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Industries
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NATIONAL AEROSPACE STANDARD

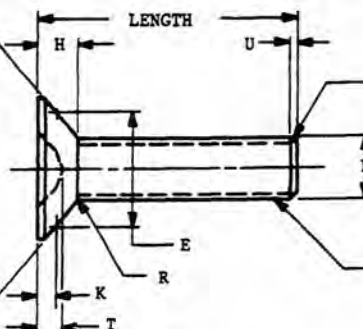
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FED. SUP CLASS
5305



⑨ OFFSET CRUCIFORM RECESS PER
MS33781 OR MS14191 (SEE
CODE)

100° ± 1°



END SHALL BE FLAT AND CHAMFERED.
CHAMFER PLUS INCOMPLETE THREAD NOT
TO EXCEED TWO PITCHES.

THREAD PER NOTES

ENLARGED VIEW OF HEAD

EDGES OF HEAD
MAY BE ROUNDED

HEAD MARKING: BASIC PART NUMBER, MANUFACTURER'S
TRADEMARK, AND FIRST DASH NUMBER ON SIZES 3 AND
LARGER. FIRST DASH NUMBER ONLY ON SIZES 04, 06,
AND 08. NO MARKING REQUIRED ON SIZE 02. MARK
MATERIAL PER CODE TO INDICATE CRES OR TITANIUM
WHERE APPLICABLE. RAISED OR DEPRESSED .010
MAX. LOCATION OPTIONAL. WHERE APPLICABLE,
ADD "R" AFTER FIRST DASH NUMBER ON SIZES 06,
08, 3, 4, AND 5 TO INDICATE MS14191 RECESS.

| PART NUMBER | THREAD SEE THD NOTE (1) | A DIA | B ABSOLUTE MIN DIA | F | H REF | R | U REF | D DIA MAX | T MAX | W MAX | RECESS GAGE PENETRATION (c) | | K | E DIA |
|----------------|----------------------------|--------------|--------------------------|--------------|----------|--------------|----------|-----------------|----------|----------|-----------------------------------|-------|----------------|----------------|
| | | | | | | | | | | | MAX | MIN | | |
| NAS1102-02 | .0860-56 UNJC-3A | .172 .162 | .126 | .015 .005 | .036 | .015 .005 | .010 | .086 | .043 | .115 | .0315 | .0225 | | |
| NAS1102-04 | .1120-40 UNJC-3A | .225 .213 | .177 | .015 .005 | .045 | .015 .005 | .013 | .112 | .055 | .148 | .0405 | .0305 | | |
| NAS1102-06 | .1380-32 UNJC-3A | .279 .267 | .231 | .015 .005 | .057 | .020 .010 | .016 | .138 | .066 | .182 | .0500 | .0395 | | |
| NAS1102-08 | .1640-32 UNJC-3A | .332 .319 | .270 | .020 .010 | .068 | .020 .010 | .016 | .164 | .078 | .215 | .0595 | .0480 | .0268 .0240 | .2671 .2667 |
| NAS1102-3 | .1900-32 UNJF-3A | .385 .371 | .322 | .020 .010 | .080 | .020 .010 | .016 | .190 | .090 | .248 | .0685 | .0560 | .0290 .0263 | .3147 .3143 |
| NAS1102-4 | .2500-28 UNJF-3A | .507 .491 | .442 | .020 .010 | .106 | .020 .010 | .018 | .250 | .118 | .325 | .0890 | .0750 | .0342 .0316 | .4245 .4241 |
| NAS1102-5 | .3125-24 UNJF-3A | .635 .617 | .568 | .020 .010 | .133 | .020 .010 | .021 | .312 | .122 | .357 | .0860 | .0700 | .0355 .0370 | .5389 .5385 |
| NAS1102-6 | .3750-24 UNJF-3A | .762 .742 | .694 | .020 .010 | .160 | .020 .010 | .021 | .375 | .145 | .427 | .1030 | .0850 | .0450 .0426 | .6532 .6528 |

MATERIAL: Alloy steel - 4140 (UNS G41400) per MIL-S-5626, 4340 (UNS G43400) per MIL-S-5000,
or 8740 (UNS G87400) per MIL-S-6049.

⑨ Cres - A286 (UNS S66286) per AMS5737, except for heat treatment.

Titanium alloy - 6AL-4V (UNS R56400) per AMS4967.

HEAT TREATMENT: Alloy steel - 160,000-180,000 PSI UTS per MIL-H-6875.

Cres - 160,000 PSI UTS min. at room temperature.

Titanium alloy - 160,000 PSI UTS min.

FINISH: Alloy steel - Cadmium plate per QQ-P-416, Type II, Class 2 (no code) or cadmium plate per QQ-P-416,
Type II, Class 2 with dull black chromate treatment (B code).

⑨ Cres - clean and passivate in accordance with QQ-P-35 (no code) or cadmium plate per QQ-P-416, Type II,
Class 2 (P code).

Titanium alloy - none (no code) or aluminum coat per NAS4006 (A code) or aluminum coat per MIL-C-83488,
Type II, Class 3 (C code) or cadmium plate per QQ-P-416, Type II, Class 2 (P code).



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LIST OF CURRENT SHEETS

| NO. | REV. |
|-----|------|
| 1 | 9 |
| 2 | 8 |

CUSTODIAN

NATIONAL AEROSPACE STANDARDS COMMITTEE

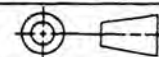
PROCUREMENT
SPECIFICATION

NOTED

TITLE

**SCREW, MACHINE-FLAT 100 DEG HEAD
FULL THREAD, OFFSET CRUCIFORM** ⑨

THIRD
ANGLE
PROJECTION



CLASSIFICATION
STANDARD PART

NAS 1102

SHEET 1 OF 2

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WASHINGTON, D.C. 20005

THIS DRAWING SUPERSEDES ALL ANTECEDENT STANDARD DRAWINGS FOR THE
SAME PRODUCT AND SHALL BECOME EFFECTIVE NO LATER THAN SIX MONTHS
FROM THE LAST DATE OF APPROVAL SHOWN HEREON.

REVISION ① 31 JAN 1960 ② 15 NOV 1960 ③ 31 MAY 1960 ④ 31 MAY 1965 ⑤ 15 JUNE 1971 ⑥ 15 FEB 1973 ⑦ 28 MAY 1982 ⑧ 15 MAY 1986 ⑨ 9 OCTOBER 1991



AEROSPACE INDUSTRIES ASSOCIATION OF AMERICA, INC.
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WASHINGTON, D.C. 20004

| LENGTH CHART | | | | | |
|--------------------------|--------|--------------------------|--------|--------------------------|----------------|
| TOLERANCE +.000 -.031 | | TOLERANCE +.000 -.062 | | TOLERANCE +.000 -.094 | |
| DASH NO. | LENGTH | DASH NO. | LENGTH | DASH NO. | LENGTH |
| 3 | .188 | 18 | 1.125 | 34 to 96 | 2.125 to 6.000 |
| 4 | .250 | 20 | 1.250 | | |
| 5 | .312 | 22 | 1.375 | | |
| 6 | .375 | 24 | 1.500 | | |
| 7 | .438 | 26 | 1.625 | | |
| 8 | .500 | 28 | 1.750 | | |
| 10 | .625 | 30 | 1.875 | | |
| 12 | .750 | 32 | 2.000 | | |
| 14 | .875 | | | | |
| 16 | 1.000 | | | | |

| MIN TENSILE STRENGTH, LBS | |
|---------------------------|---|
| PART NUMBER | ALLOY STEEL CRES (160KSI) TI (6AL-4V) |
| NAS1102-02 | 591 |
| NAS1102-04 | 966 |
| NAS1102-06 | 1,450 |
| NAS1102-08 | 2,240 |
| NAS1102-3 | 3,180 |
| NAS1102-4 | 5,820 |
| NAS1102-5 | 9,200 |
| NAS1102-6 | 14,000 |

CODE: First dash number designates diameter and thread.
Second dash number indicates length in .0625 increments (as converted to three decimal places per ANSI Y14.5).
Intermediate or longer lengths may be specified by use of whole dash numbers only.
Use of .25 inch increments is recommended for screws over 3 inches long.

- (A) following last dash number designates aluminum coat per NAS4006.
- (B) following last dash number designates dull black cadmium plating.
- (C) following last dash number designates aluminum coat per MIL-C-83488, Type II, Class 3.
- (E) in lieu of first dash designates cres.
- (P) following last dash number designates cadmium plate per QQ-P-416, Type II, Class 2.
- (R) in lieu of second dash designates recess per MS14191 for sizes 06 thru 5 inclusive.
- (V) in lieu of first dash designates titanium alloy.
- (W) following last dash number designates Type I plating. (q)

EXAMPLE: NAS1102-3-8 = .1900-32 screw, .500 length, alloy steel, MS33781 recess, Type II plating.
(B) NAS1102E5-10P = .3125-24 screw, .625 length, cres, MS33781 recess, Type II plating
(B) NAS1102V5R10 = .3125-24 screw, .625 length, titanium alloy, MS14191 recess.
(B) NAS1102-5-10B = .3125-24 screw, .625 length, alloy steel, MS33781 recess, dull black cadmium plating.

- NOTES:
- (a) Diameter of unthreaded portion of screws shall not be less than minimum pitch diameter nor more than maximum major diameter of thread.
 - (b) For screws 2 inches long or shorter, complete threads shall extend to within 2 threads of the bearing surface of the head. Screws of longer length shall have a minimum complete thread length of 1.750 inches.
 - (c) Recess gaging in accordance with MS33781 or MS14191 as applicable, refer to NAS518 and NAS519 for flushness gaging details.
 - (d) Screws shall be free from burrs and sharp edges.
 - (e) Offset cruciform screws to be installed and removed with drivers per MS33781 or MS14191 as applicable.
 - (f) Concentricity: Conical surface of head and pitch dia. of screw within .005 TIR.
 - (g) For cres, magnetic permeability shall be less than 2.0 (Air = 1.0) for a field strength H = 200 Oersteds. (Magnetic permeability indicator per MIL-1-17214.)
 - (h) Tensile stress areas used for calculation of ultimate tensile strength values are based on FED-STD-H28.
 - (k) For description of status notes, see NAS380.
 - (l) Threads in accordance with MIL-S-8879.
 - (m) Surface roughness: "D" dia., underside of head, and sides and root of threads - 32 microinches, other surfaces - 125 microinches, per ANSI B46.1.
 - (n) Dimensions are in inches and apply after plating and coating.
 - (p) MS14191 recess is applicable to sizes 06 thru 5 inclusive. MS33781 recess is applicable to all sizes.
 - (q) Type I plating ("W" code) is inactive for new design.

PROCUREMENT SPECIFICATION: MIL-B-87114, except as noted. Tensile load values as tabulated herein. Cold working head to shank fillet and fatigue requirements are not applicable.

NAS 1102

SHEET 2

APPROVAL DATE JUNE 1985 REVISION (1) 31 MARCH 1960 (2) 15 NOV 1960 (3) 31 MAY 1965 (4) 31 MAY 1968 (5) 15 JUNE 1971 (6) 28 MAY 1982 (7) 15 MAY 1986 (8) 9 OCTOBER 1991

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