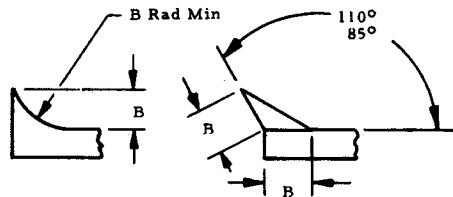
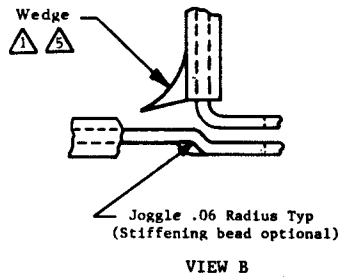
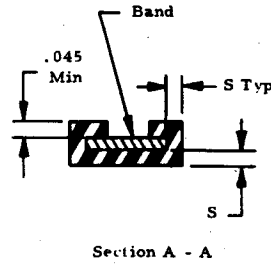
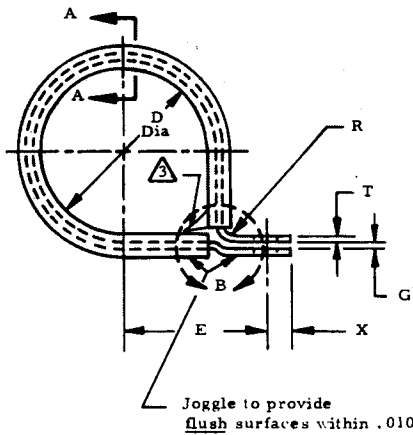
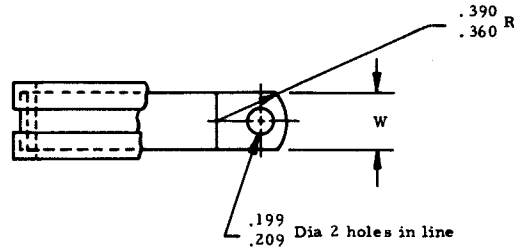


USER SYMBOLS:  
ARMY - EA

REVIEWER SYMBOLS:  
ARMY - AR  
USAF - 11  
DLA - IS

"Review/user information is current as of the date of this document. For future coordination of changes to this document, draft circulation should be based on the information in the current DODISS."

This military standard is approved for use by all Departments & Agencies of the Department of Defense. Selection for all new engineering and design applications and for repetitive use shall be made from this document.



(E) REVISED AND REDRAWN

P. A. AS Other Cust. AV 99	TITLE CLAMP, LOOP TYPE, CUSHIONED, SUPPORT	MILITARY STANDARD MS 21919
PROCUREMENT SPECIFICATION MIL-C-8603	SUPERSEDES:	SHEET 1 OF 4

APPROVED 3 JULY 53 REVISED: (E) 30 SEPT 81

Dash Nos.	Rigid Tube Nom. OD (Ref)	DIMENSIONS												
		B ±.032	D ±.015 Dia	E ±.015		G	R ±.016 Rad	S ±.020	T		W ±.010		X ±.015	
				Alum	Steel & Cres				Alum	Steel & Cres	Alum	Steel & Cres	Alum	Steel & Cres
-1	1/16	.062	.436	.436				.020	.020	.375		.188		
-2	1/8	.046	.125	.457										
-3	3/16	.110	.188	.498										
-4	1/4		.250	.529				.032				.188		
-5	5/16		.313	.560		.062				.375				
-6	3/8	.093	.375	.592										
-7	7/16	.125	.438	.623	.062									
-8	1/2		.500	.654	+.016		.040							
-9	9/16		.563	.752	-.000									
-10	5/8		.625	.783										
-11	11/16		.688	.814										
-12	3/4		.750	.845				.050						
-13	13/16		.813	.877		.109								
-14	7/8		.875	.908										
-15	15/16		.938	.939										
-16	1		1.000	.970				.032						
-17	1-1/16		1.063	1.002										
-18	1-1/8		1.125	1.062										
-19	1-3/16		1.188	1.093										
-20	1-1/4		1.250	1.124										
-21	1-5/16		1.313	1.156										
-22	1-3/8		1.375	1.187										
-23	1-7/16		1.438	1.218	.094					.500				
-24	1-1/2		1.500	1.249	+.031									
-25	1-9/16		1.563	1.281	-.000									
-26	1-5/8		1.625	1.312										
-27			1.688	1.344										
-28	1-3/4		1.750	1.374										
-29			1.813	1.406										
-30	1-7/8	.155	1.875	1.437						.500	.218	.218		
-31		.312	1.938	1.468										
-32	2		2.000	1.499										
-33			2.062	1.531										
-34	2-1/8		2.125	1.562		.125	.060	.062						
-35			2.188	1.594										
-36	2-1/4		2.250	1.624										
-37			2.312	1.655										
-38	2-3/8		2.375	1.687										
-40	2-1/2		2.500	1.752										
-42			2.625	1.812	.125			.040						
-43			2.688	1.844	+.031									
-44	2-3/4		2.750	1.875	-.000									
-45			2.812	1.906										
-46			2.875	1.937										
-48	3		3.000	2.000										
-50			3.125	2.062										
-52	3-1/4		3.250	2.125										
-54			3.375	2.187										
-56	3-1/2	.312	3.500	2.250										
-58			3.625	2.312										
-64	4		4.000	2.500										
-66			4.125	2.562										

APPROVED 3 JULY 53 REVISED: (E) FOR CHANGES SEE SHEETS 1 THRU 4

P. A. AS Other Cust: AV 99	TITLE	MILITARY STANDARD
	CLAMP, LOOP TYPE, CUSHIONED, SUPPORT	MS 21919
PROCUREMENT SPECIFICATION MIL-C-8603	SUPERSEDES:	SHEET 2 OF 4

REQUIREMENT:

1. MATERIALS:

BAND - ALUMINUM ALLOY  
CORROSION RESISTANT STEEL  
LOW CARBON STEEL

CUSHION - ETHYLENE PROPYLENE  
NITRILE  
CHLOROPRENE  
SILICONE  
FLUOROSILICONE

SEE PROCUREMENT SPECIFICATION

2. FINISH:

CHEMICAL CONVERSION  
PASSIVATED  
CADMIUM PLATED

SEE PROCUREMENT SPECIFICATION

3. MATERIAL CODES:

LETTER(S) INDICATES BAND AND CUSHION MATERIALS. DO NOT SPECIFY BAND/CUSHION COMBINATIONS NOT LISTED. MAXIMUM RECOMMENDED TEMPERATURE IS INDICATED IN PARENTHESIS.

- DE - ALUMINUM BAND WITH ETHYLENE PROPYLENE CUSHION (212°F)
- DF - ALUMINUM BAND WITH NITRILE CUSHION (212°F)
- DG - ALUMINUM BAND WITH CHLOROPRENE CUSHION (212°F)
- CE - CRES BAND WITH ETHYLENE PROPYLENE CUSHION (275°F)
- CF - CRES BAND WITH NITRILE CUSHION (212°F)
- CH - CRES BAND WITH SILICONE CUSHION (400°F)
- CG - CRES BAND WITH CHLOROPRENE CUSHION (212°F)
- CJ - CRES BAND WITH FLUOROSILICONE CUSHION (450°F)
- F - LOW CARBON STEEL BAND WITH NITRILE CUSHION (212°F)
- G - LOW CARBON STEEL BAND WITH CHLOROPRENE CUSHION (212°F)
- H - LOW CARBON STEEL BAND WITH SILICONE CUSHION (400°F)



4. CUSHION APPLICATION AND COLOR INFORMATION

ETHYLENE PROPYLENE - FOR USE IN AREAS CONTAMINATED WITH PHOSPHATE ESTER HYDRAULIC FLUID AND OTHER SYNTHETIC FLUIDS. EXCELLENT OZONE RESISTANCE. NOT RESISTANT TO PETROLEUM BASED FLUIDS. COLOR SHALL BE SOLID PURPLE.

NITRILE - FOR USE PRIMARILY IN FUEL IMMERSION AND FUEL VAPORS. GOOD OZONE RESISTANCE. NOT RESISTANT TO PHOSPHATE ESTER BASED FLUIDS. NOT FOR USE ON TITANIUM TUBING. COLOR SHALL BE SOLID YELLOW.

CHLOROPRENE - FOR GENERAL PURPOSE USE IN AREAS CONTAMINATED WITH PETROLEUM BASED HYDRAULIC FLUIDS AND OCCASIONAL FUEL SPLASH. EXCELLENT OZONE RESISTANT. NOT RESISTANT TO PHOSPHATE ESTER BASED FLUIDS. NOT FOR USE ON TITANIUM TUBING. COLOR SHALL BE BLACK WITH A BLUE IDENTIFIER PER THE PROCUREMENT SPECIFICATION.

SILICONE - FOR ELEVATED TEMPERATURE USAGE IN PHOSPHATE ESTER BASED FLUID AND OTHER SYNTHETIC FLUID CONTAMINATED AREAS. UNAFFECTED BY OZONE. NOT RESISTANT TO PETROLEUM BASED FLUIDS. COLOR SHALL BE NATURAL WHITE.

FLUOROSILICONE - FOR ELEVATED TEMPERATURE USAGE IN PETROLEUM BASED FLUID CONTAMINATED AREAS. UNAFFECTED BY OZONE. NOT RESISTANT TO PHOSPHATE ESTER BASED FLUIDS. COLOR SHALL BE SOLID BLUE.

USER SYMBOLS:  
ARMY - EA

REVISION SYMBOLS:  
ARMY - AR  
USAF - 11  
DLA - 15

\*Revision/Change information is carried on of the date of this document. For future consideration of changes to this document, draft consideration should be based on the information in the current 999999.

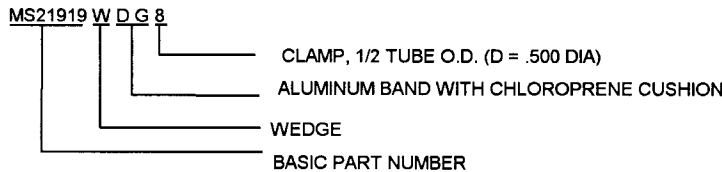
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APPROVED 3 JULY 53 REVISED 8 FOR CHANGES SEE SHEETS 1 THRU 4

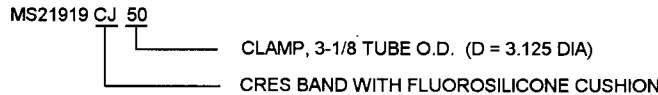
P.A. NAVY - AS Other Code ARMY - AY USAF - 99	TITLE	MILITARY STANDARD
	CLAMP, LOOP TYPE, CUSHIONED, SUPPORT	MS21919
PROCUREMENT SPECIFICATION MIL-C-8603	SUPERSEDES	SHEET 3 OF 4

NOTES:

- 1. LETTER "W" INDICATES WEDGE TYPE CUSHION. WEDGE (W) IS MANDATORY FOR -2 THRU -48 SIZE CLAMPS.
- 2. WEDGE IS PROHIBITED ON -1 AND -50 THRU -66 SIZE CLAMPS.
- 3. WEDGE SHALL BE INTEGRALLY MOLDED TO CUSHION OR VULCANIZED USING PRESSURE AND HEAT TO ACCOMPLISH A BOND BETWEEN CUSHION AND WEDGE
- 4. WEDGE SHALL OVERLAP AND TOUCH OPPOSITE END OF CUSHION WHEN CLAMP MOUNTING HOLES ARE ALIGNED AND DIMENSION G IS 0.00 (CLAMP COMPLETELY CLOSED).
- 5. THE CLAMP BAND SHALL BE FINISHED DURING MANUFACTURE SUCH AS TO REMOVE ALL TOOL AND DIE MARKS SHARP EDGES AND BURRS.
- 6. CLAMPS WITH LOW CARBON STEEL BANDS ARE INACTIVE FOR NEW AIRCRAFT DESIGN AS OF 1 OCTOBER 1982.
- 7. CANCELLED P/N LISTED IN INTERCHANGEABILITY TABLE ARE CANCELLED AFTER 1 OCTOBER 1982. REPLACEMENT P/N CAN REPLACE CANCELLED P/N UNIVERSALLY BUT CANCELLED P/N CANNOT REPLACE REPLACEMENT P/N UNIVERSALLY.
- 8. DIMENSIONS ARE IN INCHES.
- 9. INTENDED USE: THESE CLAMPS ARE INTENDED FOR GENERAL PURPOSE CLAMPING APPLICATION INCLUDING ELECTRICAL WIRE BUNDLE CLAMPING. FOR HIGH PERFORMANCE LOOP STYLE CLAMPS FOR USE IN MIL-H-5440 HYDRAULIC SYSTEMS SEE MIL-C-85052.
- 10. EXAMPLE PART NUMBERS:  
FOR -2 THRU -48 SIZE CLAMPS (WEDGE MANDATORY) 1



FOR -50 THRU -66 SIZE CLAMPS (WEDGE PROHIBITED) 2



- 11. REFERENCED DOCUMENTS SHALL BE OF THE ISSUE IN EFFECT ON DATE OF INVITATION FOR BID OR REQUEST FOR PROPOSAL EXCEPT THAT REFERENCED INDUSTRY DOCUMENTS SHALL BE GIVE THE DATE OF THE ISSUE ADOPTED.
- 12. FOR DESIGN FEATURE PURPOSES, THIS STANDARD TAKES PRECEDENCE OVER PROCUREMENT DOCUMENTS REFERENCED HEREIN.

INTERCHANGEABILITY TABLE 3

FOR -2 THRU -48		FOR -50 THRU -66	
CANCELLED PART NUMBER	REPLACEMENT PART NUMBER	CANCELLED PART NUMBER	REPLACEMENT PART NUMBER
MS 21919 WB (F, G, H) ( )	MS 21919 W (F, G, H) ( ) 4	MS 21919 WC (F, G, H) ( )	MS 21919C (F, G, H) ( )
MS21919B (F, G, H) ( )	MS 21919 W (F, G, H) ( ) 4	MS 21919 WD (F, G) ( )	MS 21919D (F, G) ( )
MS 21919 D (F, G) ( )	MS 21919 WD (F, G) ( )	MS 21919 WB (F, G, H) ( )	MS 21919 (F, G, H) ( ) 4
MS 21919 C (F, G, H) ( )	MS 21919 WC (F, G, H) ( )	MS 21919 B (F, G, H) ( )	MS 21919 (F, G, H) ( ) 4
MS21919 (F, G, H) ( )	MS 21919 W (F, G, H) ( ) 4	MS 21919 DH ( )	MS 21919 CH ( )
MS 21919 DH ( )	MS 21919 WCH ( )	MS 21919 WDH ( )	MS 21919CH ( )
MS 21919 WDH ( )	MS21919 WCH ( )	MS 21919 W (F, G, H) ( )	MS 21919 (F, G, H) ( ) 4

NOTE: INSERT APPROPRIATE SIZE (DASH NO.) IN PARENTHESIS AT END OF PART NUMBER.

P.A. NAVY - AS Other Cost  ARMY - AV USAF - 99	TITLE	MILITARY STANDARD
	CLAMP, LOOP TYPE, CUSHIONED, SUPPORT	MS21919
PROCUREMENT SPECIFICATION MIL-C-8603	SUPERSEDES:	SHEET 4 OF 4

USER SYMBOLS  
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 For future consideration of changes in this document, draft submissions  
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This military standard is approved for use by all Government  
 agencies of the Government of Britain. Subsequent for all use  
 necessary and design appropriate and for revisions are that  
 to make from this document.

APPROVED 3 JULY 63 REVISED (E) FOR CHANGES SEE SHEETS 1 THRU 4