.60)	1.726 (43.84)	2-029
27			20	0.875 (22.23)	1.250 (31.75)	1		2.504 (63.60)		
28			24	1.000 (25.40)	1.380 (35.05)	1		2.504 (63.60)		
29	J (33)	2.062-16 UNS	20	0.875 (22.23)	1.250 (31.75)	1	2.391 (60.73)	2.702 (68.63)	1.921 (48.79)	2-031
30			24	1.000 (25.40)	1.380 (35.05)	1		2.702 (68.63)		
31			28	1.250 (31.75)	1.625 (41.28)	1		2.702 (68.63)		

NOTES:

1. Shell sizes are provided within parentheses for information and are not a part of the designator.
2. Dimensions are in inches. Metric equivalents are given for information only.
3. Dimensions apply after plating.

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Dash Number	D MAX	E MAX	F REF	G REF	L MAX	L1 MAX	L2 MAX	V THREAD CLASS 2
01	1.330 (33.78)	3.113 (79.07)	1.281 (32.54)	.937 (23.80)	4.44 (112.8)	4.77 (121.16)	2.04 (51.82)	.625-24 UNEF
02	1.330 (33.78)	3.113 (79.07)	1.281 (32.54)	1.125 (28.58)	4.44 (112.8)	4.83 (122.68)	2.04 (51.82)	.750-20 UNEF
03	1.518 (38.56)	3.297 (83.74)	1.281 (32.54)	1.125 (28.58)	4.82 (122.4)	5.15 (130.81)	2.30 (58.42)	.750-20 UNEF
04	1.705 (43.31)	3.446 (87.53)	1.281 (32.54)	1.312 (33.32)	5.15 (130.8)	5.47 (138.94)	2.56 (65.02)	.875-20 UNEF
05	1.518 (38.56)	3.297 (83.74)	1.281 (32.54)	.937 (23.80)	4.82 (122.4)	5.08 (129.03)	2.30 (58.42)	.625-24 UNEF
06	1.518 (38.56)	3.297 (83.74)	1.281 (32.54)	1.125 (28.58)	4.82 (122.4)	5.15 (130.81)	2.30 (58.42)	.750-20 UNEF
07	1.518 (38.56)	3.297 (83.74)	1.281 (32.54)	1.312 (33.32)	4.82 (122.4)	5.21 (132.33)	2.30 (58.42)	.875-20 UNEF
08	1.705 (43.31)	3.446 (87.53)	1.281 (32.54)	1.312 (33.32)	5.15 (130.8)	5.47 (138.94)	2.56 (65.02)	1.000-20 UNEF
09	1.705 (43.31)	3.446 (87.53)	1.281 (32.54)	.937 (23.80)	5.15 (130.8)	5.34 (135.64)	2.56 (65.02)	.625-20 UNEF

FIGURE 1. Dimensions and configuration – Continued.

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w/ AMENDMENT 1

Dash Number	D MAX	E MAX	F REF	G REF	L MAX	L1 MAX	L2 MAX	V THREAD CLASS 2
10	1.705 (43.31)	3.446 (87.53)	1.281 (32.54)	1.125 (28.58)	5.15 (130.8)	5.41 (137.41)	2.56 (65.02)	.750-20 UNEF
11	1.705 (43.31)	3.446 (87.53)	1.281 (32.54)	1.312 (33.32)	5.15 (130.8)	5.47 (138.94)	2.56 (65.02)	1.000-20 UNEF
12	2.080 (52.83)	3.935 (99.95)	1.312 (33.32)	1.531 (38.89)	6.02 (152.9)	6.35 (161.29)	3.05 (77.47)	1.188-18 UNEF
13	1.893 (48.08)	3.622 (92.00)	1.281 (32.54)	1.312 (33.32)	5.52 (140.2)	5.77 (146.56)	2.80 (71.12)	1.000-20 UNEF
14	1.893 (48.08)	3.622 (92.00)	1.312 (33.32)	1.531 (38.89)	5.52 (140.2)	5.87 (149.10)	2.80 (71.12)	1.188-18 UNEF
15	2.393 (60.78)	4.325 (109.86)	1.406 (35.71)	1.750 (44.45)	6.72 (170.7)	7.06 (179.32)	3.46 (87.88)	1.438-18 UNEF
16	2.080 (52.83)	3.935 (99.95)	1.281 (32.54)	1.312 (33.32)	6.02 (152.9)	6.26 (159.00)	3.05 (77.47)	1.000-20 UNEF
17	2.080 (52.83)	3.935 (99.95)	1.312 (33.32)	1.531 (38.89)	6.02 (152.9)	6.35 (161.29)	3.05 (77.47)	1.188-18 UNEF
18	2.393 (60.78)	4.325 (109.86)	1.406 (35.71)	1.750 (44.45)	6.72 (170.7)	7.06 (179.32)	3.46 (87.88)	1.438-18 UNEF
19	2.393 (60.78)	4.325 (109.86)	1.281 (32.54)	1.312 (33.32)	6.72 (170.7)	6.82 (173.23)	3.46 (87.88)	1.000-20 UNEF
20	2.393 (60.78)	4.325 (109.86)	1.312 (33.32)	1.531 (38.89)	6.72 (170.7)	6.91 (175.14)	3.46 (87.88)	1.188-18 UNEF
21	2.393 (60.78)	4.325 (109.86)	1.406 (35.71)	1.750 (44.45)	6.72 (170.7)	7.06 (179.32)	3.46 (87.88)	1.438-18 UNEF
22	3.018 (76.66)	4.988 (126.70)	1.593 (40.46)	2.093 (53.16)	8.01 (203.5)	8.35 (212.09)	4.27 (108.46)	1.750-18 UNS
23	2.580 (65.53)	4.535 (115.19)	1.406 (35.71)	1.750 (44.45)	7.12 (180.8)	7.42 (188.47)	3.71 (94.23)	1.438-18 UNEF
24	2.580 (65.53)	4.535 (115.19)	1.593 (40.46)	2.093 (53.16)	7.12 (180.8)	7.67 (194.82)	3.71 (94.23)	1.750-18 UNS
25	3.018 (76.66)	4.988 (126.70)	1.625 (41.28)	2.343 (59.51)	8.01 (203.5)	8.46 (214.88)	4.27 (108.46)	2.000-18 UNS
26	3.018 (76.66)	4.988 (126.70)	1.406 (35.71)	1.750 (44.45)	8.01 (203.5)	8.10 (205.74)	4.27 (108.46)	1.438-18 UNEF
27	3.018 (76.66)	4.988 (126.70)	1.593 (40.46)	2.093 (53.16)	8.01 (203.5)	8.35 (212.09)	4.27 (108.46)	1.750-18 UNS
28	3.018 (76.66)	4.988 (126.70)	1.625 (41.28)	2.343 (59.51)	8.01 (203.5)	8.46 (214.88)	4.27 (108.46)	2.000-18 UNS
29	3.250 (82.55)	5.330 (135.38)	1.593 (40.46)	2.093 (53.16)	8.58 (217.9)	8.94 (227.08)	4.60 (116.84)	1.750-18 UNS
30	3.250 (82.55)	5.330 (135.38)	1.625 (41.28)	2.343 (59.51)	8.58 (217.9)	9.05 (229.87)	4.60 (116.84)	2.000-18 UNS
31	3.250 (82.55)	5.330 (135.38)	1.900 (48.26)	2.750 (69.85)	8.58 (217.9)	9.39 (238.51)	4.60 (116.84)	2.250-16 UN

FIGURE 1. Dimensions and configuration – Continued.

REQUIREMENTS:

1. Dimensions and configurations: See figure 1.
2. Interface dimensions shall conform to MIL-DTL-28840 except as noted herein (see detail B).
3. Material and finish: Materials for repositionable body details which are not defined in figure 1, including connector interface adapter and band termination adapter, shall be suitable for the purpose intended in accordance with MIL-DTL-28840, and finished in accordance with table I. Frame and all components except hardware (screws, washers, retainers), to be in accordance with table I. Repositioning lock mechanism shall be corrosion resistant steel or in accordance with table I. Self-locking device shall be corrosion resistant material. Elastomers (grommet and o-rings) to be fluorosilicone suitable for intended function.

TABLE I. Material and finish.

Material and finish designator	Material	Finish 1/
W	Aluminum alloy in accordance with ASTM B85/B85M, ASTM B26/B26M, ASTM B108/B108M, ASTM B209, ASTM B211/B211M, or ASTM B221	Cadmium plate, olive drab over electroless nickel
L		Tin-Zinc, non-reflective
S		Zinc-nickel, non-reflective
D	Corrosion resistant steel in accordance with ASTM A276, ASTM A473, or ASTM A580/A580M, type 316	Cadmium plate, black

1/ Hardware shall be passivated in accordance with SAE-AMS2700.

4. Design of sealed repositionable body section shall facilitate repositioning from straight to 45 and 90 degree orientations and provide a positive locking feature without requiring decoupling from connector or disassembly of shield termination, sealing grommet or strain relief saddle clamps.
5. Backshell repositioning durability: The backshell shall be capable of completing 10 cycles of repositioning from straight, 45 degree, and 90 degree orientations. Validation shall be accomplished by hand at a rate not to exceed 1 cycle per 15 seconds. Backshell shall show no evidence of mechanical defects detrimental to operation.
6. Repositioning and Self-locking mechanisms: The repositioning lock elements and self-locking coupling nuts shall not exhibit any loosening or disengagement from their mated connectors following vibration testing.

MARKING: The backshell shall be identified with the manufacturer's name or trademark and the Part or Identifying Number (PIN).

PIN example:

M28840 /31 - 16 L

M28840 Military designator
/31 Specification sheet number
16 Dash number
L Material and finish designator (See table I)

QUALIFICATION:

1. Two samples of each shell size range (small, medium, and large) per test group shall be tested in accordance with MIL-DTL-28840 and as defined by requirements herein.
2. When a counterpart connector is required but there are no known qualified sources a commercial counterpart connector may be used as a substitution. For those tests not requiring indication of connector performance when tested with the connector accessory, a similarly compatible dummy connector, duplicating accessory mating features may be used in place of the actual connector.
3. When a fluid test is required, one untested connector accessory, from any shell size range for each material and finish being qualified, shall be subjected to each fluid type. Qualification by similarity to MIL-DTL-28840/6 is permitted.
4. Unless otherwise specified herein or approved by the qualifying activity, units under test are to be oriented in the straight configuration.
5. Backshell repositioning durability requirements shall be verified prior to vibration testing.
6. Repositioning and self-locking mechanisms requirements shall be met following vibration testing.
7. When equipped with secondary seal per figure 1, test depth for water pressure test to be 10 meters (32.8 feet).
8. Safety wire pull out test is not required.
9. Salt spray (corrosion) units under test shall be suspended in test chamber with the straight-orientation axis aligned approximately 5 degrees from vertical to prevent salt-water from pooling within the unit.

RESTRICTIONS:

Material and finish designators W and D are inactive for NAVSEA new design, unless approved by NAVSEA.

REFERENCED DOCUMENTS: In addition to MIL-DTL-28840, this document references the following:

ASTM A276
ASTM A473
ASTM A580/A580M
ASTM B26/B26M
ASTM B85/B85M
ASTM B108/B108M
ASTM B209
ASTM B211/B211M
ASTM B221
AMS2700
MIL-DTL-28840/6

CONCLUDING MATERIAL

Custodians:
Army - AT
Navy – EC

Preparing activity:
DLA – CC

Reviewers:
Army – AV, MI
Navy – OS, SH, YD

(Project 5935-2026-025)

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