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BSI Standards Publication

Aerospace series — Bolts with double hexagon head, relieved shank long thread, — In heat resisting steel FE-PM 38 (FV 535) — Classification: 1 000 MPa/550 °C

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National foreword

This British Standard is the UK implementation of EN 3323:2009.

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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Date	Text affected
31 October 2015	Implementation of CEN Correction Notice 4 March 2009: Figure 1 and its key updated

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 3323

February 2009

ICS 49.030.20

English Version

Aerospace series - Bolts with double hexagon head, relieved shank long thread, - In heat resisting steel FE-PM 38 (FV 535) - Classification: 1 000 MPa/550 °C

Série aérospatiale - Vis à tête bihexagonale, à tige réduite, à filetage long, en acier résistant à chaud FE-PM38 (FV535) - Classification : 1 000 MPa/550 °C

Luft- und Raumfahrt - Zwölfkantschrauben, Dünnschaft, langes Gewinde, - Aus hochwarmfestem Stahl FE-PM 38 (FV 535) - Klasse: 1 000 MPa/550 °C

This European Standard was approved by CEN on 2 August 2008.

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

Management Centre: Avenue Marnix 17, B-1000 Brussels

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Foreword

This document (EN 3323:2009) 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of an identical text or by endorsement, at the latest by August 2009, and conflicting national standards shall be withdrawn at the latest by August 2009.

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1 Scope

This standard specifies the characteristics of double hexagon head bolts with relieved shank and long thread in heat resisting steel FM-PM 38, tensile strength class 1 000 MPa at room temperature. The maximum test temperature of the material is 550 °C.

These bolts are to be used in aerospace fastening systems, of parts made in titanium, mainly stressed in tension.

2 Normative references

EN 2424 Aerospace series — Marking of aerospace products[1]

EN 2493 Aerospace series — Heat resisting steel FE-PM 38 — 1 000 MPa ≤ R_m ≤ 1140 MPa — Bars[2]

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

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

ISO 4095 Aerospace — Bihexagonal drives — Wrenching configuration — Metric series

ISO 5855-1 Aerospace — MJ Threads — Part 1: General requirements

ISO 5855-2 Aerospace — MJ Threads — Part 2: Limit dimensions for bolts and nuts

1 Published as ASD standard at the date of publication of this standard.

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

3 Required characteristics

3.1 Configuration – Dimensions – Tolerances

The configuration shall be in accordance with the figure. Dimensions and tolerances shall conform to the values shown in the figure and in Tables 1 and 2.

3.2 Surface roughness

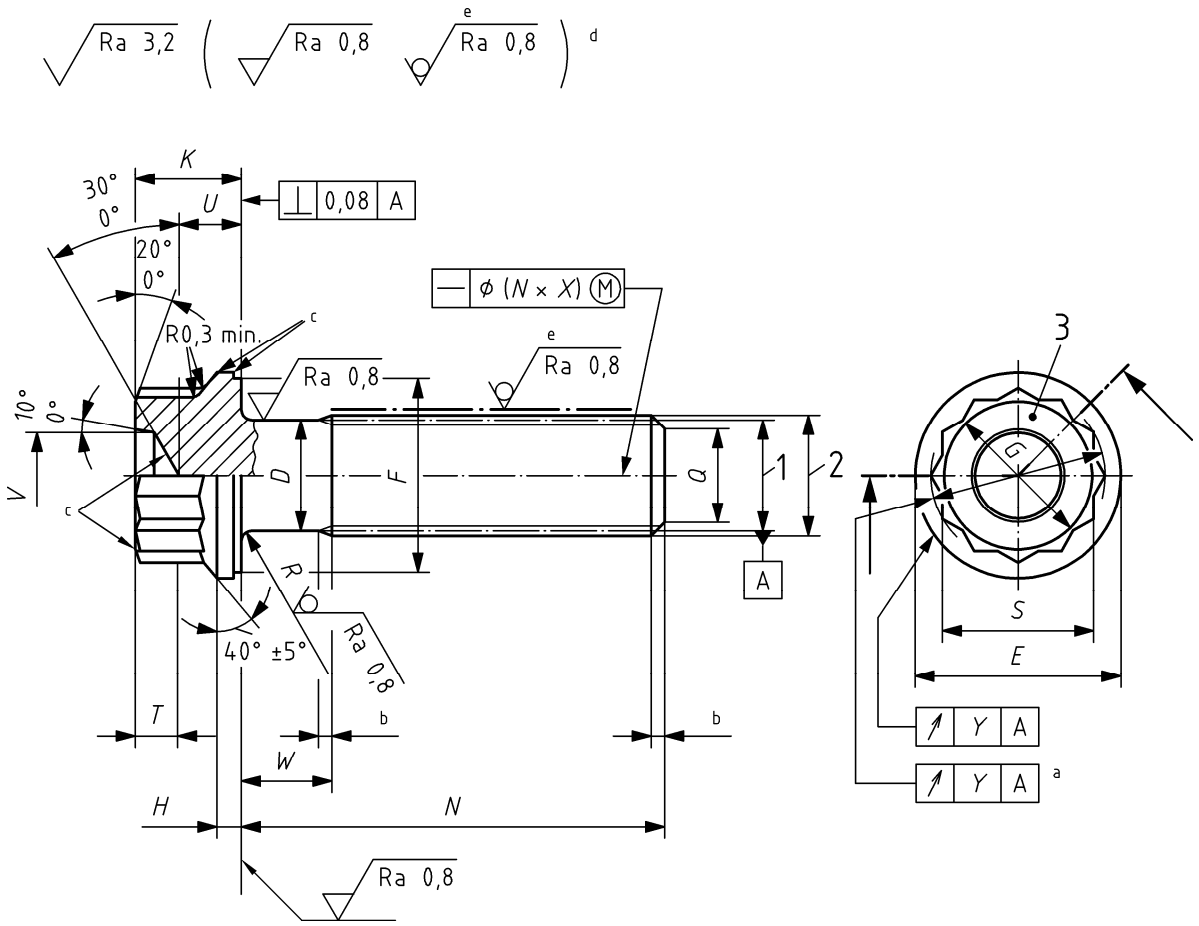
See the figure.

3.3 Material

Heat resisting steel FM-PM 38 to EN 2493.

3.4 Surface treatment

None.



Key

1 Pitch ø

2 Thread ø

3 Marking

a 12 times

b In accordance with ISO 3353-1

c Shape in this area at manufacturer's option

d Break sharp edges 0,1 mm to 0,4 mm

e Rolled

Figure 1 — Configuration

Table 1 — Dimensions

Dimensions in millimetres

Diameter code	Thread[a]	D	E **4**	F	G	H	K	Q	R	**5**	S[b]	T	U	**6**	V	**7**	X	Y
8	**9**	± 0,13	max.	min.	min.	min.	Js 14	± 0,5	max.	min.	**10**	min.	max.	min.	max.	min.	**11**	**12**
050	MJ 5 x 0,8 – 4h6h	4,48	9,1	8,3	6,8	1	5,5	3,5	0,5	0,3	7	2	2,9	2,5	3,7	3,2	0,003	0,13
060	MJ 6 x 1 – 4h6h	5,35	10,6	9,8	7,8	1,2	6	4,2	0,7	0,5	8	2,3	3,2	2,8	4,6	4,1		0,15
070	MJ 7 x 1 – 4h6h	6,35	12,1	11,3	8,8	1,4	6,5	5,2			9	2,6	3,7	3,3	5,4	4,9		0,18
080	MJ 8 x 1 – 4h6h	7,35	13,6	12,8	9,8	1,6	7	6,2			10	2,8	4,1	3,7	5,7	5,2		0,2
100	MJ 10 x 1,25 – 4h6h	9,19	16,7	15,7	11,8	2	8	7,9	0,8	0,6	12	3,1	5,1	4,7	7,2	6,7	0,0025	0,25
120	MJ 12 x 1,25 – 4h6h	11,19	**A.1.1.1** 9,9	**A.1.1.** 8,8	**A.1.1.** 3,7	**A.1.1.** ,4	**A.1.1.1** ,2	**A.1.1.1** ,9	**A.1.1.1** ,9		14	3,5	6	5,6	8,5	8	**12.1**	0,3

[a] In conformity with ISO 5855 parts 1 and 2.

[b] Double hexagon wrenching profile to ISO 4095 on length T min.

Table 2 — Lengths and masses

Diameter code		050			060			070			080			100			120		
Length code	N	W		Mass	W		Mass	W		Mass	W		Mass	W		Mass	W		Mass
		max.	min.	**13**	max.	min.	**14**	max.	min.	**15**	max.	min.	**16**	max.	min.	**17**	max.	min.	**18**
008	8	2,1	1,7	3,08	2,7	2,2	**18.1**	2,7	2,2	**18.2**	2,7	**A.1.1.1.8** 2,2	**18.3**	3,3	2,7	**18.4**	3,4	2,8	**18.5**
010	10			3,32			4,77			6,72			**A.1.1.1.9** 8,99						
012	12			3,57			5,12			7,21			9,65						
014	14			3,81			5,46			7,70			10,31			16,70			26,28
016	16			4,06			5,82			8,19			10,97			17,72			27,80
018	18			4,30			6,17			8,69			11,63			18,76			29,32
020	20	4	2,5	4,55			6,51			9,18			12,29			19,79			30,85
022	22	6	4,5	4,79	4	2,5	6,87			9,67			12,95			20,82			32,37
024	24	8	6,5	5,04	6	4,5	7,22	4	2,5	10,16			13,61			21,84			33,90

026	26	10	8,5	5,28	8	6,5	7,56	6	4,5	10,65	4	2,5	14,26			22,87		35,42
028	28	12	10,5	5,53	10	8,5	7,92	8	6,5	11,14	6	4,5	14,93			23,90		36,95
030	30	14	12,5	5,78	12	10,5	8,26	10	8,5	11,6	8	6,5	15,59	4	2,7	24,93		38,47
032	32	16	14,5	6,02	14	12,5	8,61	12	10,5	12,13	10	8,5	16,25	6	4,5	25,96		40,01

Table 2 — Lengths and masses *(continued)*

Diameter code		050			060			070			080			100			120		
Length code	N	W		Mass	W		Mass	W		Mass	W		Mass	W		Mass	W		Mass
		max.	min.	**19**	max.	min.	**20**	max.	min.	**21**	max.	min.	**22**	max.	min.	**23**	max.	min.	**24**
034	34	18	16,5	6,26	16	14,5	8,97	14	12,5	12,62	12	10,5	16,90	8	6,5	26,99	4	2,8	41,53
036	36	20	18,5	6,50	18	16,5	9,31	16	14,5	13,12	14	12,5	17,57	10	8,5	28,02	6	4,5	43,06
038	38	22	20,5	6,75	20	18,5	9,66	18	16,5	13,61	16	14,5	18,23	12	10,5	29,04	8	6,5	44,59
040	40	24	22,5	6,99	22	20,5	10,01	20	18,5	14,10	18	16,5	18,88	14	12,5	30,07	10	8,5	46,11
042	42	26	24,5	7,24	24	22,5	10,36	22	20,5	14,60	20	18,5	19,54	16	14,5	31,10	12	10,5	47,64
044	44	28	26,5	7,48	26	24,5	10,71	24	22,5	15,09	22	20,5	20,20	18	16,5	32,13	14	12,5	49,16
046	46	30	28,5	7,73	28	26,5	11,06	26	24,5	15,58	24	22,5	20,87	20	18,5	33,16	16	14,5	50,69
048	48	32	30,5	7,97	30	28,5	11,41	28	26,5	16,07	26	24,5	21,52	22	20,5	34,19	18	16,5	52,21
050	50	34	32,5	8,22	32	30,5	11,76	30	28,5	16,56	28	26,5	22,18	24	22,5	35,22	20	18,5	53,74
052	52	36	34,5	8,47	34	32,5	12,11	32	30,5	17,05	30	28,5	22,84	26	24,5	36,24	22	20,5	55,26
054	54	38	**A.1.1.1** 6,5	**A.1.1.1** ,71	**A.1.1.1.** 6	**A.1.1.1** 4,5	**A.1.1.1** 2,46	**A.1.1.1** 4	**A.1.1.1** 2,5	**A.1.1.1** 7,55	**A.1.1.1** 2	**A.1.1.1** 0,5	**A.1.1.1** 3,49	**A.1.1.1** 8	**A.1.1.1** 6,5	**A.1.1.1** 7,27	**A.1.1.1** 4	**A.1.1.1** 2,5	**A.1.1.1** 6,79
A.1.1.1 56	**A.1.1.1** 6	**A.1.1.1** 0	**A.1.1.1** 8,5	**A.1.1.1** ,96	**A.1.1.1.** 8	**A.1.1.1** 6,5	**A.1.1.1** 2,80	**A.1.1.1** 6	**A.1.1.1** 4,5	**A.1.1.1** 8,04	**A.1.1.1** 4	**A.1.1.1** 2,5	**A.1.1.1** 4,16	**A.1.1.1** 0	**A.1.1.1** 8,5	**A.1.1.1** 8,30	**A.1.1.1** 6	**A.1.1.1** 4,5	**A.1.1.1** 8,31

Table 2 — Lengths and masses *(continued)*

Diameter code		050			060			070			080			100			120		
Length code	N	W		Mass	W		Mass	W		Mass	W		Mass	W		Mass	W		Mass
		max.	min.	**25**	max	min.	**26**	max	min.	**27**	max.	min.	**28**	max.	min.	**29**	max.	min.	**30**
058	58	42	40,5	9,20	40	38,5	13,16	38	36,5	18,53	36	34,5	24,82	32	30,5	39,33	28	26,5	59,84
060	60	44	42,5	9,45	42	40,5	13,51	40	38,5	19,02	38	36,5	25,48	34	32,5	40,36	30	28,5	61,36
062	62	46	44,5	9,69	44	42,5	13,85	42	40,5	19,51	40	38,5	26,13	36	34,5	41,39	32	30,5	62,89
064	64	48	46,5	9,94	46	44,5	14,20	44	42,5	20,00	42	40,5	26,80	38	36,5	42,42	34	32,5	64,41
066	66	50	48,5	10,18	48	46,5	14,55	46	44,5	20,50	44	42,5	27,46	40	38,5	43,44	36	**A.1.1.1** 4,5	**A.1.1.1** 5,94
A.1.1.1. 68	**A.1** 8	**A.1.1.** 2	**A.1.1.1** 0,5	**A.1.1.1** 0,43	**A.1.1** 0	**A.1.1.1** 8,5	**A.1.1.1.** 4,90	**A.1.1** 8	**A.1.1.1** 6,5	**A.1.1.1.** 0,99	**A.1.** 6	**A.1.1.1** 4,5	**A.1.1.1.** 8,12	**A.1.** 2	**A.1.1.1** 0,5	**A.1.1.1.** 4,47	**A.1.1.1** 8	**A.1.1.1** 6,5	**A.1.1.1** 7,46
A.1.1.1. 70	**A.1** 0	**A.1.1.** 4	**A.1.1.1** 2,5	**A.1.1.1** 0,67	**A.1.1** 2	**A.1.1.1** 0,5	**A.1.1.1.** 5,25	**A.1.1** 0	**A.1.1.1** 8,5	**A.1.1.1.** 1,48	**A.1.** 8	**A.1.1.1** 6,5	**A.1.1.1.** 8,77	**A.1.** 4	**A.1.1.1** 2,5	**A.1.1.1.** 5,50	**A.1.1.1** 0	**A.1.1.1** 8,5	**A.1.1.1** 8,99

Table 2 — Lengths and masses *(continued)*

Diameter code		050			060			070			080			100			120		
Length code	N	W		Mass	W		Mass	W		Mass	W		Mass	W		Mass	W		Mass
		max.	min.	**31**	max.	min.	**32**	max.	min.	**33**	max.	min.	**34**	max.	min.	**35**	max.	min.	**36**
072	72				54	52,5	15,60	52	50,5	21,97	50	48,5	29,43	46	44,5	46,53	42	40,5	70,5
074	74				56	54,5	15,95	54	52,5	22,46	52	50,5	30,10	48	46,5	47,56	44	42,5	72,0
076	76				58	56,5	16,29	56	54,5	22,96	54	52,5	30,75	50	48,5	48,59	46	44,5	73,5
078	78				60	58,5	16,65	58	56,5	23,46	56	54,5	31,41	52	50,5	49,61	48	46,5	75,1
080	80				62	60,5	17,00	60	58,5	23,95	58	56,5	32,07	54	52,5	50,64	50	48,5	76,6
082	82			**37**	64	62,5	17,34	62	60,5	24,44	60	58,5	32,74	56	54,5	51,67	52	50,5	78,1
084	84				66	64,5	17,70	64	62,5	24,93	62	60,5	33,39	58	56,5	52,70	54	52,5	79,6
086	86							66	64,5	25,42	64	62,5	34,05	60	58,5	53,73	56	54,5	81,2
088	88							68	66,5	25,91	66	64,5	34,71	62	60,5	54,76	58	56,5	82,7
090	90						**38**	70	68,5	26,41	68	66,5	35,37	64	62,5	55,79	60	58,5	84,2
092	92							72	70,5	26,90	70	68,5	36,03	66	64,5	56,81	62	60,5	85,7

Table 2 — Lengths and masses *(continued)*

Diameter code		050			060			070			080			100			120		
Length code	N	W		Mass	W		Mass	W		Mass	W		Mass	W		Mass	W		Mass
39		max	min	**40**	max	min	**41**	max	min	**42**	max	min	**43**	max	min	**44**	max	min	**45**
094	94							74	72,5	27,39	72	70,5	36,69	68	66,5	57,84	64	62,5	87,3
096	96							76	74,5	27,88	74	72,5	37,35	70	68,5	58,87	66	64,5	88,8
098	98							78	76,5	28,37	76	74,5	38,00	72	70,5	59,90	68	66,5	90,3
100	100										78	76,5	38,66	74	72,5	60,93	70	68,5	91,8
104	104										82	80,5	39,98	78	76,5	62,99	74	72,5	94,9
108	108										86	84,5	41,30	82	80,5	65,04	78	76,5	97,9
112	112										90	88,5	42,62	86	84,5	67,10	82	80,5	101,0
116	116																		

46 **47** **48** **49**

Table 2 — Lengths and masses *(continued)*

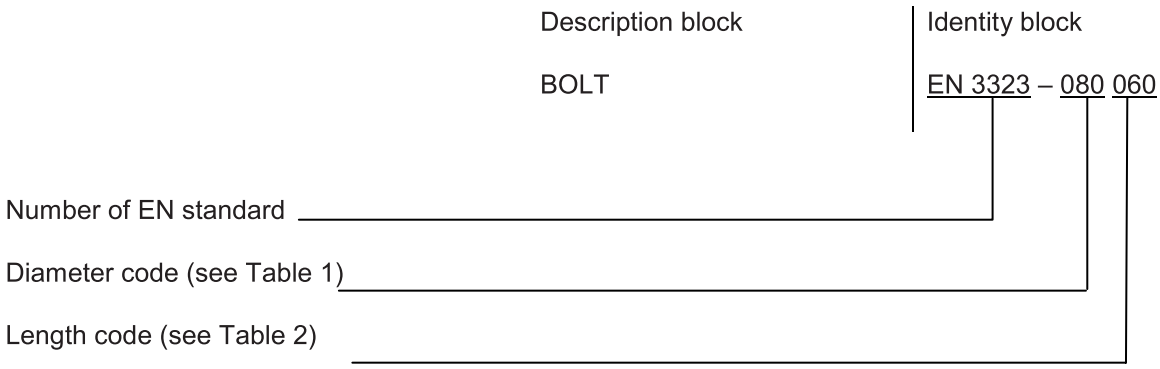
Diameter code		050			060			070			080			100			120		
A.1.1.1.8 ength code	**A.1.1**	**A.1.1.1.91**		**A.1.1.1** ass	**A.1.1.1.93**		**A.1.1.1** ass	**A.1.1.1.95**		**A.1.1.1** ass	**A.1.1.1.97** W		**A.1.1.1.** ass	**A.1.1.1.99** W		**A.1.1.1** ass	**A.1.1.1.101** W		**A.1.1.1.** ass
50		max	min	**51**	max	min	**52**	max	min	**53**	max	min	**54**	max	min	**55**	max	min	**56**
120	120	**56.1.1**			**56.1.2**			**56.1.3**			**56.1.4**			94	92,5	71,21	90	88,5	107,1
124	124													98	96,5	73,27	94	92,5	110,1
128	128													102	100,5	75,33	98	96,5	113,2
132	132													106	104,5	77,39	102	100,5	116,2
136	136													110	108,5	79,44	106	104,5	**A.1.1.1.** 19,3
A.1.1.1.1 40	**A.1.1** 40													114	112,5	81,50	110	108,5	122,3
144	144															**56.1.5**	114	112,5	125,4
148	148																118	116,5	128,4
152	152																122	120,5	131,5

Table 2 — Lengths and masses *(continued)*

Diameter code		050			060			070			080			100			120		
Length code	N	W		Mass	W		Mass	W		Mass	W		Mass	W		Mass	W		Mass
56.1.6		max	min	**56.1.7**	max	min	**56.1.8**	max	min	**56.1.9**	max	min	**56.1.1**	max	min	**56.1.1**	max	min	**56.1.12**
156	**56**	**56.1.14**			**56.1.15**			**56.1.16**			**56.1.17**			**56.1.18**			126	124,5	134,5
160	**56**																130	128,5	**56.1.20** 137,6
56.1.21 164	**56**																134	132,5	140,6
168	**56**																138	136,5	143,2

57 Designation

Example:



NOTE If necessary, the design code I 9005 may be placed between the description block and the identity block.

58 Marking

Each bolt shall be marked at the place indicated on the figure according to the category A of marking defined by EN 2424.

59 Technical specification

According to EN 3302.

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