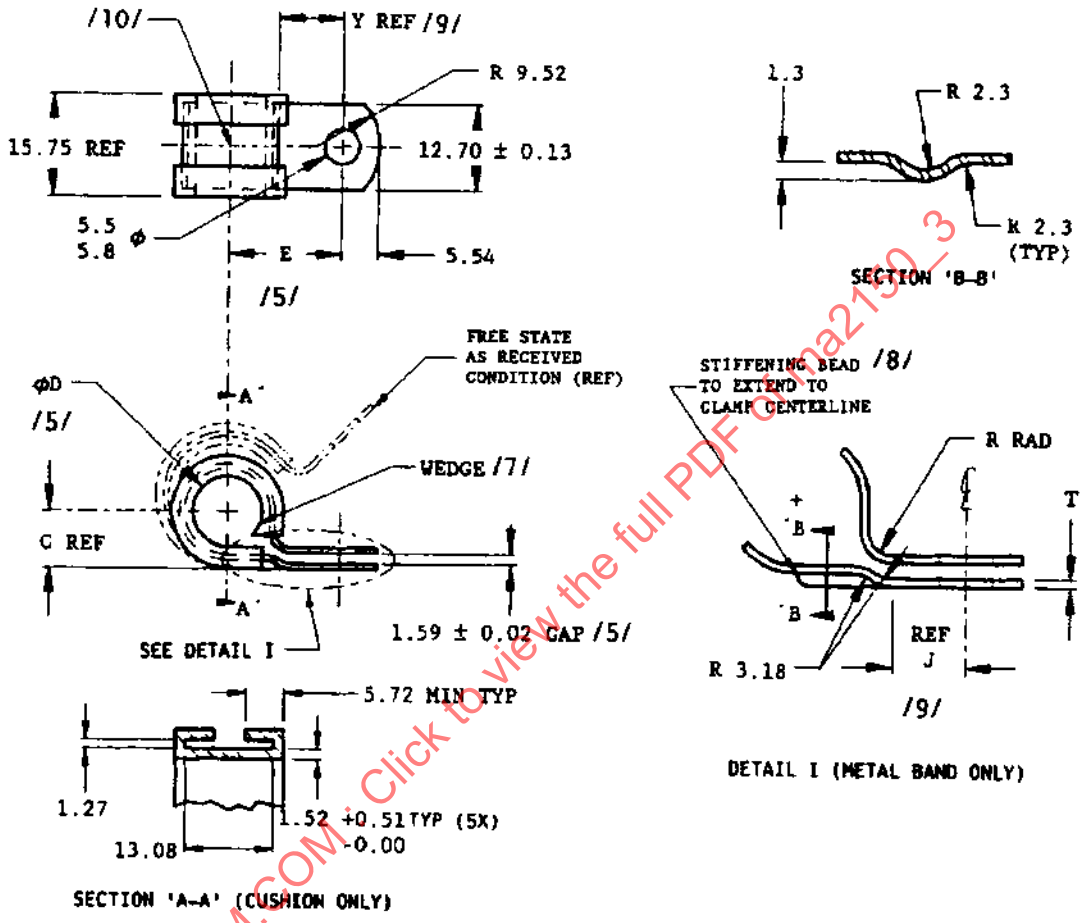
FEDERAL SUPPLY CLASS
5340

RATIONALE

MA2150/3 HAS BEEN REAFFIRMED TO COMPLY WITH THE SAE FIVE-YEAR REVIEW POLICY.



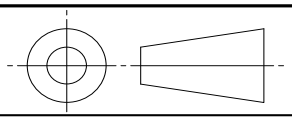

NOTE: GEOMETRIC DIMENSIONING AND TOLERANCING ARE SUBJECT TO INTERPRETATION OF ANSI 14.5M-1982.

FIGURE 1





THIRD ANGLE PROJECTION



ISSUED 1991-04 REAFFIRMED 2015-04

CUSTODIAN: G-3/G-3E

PROCUREMENT SPECIFICATION: MA2150

# AEROSPACE STANDARD

CLAMP, LOOP STYLE, CUSHIONED, WITH WEDGE, HIGH TEMPERATURE, METRIC

**MA2150/3**

TABLE 1 - DIMENSIONAL TABULATION

| Size Code | ϕ D Norm mm Tolerances | C Ref | E ±0.38 | J Ref | R Rad ±0.25 | T Per Spec | Y Ref |
|---|---|---|---|---|---|---|---|
| 03 | 3.2 | 5.16 | 11.89 | 5.97 | 2.29 | 0.51 | 8.26 |
| 04 | 4.0 | 5.56 | 12.29 | 5.97 | 2.29 | 0.51 | 8.26 |
| 05 | 5.0 | 6.06 | 12.79 | 5.97 | 2.29 | 0.51 | 8.26 |
| 06 | 6.0 | 6.56 | 13.29 | 5.97 | 2.29 | 0.51 | 8.26 |
| 08 | 8.0 | 7.56 | 14.29 | 5.97 | 2.29 | 0.51 | 8.26 |
| 10 | 10.0 | 8.56 | 15.29 | 5.97 | 2.29 | 0.51 | 8.26 |
| 12 | 12.0 | 9.56 | 16.29 | 5.97 | 2.29 | 0.51 | 8.26 |
| 14 | 14.0 | 10.86 | 18.68 | 6.50 | 3.18 | 0.81 | 9.35 |
| 15 | 15.0 | 11.36 | 19.18 | 6.50 | 3.18 | 0.81 | 9.35 |
| 16 | 16.0 | 11.86 | 19.68 | 6.50 | 3.18 | 0.81 | 9.35 |
| 18 | 18.0 | 12.86 | 20.68 | 6.50 | 3.18 | 0.81 | 9.35 |
| 20 | 20.0 | 13.86 | 21.68 | 6.50 | 3.18 | 0.81 | 9.35 |
| 22 | 22.0 | 14.86 | 22.68 | 6.50 | 3.18 | 0.81 | 9.35 |
| 25 | 25.0 | 16.36 | 24.18 | 6.50 | 3.18 | 0.81 | 9.35 |
| 28 | 28.0 | 18.06 | 25.94 | 6.65 | 3.18 | 1.02 | 9.40 |
| 32 | 32.0 | 20.06 | 27.94 | 6.65 | 3.18 | 1.02 | 9.40 |
| 36 | 36.0 | 22.06 | 29.94 | 6.65 | 3.18 | 1.02 | 9.40 |
| 38 | 38.0 | 23.06 | 30.94 | 6.65 | 3.18 | 1.02 | 9.40 |
| 40 | 40.0 | 24.06 | 31.94 | 6.65 | 3.18 | 1.02 | 9.40 |

GENERAL NOTES:

1. MATERIALS: BAND - 17-7PH, CORROSION RESISTANT STEEL PER AMS-5528, ANNEALED

CUSHION - FABRIC REINFORCED SILICONE RUBBER, 65-75 DUROMETER (ON UNREINFORCED MATERIAL), COLOR LIGHT BLUE, PER MA2150 WITH ADDITIONAL REQUIREMENTS SHOWN ON THIS SPECIFICATION SHEET. THE FABRIC REINFORCING MATERIAL SHALL BE MOLDED INTO THE BAND SIDE OF THE CLAMP CUSHION AT 0.785 RADIANS (45°) ANGLE (SEE FIGURE 2).

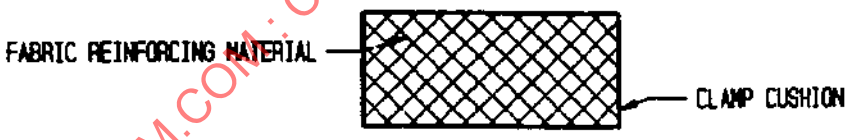



FIGURE 2 - CUSHION REINFORCEMENT

CUSHION REQUIREMENTS:

1. PHYSICAL PROPERTIES - AS SPECIFIED IN TABLE 2. UNLESS OTHERWISE SPECIFIED RESULTS ARE AN AVERAGE OF 5 SPECIMENS AND TOLERANCE ON TEMPERATURE IS (±2.8 °C).

2. COMPRESSION SET - SEE MA2150, PARAGRAPH 4.5.3.2

3. FLAMMABILITY - SEE MA2150, PARAGRAPH 4.5.3.3.2, VERTICAL BURN TEST

TABLE 2 - CUSHION PHYSICAL PROPERTIES

| Test | Test Method | Required Original Properties | Allowable Change From Actual Original Properties After: Heat Aging 70 h at +260 °C | Allowable Change From Actual Original Properties After: Oil Immersion in MIL-L-7808 70 h at +150 °C | Allowable Change From Actual Original Properties After: Dip Test[1] |
|---|---|---|---|---|---|
| Hardness, Durometer "A" | ASTM D 2240 | 65 - 75 | +10 Pts Max | -30 Pts Max | +5 Pts |
| Tensile Strength - MPa | ASTM D 412[2] | 8.2 Min | 6.9 Min | 2.0 Min | 5.5 Min |
| Elongation - % | ASTM D 412[2] | 30 Min | 30 Min | 30 Min | 30 Min |
| Tear Strength - kN/m | ASTM D 624 (Die "B") | 67.5 Min | 67.5 Min | 67.5 Min | 67.5 Min |
| Volume Change - % | ASTM D 471 | --- | --- | +45% Max | +5% Max |
| Weight Change - % | ASTM D 471 | Report | -5% Max | --- | --- |
| Specific Gravity | ASTM D 471 | Report | --- | --- | --- |

[1]DIP TEST - TEST SAMPLE SHALL BE DIPPED IN A-A-711, TYPE I SOLVENT AND ALLOWED TO DRY AT ROOM TEMPERATURE FOR 24 H. THIS PROCEDURE SHALL BE REPEATED 10 TIMES.

[2]TESTS WILL BE CONDUCTED IN ACCORDANCE WITH ASTM D 412 ON THE FABRIC REINFORCED CUSHION TEST SPECIMEN, EXCEPT AS NOTED HEREIN. DIE "A" DUMBELL SPECIMENS SHALL BE CUT FROM ACTUAL CUSHION WITH THE FABRIC WEAVE AT 0.785 RADIANS (45°) ANGLE TO THE DIRECTION OF PULL AND WITH THE EARS FOLDED OUT TO FLATTEN THE SPECIMEN. THE RATE OF SEPARATION OF THE JAWS SHALL BE 304.8 MILLIMETERS PER MINUTE. THE TENSILE STRENGTH AND PERCENT ELONGATION SHALL BE MEASURED WHEN THE FABRIC REINFORCING MATERIAL BEGINS TO SEPARATE FROM THE ELASTOMER OR THE SPECIMEN BREAKS COMPLETELY.

TENSILE STRENGTH SHALL BE BASED ON OVERALL THICKNESS OF RUBBER AND FABRIC REINFORCING MATERIAL. SPECIMEN FAILURES DUE TO FABRIC SEPARATION AT THE TEST FIXTURE JAWS SHALL BE DISCARDED AND ANOTHER SAMPLE TESTED.

GENERAL NOTES (Continued):

2. HEAT TREATMENT: BAND - STRESS RELIEVE AND HEAT TREAT TO CONDITION TH1100 PER MIL-H-6875 AFTER FORMING.

CUSHION - NONE

3. CLAMP BAND HARDNESS: 51-59 HR30N (SEE PROCUREMENT SPECIFICATION)

4. FINISH: BAND - REMOVE SCALE. PASSIVATE PER QQ-P-35.

CUSHION - NONE

/5/ DIAMETER "D" IS THE NOMINAL DIAMETER FOR WHICH A CLAMP SIZE IS INTENDED FOR USE. DIAMETER "D" SHALL BE VERIFIED BY THE "DIAMETRAL RETENTION" TEST OF THE PROCUREMENT SPECIFICATION. DIMENSION "E" SHALL BE MEASURED WITH THE CLAMP INSTALLED ON A MANDREL OF "D" DIAMETER ±0.025 AND A 1.59 ± 0.013 GAP SPACER BETWEEN UPPER AND LOWER FOOT AS SHOWN.

6. PROCUREMENT SPECIFICATION: MA2150

/7/ WEDGE SHALL BE REQUIRED ON SIZE (-10) AND LARGER. THE WEDGE SHALL BE MOLDED AS AN INTEGRAL PART OF THE CUSHION AND CONTOURED TO FIT "D" DIAMETER. WEDGE MUST TOUCH CUSHION ON LOWER FOOT WITH CLAMP INSTALLED ON A MANDREL WITHOUT SPACER.

/8/ STIFFENING BEAD SHALL BE REQUIRED ON SIZE (-06) AND LARGER. ALL RADII ON THE STIFFENING BEAD SHALL BE SMOOTH AND BLENDED. NO SHARP TOOL MARKS ARE ALLOWED.

/9/ REFERENCE DIMENSIONS "Y" AND "J" ARE PROVIDED TO GAIN MAXIMUM SUPPORT FOR THE LOWER FOOT BY CLOSELY FITTING THE UPPER FOOT BEND RADIUS TO THE STIFFENING BEAD BLEND RADIUS WHEN CLOSED AGAINST EACH OTHER.

/10/ IDENTIFICATION: MARK THE COMPLETE STANDARD PART NUMBER AND MANUFACTURER'S NAME, TRADEMARK OR CAGE NUMBER ON THE BAND ABOVE THE THEORETICAL CENTERLINE IN AN AREA NOT COVERED BY CUSHION PER AS478 (2A1).

CLAMP BANDS SIZES (-03), (-04) AND (-05) MAY BE MARKED WITH THE SPECIFICATION SHEET NUMBER, THE SIZE CODE AND MANUFACTURER'S IDENTIFICATION DUE TO SPACE LIMITATIONS.

11. IF MA2150/4 CLAMP SUPPORTS ARE USED THE MAXIMUM TUBE OVERHANG SHALL BE 50% OF TUBE O.D. THIS WASHER CAN BE DETRIMENTAL IF THE CLAMP IS NOT FULLY SUPPORTED.

12. SURFACE TEXTURE (SEE MA2150 PARA. 3.6)

13. METAL BANDS SHALL HAVE ALL BURRS AND SHARP EDGES REMOVED

14. DIMENSIONS IN MILLIMETERS. UNLESS OTHERWISE SPECIFIED TOLERANCES: LINEAR DIMENSIONS X.XX ± 0.25, X.X ± 0.76, ANGLES ± 0.035 RADIANS