INCH-POUND

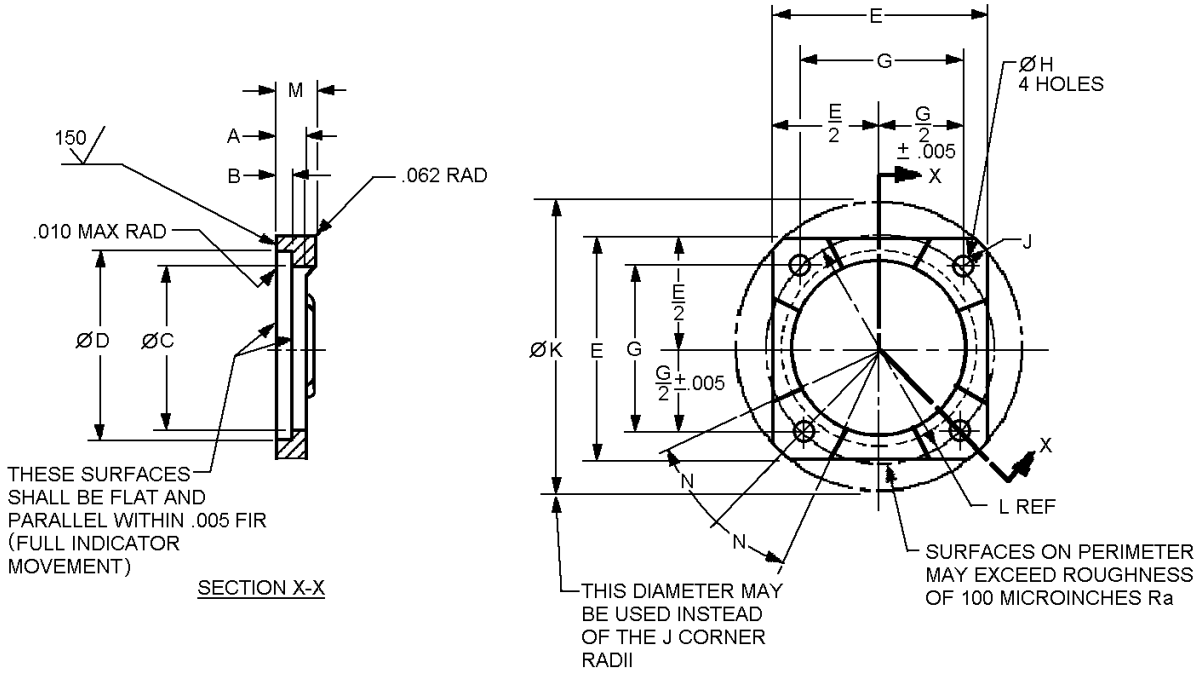
MS20756E
w/AMENDMENT 1
26 October 2010
SUPERSEDING
MS27056E
17 November 2009

DETAIL SPECIFICATION SHEET

FLANGE, SWIVEL, RETAINING

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 SAE-AS4875.



Inches	mm
.005	0.13
.010	0.25
.062	1.57

FIGURE 1. Swivel fitting flange type I rectangle size 8 through 32.

Size designator	Tubing OD and hose ID inches (mm)	A +.015 -.005 (+0.38 -0.13) inches (mm)	B +.005/-.000 (+0.13 -0.000) inches (mm)	C dia (see note 4) +.010/-.000 (+0.25 -0.000) inches (mm)	D dia (see note 4) +.005 (+0.13 -.000) inches (mm)	E inches (mm)	
8	.500 (12.70)	.234 (5.94)	.136 (3.45)	.750 (19.05)	.885 (22.48)	1.390 (35.31)	±.016 (0.41)
10	.625 (15.88)			.880 (22.35)	1.010 (25.65)	1.468 (37.29)	
12	.750 (19.05)			1.125 (28.58)	1.260 (32.00)	1.594 (40.49)	
16	1.000 (25.40)			1.375 (34.93)	1.510 (38.35)	1.750 (44.45)	
20	1.250 (31.75)			1.688 (42.88)	1.854 (47.09)	2.188 (55.58)	±.020 (0.51)
24	1.500 (38.10)	.297 (7.54)	.168 (4.27)	1.938 (49.23)	2.135 (54.23)	2.375 (60.33)	
32	2.000 (50.80)			2.562 (65.07)	2.760 (70.10)	3.000 (76.20)	

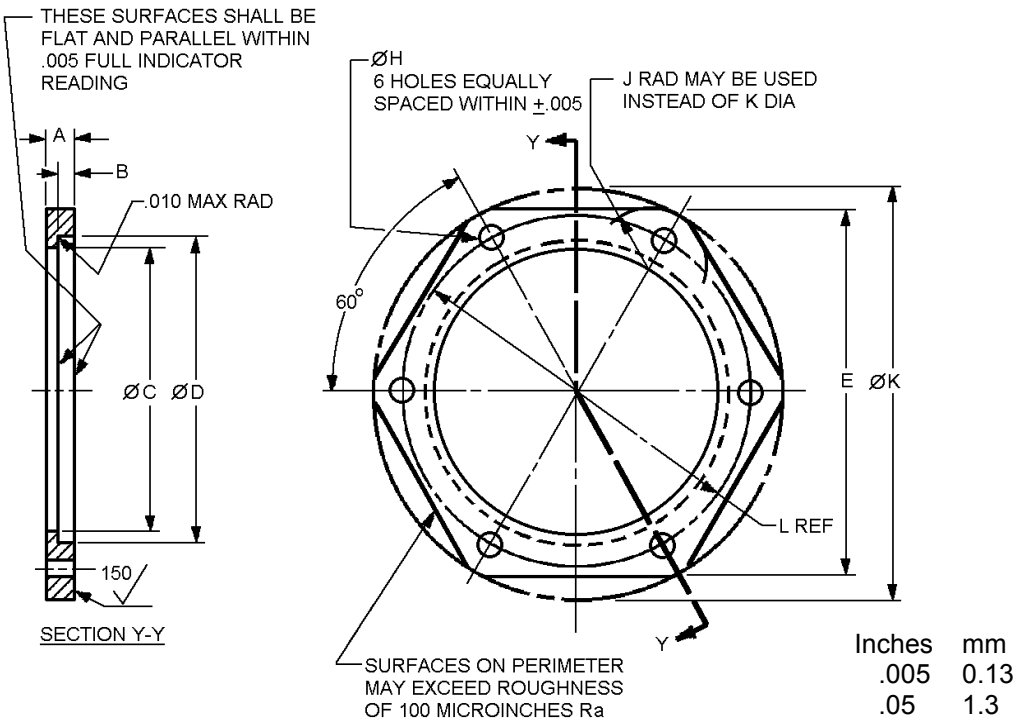
FIGURE 1. Swivel fitting flange type I rectangle size 8 through 32 – Continued.

Size number	G ±.005 (±0.13) inches (mm)	H dia +.010/-.000 (+0.25 -0.000) inches (mm)	J radius ±.016 (±0.41) inches (mm)	K dia ±.015 (±0.38) inches (mm)	L dia inches (mm)	M ±.016 (±0.41) inches (mm)	N
8	.950 (24.13)	.205 (5.21)	.219 (5.56)	1.782 (45.26)	1.344 (34.14)	.296 (7.52)	20°
10	1.038 (26.37)			1.906 (48.41)	1.468 (37.29)		
12	1.156 (29.36)			2.094 (53.19)	1.635 (41.53)		
16	1.312 (33.32)			2.312 (58.72)	1.855 (47.12)		18°
20	1.656 (42.06)	.266 (6.76)	.266 (6.76)	2.875 (73.03)	2.342 (59.49)		16°
24	1.812 (46.02)		.281 (7.14)	3.094 (78.59)	2.562 (65.07)	.359 (9.12)	
32	2.375 (60.33)	.328 (8.33)	.312 (7.92)	3.953 (100.41)	3.359 (85.32)		12°

Size number	Weight max (estimated) lbs (gram)		
	Steel	Al alloy	Titanium
8	.03 (14)	.01 (5)	.02 (9)
10	.05 (23)	.02 (9)	.03 (14)
12	.08 (36)	.03 (14)	.04 (18)
16			
20	.14 (64)	.05 (23)	.07 (32)
24	.17 (77)	.06 (27)	.09 (41)
32	.25 (113)	.09 (41)	.13 (59)

NOTES:
1. Dimensions are in inches.
2. Metric equivalents are given for information only.
3. Unless otherwise, tolerances, ±.005 inch (0.13 mm) angles ±.5°.
4. Diameters C and D shall be concentric within .010 inch (0.25 mm) full indicator reading.
5. Unless otherwise specified, the surface roughness shall not exceed 100 microinches (25.4 µm) Ra in accordance with ASME B46.1.
6. Break all sharp edges; remove all loose or hanging burrs and slivers that may become dislodged.
7. For tube sizes -8 through -16, maximum operating temperature 275°F (135°C), maximum pressure 1500 psi (10 MPa).
8. For tube sizes -20 though -48, maximum operating temperature 275°F (135°C), maximum pressure 500 psi (3.4 MPa).

FIGURE 1. Swivel fitting flange type I rectangle size 8 through 32 – Continued.



Size designator	Tubing OD and hose ID inches (mm)	A +.015 -.005 (+0.38 -0.13) inches (mm)	B +.005/-.000 (+0.13 -0.000) inches (mm)	C dia (see note 4) +.010/-.000 (+0.25 -0.000) inches (mm)	D dia (see note 4) +.005 (+0.13 -.000) inches (mm)	E inches (mm)	
8	.500 (12.70)	.234 (5.94)	.136 (3.45)	.750 (19.05)	.885 (22.48)	1.390 (35.31)	±.016 (0.41)
10	.625 (15.88)			.880 (22.35)	1.010 (25.65)	1.468 (37.29)	
12	.750 (19.05)			1.125 (28.58)	1.260 (32.00)	1.594 (40.49)	
16	1.000 (25.40)			1.375 (34.93)	1.510 (38.35)	1.750 (44.45)	
20	1.250 (31.75)			1.688 (42.88)	1.854 (47.09)	2.188 (55.58)	±.020 (0.51)
24	1.500 (38.10)	.297 (7.54)	.168 (4.27)	1.938 (49.23)	2.135 (54.23)	2.375 (60.33)	
32	2.000 (50.80)			2.562 (65.07)	2.760 (70.10)	3.000 (76.20)	
40	2.500 (63.50)			3.062 (77.77)	3.291 (83.59)	4.000 (101.60)	
48	3.000 (76.20)			3.562 (90.47)	3.791 (96.29)	4.500 (114.30)	

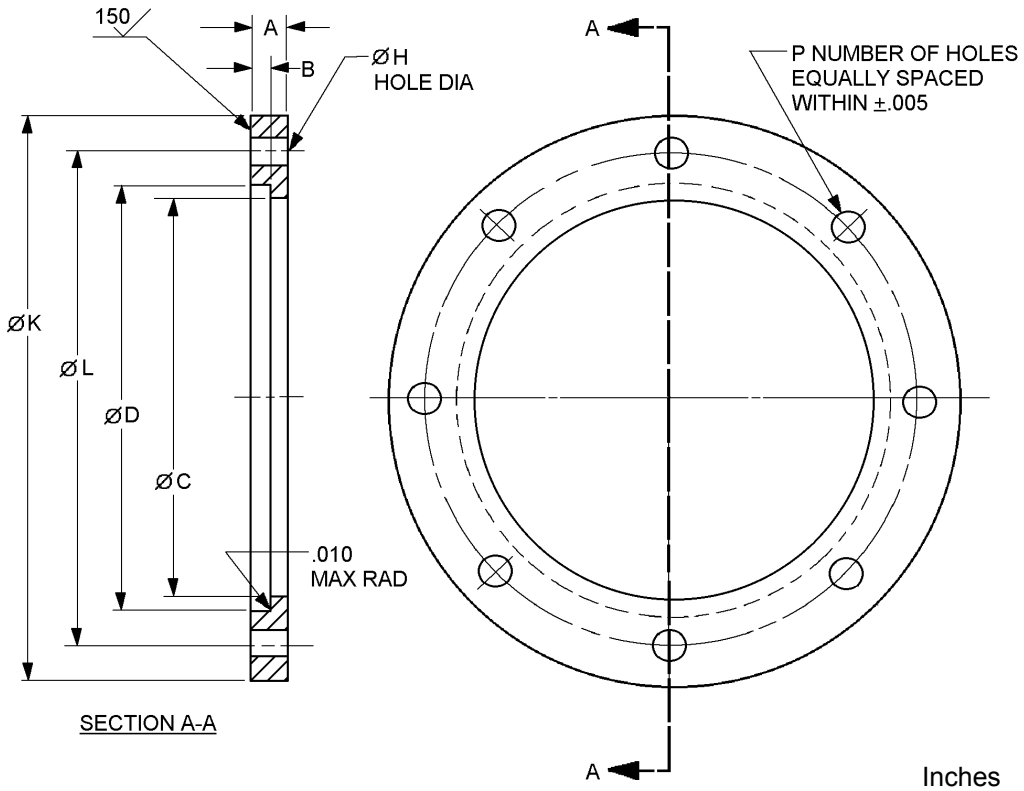
FIGURE 2. Swivel fitting flange type II hexagon size 8 through 48.

Size number	G ±.005 (±0.13) inches (mm)	H dia +.010/-.000 (+0.25 -0.000) inches (mm)	J radius ±.016 (±0.41) inches (mm)	K dia ±.015 (±0.38) inches (mm)	L dia inches (mm)	M ±.016 (±0.41) inches (mm)	N
8	.950 (24.13)	.205 (5.21)	.219 (5.56)	1.782 (45.26)	1.344 (34.14)	.296 (7.52)	20°
10	1.038 (26.37)			1.906 (48.41)	1.468 (37.29)		
12	1.156 (29.36)			2.094 (53.19)	1.635 (41.53)		
16	1.312 (33.32)			2.312 (58.72)	1.855 (47.12)		18°
20	1.656 (42.06)	.266 (6.76)	.266 (6.76)	2.875 (73.03)	2.342 (59.49)		16°
24	1.812 (46.02)		.281 (7.14)	3.094 (78.59)	2.562 (65.07)	.359 (9.12)	
32	2.375 (60.33)	.328 (8.33)	.312 (7.92)	3.953 (100.41)	3.359 (85.32)		12°
40	-		.375 (9.53)	4.500 (114.30)	3.812 (96.82)	-	-
48	-		.625 (15.88)	5.000 (127.00)	4.312 (109.52)	-	-

Size number	Weight max (estimated) lbs (gram)		
	Steel	Al alloy	Titanium
8	.03 (14)	.01 (5)	.02 (9)
10	.05 (23)	.02 (9)	.03 (14)
12	.08 (36)	.03 (14)	.04 (18)
16			
20	.14 (64)	.05 (23)	.07 (32)
24	.17 (77)	.06 (27)	.09 (41)
32	.25 (113)	.09 (41)	.13 (59)
40	.45 (204)	.16 (73)	.21 (95)
48	.53 (240)	.19 (86)	.24 (109)

NOTES:
1. Dimensions are in inches.
2. Metric equivalents are given for information only.
3. Unless otherwise, tolerances, ±.005 inch (0.13 mm) angles ±.5°.
4. Diameters C and D shall be concentric within .010 inch (0.25 mm) full indicator reading.
5. Unless otherwise specified, the surface roughness shall not exceed 100 microinches (25.4 µm) Ra in accordance with ASME B46.1.
6. Break all sharp edges; remove all loose or hanging burrs and slivers that may become dislodged.
7. For tube sizes -8 through -16, maximum operating temperature 275°F (135°C), maximum pressure 1500 psi (10 MPa).
8. For tube sizes -20 though -48, maximum operating temperature 275°F (135°C), maximum pressure 500 psi (3.4 MPa).

FIGURE 2. Swivel fitting flange type II hexagon size 8 through 48 - Continued.



Inches	mm
.005	0.13
.010	0.25

Size number	A +.015/ -.005 (+0.38/ -(0.13) inches (mm)	B +.005/ -.000 (+0.13/ -.000) inches (mm)	C dia (see note 4) .031 (0.79) inches (mm)	D dia (see note 4) inches (mm)		H dia +.010/ -.000 (+0.25/ -0.00) inches (mm)	K dia ±.015 (±0.38) inches (mm)
56	.312 (7.92)	.168 (4.27)	3.968 (100.79)	4.234 (107.54)	+.010/ -.000 (+0.25/ -0.000)	.328 (8.33)	5.562 (141.27)
64			4.531 (115.09)	4.797 (121.84)			6.125 (155.58)
80	.375 (9.53)	.188 (4.78)	5.531 (140.49)	5.797 (147.24)			7.125 (180.98)
96			6.531 (165.89)	6.797 (172.64)	+.020/ -.000 (0.51/ -.000)		8.125 (206.38)
112	.437 (11.10)	.200 (5.08)	7.594 (192.89)	7.860 (199.64)			9.188 (233.38)

FIGURE 3. Swivel fitting flange type II hexagon size 56 through 112.

Size number	L dia Ref inches (mm)	P number of holes
56	4.875 (123.83)	8
64	5.438 (138.13)	
80	6.438 (163.53)	10
96	7.438 (188.93)	12
112	8.500 (215.90)	14

NOTES:
1. Dimensions are in inches.
2. Metric equivalents are given for information only.
3. Unless otherwise, tolerances, ±.005 inch (0.13 mm), angles ±.5°.
4. Diameters C and D shall be concentric within .010 inch (0.25 mm) full indicator reading.
5. Unless otherwise specified, the surface roughness shall not exceed 100 microinches (2.54 µm) Ra in accordance with ASME B46.1.
6. Break all sharp edges; remove all loose or hanging burrs and slivers that may become dislodged.
7. Maximum operating temperature 275°F (135°C), maximum pressure 500 psi (3.4 MPa).

FIGURE 3. Swivel fitting flange type II hexagon size 56 through 112 – Continued.

REQUIREMENTS:

Design and construction:

Dimensions and configuration: See figures 1, 2, and 3.

Reduction by forging draft angle of 7° maximum is permissible.

Materials. Materials shall be in accordance with MIL-DTL-83798.

Finishes. Finishes for the flange shall be in accordance with MIL-DTL-83798.

Finish designators shall be as specified in table I.

TABLE I. Flange finish code. 1/

PIN code dash letter	Material	Plating finish
Blank	Steel	Cadmium plating in accordance with SAE-AMS-C-81562, type II, class 3 or SAE-AMS-QQ-P-416, type II, class 2.
	Aluminum	Anodize in accordance with MIL-A-8625, type II. 2/
	Corrosion resistant steel	No additional finish. Passivation in accordance with SAE-AMS2700, type 6 or 7.
-A	Steel	Aluminum-nickel in accordance with ASTM F1136, grade 3, NC
-D	Aluminum	Anodize above with NAVAIR trivalent chromium pretreatment (TCP) in accordance with MIL-DTL-81706, type 2, class 1A. 2/
-CN	Steel	Cadmium plating in accordance with SAE-AMS-C-81562, type II, class 3 or SAE-AMS-QQ-P-416, type II, class 2 with NAVAIR TCP in accordance with MIL-DTL-81706, type 2, class 1A.
-F	Steel	TCP in accordance with MIL-DTL-81706, type 2, class 1A. 2/
-G	Steel	Zinc plating with colorless passivate in accordance with ASTM B633, type V, Fe/Zn 25.
-H	Steel	Zinc phosphate finish in accordance MIL-DTL-16232 type Z, class1. 3/
-J	Steel	Zinc plating in accordance with ASTM B633; type II or III, Fe/Zn 5, or ASTM B695, type II, class 5.
-N	Steel	NAVAIR TCP in accordance with MIL-DTL-81706, type 2, class A.
-R	Steel	Zinc plating in accordance with ASTM B633; type VI, Fe/Zn 5.
-T	Titanium 4/	Anodized in accordance with SAE-AMS2488, type 2 or fluoride phosphated in accordance with SAE-AMS2486. 5/
-V	Steel	Zinc-nickel in accordance with SAE-AMS2417, type 1.
-Z	Zinc any type above	PIN code H, J, R, V.
-ZN	Zinc any type above	PIN code H, J, R, V with NAVAIR TCP in accordance with MIL-DTL-81706, type 2, class 1A.

1/ Shall be capable of withstanding minimum of 96 hours salt spray.
2/ Die light blue.
3/ Hexavalent chromium free.
4/ Titanium shall not be used in oxygen or potable water systems.
5/ Color equivalent to numbers /36076, /36081, /36099, /36118, /36134, /36152, /36170, /36173, and /36176 in accordance with FED-STD-595.

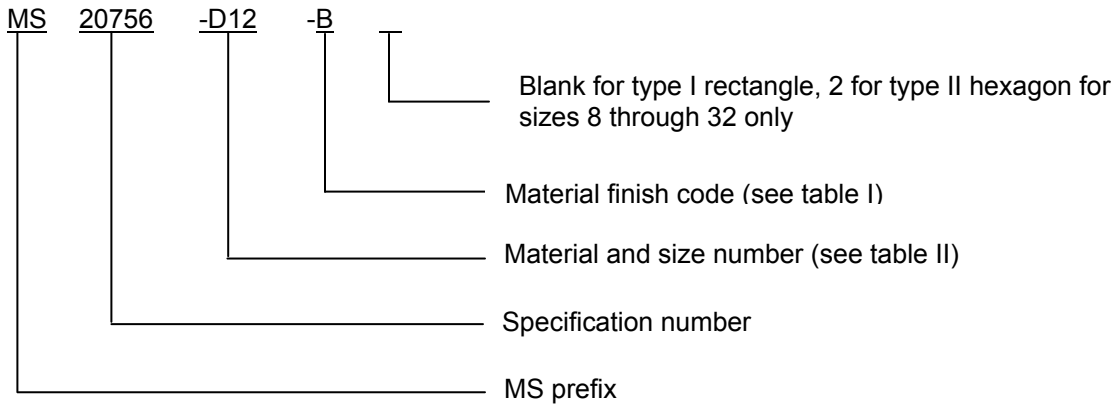
Trivalent wrenchability. When the finish has been damaged due to poor wrenchability, the surface of the connector shall be touched up using the brush plating process below. The term “trivalent wrenchability” is used to evaluate the ability of the finish to withstand abrasion from an excessive amount of wrenching

a. Brush plating of hard chromium by electrodeposition shall be in accordance with SAE-AMS-2451/5.

b. Brush plating of medium-hardness, low stress nickel by electrodeposition shall be in accordance with SAE-AMS-2451/9.

c. Brush plating of NAVAIR TCP shall be in accordance with MIL-DTL-81706, type 2, class A, material form 1 through 6, application method B. Example of a PIN: M817062A6B.

Part or Identifying Number (PIN) example:



MS20756-D12-B indicates: Flange, .750 inch tube ID, aluminum anodized with NAVAIR TCP, type I rectangle.

MS20756-D12-B2 indicates: Flange, .750 inch tube ID, aluminum anodized with NAVAIR TCP, type II hexagon.

Material and size designators. Material and size designators shall be as specified in table II.

TABLE II. Material and size designators.

Size dash number with letter material designator			
Steel	Aluminum alloy	CRES 1/	Titanium 2/
-8	-D8	-J8	-T8
-10	-D10	-J10	-T10
-12	-D12	-J12	-T12
-16	-D16	-J16	-T16
-20	-D20	-J20	-T20
-24	-D24	-J24	-T24
-32	-D32	-J32	-T32
-40	-D40	-J40	-T40
-48	-D48	-J48	-T48
-56	-D56	-J56	-T56
-64	-D64	-J64	-T64
-80	-D80	-J80	-T80
-96	-D96	-J96	-T96
-112	-D112	-J112	-T112

1/ Corrosion resistant steel (CRES).
2/ Titanium shall not be used in potable water or oxygen systems.

Marking. The complete PIN shall be permanently marked.

Guidance on use of alternative parts with less hazardous or nonhazardous materials. This specification provides for a number of alternative plating materials via the PIN. Users should select the PIN with the least hazardous material that meets the form, fit and function requirements of their application.

For nominal use on fuel and oil systems.

Amendment notations. The margins of this specification are marked with vertical lines to indicate modifications generated by this amendment. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations.

Referenced documents. In addition to SAE-AS4875, this document references the following:

MIL-A-8625	ASME B46.1
MIL-DTL-16232	ASTM B633
MIL-DTL-81706	ASTM B695
MIL-DTL-83798	ASTM F1136
FED-STD-595/36076	SAE-AMS-C-81562
FED-STD-595/36081	SAE-AMS-QQ-P-416
FED-STD-595/36099	SAE-AMS2700
FED-STD-595/36118	SAE-AMS2417
FED-STD-595/36134	SAE-AMS-2451/5
FED-STD-595/36152	SAE-AMS-2451/9
FED-STD-595/36170	SAE-AMS2486
FED-STD-595/36173	SAE-AMS2488
FED-STD-595/36176	

CONCLUDING MATERIAL

Custodians:
Army - AV
Navy - AS
Air Force - 99
DLA - CC

Preparing activity:
DLA - CC

(Project 4730-2010-063)

Review activities:
Army - AT
Navy – SA
Air Force - 85

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at https://assist.daps.dla.mil.