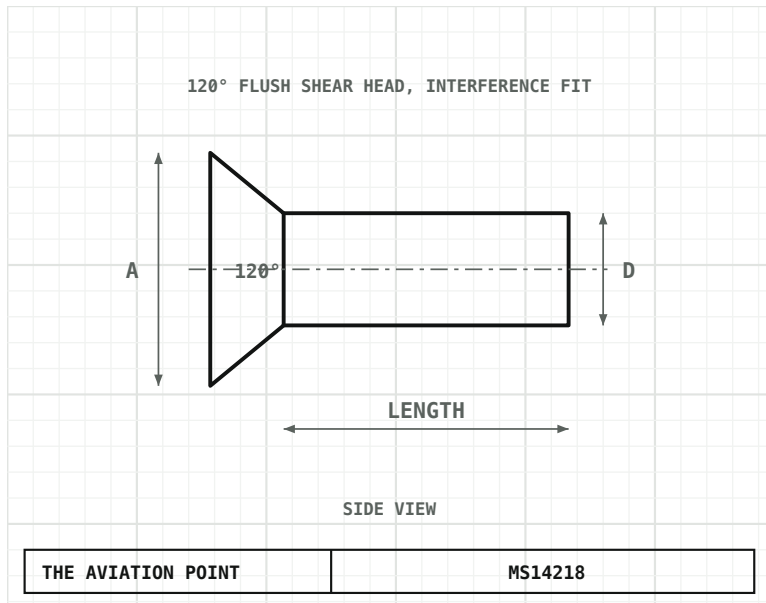
THE AVIATION POINT · THEAVIATIONPOINT.COM · THE AVIATION POINT · THEAVIATIONPOINT.COM · THE AVIATION POINT · THEAVIATIONPOINT.COM

MS14218 rivet — 120° flush shear head, interference fit

Rivet, solid, 120° flush interference shear head (MS14218, now NASM14218): the BRFZ rivet of the federal records.



Engineering drawing · dimensions in inches

Specification

Item	Value
Type	Solid rivet, 120° flush interference shear head
Material	7050-T731 driven (E), titanium columbium 45Cb (T), 2117 (AD) and 2024 (DD) aluminum alloy
Status	MS14218 (rev. C) is superseded by NASM14218 (2014 revision). The text of the standard is not public: the figures below come from MIL-HDBK-5J and the federal item data. The SRM, the drawing or the approved repair data governs.

Dimensions by size

Dimension, in	1/8	5/32	3/16	7/32	1/4	9/32	5/16
D — Nominal shank diameter	.125	.156	.188	.219	.250	.281	.312
H — Head height, reference (MS14218E)	.027	.035	.044	.053	.061	.069	.077
Nominal hole (MIL-HDBK-5J Table 8.1.2(b))	.1285	.159	.191	.228	.257	.290	.323
Test hole of the allowables (+.0005 / -.001)	.129	.161	.1935	.228	.257	.290	.316

Head heights for MS14218E from MIL-HDBK-5J Table 8.1.2.2(m), p. 8-29: at 1/8 the 120° head is .027 deep, against .042 for the MS20426 100° head. Test holes from note b of that table. Head angle 118.5° to 121.5° (federal item data). Head diameter: no public table read.

Part numbers

1/8 10 part numbers

Part no.	Length, in	Same item (NSN)
MS14218AD4-7	.438	BRFZ4AD7
MS14218E4-4	.250	BRFZ4E4, VRFZ-4E4
MS14218E4-4R	.281	BRFZ4E4-5A (-5 = R, +.031 in)
MS14218E4-5	.312	VRFZ-4E5
MS14218E4-6	.375	VRFZ-4E6
MS14218E4-6R	.406	BRFZ4E6-5A (-5 = R, +.031 in)
MS14218E4-7	.438	BRFZ4E7
MS14218E4-7R	.469	BRFZ4E7-5A (-5 = R, +.031 in)
MS14218E4-12	.750	BRFZ4E12A
MS14218E4-16	1.000	BACR15FV4E16, VRFZ-4E16

5/32 21 part numbers

Part no.	Length, in	Same item (NSN)
MS14218AD5-9	.562	BRFZ5AD9
MS14218AD5-14	.875	—
MS14218AD5-24	1.500	BACR15FV5AD24, BRFZ5AD24, VRFZ-5AD24
MS14218E5-3	.188	BRFZ5E3
MS14218E5-4R	.281	BRFZ5E4-5A (-5 = R, +.031 in)
MS14218E5-5	.312	BACR15FV5E5, BRFZ5E5, VRFZ-5E5
MS14218E5-5-R	.344	BRFZ5E5-5A (-5 = R, +.031 in)
MS14218E5-6	.375	BACR15FV5E6, BRFZ5E6
MS14218E5-6R	.406	BRFZ5E6-5A (-5 = R, +.031 in)
MS14218E5-7	.438	BACR15FV5E7, BRFZ5E7
MS14218E5-7R	.469	BRFZ5E7-5A (-5 = R, +.031 in)
MS14218E5-8	.500	BACR15FV5E8, BRFZ5E8, VRFZ-5E8
MS14218E5-9	.562	BRFZ5E9
MS14218E5-10	.625	BACR15FV5E10, VRFZ-5E10
MS14218E5-11	.688	BRFZ5E11A
MS14218E5-16	1.000	BACR15FV5E16, VRFZ-5E16
MS14218E5-18	1.125	BRFZ5E18A
MS14218E5-24	1.500	BACR15FV5E24, VRFZ-5E24
MS14218T5-5	.312	—
MS14218T5-8	.500	BACR15FV5T8, VRFZ-5T8
MS14218T5-24	1.500	BACR15FV5T24, BRFZ5T24

3/16 7 part numbers

Part no.	Length, in	Same item (NSN)
MS14218E6-5	.312	BRFZ6E5
MS14218E6-6	.375	BRFZ6E6
MS14218E6-7	.438	BACR15FV6E7, VRFZ-6E7
MS14218E6-8	.500	BACR15FV6E8, VRFZ-6E8
MS14218E6-12	.750	BACR15FV6E12, VRFZ-6E12
MS14218T6-6	.375	BACR15FV6T6, VRFZ-6T6
MS14218T6-13	.812	BRFZ6T13, VRFZ-6T13

1/4 3 part numbers

Part no.	Length, in	Same item (NSN)
MS14218E8-8	.500	BACR15FV8E8, VRFZ-8E8
MS14218E8-14	.875	BRFZ8E14A
MS14218T8-9	.562	BACR15FV8T9, VRFZ-8T9

THE AVIATION POINT · THEAVIATIONPOINT.COM · THE AVIATION POINT · THEAVIATIONPOINT.COM · THE AVIATION POINT · THEAVIATIONPOINT.COM · THE AVIATION POINT · THEAVIATIONPOINT.COM · THE AVIATION POINT · THEAVIATIONPOINT.COM · THE AVIATION POINT · THEAVIATIONPOINT.COM · THE AVIATION POINT

How to read the part number

Part	Meaning
E	Material: 7050-T731 aluminum alloy, driven (MS14218E)
T	Material: Titanium columbium alloy 45Cb (MS14218T)
AD	Material: 2117 aluminum alloy, T3 driven (MS14218AD)
DD	Material: 2024 aluminum alloy, T31 (BRFZ...DD in the federal data)
Example	MS14218E4-4 — 7050-T731, 1/8 in diameter, 1/4 in long; the same item is BRFZ4E4

Shear strength by material

Material	Joint Fsu, ksi	Source
E · 7050-T731 (MS14218E)	43	MIL-HDBK-5J Table 8.1.2.2(m), p. 8-29
DD · 2024-T31 (BRFS-DD)	41	Table 8.1.2.2(k), p. 8-27
AD · 2117-T3 (MS14218AD, BRFS-AD)	30	Tables 8.1.2.2(o) and (j)
T · Ti-45Cb (MS14218T, BRFS-T)	53	Table 8.1.2.2(l), p. 8-28

Joint allowables in MIL-HDBK-5J; Briles Rivet Corp. supplied the data of these 120° rivets. The SRM, the drawing or the approved repair data governs.

Shear strength of MS14218E

Rivet size	Rivet shear, lb
1/8	558
5/32	854
3/16	1,230
7/32	1,755
1/4	2,230
9/32	2,840
5/16	3,525

Fsu = 43 ksi on the nominal hole areas of MIL-HDBK-5J Table 8.1.2(b) (Table 8.1.2.2(m) note d). The SRM, the drawing or the approved repair data governs.

How a BRFZ number is written

Part number	Reads as
BRFZ5E3	= MS14218E5-3: diameter 5/32 first, then the material E, then the length 3/16
BRFZ6E16	= BACR15FV6E16 = VRFZ-6E16 (same NSN)
BRFZ4E4-5A	the federal records write -5A, never A-5; meaning of -5 and A not confirmed

BRFZ puts the diameter before the material; MS14218 puts the material first. Read from same-NSN pairs: 27 of 28 match the rule (DLA FLIS).

Cross-references

Number	Relation	Level	Source
NASM14218	Supersedes MS14218 (2014 revision)	standard	NASM14218 listing
BRFZ	Same item: BRFZ = MS14218-; 27 of 28 pairs	nsn	DLA FLIS
BACR15FV	Same item; 17 of 19 pairs match the rule	nsn	DLA FLIS
VRFZ	Same item as BACR15FV; 19 of 19 pairs	nsn	DLA FLIS

Same NSN = one item of supply, true for that exact item; the rule is checked on the pairs listed. The SRM, the drawing or the approved repair data governs.

Notes

- Intended where flushness, fatigue life, static joint strength and corrosion resistance are of primary design importance (NASM14218 listing).
- Installed with interference along the shank and the sides of the head, by machine on large fuselage assemblies (SAE 2019-01-1377 abstract).
- The 120° head is shallower than the 100° heads: it needs its own countersink cutter and its own head gauge.
- An R on an MS14218 number, and a -5 on a BRFZ one, add 0.031 in (1/32) to the length (MS14218C para. 9; DLA FLIS: “Rivet increased length by .031 inch”): MS14218E5-7R = BRFZ5E7-5A, 0.469 in.
- The A suffix of BRFZ has no published definition. In DLA FLIS, 9 of 10 BRFZ A records with a Boeing number carry Boeing 3M1321, so it reads as the item made to 3M1321: an inference, medium confidence, not a definition. In those records it changes no size, head, material or temper.
- Related: MS14219E, 120° flush tension head, 7050-T731, Fsu 43 ksi (MIL-HDBK-5J Table 8.1.2.2(p)).
- The SRM, the drawing or the approved repair data governs.

SOURCES · MIL-HDBK-5J, section 8.1.2.2 · DLA FLIS public data, FSC 5320 · NASM14218 listing · SAE 2019-01-1377, abstract

SCAN · OPEN THIS DATA SHEET
theaviationpoint.com/parts/solid-rivets/ms14218/

THE AVIATION POINT · THEAVIATIONPOINT.COM · THE AVIATION POINT · THEAVIATIONPOINT.COM · THE AVIATION POINT · THEAVIATIONPOINT.COM · THE AVIATION POINT · THEAVIATIONPOINT.COM · THE AVIATION POINT · THEAVIATIONPOINT.COM · THE AVIATION POINT · THEAVIATIONPOINT.COM · THE AVIATION POINT