BOLT – REDUCED COUNTERSUNK HEAD, SHEAR COUPLING, SHORT THREAD

Issue : **F**
Date : **Jul 04**
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SUMMARY

1 - SCOPE AND FIELD OF APPLICATION

This standard specifies the dimensions, tolerances, required characteristics and the mass of a reduced countersunk head bolt, shear coupling, short thread.

REMARK : use preferably EN 6114 bolts (intermediate CSK head).

2 - REFERENCES

ANSI/ASME-B46-1	: Surface texture (surface roughness waviness, and lay).
AMS 4928	: Titanium alloys bars, wire, forgings, and rings 6AL-4V annealed.
AMS 4967	: Titanium alloys bars, wire, forgings, and rings 6.0AL-4.0V annealed, heat treatable.
AS 8879	: Screw thread – UNJ profile inch.

EN 2424	: Aerospace series - Marking of aerospace products.
EN 4473	: Aerospace series - Aluminium pigmented coatings – Technical specification.
EN 6114	: Bolt – Countersunk head, short thread
EN 6116	: Bolt – Short thread, recessed on thread end.
EN 6117	: Specification for lubrication of bolts with cetyl alcohol.
EN 6118	: Process specification – Aluminium base protection for fasteners.
ISO 8080	: Aerospace – Anodic treatment of titanium and titanium alloys - Sulfuric acid process.

3 - TERMINOLOGY

Not applicable.

4 - REQUIRED CHARACTERISTICS

4.1 - Configuration, dimensions, tolerances, mass

4.1.1 - Configuration shall be in accordance with the Figure.

4.1.2 - Dimensions shall be in accordance with the Figure, Table 1 and Table 2.

Roll-formed thread as per AS 8879 except TD diameter.

4.1.3 - General tolerances shall be in accordance with the Figure, Table 1 and Table 2.

Concentricity tolerances between :

- Tapered surface of head with Ø D : 0,127 mm (TIR).
- Cylindrical part of head and Ø D within the values of F (TIR) (see Table 1).

4.1.4 - Mass : the calculation of the mass of a bolt shall be provided as per indications hereafter :

CALCULATION OF THE MASS OF A BOLT

Add the mass of the head and threaded part (invariable mass) to the mass of the smooth part (variable mass).

Total mass of the head and threaded part :

1st mass column of Table 1.

Mass of the smooth part :

Multiply the value of the 2nd mass column of Table 1 (value according to the diameter code No.) by the length code No. of the bolt.

Example :	BOLT ASNA2657V3-8	
Invariable mass	:	0,59
Variable mass	: 0,13 x 8 =	1,04
Head mass to be deducted	:	-0,09
Total mass	:	1,54 g

4.2 - Materials, finishes, lubrications, identifications

Materials, finishes, lubrications and identifications shall be in accordance with Table 3.

4.3 - Mechanical characteristics

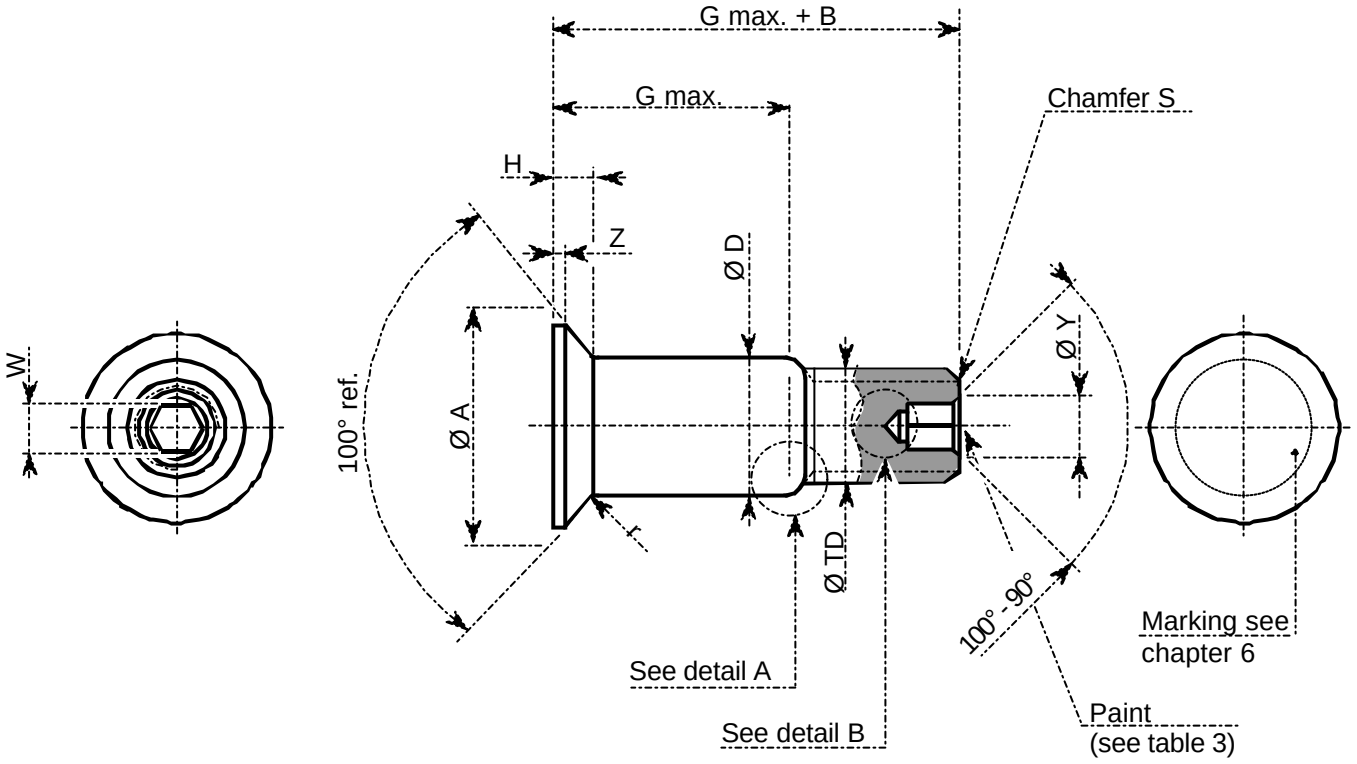
Mechanical characteristics shall be in accordance with Table 4.

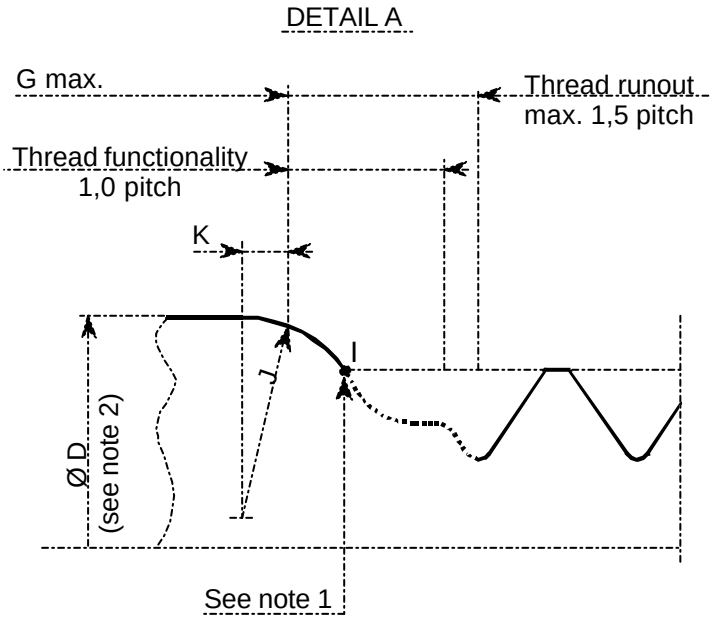
4.4 - General characteristics

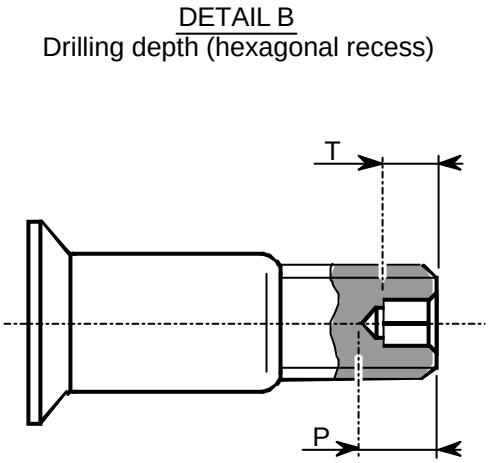
Surface condition as per ANSI/ASME-B46-1.

4.5 - Repair sizes

Repair sizes characteristics shall be in accordance with Table 5 and Table 6.







Note 1 : The diameter measured at point I shall be less than or equal to the max. diameter TD.

Note 2 : Check concentricity of diameters D (shank) and TD (thread) to avoid interference between the bolt thread and hole when using tight interference fits.

Note 3 : The maximum thread runout and functionality for first and second oversizes is incremented by 0,25 mm.

Dimensions in mm.

Figure - Configuration, dimensions, tolerances

Table 1 - Dimensions, tolerances, mass

DIAMETER CODE No.	NOMINAL SHANK DIAMETER (in inch)	THREAD UNJF-3A modified (in inch)	Ø A	B Ref.	Ø D	Ø TD	F (1)	H Ref. (2)	r
2	.1562	.1640-32	6,634 6,512	7,112	4,153 4,128	4,051 3,988	0,102	1,041 0,991	0,635 0,381
3	.1875	.1900-32	7,660 7,533	7,366	4,813 4,788	4,673 4,597	0,127	1,194 1,143	0,762 0,508
4	.2500	.2500-28	10,028 9,901	8,128	6,337 6,312	6,197 6,121	0,152	1,549 1,498	

DIAMETER CODE No.	NOMINAL SHANK DIAMETER (in inch)	THREAD UNJF-3A modified (in inch)	Z max.	S	HEXAGONAL RECESS			
					W	T	Ø Y	P max.
2	.1562	.1640-32	0,305	0,794 x 37°	2,05 2,01	2,54 2,04	3,02 2,64	3,43
3	.1875	.1900-32	0,381					
4	.2500	.2500-28			2,46 2,41	2,79 2,29	3,61 3,10	3,78

DIAMETER CODE No.	NOMINAL SHANK DIAMETER (in inch)	THREAD UNJF-3A modified (in inch)	DETAIL A			MASS (g)		
			J	K ref.	Max. installation interference (µm)	Head and thread	Smooth part	Mass to be deducted
2	.1562	.1640-32	2,16 1,65	0,33	-	0,34	0,09	0,06
3	.1875	.1900-32	2,67 1,78	0,41	90	0,59	0,13	0,09
4	.2500	.2500-28	3,68 3,18	0,53	110	1,12	0,22	0,21

Dimensions in millimeter unless otherwise stated.

(1) See chapter 4.1.3.

(2) Dimension H is dimensioned based on max. diameter D.

Table 2 - Dimensions, tolerances

LENGTH CODE No.	G ± 0,127	LENGTH (G max. + B ref.) ± 0,254		
		2	3	4
1	1,59	8,70	8,95	9,72
2	3,18	10,29	10,54	11,31
3	4,76	11,87	12,12	12,89
4	6,35	13,46	13,71	14,48
5	7,94	15,05	15,30	16,07
6	9,52	16,64	16,88	17,65
7	11,11	18,22	18,47	19,24
8	12,70	19,81	20,06	20,83
9	14,29	21,40	21,65	22,42
10	15,88	22,99	23,24	24,01
11	17,46	24,57	24,82	25,59
12	19,05	26,16	26,41	27,18
13	20,64	27,75	28,00	28,77
14	22,22	29,34	29,58	30,35
15	23,81	30,92	31,17	31,94
16	25,40	32,51	32,76	33,53
17	26,99	34,10	34,35	35,12
18	28,58	35,69	35,94	36,71
19	30,16	37,27	37,52	38,29
20	31,75	38,86	39,11	39,88
21	33,34	40,45	40,70	41,47
22	34,92	42,04	42,28	43,05
23	36,51	43,62	43,87	44,64
24	38,10	45,21	45,46	46,23

LENGTH CODE No.	G ± 0,127	LENGTH (G max. + B ref.) ± 0,254		
		2	3	4
25	39,69	46,80	47,05	47,82
26	41,28	48,39	48,64	49,41
27	42,86	49,97	50,22	50,99
28	44,45	51,56	51,81	52,58
29	46,04	53,15	53,40	54,17
30	47,62	54,74	54,98	55,75
31	49,21	56,32	56,57	57,34
32	50,80	57,91	58,16	58,93
34	53,98	61,09	61,34	62,11
36	57,15	64,26	64,51	65,28
38	60,32	67,44	67,68	68,45
40	63,50	70,61	70,86	71,63
42	66,68	73,79	74,04	74,81
44	69,85	76,96	77,21	77,98
46	73,02	80,14	80,38	81,15
48	76,20	83,31	83,56	84,33
50	79,38	86,49	86,74	87,51
52	82,55	89,66	89,91	90,68
54	85,72	92,84	93,08	93,85
56	88,90	96,01	96,26	97,03
58	92,08	99,19	99,44	100,21
60	95,25	102,36	102,61	103,38

Dimensions in mm.

Table 3 - Materials, finishes, lubrications, identifications

CODE	MATERIAL	FINISH	LUBRICATION	BOLT IDENTIFICATION
T	Titanium alloy 6AL-4V as per AMS 4928 or AMS 4967 or equivalent. Rc min. = 650 MPa	Sulfuric-acid anodizing as per ISO 8080	Cetyl alcohol as per EN 6117	None
V		IVD as per EN 6118		
K		Aluminium coating as per specification EN 4473		A white paint layer at thread end

Table 4 - Mechanical characteristics

DIAMETER CODE No.	Min. DOUBLE SHEAR STRENGTH (N)	Min. TENSILE STRENGTH (N)
2	17 837	7 340
3	23 931	8 896
4	41 368	16 458

Table 5 - Sizes 1st repair

ITEM CODE No.	B ref.	Ø D	H ref.
3X	7,620	5,146 5,121	1,05 1,00
4X	8,382	6,733 6,708	1,38 1,33

Dimensions in mm.

Table 6 - Sizes 2nd repair

ITEM CODE No.	Ø A	B ref.	Ø D	H ref.
3Y	8,390 8,262	7,620	5,542 5,517	1,19 1,14
4Y	10,820 10,693	8,382	7,130 7,104	1,55 1,50

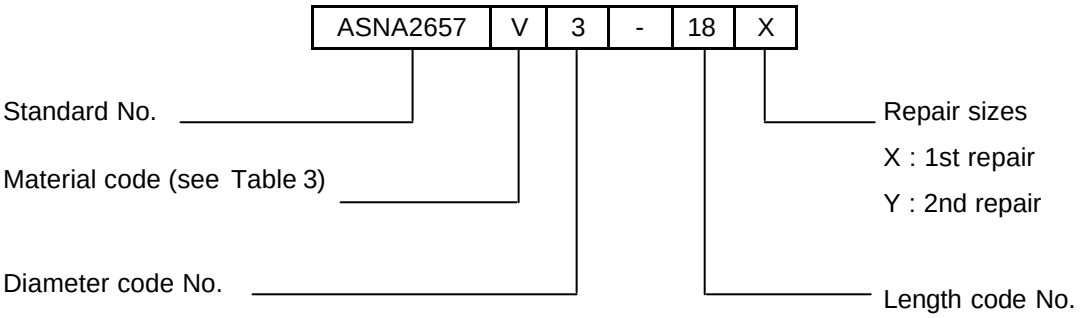
Dimensions in mm.

5 - DESIGNATION

Example of part number identification to be used on drawing schedules :

ASNA2657V3-18X , Bolt

Example of part number construction :



6 - MARKING

Marking shall be recessed to a maximum depth of 0,25 mm (.01 inch) as per EN 2424, category P.

7 - TECHNICAL SPECIFICATION

EN 6116.

8 - MANUFACTURERS

Refer to the list of qualified manufacturers and products.

AMENDMENT RECORD SHEET

Issue	Modified paragraph	Modification summary	Justification
A.08.89		New standard.	PM A 320 P.1727 Mod. 21035
B.01.90		Paragraph 1 modified. Paragraph 2 modified.	TF3 - WG1 decision Restatement
C.06.90		HI-KOTE 1 (code K) added.	ATR GATR/D20/90-JB 75
D.01.92		Repair sizes added. Resistances modified.	Mod. 9999
E.04.98		Standard fully amended. Dimension B added in table 5. Dimensions A and B added in table 6.	In accordance with manufacturer's documentation
F.07.04		Diameter code No. 2 added. Detail A modified and Note 3 added in figure. Marking modified. Material code T added.	A380 Pylons (APF)

Note : Modification to the last standard issue are indicated by a vertical line in the margin.