

INCH-POUND

MIL-DTL-83723/27C
27 October 2015
SUPERSEDING
MIL-DTL-83723/27B
23 May 2003

DETAIL SPECIFICATION SHEET

CONNECTORS, ELECTRICAL, BACKSHELL, WITH HEAT-SHRINKABLE STRAIN-RELIEF BOOT (STRAIGHT AND RIGHT ANGLE), THREADED COUPLING

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-83723.

Inactive for new design as of 14 September 1993.

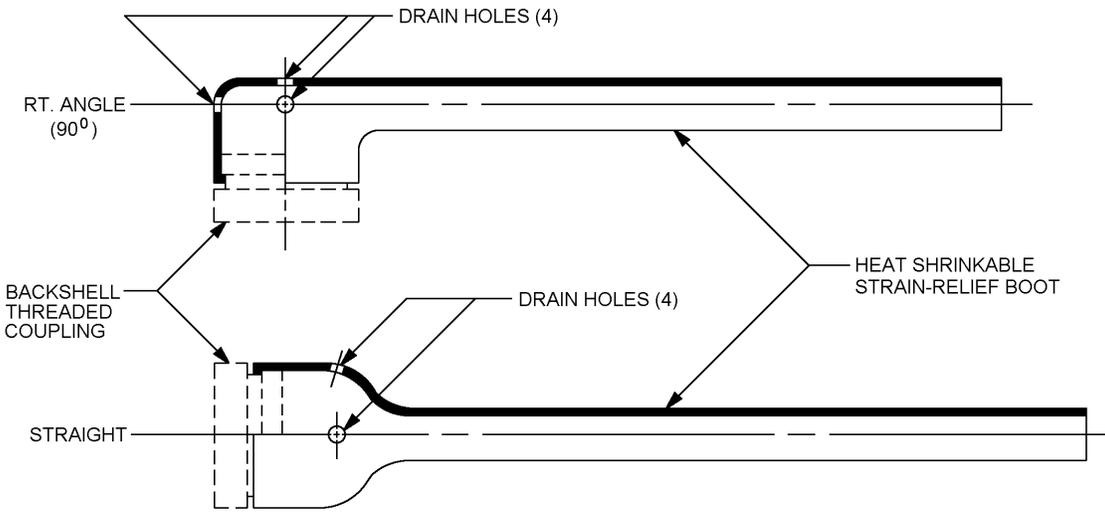
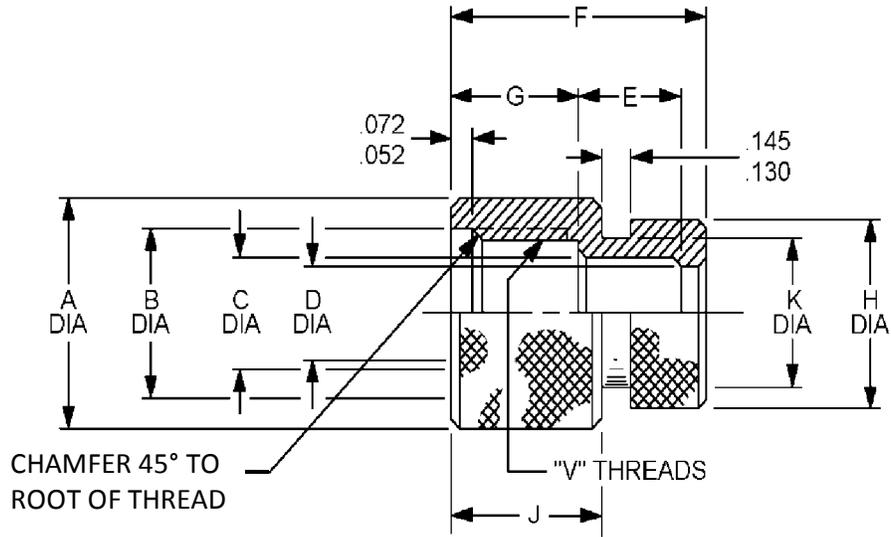


FIGURE 1. Completed assembly.





Shell size designator	Shell size	A dia max	B dia	C dia	D dia	E	F max
08	8S	.577	.447	.284	.250	.300	.830
10	10S	.640	.510	.344	.303	.300	.830
11	10SL	.702	.572	.413	.383	.300	.830
13	12S	.765	.635	.464	.408	.300	.830
12	12	.765	.635	.464	.408	.300	.830
16	14S	.890	.760	.567	.490	.300	.830
14	14	.890	.760	.567	.490	.300	.830
17	16S	1.015	.885	.693	.609	.300	.830
16	16	1.015	.885	.693	.609	.300	.996
18	18	1.140	1.010	.810	.730	.300	.996
20	20	1.265	1.135	.947	.870	.309	.996
22	22	1.390	1.260	1.078	.978	.309	.996
24	24	1.515	1.385	1.185	1.090	.246	.996
28	28	1.765	1.635	1.406	1.250	.246	1.076
32	32	2.015	1.885	1.657	1.520	.185	1.076
36	36	2.265	2.135	1.865	1.756	.185	1.076
40	40	2.515	2.392	2.203	1.880	.570	1.222

FIGURE 2. Backshell, threaded coupling.

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Shell size designator	Shell size	G +.015 -.000	H min	K max	J min	V threads
08	8S	.365	.479	.391	.430	7/16-28UNEF-2B
10	10S	.365	.539	.451	.430	1/2-28UNEF-2B
11	10SL	.365	.608	.520	.430	9/16-24 UNEF-2B
13	12S	.365	.659	.571	.430	5/8-24 UNEF-2B
12	12	.365	.659	.571	.430	5/8-24 UNEF-2B
16	14S	.365	.782	.694	.430	3/4-20 UNEF-2B
14	14	.365	.782	.694	.430	3/4-20 UNEF-2B
17	16S	.365	.908	.820	.430	7/8-20 UNEF-2B
16	16	.521	.908	.820	.596	7/8-20 UNEF-2B
18	18	.521	1.025	.937	.596	1-20 UNEF-2B
20	20	.521	1.212	1.074	.596	1-1/8-18 UNEF-2B
22	22	.521	1.343	1.205	.596	1-1/4-18 UNEF-2B
24	24	.521	1.450	1.312	.596	1-3/8-18 UNEF-2B
28	28	.521	1.671	1.533	.596	1-5/8-18 UNEF-2B
32	32	.521	1.956	1.784	.596	1-7/8-16 UN-2B
36	36	.521	2.164	1.992	.596	2-1/8-16 UN-2B
40	40	.552	2.500	2.328	.627	2-3/8-16 UN-2B

NOTES:

1. Dimensions in inches. Unless otherwise specified tolerances shall be $.XX \pm .010$ and $.XXX \pm .005$, angular $X^\circ X' \pm 0^\circ 30'$.
2. Dimensions apply after plating.

FIGURE 2. Backshell, threaded coupling – Continued.

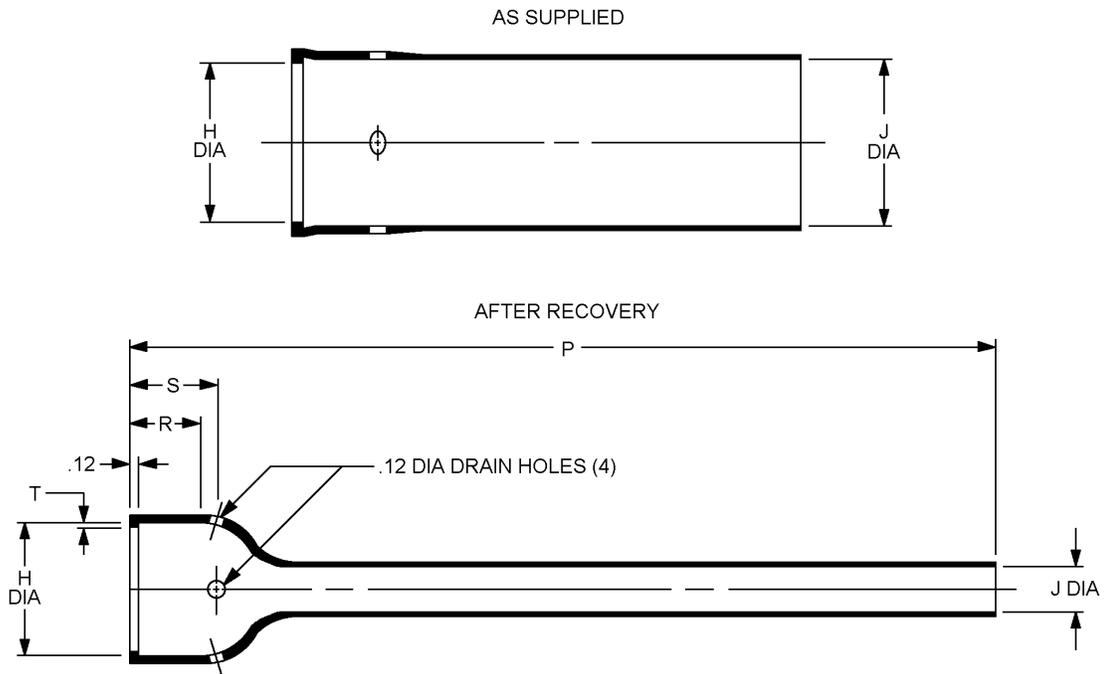


FIGURE 3. Heat-shrinkable strain-relief boot, straight.

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Shell size designator	Shell size	H dia		J dia		
		As supplied min	Recovered max	As supplied min 1/		Recovered max
				A	B	
08	8S	.88	.45	.88	.55	.25
10	10S	.88	.45	.88	.55	.25
11	10SL	1.01	.59	1.01	.63	.29
13	12S	1.01	.59	1.01	.63	.29
12	12	1.01	.59	1.01	.63	.29
15	14S	1.16	.74	1.16	.72	.33
14	14	1.16	.74	1.16	.72	.33
17	16S	1.34	.90	1.34	.84	.38
16	16	1.34	.90	1.34	.84	.38
18	18	1.34	.90	1.34	.84	.38
20	20	1.47	1.16	1.47	.91	.41
22	22	1.72	1.34	1.72	1.07	.48
24	24	1.72	1.34	1.72	1.07	.48
28	28	1.97	1.62	1.97	1.24	.56
32	32	2.47	1.85	2.47	1.54	.69
36	36	2.47	1.85	2.47	1.54	.69
40	40	2.73	2.35	2.73	1.70	.77

FIGURE 3. Heat-shrinkable strain-relief boot, straight – Continued.

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Shell size designator	Shell size	P recovered	R recovered	S recovered	T recovered
08	8S	4.17	.46	.56	.040
10	10S	4.17	.46	.56	.040
11	10SL	4.77	.48	.59	.040
13	12S	4.77	.48	.59	.040
12	12	4.77	.48	.59	.040
15	14S	5.46	.48	.61	.040
14	14	5.46	.48	.61	.040
17	16S	6.28	.48	.62	.040
16	16	6.28	.48	.62	.040
18	18	6.28	.48	.62	.040
20	20	7.00	.55	.71	.065
22	22	8.00	.60	.78	.065
24	24	8.00	.60	.78	.065
28	28	8.00	.60	.82	.065
32	32	8.00	.63	.92	.080
36	36	8.00	.63	.92	.080
40	40	8.00	.63	.93	.080

NOTES:

1. Material:

- a. Type A: Polyolefin
- b. Type B: Fluoroelastomer

2. Boots will shrink to recovered dimensions upon application of heat in excess of 175°C.

FIGURE 3. Heat-shrinkable strain-relief boot, straight – Continued.

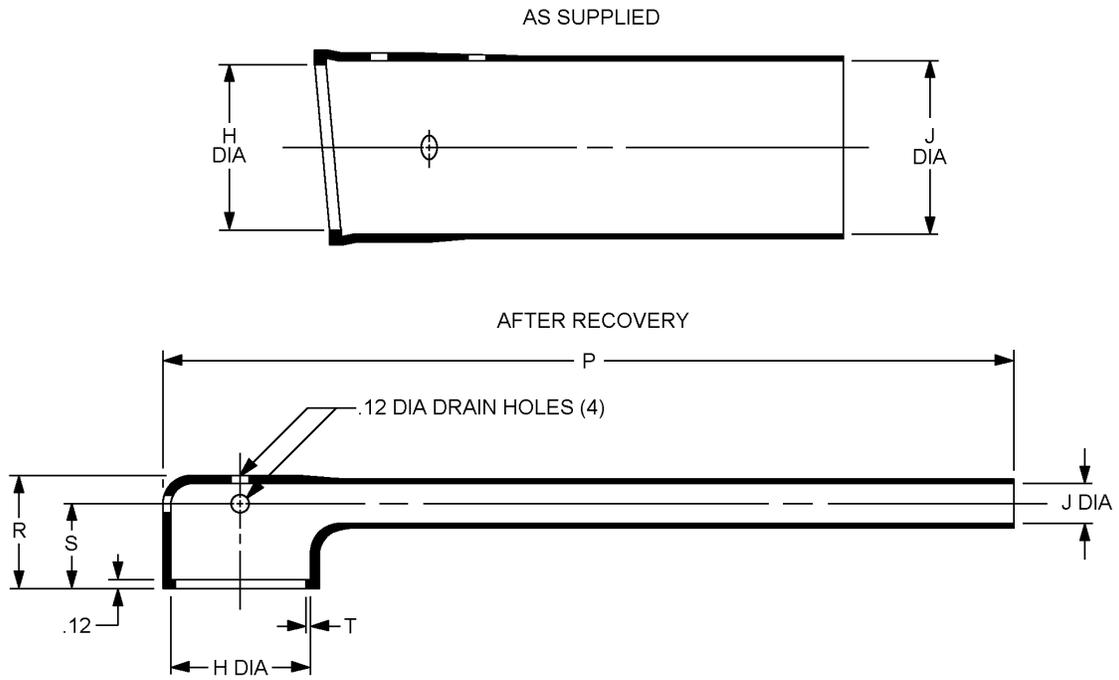


FIGURE 4. Heat-shrinkable strain-relief boot, right angle (90°).

Shell size designator	Shell size	H dia		J dia		
		As supplied min	Recovered max	As supplied min $\frac{2}{\prime}$		Recovered max
				A	B	
08	8S	.88	.45	.88	.55	.25
10	10S	.88	.45	.88	.55	.25
11	10SL	1.01	.59	1.01	.63	.29
13	12S	1.01	.59	1.01	.63	.29
12	12	1.01	.59	1.01	.63	.29
15	14S	1.16	.74	1.16	.72	.33
14	14	1.16	.74	1.16	.72	.33
17	16S	1.34	.90	1.34	.84	.38
16	16	1.34	.90	1.34	.84	.38
18	18	1.34	.90	1.34	.84	.38
20	20	1.47	1.16	1.47	.91	.41
22	22	1.72	1.34	1.72	1.07	.48
24	24	1.72	1.34	1.72	1.07	.48
28	28	1.97	1.62	1.97	1.24	.56
32	32	2.47	1.85	2.47	1.54	.69
36	36	2.47	1.85	2.47	1.54	.69
40	40	2.73	2.35	2.73	1.70	.77

FIGURE 4. Heat-shrinkable strain-relief boot, right angle (90°) – Continued.

Shell size designator	Shell size	P Recovered	R Recovered	S +/- 10%	T Recovered ref
08	8S	4.14	.73	.49	.040
10	10S	4.14	.73	.49	.040
11	10SL	4.88	.78	.59	.040
13	12S	4.88	.78	.59	.040
12	12	4.88	.78	.59	.040
15	14S	5.76	.82	.61	.040
14	14	5.76	.82	.61	.040
17	16S	6.78	.86	.65	.040
16	16	6.78	.86	.65	.040
18	18	6.78	.86	.65	.040
20	20	7.29	.96	.74	.065
22	22	8.41	1.08	.82	.065
24	24	8.41	1.08	.82	.065
28	28	8.84	1.16	.86	.065
32	32	8.95	1.31	.97	.080
36	36	8.95	1.31	.97	.080
40	40	9.19	1.38	.98	.080

NOTES:

1. Boots will shrink to recovered dimensions upon application of heat in excess of 175°C.
2. Material:
 - a. Type A: Polyolefin
 - b. Type B: Fluoroelastomer

FIGURE 4. Heat-shrinkable strain-relief boot, right angle (90°) – Continued.

TABLE I. Material requirements. 1/

Material property	Unit	Requirement type A (polyolefin)	Requirement type B (fluoroelastomer)	Method of test
Physical properties:				
Dimensions Dimension recovery	Inches	In accordance with figures 3 and 4	In accordance with figures 3 and 4	ASTM D876
Elastic Memory	Percent	275 min. expansion	200 min. expansion	See requirements
		93 min. retraction	90 min. retraction	
Tensile strength	psi	1200 minimum	1800 minimum	ASTM D412, Die D
Ultimate elongation	Percent	250 minimum	300 minimum	
Specific gravity	---	1.40 maximum	1.95 maximum	ASTM D792
Low-temperature flexibility at -55°C (-67°F)	---	No cracking	No cracking	See requirements
Heat shock (4 hours) Type A: 225°(437°F) Type B: 300°C (572°F)	---	No dripping, flowing or cracking	No dripping, flowing or cracking	See requirements
Heat aging (168 hours) Type A: 175°C Type B: 250°C	---	---	---	See requirements
Followed by tests for: Tensile strength Elongation	psi	1000 minimum	1200 minimum	ASTM D412, Die D
	Percent	200 minimum	250 minimum	
Hardness	Shore durometer	40 ± 5 (Shore D)	85 ± 5 (Shore A)	ASTM D2240
Stiffness	PSI	10000 maximum	not applicable	ASTM D747

See footnote at end of table.

TABLE I. Material requirements – Continued. 1/

Material property	Unit	Requirement type A (polyolefin)	Requirement type B (fluoroelastomer)	Method of test
Chemical properties:				
Flammability	---	Time: 120 seconds max to self-extinguish Extent: 1.0 inch max	Time: 60 seconds max to self-extinguish Extent: 1.0 inch max	ASTM D635
Fungus resistance	---	Rating of 1 or less	Rating of 1 or less	ASTM G21
Corrosion 16 hrs. at 17°C Copper mirror	---	Noncorrosive	Noncorrosive	ASTM D2671 appendix A.1.5.1
Fluid resistance 24 hrs at 25° Hydraulic fluid JP-4 fuel Lubricating Oil Deicing fluid Followed by tests for: Tensile strength Elongation	---	---	---	See requirements
	psi	750 minimum	1600 minimum	---
	Percent	200 minimum	200 minimum	---
Water absorption	Percent	0.5 maximum	0.5 maximum	ASTM D570
Electrical properties:	---	---	---	---
Dielectric strength	Volts/mil	200 minimum	200 minimum	ASTM D876
Volume resistivity	Ohms-cm	10 ¹² minimum	10 ¹⁰ minimum	ASTM D257

1/ Material: Material shall be modified crosslinked polyolefin (type A: 150°C) or fluoroelastomer (type B: 200°C) and shall have the characteristics shown in table I above.

REQUIREMENTS:

Design and construction: See figures 1 through 4 and table I.

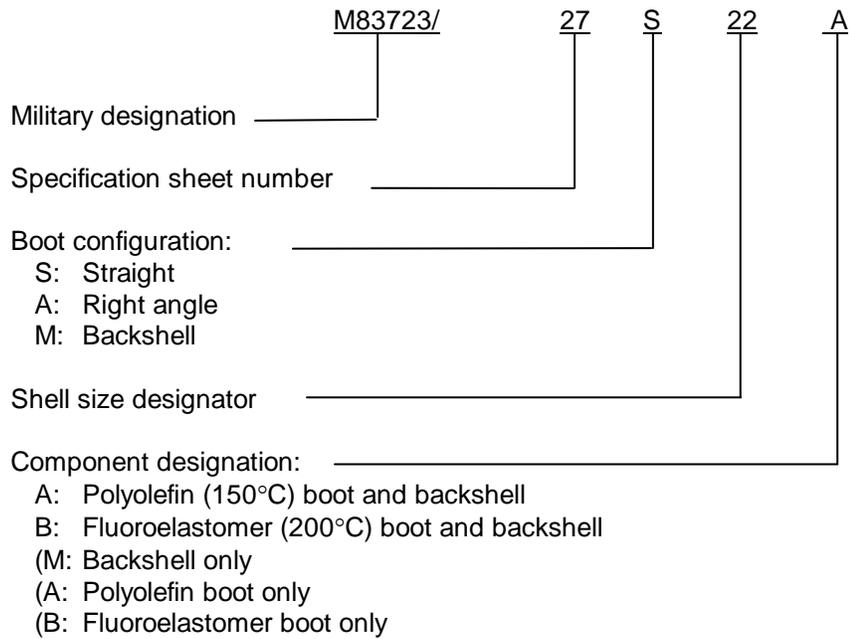
Material: Aluminum alloy.

Finish: Class R, 200° conductive finish.

Remove all burrs and sharp edges.

Marking: Package shall be marked with military Part or Identifying Number (PIN) and manufacturer's identification.

PIN example:



Additional PIN examples:

M83723/27M22(M – Metal backshell only for shell size 22

M82723/27A17(B – Right angle fluoroelastomer boot only to fit backshell size 16S

Elastic memory

A 6 x 1/8 inch specimen cut from a molded slab shall be marked with two parallel gage lines 1 inch apart in the central portion of the specimen. A 2 inch portion of the specimen including both gage lines shall then be heated for 5 minutes in a $200^{\circ} \pm 5^{\circ}\text{C}$ ($392^{\circ} \pm 9^{\circ}\text{F}$) oven or equivalent, removed from the oven, and stretched within 10 seconds until the gage lines are 4 inches apart. The extended specimen then shall be cooled at room temperature and released from tension. After 24 hours at room temperature, the distance between the gage lines shall be measured and recorded as the extended length. The portion of the specimen including both gage lines then shall be reheated for 5 minutes in a $200^{\circ} \pm 5^{\circ}$ ($392^{\circ} \pm 9^{\circ}\text{F}$) oven or equivalent, removed from the oven, and allowed to retract. The specimen shall again be cooled to room temperature and the distance between the gage lines then shall be measured and recorded as the retracted length. Expansion and retraction shall be calculated as follows:

$$\text{Expansion} = (\text{extended length} - 1) \times 100 \text{ percent}$$

$$\text{Retraction} = \frac{\text{extended length} - \text{retracted length} - \text{retracted length}}{\text{extended length} - 1} \times 100 \text{ percent}$$

Low-temperature flexibility

A 6 x 1/4 inch specimen out from a molded slab shall be mounted in a loop position between movable, parallel jaws 2 1/2 inches apart. Each end of the specimen shall be firmly fastened by at least 3/4 of an inch extending into a set of jaws. The specimen and the test fixture shall be conditioned for 4 hours at $-55^{\circ} \pm 2^{\circ}\text{C}$ ($-67^{\circ} \pm 4^{\circ}\text{F}$). While at this temperature, the jaws shall be moved rapidly from 2 1/2 inch to a 1 inch separation.

Heat shock

A 6-inch by 1/2 inch specimen cut from a molded slab shall be conditioned in an oven at temperature. After this conditioning, the specimen shall be visually examined for evidence of dripping, flowing, or cracking.

Heat aging

Three specimens, prepared and measured in accordance with ASTM D412, shall be conditioned at temperature for 168 hours in an oven with an air velocity of from 100 to 200 feet per minute past the specimens. After conditioning, the specimens shall be removed from the oven, cooled to room temperature, and tested for tensile strength elongation.

Fluid resistance

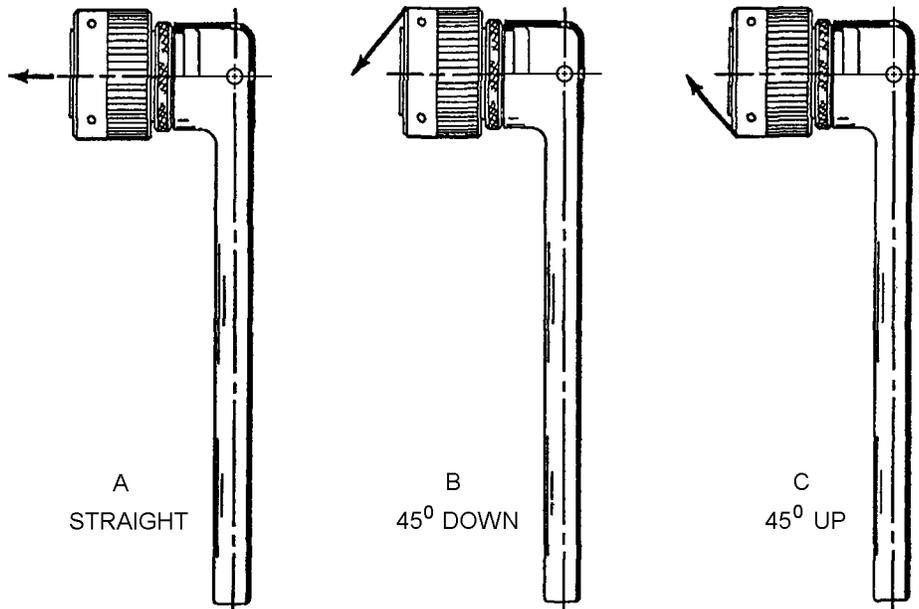
Specimens 6 x .25 x .075 shall be cut from molded slabs. Three (3) specimens shall be immersed in each of the fluids specified. The volume of fluid shall be not less than 20 times that of the specimens. After immersion, the specimens shall be lightly wiped and air dried for 30 to 60 minutes at standard conditions.

Fluid	Specification
Hydraulic fluid, petroleum base	MIL-PRF-5606
JP-4 fuel	MIL-DTL-5624
Lubricating oil	MIL-PRF-7808
Lubricating oil	MIL-PRF-23699
Deicing fluid	SAE-AMS1424

PERFORMANCE:

Temperature life

Three straight and three 90° angle boots of each material (type A and type B) shall be installed on a connector and exposed to rated temperature (type A: 150°C) (type B: 200°C) for 1000 hours. At the end of this time, they shall be cooled to room temperature and the pull-off tests depicted below shall be performed. The minimum force required to pull boot from connector at any angle shall be 25 pounds.



QUALITY ASSURANCE:

Preproduction tests

Preproduction tests shall consist of the entire list of material requirements in table I and the performance test for temperature life.

Acceptance test

Acceptance tests shall consist of dimensional recovery, tensile strength, elongation, stiffness, heat shock and hardness.

Changes from previous issue. The margins of this specification sheet are marked with vertical lines to indicate where changes from the previous issue were made. 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 and relationship to the previous issue.

Referenced documents. In addition to MIL-DTL-83723, this document references the following:

- MIL-PRF-5606
- MIL-DTL-5624
- MIL-PRF-7808
- MIL-PRF-23699
- ASTM G21
- ASTM D257
- ASTM D412
- ASTM D570
- ASTM D635
- ASTM D747
- ASTM D792
- ASTM D876
- ASTM D2240
- ASTM D2671
- SAE-AMS1424

CONCLUDING MATERIAL

Custodians:

- Army - CR
- Navy - AS
- Air Force – 85
- DLA - CC

Preparing activity:

DLA - CC

(Project 5935-2015-175)

Review activity:

- Army - MI
- Air Force - 99

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