

**Aerospace series
— Bolts, normal bi-
hexagonal head, coarse
tolerance normal
shank, medium length
thread, in titanium
alloy, anodized,
MoS₂ lubricated —
Classification: 1 100
MPa (at ambient
temperature) / 315 °C**

ICS 49.030.20

National foreword

This British Standard is the UK implementation of EN 4135:2009.

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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EN 4135

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English Version

Aerospace series - Bolts, normal bi-hexagonal head, coarse tolerance normal shank, medium length thread, in titanium alloy, anodized, MoS2 lubricated - Classification: 1 100 MPa (at ambient temperature) / 315 °C

Série aéronautique - Vis à tête bihexagonale normale, tige normale à tolérance large, filetage moyen, en alliage de titane, anodisées, lubrifiées MoS2 - Classification : 1 100 MPa (à température ambiante) / 315 °C

Luft- und Raumfahrt - Zwölfkantschrauben, mittlere Gewindelänge, aus Titanlegierung, anodisiert, MoS2-geschmiert - Klasse: 1 100 MPa (bei Raumtemperatur) / 315 °C

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Foreword

This document (EN 4135:2009) 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of an identical text or by endorsement, at the latest by January 2010, and conflicting national standards shall be withdrawn at the latest by January 2010.

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1 Scope

This standard specifies the characteristics of bolts, normal bi-hexagonal head, coarse tolerance normal shank, medium length thread, in titanium alloy, anodized, MoS₂ lubricated.

Classification: 1 100 MPa ¹⁾ / 315 °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.

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

EN 2491, *Aerospace series — Molybdenum disulphide dry lubricants — Coating methods.*

EN 9100, *Aerospace series — Quality management systems — Requirements (based on ISO 9001:2000) and Quality systems — Model for quality assurance in design, development, production, installation and servicing (based on ISO 9001:1994).*

EN 9133, *Aerospace series — Quality management systems — Qualification procedure for aerospace standard parts.*

ISO 3185, *Aerospace — Bolts, normal bihexagonal head, normal shank, short or medium length MJ threads, metallic material, coated or uncoated, strength classes less than or equal to 1 100 MPa — Dimensions.*

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

ISO 4095, *Aerospace — Bihexagonal drives — Wrenching configuration — Metric series.*

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

ISO 7913, *Aerospace — Bolts and screws, metric — Tolerances of form and position.*

ISO 9152, *Aerospace — Bolts, with MJ threads, in titanium alloys, strength class 1 100 MPa — Procurement specification.*

TR 3775, *Aerospace series — Bolts and pins — Materials.* ³⁾

TR 4070, *Aerospace series — Molybdenum disulphide coatings — List of commercial products.* ³⁾

3 Required characteristics

3.1 Configuration — Dimensions — Masses

See Figure 1 and Table 1.

1) Minimum tensile strength of the material at ambient temperature.

2) Maximum temperature that the bolt can withstand without continuous change in its original characteristics, after return to ambient temperature. The maximum temperature is determined by the surface treatment.

3) Published as ASD Technical Report at the date of publication of this standard.

Dimensions and tolerances are: in conformity with ISO 3185, expressed in millimetres and apply after anodizing but before lubricating.

3.2 Tolerances of form and position

ISO 7913

3.3 Materials

TR 3775 (titanium alloy, classification 1 100 MPa)

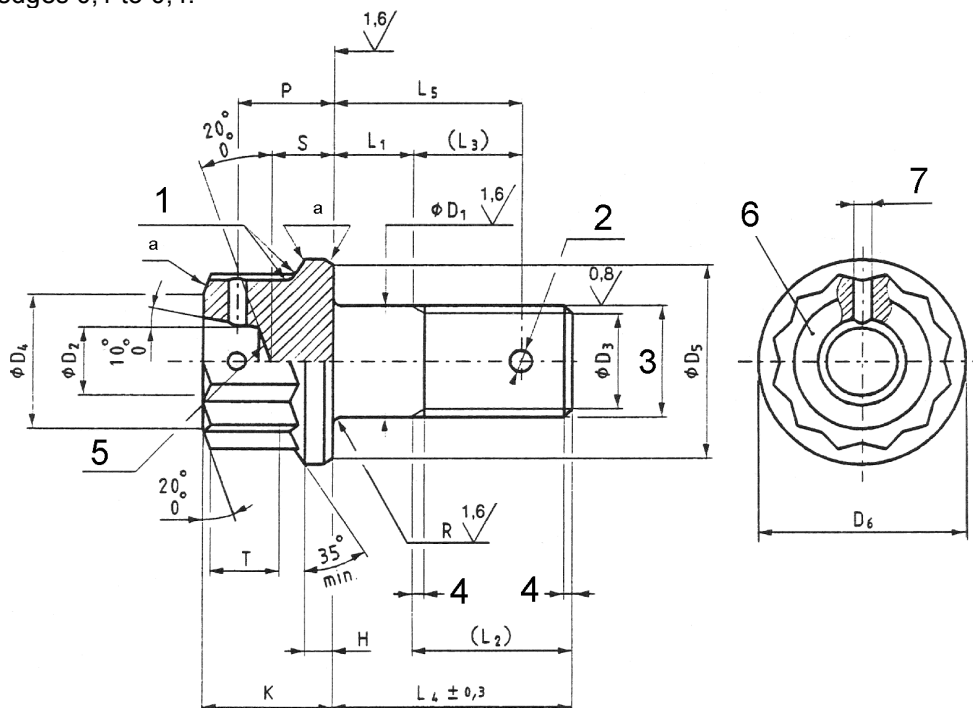
3.4 Surface treatment

Lubrication:

- a) Lubricant: see Clause 4;
- b) Application: EN 2491, 5 µm to 10 µm.

$\sqrt{3,2}$ [$\sqrt{0,8}$ $\sqrt{1,6}$] Values in micrometres apply prior to surface treatment.

Break sharp edges 0,1 to 0,4.



Key

- 1 Radius 0,3 min.
- 2 1 hole $\varnothing D_8$ optional
- 3 Thread \varnothing
- 4 Conforms to ISO 3353-1
- 5 Shape optional
- 6 Marking
- 7 4 holes $\varnothing D_7$ equidistant optional
- a Rounded or chamfered in this area.

Figure 1

Table 1

Diameter code	Thread ^a	D_1	D_2	D_3	D_4	D_5	D_6	D_7	D_8	H	K
		h12	$+0,5$ 0	$\pm 0,5$	min.	min.	max.	H13	H13	min.	h15
050	MJ5×0,8 - 4h6h	5	3,2	3,4	6,8	8,3	9,1	1	1,5	1	6,5
060	MJ6×1 - 4h6h	6	4,1	4,2	7,8	9,8	10,6	1,4		1,2	7,5
070	MJ7×1 - 4h6h	7	4,9	5,2	8,8	11,3	12,1		1,9	1,4	8,2
080	MJ8×1 - 4h6h	8	5,2	6,2	9,8	12,8	13,6	1,6		1,6	8,6
100	MJ10×1,25 - 4h6h	10	6,7	7,9	11,8	15,7	16,7		2,4	2	10,1
120	MJ12×1,25 - 4h6h	12	8	9,8	13,7	18,8	19,9	2,4		2,4	11,4

Diameter code	$L_1 \pm 0,2$ ^{b, c}		L_2	L_3	P	R		S	T	Wrenching dash number ^d	Mass ^e		
	Length code	Nom.				Nom.	Tol.				$+0,4$ 0	min.	f
050	003 to 050	3 to 50	12	7,5	4,5	0,5	0 -0,2	2,5	2,8	07	2,201	0,087	
060	003 to 060	3 to 60	14	8,5	5,2	0,7		2,8	3,5	08	3,350	0,126	
070	004 to 070	4 to 70	15	9,5	5,9			3,3	3,8	09	4,925	0,171	
080	004 to 080	4 to 80	16,5	10,5	6,3			3,7	3,9	10	7,012	0,224	
100	005 to 100	5 to 100	20,5	13	7,7			0,8	4,7	4,2	12	12,897	0,349
120	006 to 120	6 to 120	22,5	14,5	8,8			0,9	5,6	4,5	14	21,155	0,503

^a In accordance with ISO 5855-2.

^b Increments:
1 for $L_1 \leq 30$;
2 for $30 < L_1 \leq 100$;
4 for $L_1 > 100$.

^c If greater lengths are required, they shall be chosen using the above increments. The length code corresponds to the length L_1 , completed by one or two zeros to the left, where necessary, to obtain a three digit code.

^d In accordance with ISO 4095 over T min.

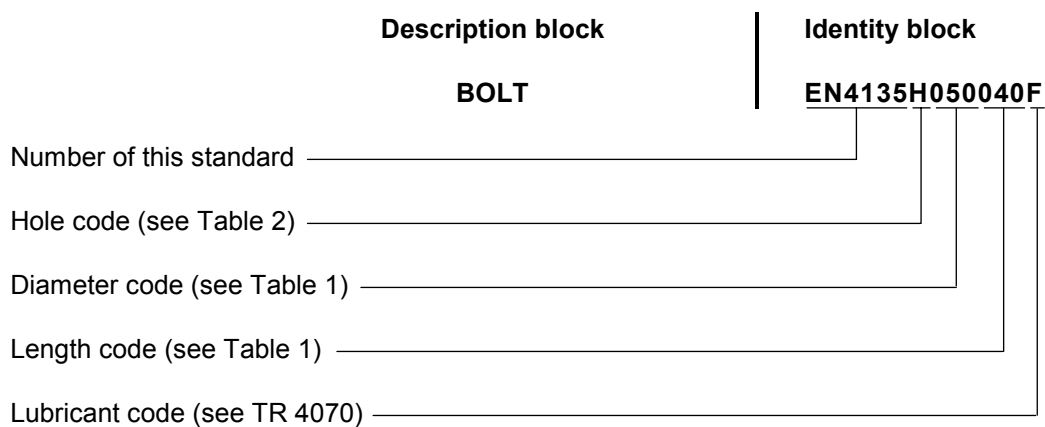
^e Approximate values (kg/1 000 pieces), calculated on the basis of $4,45 \text{ kg/dm}^3$, given for information purposes only. They apply to bolts without holes.

^f value for head and first L_4 .

^g Increase for each additional millimetre of L_4 .

4 Designation

EXAMPLE



NOTE If necessary the originator code I9005 should be placed between the description block and the identity block.

Table 2

Holes	Code
Lockwire	H
Split pin	D
Lockwire and split pin	C
No hole	— (hyphen)

5 Marking

EN 2424, style B (see Figure 1).

6 Technical specification

ISO 9152, except for clauses:

- a) Approval of manufacturers: see EN 9100;
- b) Qualification of bolts: see EN 9133.

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