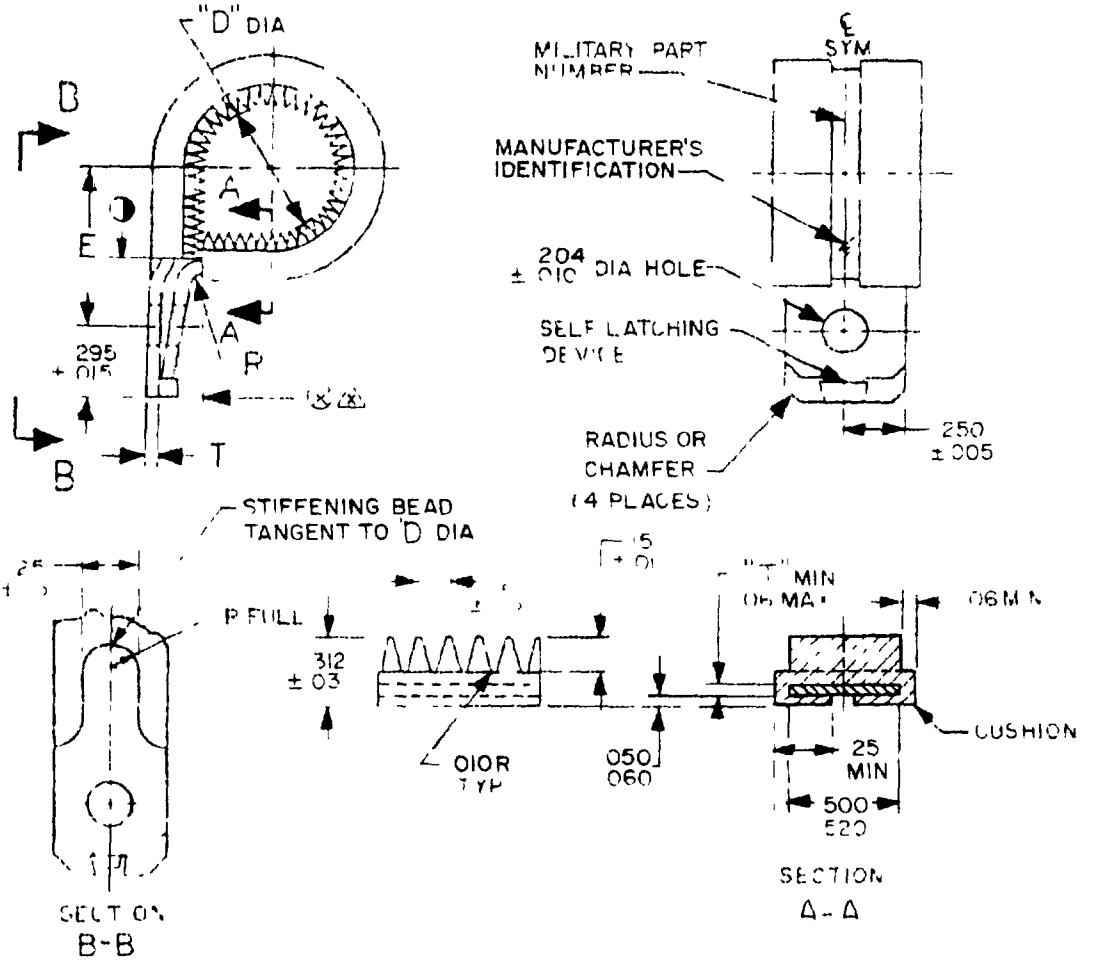
MILITARY SPECIFICATION SHEET

STRAPS, CLAMPS, PLASTIC AND METAL, AND MOUNTING HARDWARE, PLASTIC FOR CABLE HARNESS TYING AND SUPPORT CLAMP, ONE, METAL, CUSHIONED, ADJUSTABLE, WIRE SUPPORT, TYPE V, CLASS 1

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

The complete requirements for acquiring the clamp described herein shall consist of this document and the issue in effect of specification MIL-S-23190.



(X) Cushion "M" material shall start at the point "◑" as shown and stop tangent to "R" at the point identified "(X)" as shown.

AMSC N/A

TABLE I.

Dash No.	D (Ref)	E ±.015	R	T
-1	.073	D/2 +.562	.062	.020 Min
-3	.187	D/2 +.604		
-4	.250			
-6	.375			
-8	.500			
-10	.625			
-12	.750			
-14	.875			
-16	1.000			
-18	1.125	D/2 +.614		.032 Min
-20	1.250			
-22	1.375			
-24	1.500			
-26	1.625			
-28	1.750		.125	
-30	1.875			

Dash No.	D (Ref)	E ±.015	R	T
-32	2.000	D/2 +.622	.125	.040 Min
-34	2.125			
-36	2.250			
-38	2.375			
-40	2.500			
-42	2.625			
-44	2.750			
-46	2.875			
-48	3.000	D/2 +.632		
-50	3.125			
-52	3.250			
-54	3.375			
-56	3.500			
-58	3.625			
-64	4.000			
-66	4.125			

Inches	mm	Inches	mm	Inches	mm	Inches	mm
.005	0.13	.187	4.75	.625	15.88	2.250	57.15
.010	0.25	.204	5.18	.632	16.05	2.375	60.33
.015	0.38	.250	6.35	.750	19.05	2.500	63.50
.020	0.51	.260	6.60	.875	22.23	2.625	66.68
.030	0.76	.295	7.49	1.000	25.40	2.750	69.85
.032	0.81	.312	7.92	1.125	28.58	2.875	73.03
.040	1.02	.375	9.53	1.250	31.75	3.000	76.20
.050	1.27	.500	12.70	1.375	34.93	3.125	79.38
.060	1.52	.510	12.95	1.500	38.10	3.250	82.55
.062	1.57	.520	13.21	1.625	41.28	3.375	85.73
.070	1.78	.562	14.27	1.750	44.45	3.500	88.90
.078	1.98	.604	15.34	1.875	47.63	3.625	92.08
.120	3.05	.614	15.60	2.000	50.80	4.000	101.60
.125	3.18	.622	15.80	2.125	53.98	4.125	104.78
.150	3.81						

REQUIREMENTS:

1. Material.

Clamp: Corrosion and heat resistant steel in accordance with AMS 5510 or AMS 5512. Passivate per QQ-P-35.

Cushion:

a. Silicone (Designator A):

(1) Samples: The sample shall consist of ten (10) ASTM standard slabs or 360 square inches (2320 cm^2) of extruded or calendered strip 0.070 inch nominal thickness with a minimum width of 3 inches.

(2) Physical and Chemical Properties: The silicone elastomer shall meet the following chemical and physical properties specified in Table II.

TABLE II. Chemical and physical properties. 1/

Property	Requirement	Test Procedure
Tensile Strength	900 psi Minimum	ASTM D-412
Elongation	300% Minimum	ASTM D-412
Tear Strength	40 ppi Minimum	ASTM D-624 Die "B" with the grain
Hardness	50 ± 10 pts	--
Compression Set; 22 Hours at 150° ± 2°C (302° ± 4°F), 25% Deflection	15% Maximum	ASTM D-395
Heat Resistance	35 Days at 260° ± 10°C (500° ± 18°F)	ASTM D-573
Change in Volume	-15% Maximum	
Change in Hardness	+15 pts Maximum	
Change in tensile strength	-60% Maximum	
Change in elongation	-60% Maximum	
Change in tear strength	-0% Maximum	
Immersion in Fluid	22 Hours at 70° ± 1°C (158° ± 2°F)	ASTM D-471
In MIL-H-5606, Hydraulic Fluid	--	
Change in Volume	-0, +15%	
Change in Hardness	-15, +0 pts	
In MIL-L-7808, Lubricating Oil	--	
Change in Volume	-0, +15%	
Change in Hardness	-15, +0 pts	

1/ For qualification only.

(3) Color: The silicone elastomer color shall be red.

b. Fluorosilicone (Designator B): Fluorosilicone elastomer shall be in accord- ance with MIL-R-25988, Type II, Class 1, Grade 60. Color shall be black.

2. Melting Point: Not required.

3. Qualification Test Samples: Table II test results for silicone cushion materials and test results for MIL-R-25988 fluorosilicone cushion materials shall be provided with the qualification samples.

M23190/2-1A Will Qualify	-1 thru -2
-3B	-3 thru -4
-10A	-6 thru -14
-20B	-16 thru -24
-28A	-26 thru -30
-36B	-32 thru -38
-42A	-40 thru -46
-52B	-48 thru -54
-64B	-56 thru -66

4. Quality Conformance Inspection:

4.1 Group A Inspection Tests: The following test shall be included as part of the Group A inspection.

a. Compression Set (Silicone only - designator A)

(1) Sampling Plan. The specimens shall be taken from a standard ASTM slab or from 36 square inches (232 cm^2) of extruded or calendered strip 0.070 inch nominal thickness with a minimum width of 3 inches supplied with the production lot (manufactured from the same lot of material as the clamp cushion). The Accepted Quality Level (AQL) shall be 0.0 (Percent Defective).

(2) Test Method. The cushion shall be tested in accordance with Table II.

(3) Requirement. The compression set requirement shall be as specified in Table II.

b. Cushion Hardness Test (Silicone only - designator A)

(1) Sampling Plan. The specimens shall be taken from a standard ASTM slab or from 36 square inches (232 cm^2) of extruded or calendered strip 0.070 inch nominal thickness with a minimum width of 3 inches supplied with the production lot (manufactured from the same lot of material as the clamp cushion). The Accepted Quality Level (AQL) shall be 0.0 (Percent Defective).

(2) Test Method. The cushion shall be tested in accordance with Table II.

(3) Requirement. The hardness requirement shall be as specified in Table II.

c. Cushion Fluid Test (fluorosilicone Only - designator B)

(1) Sampling Plan. Random clamp specimens shall be selected at inspection level S2 of MIL-STD-105. The accepted quality level shall be zero (Percent Defective). Upon approval by the qualifying activity, an in-process control procedure may be permitted.

(2) Test Method. The cushion shall be removed from each clamp then the full length and width measured to the nearest tenth of an inch. The cushion shall be soaked in aviation turbine fuel, Grade JP-4, manufactured in accordance with MIL-T-5624. The soak shall be 22 hours (+1, -0 hours) at room ambient (20 + 5°C). At the end of the soak period the excess fuel shall be removed by wiping, then air dryed at room ambient for no longer than one fourth hour. The full length and width shall then be measured to the nearest tenth of an inch. The percent difference between the initial and final measurement shall be determined.

(3) Requirement. The percent difference in the length and the width shall not exceed 20 percent.

(4) Sample Disposition. The clamp band may be returned to stock for refurbishing.

NOTES:

1. Dimensions are in inches.

2. Remove all burrs and sharp edges and break all sharp corners on clamp band. Mold marks and flash are permissible on cushions.

3. Metric equivalents (to the nearest .01 mm) are given for general information only and are based upon 1 inch = 25.4 mm.

4. The clamps covered by this specification are manufactured under United States Patent Number 3995795. The patent expires on 7 December 1993. The Government does not have a royalty-free license.

5. These clamps are intended for use with electrical wire and wire bundles on aerospace vehicles.

6. Cushion application:

Silicone - Silicone cushions are for elevated temperature usage in phosphate ester based fluid and other synthetic fluid contaminated areas. Silicone cushions are unaffected by ozone and not resistant to petroleum based fluids.

Fluorosilicone - Fluorosilicone cushions are for elevated temperature usage in petroleum based fluid contaminated areas. Fluorosilicone cushions are unaffected by ozone and are resistant to phosphate ester based fluids.

7. These clamps are equivalent to the MS21919 clamps of the same dash number and cushion material. MS21919 cannot replace MIL-S-23190/2 clamps. See table II.

8. The locking mechanism shall be closed and locked when clamped over a mandrel with a diameter "D" specified in Table I.

9. Example of Part Number:

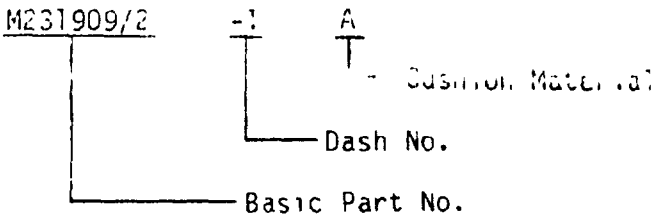


TABLE III. Clamp loop interchangeability.

Replacement	Replaces	Replacement	Replaces
M23190/2-1A -1B	MS21919CH1 and 2 CJ1 and 2	M23190/2-32A -32B	MS21919WCH32 and 33 CJ32 and 33
M23190/2-3A -3B	MS21919WCH3 CJ3	M23190/2-34A -34B	MS21919WCH34 and 35 CJ34 and 35
M23190/2-4A -4B	MS21919WCH4 and 5 CJ4 and 5	M23190/2-36A -36B	MS21919WCH36 and 37 CJ36 and 37
M23190/2-6A -6B	MS21919WH6 and 7 CJ6 and 7	M23190/2-38A -38B	MS21919WCH38 CJ38
M23190/2-8A -8B	MS21919WCH8 and 9 CJ8 and 9	M23190/2-40A -40B	MS21919WCH40 CJ40
M23190/2-10A -10B	MS21919WCH10 and 11 CJ10 and 11	M23190/2-42A -42B	MS21919WCH42 and 43 CJ42 and 43
M23190/2-12A -12B	MS21919WCH12 and 13 CJ12 and 13	M23190/2-44A -44B	MS21919WCH44 and 45 CJ44 and 45
M23190/2-14A -14B	MS21919WCH14 and 15 CJ14 and 15	M23190/2-46A -46B	MS21919WCH46 CJ46
M23190/2-16A -16B	MS21919WCH16 and 17 CJ16 and 17	M23190/2-48A -48B	MS21919WCH48 CJ48
M23190/2-18A -18B	MS21919WCH18 and 19 CJ18 and 19	M23190/2-50A -50B	MS21919CH50 CJ50
M23190/2-20A -20B	MS21919WCH20 and 21 CJ20 and 21	M23190/2-52A -52B	MS21919CH52 CJ52
M23190/2-22A -22B	MS21919WCH22 and 23 CJ22 and 23	M23190/2-54A -54B	MS21919CH54 CJ54
M23190/2-24A -24B	MS21919WCH24 and 25 CJ24 and 25	M23190/2-56A -56B	MS21919CH56 CJ56
M23190/2-26A -26B	MS21919WCH26 and 27 CJ26 and 27	M23190/2-58A -58B	MS21919CH58 CJ58
M23190/2-28A -28B	MS21919WCH28 and 29 CJ28 and 29	M23190/2-64A -64B	MS21919CH64 CJ64
M23190/2-30A -30B	MS21919WCH30 and 31 CJ30 and 31	M23190/2-66A -66B	MS21919CH66 CJ66

Custodians:
Army - CR
Navy - AS
Air Force - 85

Review activities:
Army -
Navy -
Air Force - 80, 99
DAS - GS
DOD - NS

User activities:
Army -
Navy -
Air Force -

Preparing Activity.
Navy - AS
Project No. 5975-0593