

Aerospace series**Bolt, blind, 130° flush shear head Self-Locking**

When this standard is applied, a careful check must be made as to whether any protective rights exist. This standard issuer hereby disclaims any liability for infringement of patent or design rights resulting from the use of this standard.

**Published and distributed by :
AIRBUS S.A.S.
ENGINEERING DIRECTORATE
31707 BLAGNAC Cedex
FRANCE**

Contents

- 1 Scope
- 2 Normative references
- 3 Requirements
- 4 Designation
- 5 Marking
- 6 Technical specification

1 Scope

This standard specifies the dimensions, tolerances, required characteristics and the mass of a Blind, 130° Flush Shear Head, Self-locking, Bolt for use in aerospace applications.

2 Normative references

This Airbus Standard incorporates by dated or undated reference provisions from other publications. All normative references cited at the appropriate places in the text are listed hereafter. For dated references, subsequent amendments to or revisions of any these publications apply to this Airbus Standard only when incorporated in it by amendment of revision. For undated references, the latest issue of the publication referred to shall be applied.

ASTM D4181	Classification for Acetal molding and extrusions.
ASTM A967-96	Chemical passivation treatments for Stainless Steel Parts
AS87132	Lubricant, Cetyl alcohol, 1-Hexadecanol, Application to fasteners
AMS5731	Steel corrosion and heat resistant bars and forgings.
AMS5732	Steel corrosion and heat resistant bars and forgings.
AMS5737	Steel corrosion and heat resistant bars and forgings.
AMS5639	Steel corrosion resistant bars and forgings.
AMS4928	Titanium alloy bars and forgings.
AMS4967	Titanium alloy bars and forgings.
AMS-H-81200	Heat treatment of Titanium and Titanium alloys.
AMS-T-9047	Titanium and Titanium Alloy bars.
EN 2424	Aerospace series – Marking of aerospace products.
FCBF200	Fasteners, blind, high strength for advanced composite materials.
ISO 2768-1	General tolerances.
MBF2000	Procurement specification.
MIL-PRF-46010	Lubricant solid film heat cured.
MIL-C-83488	Coating, aluminium, Ion Vapor deposited

3 Requirements

3.1 Configuration, dimensions, tolerances and mass

3.1.1 The configuration, dimensions, tolerances and mass shall conform to figures 1, 2, & 3, and tables 1, 2, 3, 4 & 5.

Tolerances not specified, shall be in accordance with ISO2768-1.

3.1.2 Locking feature consists of three indentations located approximately 120° apart on the periphery of the nut component. Distortion of the shank shall not prevent insertion of the fastener into a ring gauge of diameter equivalent to minimum recommended hole size. Force of insertion shall not exceed 5.0 pounds.

3.1.3 Holes should be straight and perpendicular to surface, and should be reasonably round and free from delaminations.

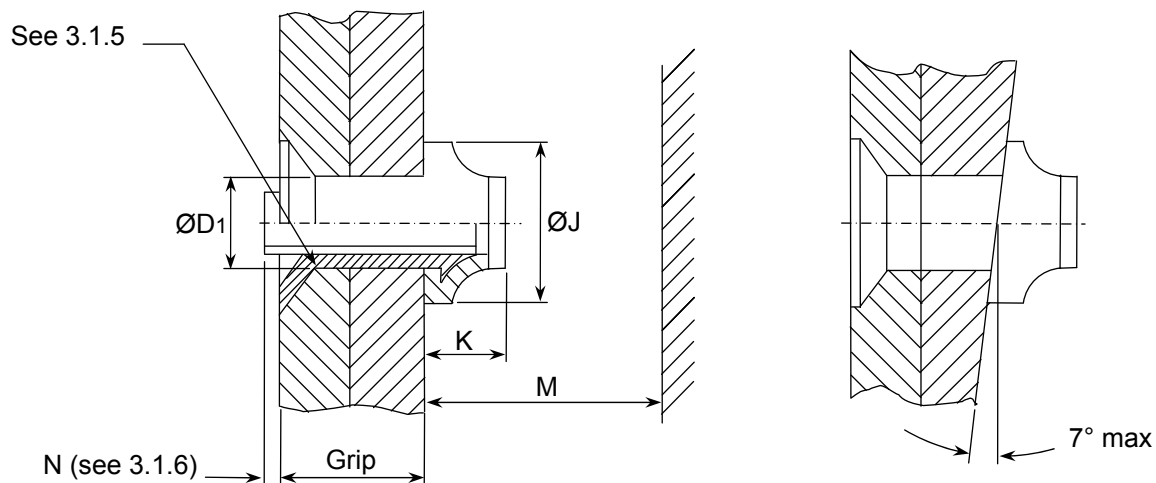
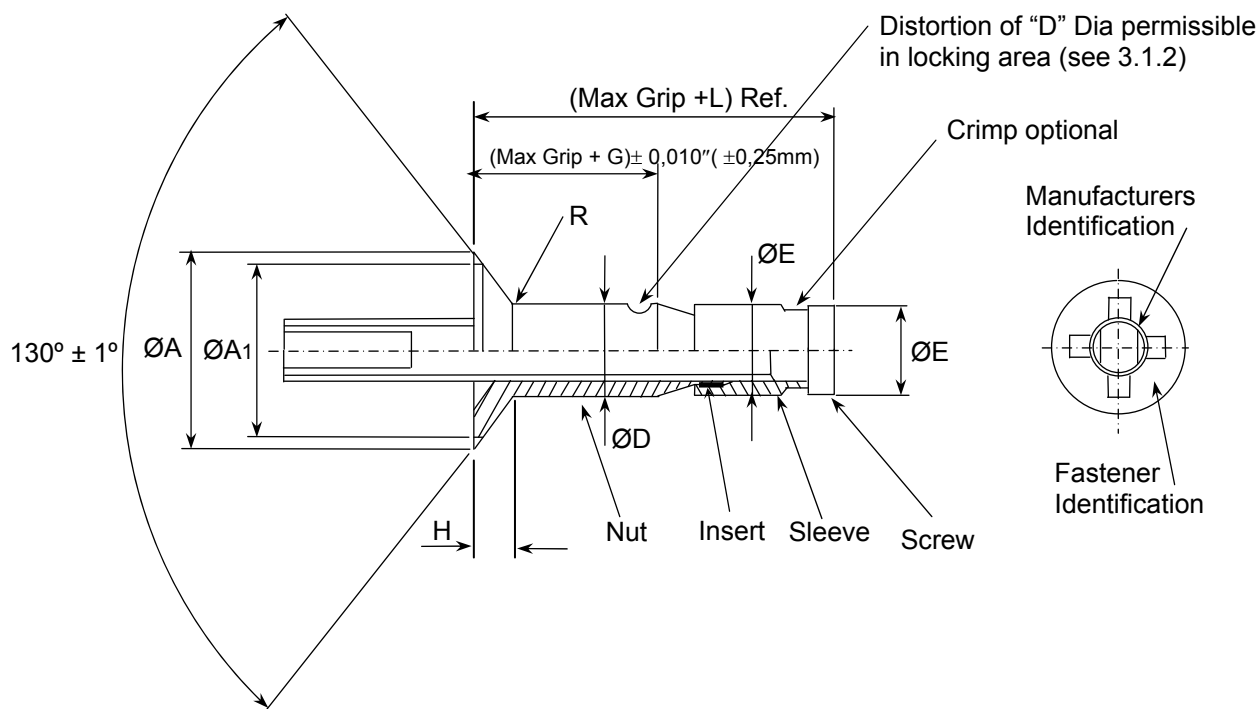
3.1.4 Sheets should be firmly clamped together during drilling.

3.1.5 Edges of holes should be given a slight chamfer.

3.1.6 Core bolt break-off limits are measured from top of nut head.

3.1.7 Materials and surface treatment shall be in accordance with table 6.

3.1.8 Mechanical properties shall be in accordance with table 7.

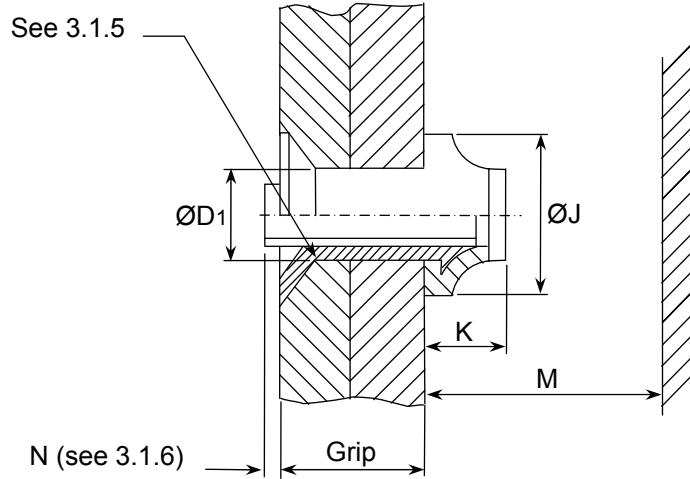
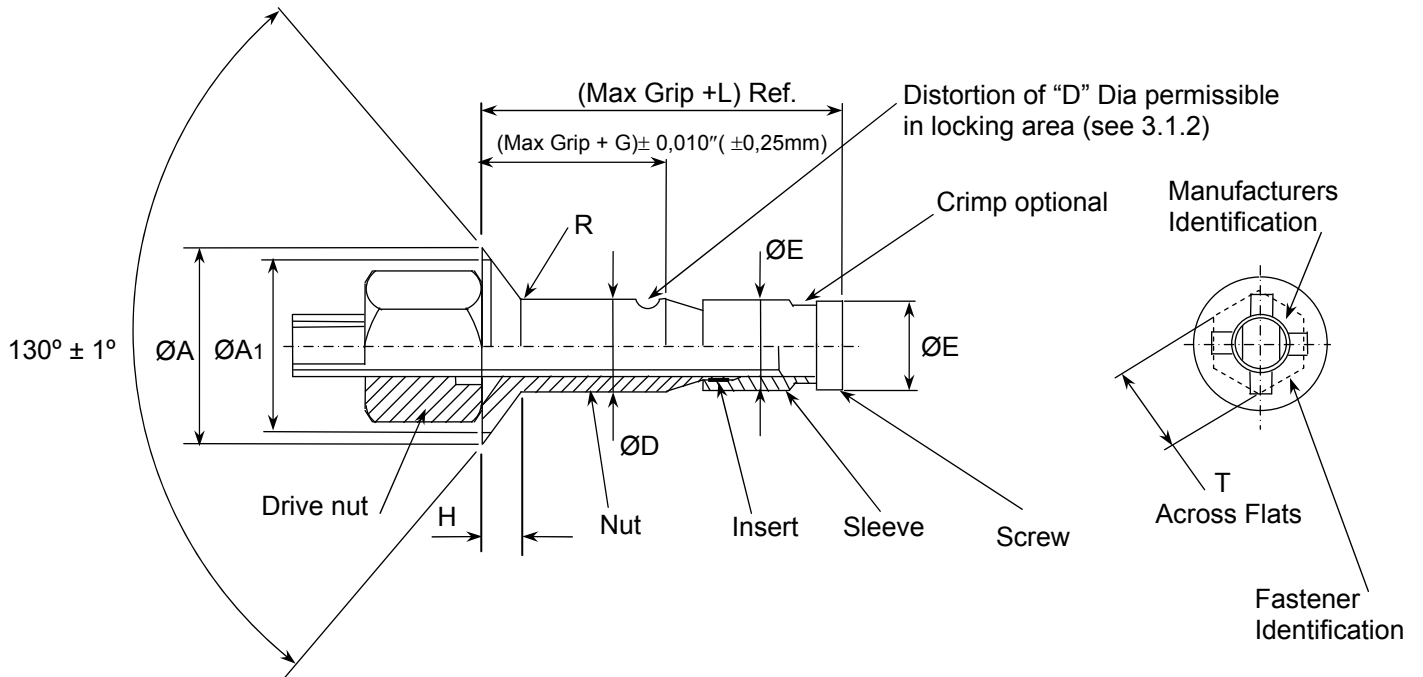


Typical installation
(see notes 3.1.3 and 3.1.4)

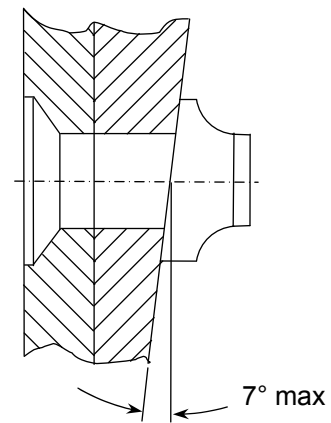
Installation on surface
with slope up to 7° max

Procurement code (Y)

Figure 1: Configuration for fasteners without "drive nut"



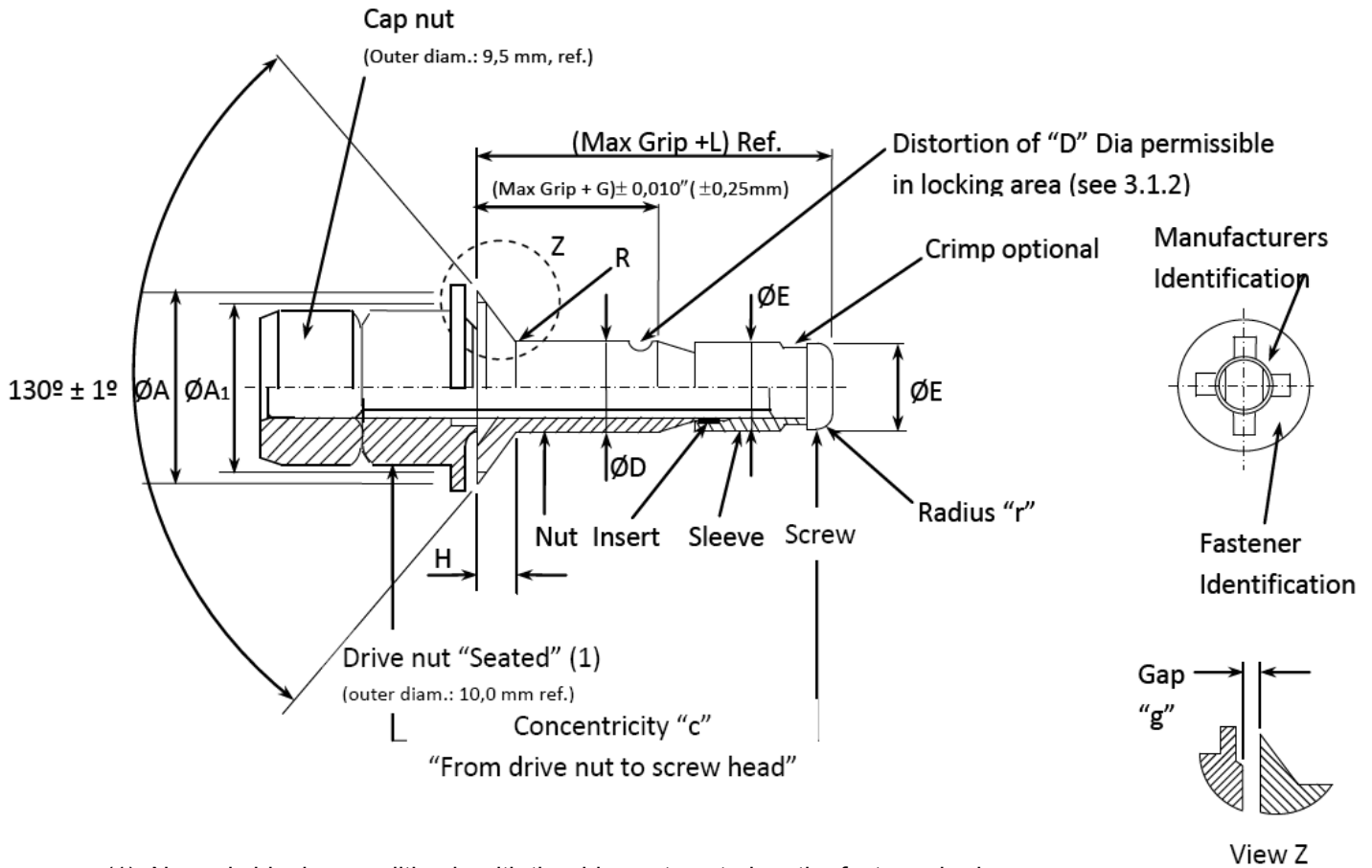
Typical installation
(see notes 3.1.3 and 3.1.4)



Installation on surface
with slope up to 7° max

Procurement code (Z)

Figure 2: Configuration for fasteners with "drive nut"



- (1) Normal shipping condition is with the drive nut seated on the fastener body
- (2) Specific dimensions and tolerances for robotic version are indicated in Table 2

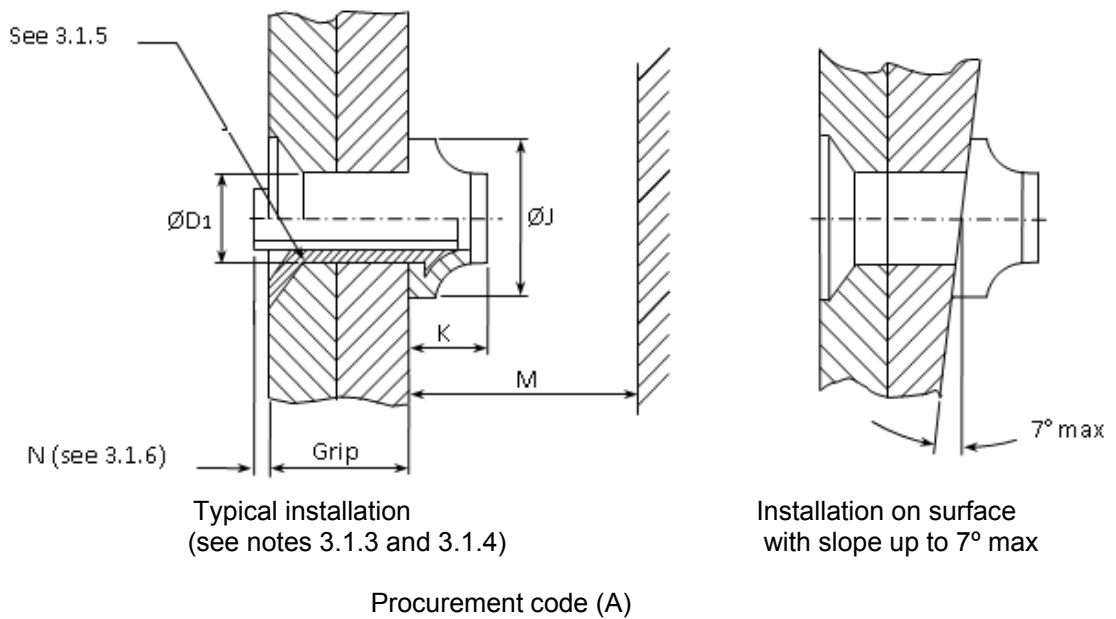


Figure 3: Configuration for fasteners for robotic installation

Table 1: Dimensions and Tolerances of fastener

Dimensions in inch (mm) (Continued)

Dia Dash Number	Nominal Dia	ØA Theoretical Not for insp. purposes	ØA1 Min	ØD	ØE Max	G Ref	H Ref	L Ref	R Max	T Ref
-5	5/32 (4,0)	0.332 0.325 (8,43) (8,26)	0.296 (7,52)	0.1645 0.1625 (4,178) (4,128)	0.1640 (4,165)	0.017 (0,43)	0.039 (0,99)	0.512 (13,00)	0.030 (0,76)	0.375 (9,52)
-6	3/16 (4,8)	0.385 0.378 (9,78) (9,60)	0.342 (8,69)	0.1985 0.1965 (5,042) (4,991)	0.1985 (5,041)	0.027 (0,68)	0.043 (1,09)	0.575 (14,60)	0.030 (0,76)	0.375 (9,52)
-7	7/32 (5,6)	0.416 0.409 (10,56) (10,39)	0.373 (9,47)	0.2275 0.2255 (5,778) (5,728)	0.2275 (5,778)	0.035 (0,89)	0.043 (1,09)	0.635 (16,13)	0.030 (0,76)	0.375 (9,52)
-8	1/4 (6,4)	0.507 0.499 (12,88) (12,67)	0.463 (11,76)	0.2595 0.2575 (6,591) (6,541)	0.2595 (6,591)	0.055 (1,40)	0.057 (1,45)	0.700 (17,78)	0.030 (0,76)	0.375 (9,52)
-9	9/32 (7,2)	0.538 0.530 (13,66) (13,46)	0.494 (12,55)	0.2895 0.2875 (7,353) (7,303)	0.2895 (7,353)	0.065 (1,65)	0.057 (1,45)	0.815 (20,70)	0.030 (0,76)	0.500 (12,70)
-10	5/16 (7,9)	0.635 0.626 (16,13) (15,90)	0.577 (14,66)	0.3115 0.3095 (7,912) (7,861)	0.3110 (7,899)	0.070 (1,78)	0.075 (1,90)	0.892 (22,66)	0.040 (1,02)	0.500 (12,70)
-11	11/32 (8,7)	0.666 0.657 (16,92) (16,69)	0.608 (15,44)	0.3435 0.3415 (8,725) (8,674)	0.3433 (8,720)	0.075 (1,90)	0.074 (1,88)	0.941 (23,90)	0.040 (1,02)	0.500 (12,70)

Table 1: Dimensions and Tolerances of fastener (concluded)

Installation see notes 3.1.3 to 3.1.7						
Dia Dash Number	Nominal Dia	ØD1 Recom hole size*	ØJ min	K max	M Ref	N See note 3.1.6
-5	5/32 (4,0)	0.168 0.165 (4,267) (4,191)	0.250 (6,35)	0.300 (7,62)	0.582 (14,78)	+0.103 −0.000 +(2,62) −(0,00)
-6	3/16 (4,8)	0.202 0.199 (5,131) (5,055)	0.300 (7,62)	0.350 (8,89)	0.645 (16,38)	
-7	7/32 (5,6)	0.231 0.228 (5,867) (5,791)	0.350 (8,89)	0.400 (10,16)	0.705 (17,91)	
-8	1/4 (6,4)	0.263 0.260 (6,680) (6,604)	0.400 (10,16)	0.450 (11,43)	0.770 (19,56)	
-9	9/32 (7,2)	0.293 0.290 (7,44) (7,37)	0.450 (11,43)	0.500 (12,70)	0.885 (22,48)	
-10	5/16 (7,9)	0.315 0.312 (8,001) (7,925)	0.475 (12,06)	0.550 (13,97)	0.962 (24,43)	
-11	11/32 (8,7)	0.347 0.344 (8,814) (8,738)	0.525 (13,34)	0.575 (14,60)	1.011 (25,68)	
* For information only. Check applicable documentation						

Table 2: Dimensions and Tolerances of fastener for robotic installation

Dimensions in inch (mm)

Dia Dash Number	Nominal Diameter	Radius "r"		Gap "g"		Concentricity "c"
		Min	Max	Min	Max	Max
-5	5/32 (4,0)	0.010 (0,254)	0.030 (0,762)	0.005 (0,127)	0.042 (1,067)	0.030 (0,762)
-6	3/16 (4,8)	0.015 (0,381)	0.035 (0,889)	0.006 (0,152)	0.050 (1,270)	0.027 (0,686)
-8	1/4 (6,4)	0.020 (0,508)	0.040 (1,016)	0.008 (0,203)	0.062 (1,575)	0.022 (0,559)

Table 3: Grip range and mass

Diameter Dash Number					-5	-6	-7	-8	-9	-10	-11
Nominal Diameter				inch	5/32	3/16	7/32	1/4	9/32	5/16	11/32
				(mm)	(4,0)	(4,8)	(5,6)	(6,4)	(7,2)	(7,9)	(8,7)
Grip Code No*	Grip Range				Mass kg/1000 Parts (Ref)						
	inch		mm								
	Max	Min	Max	Min							
-100	.100	.050	2,54	1,27	0,89	-	-	-	-	-	-
-150	.150	.100	3,81	2,54	1,15	1,84	2,63	3,79	5,31	6,43	8,19
-200	.200	.150	5,08	3,81	1,25	1,99	2,82	4,05	5,63	6,79	8,63
-250	.250	.200	6,35	5,08	1,35	2,13	3,02	4,30	5,95	7,15	9,07
-300	.300	.250	7,62	6,35	1,44	2,28	3,21	4,56	6,27	7,50	9,51
-350	.350	.300	8,89	7,62	1,54	2,43	3,40	4,81	6,60	7,86	9,95
-400	.400	.350	10,16	8,89	1,64	2,57	3,60	5,07	6,92	8,22	10,40
-450	.450	.400	11,43	10,16	1,74	2,72	3,79	5,32	7,24	8,58	10,84
-500	.500	.450	12,70	11,43	1,84	2,87	3,99	5,57	7,56	8,94	11,28
-550	.550	.500	13,97	12,70	1,94	3,02	4,18	5,83	7,88	9,30	11,72
-600	.600	.550	15,24	13,97	2,04	3,16	4,37	6,08	8,21	9,66	12,16
-650	.650	.600	16,51	15,24	2,13	3,31	4,57	6,34	8,53	10,02	12,61
-700	.700	.650	17,78	16,51	2,23	3,46	4,76	6,59	8,85	10,38	13,05
-750	.750	.700	19,05	17,78	2,33	3,60	4,96	6,85	9,17	10,73	13,49
-800	.800	.750	20,32	19,05	2,43	3,75	5,15	7,10	9,49	11,09	13,93
-850	.850	.800	21,59	20,32	2,53	3,90	5,34	7,36	9,82	11,45	14,37
-900	.900	.850	22,86	21,59	2,63	4,04	5,54	7,61	10,14	11,81	14,81
-950	.950	.900	24,13	22,86	2,72	4,19	5,73	7,86	10,46	12,17	15,26
-1000	1.000	.950	25,40	24,13	2,82	4,34	5,93	8,12	10,78	12,53	15,70
-1050	1.050	1.000	26,67	25,40	2,92	4,49	6,12	8,37	11,10	12,89	16,14
-1100	1.100	1.050	27,94	26,67	3,02	4,63	6,32	8,63	11,43	13,25	16,58
-1150	1.150	1.100	29,21	27,94	3,12	4,78	6,51	8,88	11,75	13,60	17,02
-1200	1.200	1.150	30,48	29,21	3,22	4,93	6,70	9,14	12,07	13,96	17,47
-1250	1.250	1.200	31,75	30,48	3,31	5,07	6,90	9,39	12,39	14,32	17,91
-1300	1.300	1.250	33,02	31,75	3,41	5,22	7,09	9,64	12,71	14,68	18,35
-1350	1.350	1.300	34,29	33,02	3,51	5,37	7,29	9,90	13,04	15,04	18,79
-1400	1.400	1.350	35,56	34,29	3,61	5,51	7,48	10,15	13,36	15,40	19,23
-1450	1.450	1.400	36,83	35,56	3,71	5,66	7,67	10,41	13,68	15,76	19,67
-1500	1.500	1.450	38,10	36,83	3,81	5,81	7,87	10,66	14,00	16,12	20,12
-1550	1.550	1.500	39,37	38,10	3,90	5,95	8,06	10,92	14,32	16,47	20,56
-1600	1.600	1.550	40,64	39,37	4,00	6,10	8,26	11,17	14,65	16,83	21,00

Dimensions in inch (mm) (Continued)

Table 4: Dimensions and Tolerances for 1st oversizes (concluded)

Installation see notes 3.1.3 to 3.1.7						
Dia Dash Number	Nominal Dia	ØD1 Recom hole size*	ØJ min	K max	M Ref	N See note 3.1.6
-5X	5/32 (4,0)	0.183 0.181 (4,65) (4,60)	0.270 (6,86)	0.325 (8,26)	0.614 (15,59)	+0.103 -0.000 +(2,62) -(0,00)
-6X	3/16 (4,8)	0.218 0.215 (5,54) (5,46)	0.330 (8,38)	0.350 (8,89)	0.675 (17,14)	
-8X	1/4 (6,4)	0.279 0.276 (7,08) (7,01)	0.420 (10,66)	0.450 (11,43)	0.828 (21,03)	

*For information only. Check applicable documentation.

Table 5: Grips range and mass

Diameter Dash Number					-5X	-6X	-8X
Nominal Diameter				inch	5/32	3/16	1/4
				(mm)	(4,0)	(4,8)	(6,4)
Grip Code No	Grip Range				Mass kg/1000 Parts (Ref)		
	inch		mm				
	Max	Min	Max	Min			
-100	.100	.050	2,54	1,27	-	-	-
-150	.150	.100	3,81	2,54	1,41	2,18	4,44
-200	.200	.150	5,08	3,81	1,50	2,34	4,70
-250	.250	.200	6,35	5,08	1,60	2,49	4,96
-300	.300	.250	7,62	6,35	1,70	2,65	5,22
-350	.350	.300	8,89	7,62	1,80	2,80	5,49
-400	.400	.350	10,16	8,89	1,90	2,96	5,75
-450	.450	.400	11,43	10,16	2,01	3,11	6,01
-500	.500	.450	12,70	11,43	2,11	3,27	6,28
-550	.550	.500	13,97	12,70	2,21	3,42	6,54
-600	.600	.550	15,24	13,97	2,31	3,57	6,80
-650	.650	.600	16,51	15,24	2,40	3,72	7,06
-700	.700	.650	17,78	16,51	2,49	3,88	7,33
-750	.750	.700	19,05	17,78	2,59	4,03	7,59
-800	.800	.750	20,32	19,05	2,68	4,19	7,85
-850	.850	.800	21,59	20,32	2,78	4,34	8,11
-900	.900	.850	22,86	21,59	2,87	4,49	8,38
-950	.950	.900	24,13	22,86	2,97	4,65	8,64
-1000	1.000	.950	25,40	24,13	3,06	4,80	8,90
-1050	1.050	1.000	26,67	25,40	3,16	4,96	9,17
-1100	1.100	1.050	27,94	26,67	3,25	5,11	9,43
-1150	1.150	1.100	29,21	27,94	3,35	5,26	9,69
-1200	1.200	1.150	30,48	29,21	3,44	5,42	9,96
-1250	1.250	1.200	31,75	30,48	3,54	5,57	10,22
-1300	1.300	1.250	33,02	31,75	3,63	5,73	10,48
-1350	1.350	1.300	34,29	33,02	3,73	5,88	10,74
-1400	1.400	1.350	35,56	34,29	3,82	6,03	11,01
-1450	1.450	1.400	36,83	35,56	3,92	6,19	11,27
-1500	1.500	1.450	38,10	36,83	4,01	6,34	11,53
-1550	1.550	1.500	39,37	38,10	4,11	6,50	11,80
-1600	1.600	1.550	40,64	39,37	4,20	6,65	12,06

3.2 Material and surface treatment

The material and surface treatment shall be in accordance with table 6.

Table 6: Material and surface treatment

Item	Material	Heat Treatment	Surface treatment	Code
Nut	6Al-4V Titanium per AMS-T-9047, STA, or AMS4928 or AMS4967	Per AMS-H-81200, To 95 KSI (655 MPa) shear strength minimum. Maximum hydrogen 125ppm	Phosphate Fluoride	(-)
Screw	A-286 With chemical composition per AMS5731, AMS5732 or AMS5737	To 175 KSI (1207 MPa) Tensile minimum	Passivate per ASTM-A967-96	
Sleeve	304 Stainless steel per AMS5639	Annealed		
Insert	Acetal per ASTM D4181	-	None	
Drive Nut (Procurement code "Z")	Mild steel	As required for performance	Light grey corrosion protective coating	
Cap Nut / Drive Nut (Robotic version - Procurement code "A")	Mild steel	As required for performance	Black Oxide	
Nut	6AL-4V Titanium per AMS-T-9047, STA, or AMS4928 or AMS4967	Per AMS-H-81200, To 95 KSI (655 MPa) shear strength minimum. Maximum hydrogen 125ppm	IVD Aluminium coat per MIL-C-83488, Class 3, Type II	A
Screw	A-286 With chemical composition per AMS5731, AMS5732 or AMS5737	To 175 KSI (1207 MPa) Tensile minimum	Passivate per ASTM-A967-96	
Sleeve	304 Stainless steel per AMS5639	Annealed		
Insert	Acetal per ASTM D4181	-	None	
Drive Nut (Procurement code "Z")	Mild steel	As required for performance	Light grey corrosion protective coating	
Cap Nut / Drive Nut (Robotic version - Procurement code "A")	Mild steel	As required for performance	Black Oxide	
Note: Following lubricants may be applied to each one of the components by the fastener manufacturer, as required for performance (no other being allowed). Nut: Cetyl Alcohol per AS87132. Screw and Sleeve: Dry film lube per MIL-PRF-46010 (Type I or Type III), Everlube 812, or Cetyl Alcohol per AS87132.				

3.3 Mechanical Properties

Mechanical properties shall be in accordance with table 7.

Table 7: Mechanical Properties

Diameter Dash No	Locking Torque (Min)		Double Shear Strength (Min)		Tensile Strength (Min)	
	In-lb	Nm	lb	daN	lb	daN
-5	1.0	0,11	3150	1401	900	400
-5X			3780	1681		
-6	1.5	0,17	4600	2046	1400	623
-6X			5350	2380		
-7	2.0	0,23	6050	2691	1600	712
-8	2.5	0,28	7900	3514	2100	934
-8X			8850	3937		
-9	3.0	0,34	9800	4359	2600	1157
-10	3.5	0,400	11350	5049	3600	1601
-11	4.0	0,452	13850	6161	4400	1957

4 Designation

This type of standard shall be designated according to the philosophy of the following example:

Description block		Identity block				
Bolt, Blind, 130° Flush Shear Head		ABS0257	-5	A	200	(Y)* (Z)* (A)*
Number of this standard						
Diameter dash number (see table 1 and 4)						
Finish code (see table 6)						
Grip code number (see table 3 & 5)						

* Letters “Y”, “Z”, and “A” are reserved for the sole use of procurement departments for ordering purposes, according to:

“Y”: Fasteners without “drive nut”.

“Z”: Fasteners with “drive nut”.

“A”: Fasteners for robotic installation.

The use of “X” following the diameter dash number means first oversize (see table 4).

5 Marking

EN2424 style A.

6 Technical specification

MBF2000 or FCBF200 (depending on supplier).

RECORD OF REVISIONS

Issue	Clause modified	Description of modification
6 03/04	N/A	Rewritten in new format.
7 11/04	3.2 (note), and Figure 1	Removal of paraffin wax lubricant. Addition of "Procurement code (Y)".
8 08/06	3.1, Table-1, and Figure 3	Introduction of version for robotic installation (code "A").
9 09/07	Tables 2 to 4	Introduction of diameter dash (-9). Modification of Item "Drive Nut and Cap Nut" in Table 3 (Material and surface treatment). Correction of double shear value for diameter dash (-7).
10 04/08	Tables 1, 2 and 4 Figure 3 Table 1A	Introduction of diameters dash (-10) and (-11). Modification of Figure 3 (Robotic Version) Introduction of Table 1A (Dimensions for Robotic Version)
11 08/10	Table 4 and 5	Introduction of 1 st oversizes for dash (-5), (-6) and (-8) Correction of "G" value for dash (-6) Correction of "recommended hole" value for dash (-9) Correction of "M" value for all sizes Suppression of manufacturers installation documents
12 02/11	Table 3 & 5 Table 2 Table 4 Table 1 & 4	Correction of max grip in mm for grip codes (-600) and (-1600). Correction of min grip in mm for grip code (-650). Modification of Max "r" values Correction of " ΦD_1 recom. hole size" min value in mm for dia. dash (-5X) and min value in inches for dia. dash (-8X). ΦP csk removed from figures -1, -2 and -3 and tables -1 & -4 (because same dimension as ΦA)