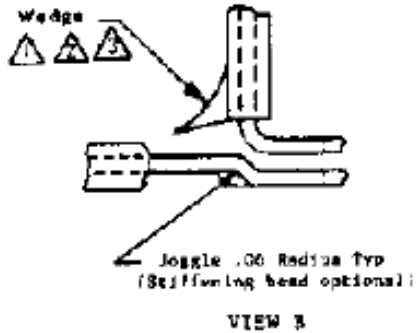
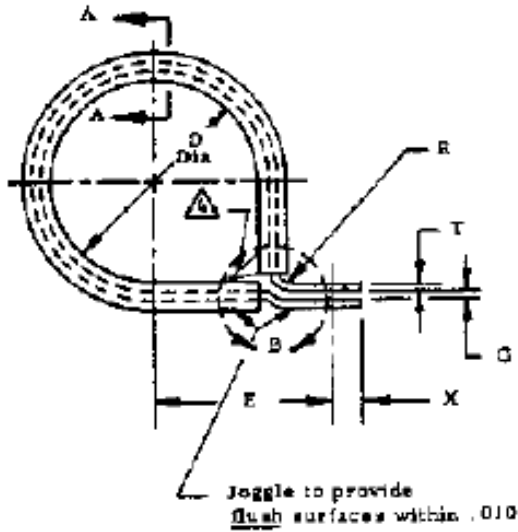
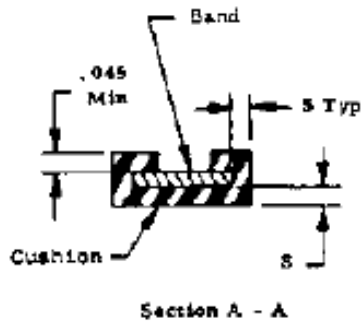
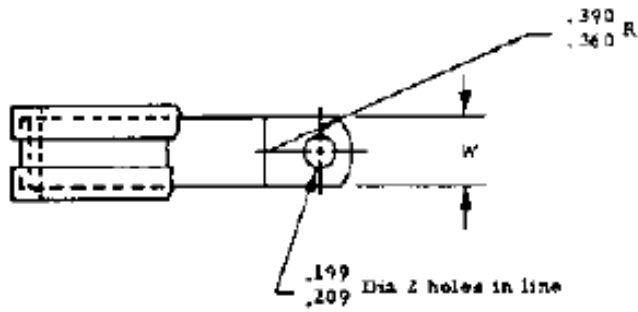


# MS 21919



# MS 21919

| Dash Nos. | Rigid Tube Nom. OD (Ref) | DIMENSIONS |                      |              |                  |        |                      |                     |       |                  |              |                  |              |                  |
|-----------|--------------------------|------------|----------------------|--------------|------------------|--------|----------------------|---------------------|-------|------------------|--------------|------------------|--------------|------------------|
|           |                          | B          | D<br>+/-,015<br>Dia. | E<br>+/-,015 |                  | G      | R<br>+/-,016<br>Rad. | S<br>+0,020<br>.000 | T     |                  | W<br>+/-,010 |                  | X<br>+/-,015 |                  |
|           |                          |            |                      | Alum.        | Steel<br>& Cres. |        |                      |                     | Alum. | Steel<br>& Cres. | Alum.        | Steel<br>& Cres. | Alum.        | Steel<br>& Cres. |
| -1        | 1/16                     | (2)        | .062                 | .436         | .436             |        |                      |                     | .020  | .020             | .375         |                  | .188         |                  |
| -2        | 1/8                      | .046       | .125                 | .457         | .457             |        |                      |                     |       |                  |              |                  |              |                  |
| -3        | 3/16                     | .110       | .188                 | .498         | .498             |        |                      |                     |       |                  |              |                  |              |                  |
| -4        | 1/4                      |            | .250                 | .529         | .529             |        |                      |                     |       |                  |              |                  |              |                  |
| -5        | 5/16                     |            | .313                 | .560         | .560             |        |                      | .062                | .032  |                  | .375         |                  | .188         |                  |
| -6        | 3/8                      | .093       | .375                 | .592         | .592             |        |                      |                     |       |                  |              |                  |              |                  |
| -7        | 7/16                     | .125       | .438                 | .623         | .623             |        |                      |                     |       |                  |              |                  |              |                  |
| -8        | 1/2                      |            | .500                 | .654         | .654             | .062   |                      |                     |       |                  |              |                  |              |                  |
| -9        | 9/16                     |            | .563                 | .752         | .749             | +0,016 |                      | .040                |       |                  |              |                  |              |                  |
| -10       | 5/8                      |            | .625                 | .783         | .780             | -.000  |                      |                     |       |                  |              |                  |              |                  |
| -11       | 11/16                    |            | .688                 | .814         | .811             |        |                      |                     |       |                  |              |                  |              |                  |
| -12       | 3/4                      |            | .750                 | .845         | .842             |        |                      |                     |       |                  |              |                  |              |                  |
| -13       | 13/16                    |            | .813                 | .877         | .858             |        |                      | .109                | .050  |                  |              |                  |              |                  |
| -14       | 7/8                      |            | .875                 | .908         | .889             |        |                      |                     |       |                  |              |                  |              |                  |
| -15       | 15/16                    |            | .938                 | .939         | .920             |        |                      |                     |       |                  |              |                  |              |                  |
| -16       | 1                        |            | 1.000                | .970         | .951             |        |                      |                     |       | .032             |              |                  |              |                  |
| -17       | 1-1/16                   |            | 1.063                | 1.002        | .983             |        |                      |                     |       |                  |              |                  |              |                  |
| -18       | 1-1/8                    |            | 1.125                | 1.062        | 1.030            |        |                      |                     |       |                  |              |                  |              |                  |
| -19       | 1-3/16                   |            | 1.188                | 1.093        | 1.061            |        |                      |                     |       |                  |              |                  |              |                  |
| -20       | 1-1/4                    |            | 1.250                | 1.124        | 1.092            |        |                      |                     |       |                  |              |                  |              |                  |
| -21       | 1-5/16                   |            | 1.313                | 1.156        | 1.124            |        |                      |                     |       |                  |              |                  |              |                  |
| -22       | 1-3/8                    |            | 1.375                | 1.187        | 1.155            |        |                      |                     |       |                  |              |                  |              |                  |
| -23       | 1-7/16                   |            | 1.438                | 1.218        | 1.186            | .094   |                      |                     |       |                  |              |                  |              |                  |
| -24       | 1-1/2                    |            | 1.500                | 1.249        | 1.217            | +0,031 |                      |                     |       |                  |              |                  |              |                  |
| -25       | 1-9/16                   |            | 1.563                | 1.281        | 1.259            | -.000  |                      |                     |       |                  |              |                  |              |                  |
| -26       | 1-5/8                    |            | 1.625                | 1.312        | 1.280            |        |                      |                     |       |                  |              |                  |              |                  |
| -27       |                          | .155       | 1.688                | 1.344        | 1.312            |        |                      |                     |       | .500             |              | .218             |              |                  |
| -28       | 1-3/4                    | .312       | 1.750                | 1.374        | 1.342            |        |                      |                     |       |                  |              |                  |              |                  |
| -29       |                          |            | 1.813                | 1.406        | 1.374            |        |                      |                     |       |                  |              |                  |              |                  |
| -30       | 1-7/8                    |            | 1.875                | 1.437        | 1.405            |        |                      |                     |       |                  | .500         |                  | .218         |                  |
| -31       |                          |            | 1.938                | 1.468        | 1.444            |        |                      |                     |       |                  |              |                  |              |                  |
| -32       | 2                        |            | 2.000                | 1.499        | 1.475            |        |                      |                     |       |                  |              |                  |              |                  |
| -33       |                          |            | 2.062                | 1.531        | 1.507            |        |                      |                     |       |                  |              |                  |              |                  |
| -34       | 2-1/8                    |            | 2.125                | 1.562        | 1.538            |        |                      |                     |       |                  |              |                  |              |                  |
| -35       |                          |            | 2.188                | 1.594        | 1.570            |        |                      | .125                | .060  | .062             |              |                  |              |                  |
| -36       | 2-1/4                    |            | 2.250                | 1.624        | 1.600            |        |                      |                     |       |                  |              |                  |              |                  |
| -37       |                          |            | 2.312                | 1.655        | 1.631            |        |                      |                     |       |                  |              |                  |              |                  |
| -38       | 2-3/8                    |            | 2.375                | 1.687        | 1.663            |        |                      |                     |       |                  |              |                  |              |                  |
| -40       | 2-1/2                    |            | 2.500                | 1.752        | 1.728            |        |                      |                     |       |                  |              |                  |              |                  |
| -42       |                          |            | 2.625                | 1.812        | 1.788            |        |                      |                     |       |                  |              |                  |              |                  |
| -43       |                          |            | 2.688                | 1.844        | 1.820            | .125   |                      |                     |       |                  |              |                  |              |                  |
| -44       | 2-3/4                    |            | 2.750                | 1.875        | 1.851            | +0,031 |                      |                     |       | .040             |              |                  |              |                  |
| -45       |                          |            | 2.812                | 1.906        | 1.882            | -.000  |                      |                     |       |                  |              |                  |              |                  |
| -46       |                          |            | 2.875                | 1.937        | 1.913            |        |                      |                     |       |                  |              |                  |              |                  |
| -48       | 3                        |            | 3.000                | 2.000        | 1.976            |        |                      |                     |       |                  |              |                  |              |                  |
| -50       |                          |            | 3.125                | 2.062        | 2.038            |        |                      |                     |       |                  |              |                  |              |                  |
| -52       | 3-1/4                    |            | 3.250                | 2.125        | 2.101            |        |                      |                     |       |                  |              |                  |              |                  |
| -54       |                          |            | 3.375                | 2.187        | 2.163            |        |                      |                     |       |                  |              |                  |              |                  |
| -56       | 3-1/2                    | (2)        | 3.500                | 2.250        | 2.226            |        |                      |                     |       |                  |              |                  |              |                  |
| -58       |                          |            | 3.625                | 2.312        | 2.288            |        |                      |                     |       |                  |              |                  |              |                  |
| -64       | 4                        |            | 4.000                | 2.500        | 2.476            |        |                      |                     |       |                  |              |                  |              |                  |
| -66       |                          |            | 4.125                | 2.562        | 2.538            |        |                      |                     |       |                  |              |                  |              |                  |

- NOTES:
- PROCUREMENT SPECIFICATION: MIL-C-8803
  - SUPERSEDES: NONE
  - THIS INFORMATION FROM MILITARY STANDARD MS21919 PAGE 2 OF 4, REVISED SEPTEMBER 30, 1981, SOME DETAILS MAY HAVE BEEN OMITTED FOR CLARITY.

**REQUIREMENT:**

**1. MATERIALS:**

BAND --- ALUMINUM ALLOY  
CORROSION RESISTANT STEEL  
LOW CARBON STEEL

CUSHION --- ETHYLENE PROPYLENE  
NITRILE  
CHLOROPRENE  
SILICONE  
FLUOROSILICONE

**2. FINISH:**

CHEMICAL CONVERSION  
PASSIVATED  
CADMIUM PLATED

**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.

**NOTES:**

- PROCUREMENT SPECIFICATION: MIL-C-8803
- SUPERSEDES: NONE
- THIS INFORMATION FROM MILITARY STANDARD MS21919 PAGE 3 OF 4, REVISED SEPTEMBER 30, 1981, SOME DETAILS MAY HAVE BEEN OMITTED FOR CLARITY.

# MS 21919

## 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 -86 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 OCTOBER 1, 1982.
- [ 7 ] CANCELLED P / N LISTED IN INTERCHANGEABILITY TABLE, ARE CANCELLED AFTER OCTOBER 1, 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 APPLICATIONS 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 ]  
 MS21919 W DG 8  
 CLAMP, 1/2 TUBE O.D. ( D = .500 DIA )  
 ALUMINUM BAND WITH CHLOROPRENE CUSHION  
 WEDGE  
 BASIC PART NUMBER
- FOR -50 THRU -86 SIZE CLAMPS (WEDGE PROHIBITED) [ 2 ]  
 MS21919 CJ 50  
 CLAMP, 3-1/8 TUBE O.D. ( D = 3.125 DIA )  
 CRES BAND WITH FLUOROSILICONE CUSHION
11. REFERENCED DOCUMENTS SHALL BE OF THE ISSUE IN EFFECT ON DATE OF INVITATIONS FOR BIDS OR REQUEST FOR PROPOSAL, EXCEPT THAT REFERENCED ADOPTED INDUSTRY DOCUMENTS SHALL GIVE THE DATE OF THE ISSUE ADOPTED.
12. FOR DESIGN FEATURE PURPOSES, THIS STANDARD TAKES PRECEDENCE OVER PROCUREMENT DOCUMENTS REFERENCED HEREIN.

## INTERCHANGEABILITY TABLE [ 7 ]

| FOR -2 THRU -48           |                                 | FOR -50 THRU -86          |                               |
|---------------------------|---------------------------------|---------------------------|-------------------------------|
| CANCELLED PART NUMBER     | REPLACEMENT PART NUMBER         | CANCELLED PART NUMBER     | REPLACEMENT PART NUMBER       |
| MS21919WB ( F, G, H ) ( ) | MS21919W ( F, G, H ) ( ) [ 6 ]  | MS21919WC ( F, G, H ) ( ) | MS21919C ( F, G, H ) ( )      |
| MS21919B ( F, G, H ) ( )  | MS21919W ( F, G, H ) ( ) [ 6 ]  | MS21919WD ( F, G, H ) ( ) | MS21919D ( F, G, H ) ( )      |
| MS21919D ( F, G, ) ( )    | MS21919WD ( F, G, ) ( )         | MS21919WB ( F, G, H ) ( ) | MS21919 ( F, G, H ) ( ) [ 6 ] |
| MS21919C ( F, G, H ) ( )  | MS21919WC ( F, G, H ) ( )       | MS21919B ( F, G, H ) ( )  | MS21919 ( F, G, H ) ( ) [ 6 ] |
| MS21919 ( F, G, H ) ( )   | MS21919WD ( F, G, H ) ( ) [ 6 ] | MS21919DH ( )             | MS21919CH ( )                 |
| MS21919DH ( )             | MS21919WCH ( )                  | MS21919WDH ( )            | MS21919CH ( )                 |
| MS21919WDH ( )            | MS21919WCH ( )                  | MS21919W ( F, G, H ) ( )  | MS21919 ( F, G, H ) ( ) [ 6 ] |

INSERT APPROPRIATE SIZE (DASH NUMBER) IN PARENTHESIS AT END OF PART NUMBER.

### ADDITIONAL NOTES:

- PROCUREMENT SPECIFICATION: MIL-C-8803
- SUPERSEDES: NONE
- THIS INFORMATION FROM MILITARY STANDARD MS21919 PAGE 4 OF 4, REVISED SEPTEMBER 30, 1981, SOME DETAILS MAY HAVE BEEN OMITTED FOR CLARITY.