BRITISH STANDARD

BS EN
3324:2007

Aerospace series — Bolts, hexagon head, relieved shank, long thread, in heat resisting steel FE-PM1708 (FV535) — Classification: 1 000 MPa/550 °C — Unplated

ICS 49.030.20

BSI
British Standards

National foreword

This British Standard is the UK implementation of EN 3324:2007.

The UK participation in its preparation was entrusted to Technical Committee ACE/12, Aerospace fasteners and fastening systems.

A list of organizations represented on this committee can be obtained on request to its secretary.

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English Version

Aerospace series - Bolts, hexagon head, relieved shank, long thread, in heat resisting steel FE-PM1708 (FV535) - Classification: 1 000 MPa/550 °C - Unplated

Série aérospatiale - Vis à tête hexagonale, fût dégagé, filetage long, en acier résistant à chaud FE-PM1708 (FV535) - Classification: 1 000 MPa/550 °C - Non revêtues

Luft- und Raumfahrt - Sechskantschrauben, Dünnschaft, langes Gewinde, aus hochwarmfestem Stahl FE-PM1708 (FV535) - Klasse: 1 000 MPa/550 °C - Blank

This European Standard was approved by CEN on 5 November 2007.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

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Foreword

This document (EN 3324:2007) has been prepared by the Aerospace and Defence Industries Association of Europe - Standardization (ASD-STAN).

After enquiries and votes carried out in accordance with the rules of this Association, this Standard has received the approval of the National Associations and the Official Services of the member countries of ASD, prior to its presentation to CEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2008, and conflicting national standards shall be withdrawn at the latest by June 2008.

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1 Scope

This standard specifies the characteristics of hexagon headed bolts with relieved shank and long thread, in FE-PM1708, for aerospace applications.

Classification: 1 000 MPa [1] / 550 °C [2].

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 3353-1, *Aerospace — Lead and runout threads — Part 1: Rolled external threads.*

ISO 5855-2, *Aerospace — MJ threads — Part 2: Limit dimensions for bolts and nuts.*

EN 2424, *Aerospace series — Marking of aerospace products.*

EN 2493 [3], *Heat resisting steel FE-PM38 — 1 000 MPa ≤ R_m ≤ 1 140 MPa — Bars — Aerospace series.* [4]

EN 3302, *Aerospace series — Bolts in heat resisting steel FE-PM1708 (FV535) — Classification: 1 000 MPa / 550 °C — Technical specification.*

EN 4244, *Aerospace series — Heat resisting alloy FE-PM1708 — Vacuum arc remelted — Hardened and tempered — Bar — a or D ≤ 200 mm — 1 000 MPa ≤ R_m ≤ 1 140 MPa.* [5]

EN 4245, *Aerospace series — Heat resisting alloy FE-PM1708 — Vacuum arc remelted — As forged — Forging stock — D_e ≤ 300 mm.* [5]

3 Required characteristics

3.1 Configuration – Dimensions – Tolerances – Masses

See Figure 1 and Tables 1 and 2.

3.2 Material

EN 2493

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1) Minimum tensile strength of material at ambient temperature.

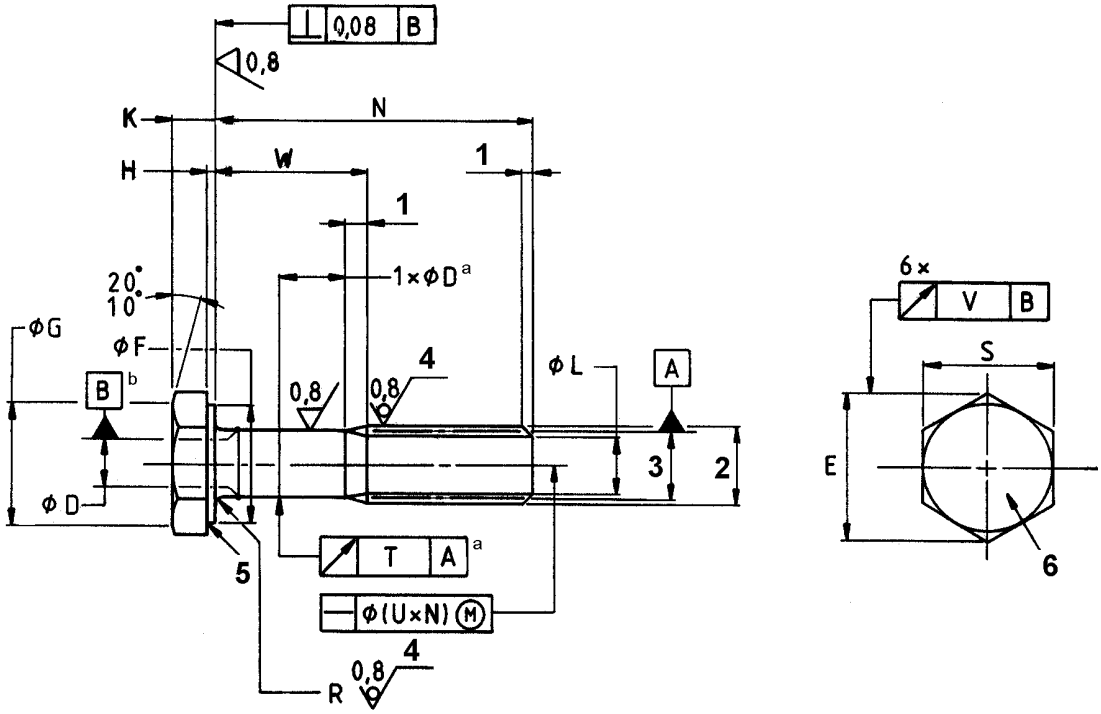
2) Maximum test temperature of the parts.

3) Inactive for new designation, see EN 4244 and EN 4245.

4) Published as ASD Standard at the date of publication of this standard.

5) Published as ASD Prestandard at the date of publication of this standard.

Remove sharp edges 0,1 to 0,4



Key

1 Conforms to ISO 3353-1
2 Thread Ø
3 Thread pitch Ø
4 Rolled
5 Shape in this area at manufacturers option
6 Marking

[a] When the length of the shank is less than one times the nominal value of the shank diameter, D, the run out is measured at a distance equal to half the length.

[b] For bolts having a shank length less than one times the nominal value of the shank diameter, D, the pitch diameter axis shall be used as the datum.

Figure 1

Table 1

Thread [a]		D	E	F	G	H	K	L	R		S	T	U	V
Code	Designation	± 0,13	min.	min.	min.	0 − 0,3	0 − 0,3	± 0,5	max.	min.	h13			
050	MJ5×0,8-4h6h	4,48	9,8	8,3	8,4	0,5	3,0	3,4	0,5	0,3	9,0	0,12	0,003	0,25
060	MJ6×1,0-4h6h	5,35	12,0	10,2	10,3		3,5	4,2	0,7	0,5	11,0			0,30
070	MJ7×1,0-4h6h	6,35	13,2	11,2	11,3		4,0	5,2			12,0	0,15		0,35
080	MJ8×1,0-4h6h	7,35	15,5	13,2	13,3	0,6	4,5	6,2			14,0			0,40
100	MJ10×1,25-4h6h	9,19	18,9	16,0	16,3		5,0	7,9	0,8	0,6	17,0		0,0025	0,50
120	MJ12×1,25-4h6h	11,19	21,1	18,0	18,3		6,0	9,8	0,9		19,0	0,18		0,60

[a] In accordance with ISO 5855-2.

Table 2

Length code	*N* ± 0,3	Thread code																	
		050			060			070			080			100			120		
		W		Mass [a]	*W*		Mass [a]	*W*		Mass [a]	*W*		Mass [a]	*W*		Mass [a]	*W*		Mass [a]
		max.	min.		max.	min.		max.	min.		max.	min.		max.	min.		max.	min.	
008	8			2,61															
010	10			2,86			4,60			6,34			9,24						
012	12	2,1	1,7	3,10			4,94			6,83			9,89						
014	14			3,35	2,7	2,2	5,30			7,32			10,55			16,93			
016	16			3,60			5,65	2,7	2,2	7,82	2,7	2,2	11,21			17,96			
018	18			3,84			5,99			8,31			11,88			18,99			
020	20	4	2,5	4,09			6,35			8,80			12,54	3,3	2,7	20,01			
022	22	6	4,5	4,33	4	2,5	6,70			9,30			13,20			21,05			
024	24	8	6,5	4,58	6	4,5	7,05	4	2,5	9,79			13,85			22,08			
026	26	10	8,5	4,82	8	6,5	7,40	6	4,5	10,28	4	2,5	14,51			23,11	3,4	2,8	
028	28	12	10,5	5,07	10	8,5	7,74	8	6,5	10,78	6	4,5	15,18			24,14			
030	30	14	12,5	5,32	12	10,5	8,10	10	8,5	11,27	8	6,5	15,84	4	2,7	25,17			
032	32	16	14,5	5,56	14	12,5	8,45	12	10,5	11,76	10	8,5	16,50	6	4,5	26,21			
034	34	18	16,5	5,81	16	14,5	8,79	14	12,5	12,25	12	10,5	17,16	8	6,5	27,23	4	2,8	41,04
036	36	20	18,5	6,05	18	16,5	9,15	16	14,5	12,74	14	12,5	17,81	10	8,5	28,26	6	4,5	42,57
038	38	22	20,5	6,30	20	18,5	9,49	18	16,5	13,24	16	14,5	18,48	12	10,5	29,29	8	6,5	44,10
040	40	24	22,5	6,54	22	20,5	9,85	20	18,5	13,74	18	16,5	19,14	14	12,5	30,32	10	8,5	45,53
042	42	26	24,5	6,79	24	22,5	10,20	22	20,5	14,23	20	18,5	19,80	16	14,5	31,35	12	10,5	47,16
044	44	28	26,5	7,04	26	24,5	10,54	24	22,5	14,72	22	20,5	20,46	18	16,5	32,39	14	12,5	48,69
046	46	30	28,5	7,28	28	26,5	10,90	26	24,5	15,21	24	22,5	21,13	20	18,5	33,42	16	14,5	50,22
048	48	32	30,5	7,53	30	28,5	11,25	28	26,5	15,70	26	24,5	21,78	22	20,5	34,44	18	16,5	51,75
050	50	34	32,5	7,77	32	30,5	11,59	30	28,5	16,19	28	26,5	22,44	24	22,5	35,47	20	18,5	53,27
052	52	36	34,5	8,02	34	32,5	11,95	32	30,5	16,69	30	28,5	23,10	26	24,5	36,50	22	20,5	54,81
054	54	38	36,5	8,26	36	34,5	12,29	34	32,5	17,19	32	30,5	23,76	28	26,5	37,53	24	22,5	56,34
056	56	40	38,5	8,51	38	36,5	12,65	36	34,5	17,68	34	32,5	24,43	30	28,5	38,57	26	24,5	57,87
058	58	42	40,5	8,74	40	38,5	13,00	38	36,5	18,17	36	34,5	25,08	32	30,5	39,60	28	26,5	59,40
060	60	44	42,5	8,99	42	40,5	13,34	40	38,5	18,66	38	36,5	25,74	34	32,5	40,62	30	28,5	60,93
062	62	46	44,5	9,24	44	42,5	13,70	42	40,5	19,15	40	38,5	26,40	36	34,5	41,65	32	30,5	62,46
064	64	48	46,5	9,48	46	44,5	14,04	44	42,5	19,65	42	40,5	27,07	38	36,5	42,68	34	32,5	63,98
066	66	50	48,5	9,73	48	46,5	14,39	46	44,5	20,14	44	42,5	27,73	40	38,5	43,71	36	34,5	65,52
068	68	52	50,5	9,97	50	48,5	14,75	48	46,5	20,63	46	44,5	28,39	42	40,5	44,75	38	34,5	67,05
070	70	54	52,5	10,22	52	50,5	15,09	50	48,5	21,13	48	46,5	29,04	44	42,5	45,78	40	38,5	68,57

continued

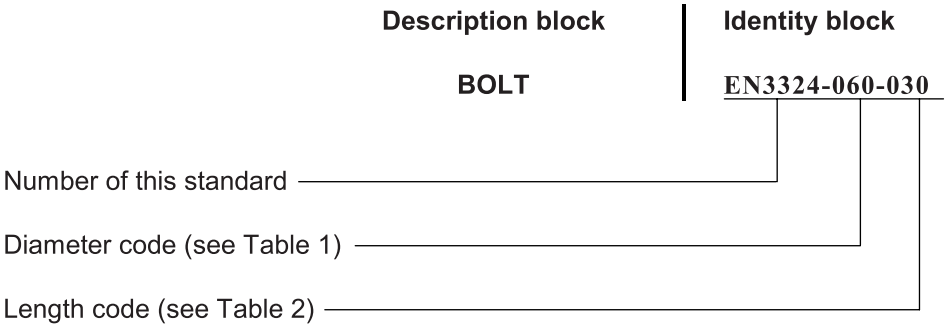
Table 2 *(concluded)*

Length code	*N* ± 0,3	Thread code																	
		050			060			070			080			100			120		
		W		Mass [a]	*W*		Mass [a]	*W*		Mass [a]	*W*		Mass [a]	*W*		Mass [a]	*W*		Mass [a]
		max.	min.		max.	min.		max.	min.		max.	min.		max.	min.		max.	min.	
072	72				54	52,5	15,45	52	50,5	21,62	50	48,5	29,70	46	44,5	46,81	42	40,5	70,11
074	74				56	54,5	15,79	54	52,5	22,11	52	50,5	30,37	48	46,5	47,83	44	42,5	71,64
076	76				58	56,5	16,14	56	54,5	22,61	54	52,5	31,03	50	48,5	48,86	46	44,5	73,17
078	78				60	58,5	16,50	58	56,5	23,10	56	54,5	31,69	52	50,5	49,89	48	46,5	74,69
080	80				62	60,5	16,84	60	58,5	23,59	58	56,5	32,35	54	52,5	50,93	50	48,5	76,23
082	82				64	62,5	17,19	62	60,5	24,08	60	58,5	33,00	56	54,5	51,96	52	50,5	77,76
084	84				66	64,5	17,55	64	62,5	24,57	62	60,5	33,67	58	56,5	52,99	54	52,5	79,28
086	86							66	64,5	25,08	64	62,5	34,33	60	58,5	54,02	56	54,5	80,82
088	88							68	66,5	25,57	66	64,5	34,99	62	60,5	55,04	58	56,5	82,35
090	90							70	68,5	26,06	68	66,5	35,65	64	62,5	56,08	60	58,5	83,87
092	92							72	70,5	26,55	70	68,5	36,32	66	64,5	57,11	62	60,5	85,40
094	94							74	72,5	27,04	72	70,5	36,97	68	66,5	58,14	64	62,5	86,94
096	96							76	74,5	27,53	74	72,5	37,63	70	68,5	59,17	66	64,5	88,47
098	98							78	76,5	28,02	76	74,5	38,29	72	70,5	60,20	68	66,5	89,99
100	100										78	76,5	38,95	74	72,5	61,23	70	68,5	91,53
104	104										82	80,5	40,28	78	76,5	63,29	74	72,5	94,58
108	108										86	84,5	41,59	82	80,5	65,35	78	76,5	97,65
112	112										90	88,5	42,92	86	84,5	67,41	82	80,5	100,70
116	116													90	88,5	69,47	86	84,5	103,77
120	120													94	92,5	71,53	90	88,5	106,82
124	124													98	96,5	73,59	94	92,5	109,88
128	128													102	100,5	75,66	98	96,5	112,95
132	132													106	104,5	77,71	102	100,5	116,00
136	136													110	108,5	79,77	106	104,5	119,07
140	140													114	112,5	81,84	110	108,5	122,12
144	144																114	112,5	125,18
148	148																118	116,5	128,24
152	152																122	120,5	131,30
156	156																126	124,5	134,37
160	160																130	128,5	137,42
164	164																134	132,5	140,48
168	168																138	136,5	143,54

[a] Mass ≈ quoted in kg/1 000 pieces.

4 Designation

EXAMPLE



NOTE If necessary, the code I9005 shall be placed between the description block and the identity block.

5 Marking

EN 2424, category A, as indicated on the Figure 1.

6 Technical specification

EN 3302

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