BS EN 4178:2017

BSI Standards Publication

Aerospace series — Screws, pan head, six lobe recess, coarse tolerance normal shank, medium length thread, in titanium alloy, anodized, MoS2 lubricated — Classification: 1 100 MPa (at ambient temperature) / 315 °C

bsi.

National foreword

This British Standard is the UK implementation of EN 4178:2017. It supersedes BS EN 4178:2009 which is withdrawn.

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.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Date	Text affected

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 4178

January 2017

ICS 49.030.10

Supersedes EN 4178:2009

English Version

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

Série aérospatiale - Vis à tête cylindrique, à empreinte six lobes, 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 - Flachkopfschrauben mit Sechs-Bogenzahn, mit mittlerer Gewindelänge, aus Titanlegierung, anodisiert, MoS2-geschmiert - Klasse: 1 100 MPa (bei Raumtemperatur) / 315 °C

This European Standard was approved by CEN on 4 March 2016.

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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

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European foreword

This document (EN 4178:2017) 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 European 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 July 2017, and conflicting national standards shall be withdrawn at the latest by July 2017.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 4178:2009.

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1 Scope

This European Standard specifies the characteristics of screws, pan head, six lobe recess, coarse tolerance normal shank, medium length thread, in titanium alloy, anodized, MoS_2 lubricated.

Classification: 1 100 MPa [1] / 315 °C [2].

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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 3911, *Aerospace series — Six lobe recess — Geometrical definition*

EN 9100, *Quality Management Systems — Requirements for Aviation, Space and Defense Organizations*

EN 9133, Aerospace series - Quality management systems - Qualification procedure for aerospace standard parts

ISO 3353-1, *Aerospace — Lead and runout threads — Part 1: Rolled external threads* [3]

ISO 5855-2, *Aerospace — MJ threads — Part 2: Limit dimensions for bolts and nuts* [3]

ISO 7913, *Aerospace — Bolts and screws, metric — Tolerances of form and position* [3]

ISO 9152, *Aerospace — Bolts, with MJ threads, in titanium alloys, strength class 1 100 MPa — Procurement specification* [3]

TR 3775, *Aerospace series — Bolts and pins — Materials* [4]

TR 4070, *Aerospace series — Molybdenum disulphide coatings — List of commercial products* [4]

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

2) Maximum temperature that the screw 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 by: ISO International Organization for Standardization (http://www.iso.ch/)

4) Published as ASD-STAN Technical Report at the date of publication of this European Standard by AeroSpace and Defence industries Association of Europe - Standardization (ASD-STAN) (www.asd-stan.org)

3 Required characteristics

3.1 Configuration – Dimensions – Masses

See Figure 1 and Table 1.

Dimensions and tolerances are expressed in millimetres and apply after anodizing but before lubricating.

3.2 Tolerances of form and position

ISO 7913 and those specified in Figure 1 and Table 1.

3.3 Materials

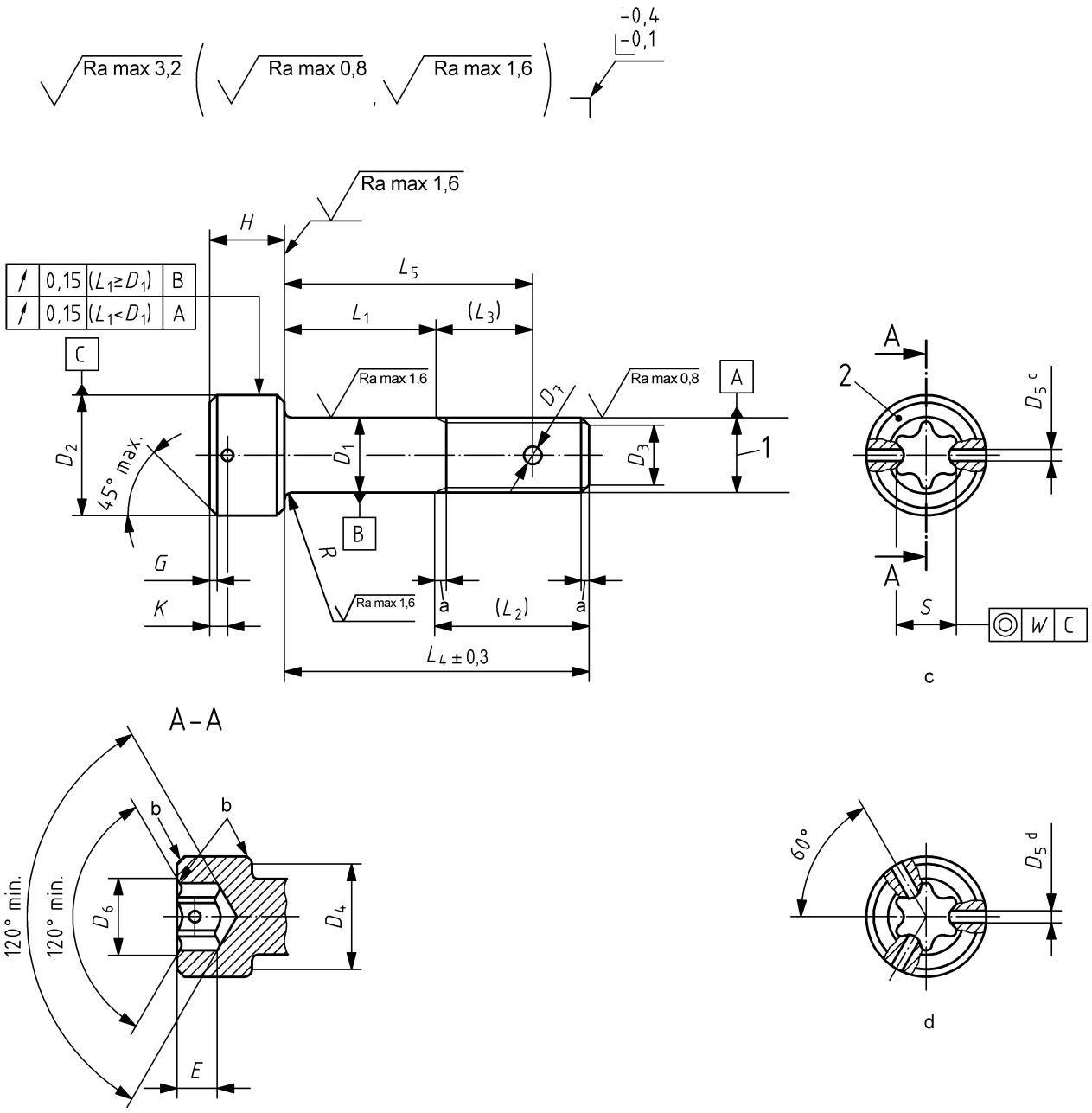
TR 3775 (titanium alloy, classification 1 100 MPa).

3.4 Surface treatment

Lubrication:

a) Lubricant: see Clause 4;

b) Application: EN 2491, 5 μm to 10 μm.



Key

1 Thread
2 Marking

a Conforms to ISO 3353-1
b Radius or chamfer
c Two holes optional for diameter codes 030 and 040
d Three holes optional for diameter codes 050 to 120
e $L_4 = L_1 + (L_2)$

Figure 1

Table 1

Diameter code	**Thread** [a]	D_1 h12	D_2 h13	D_3 Nom.	D_3 Tol.	D_4 min.	D_5 H13	D_6 max.	D_7 H13	E Nom.	E Tol.	G	H Nom.	H Tol.
030	MJ3x0,5 – 4h6h	3	5,5	2,3	0 − 0,5	5,07	1,0	3,4	-	1,5	+ 0,2 0	0,3	3	h13
040	MJ4x0,7 – 4h6h	4	7,0	3,0		6,53		3,9	1,1	2,0		0,4	4	
050	MJ5x0,8 – 4h6h	5	8,5	3,4	± 0,5	8,03		5,1	1,5	2,5		0,5	5	
060	MJ6x1 – 4h6h	6	10,0	4,2		9,38	1,4	6,3		3,0	+ 0,3 0	0,6	6	h14
080	MJ8x1 – 4h6h	8	13,0	6,2		12,33		7,5	1,9	4,0		0,8	8	
100	MJ10x1,25 – 4h6h	10	16,0	7,9		15,33	1,6	10,2	2,4	5,0	+ 0,5 0	1,0	10	
120	MJ12x1,25 – 4h6h	12	18,0	9,8		17,23		13,8		6,0		1,2	12	

Diameter code	K ± 0,1	L_1 ± 0,2 [b] [c] Length code	L_1 ± 0,2 [b] [c] Nom.	L_2	L_3	R max.	R min.	W	**Recess** EN 3911 Code	**Mass** [d] [e]	**Mass** [d] [f]
030	0,9	002 to 030	2 to 30	7,5	-	0,4	0,2	-	10	1,04	0,055
040	1,4	002 to 040	2 to 40	10,0	6,0			0,22	25	2,26	0,100
050	1,6	003 to 050	3 to 50	12,0	7,5	0,5	0,3		27	4,55	0,153
060	2,0	003 to 060	3 to 60	14,0	8,5	0,7	0,5		30	6,95	0,222
080	2,4	004 to 080	4 to 80	16,5	10,5			0,27	45	15,44	0,395
100		005 to 100	5 to 100	20,5	13,0	0,8	0,6		50	29,30	0,616
120		006 to 120	6 to 120	22,5	14,5	0,9			55	43,10	0,887

[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.

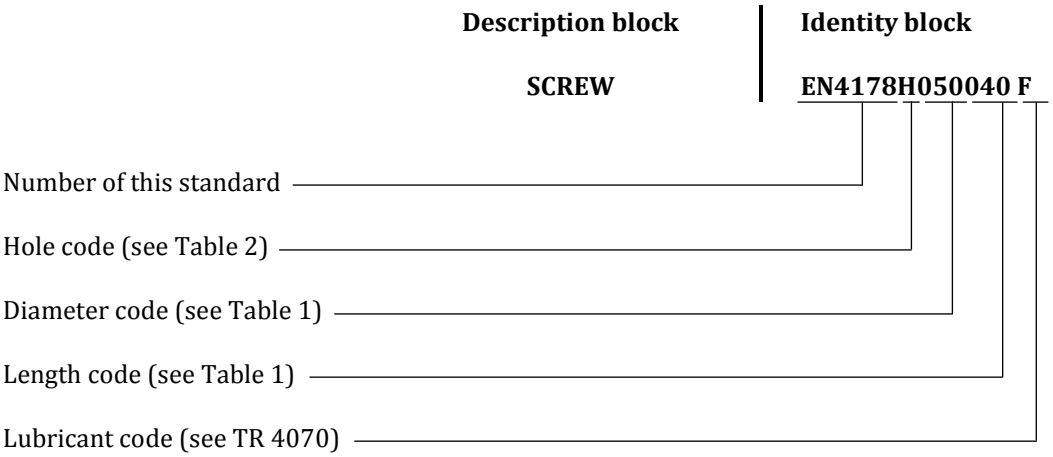
[d] Approximate values (kg/1 000 pieces), calculated on the basis of 4,45 kg/dm^3, given for information purposes only. They apply to screws without holes.

[e] Value for head and first L_4.

[f] Increase for each additional millimetre of L_4.

4 Designation

EXAMPLE



NOTE If necessary, the code I9005 shall 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

See Table 3 and Figure 1.

Table 3

Diameter code	EN 2424 Style
030 and 040	N
050 to 120	B

6 Technical specification

ISO 9152, except for clauses:

a) Approval of manufacturers: see EN 9100;

b) Qualification of screws: see EN 9133.

Annex A
(informative)

Standard evolution form

The main changes with respect to the previous editions are listed in Table A.1.

Table A.1 — Main changes to previous editions *(1 of 2)*

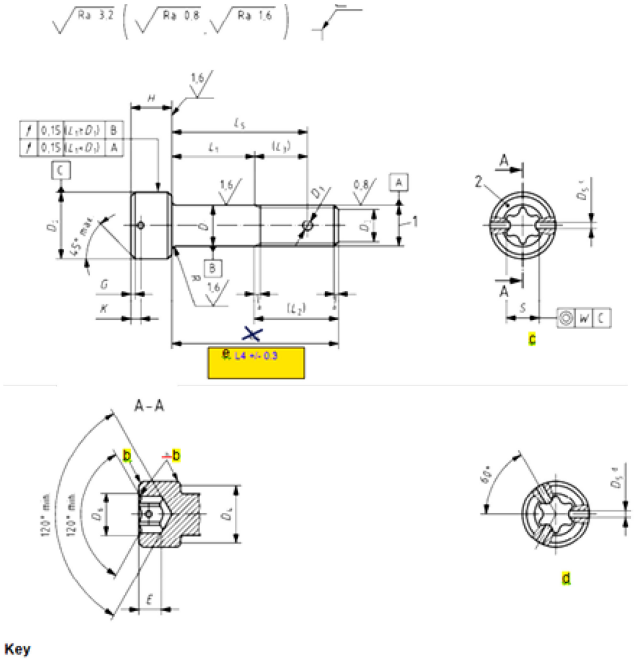
prEN/EN Number	Edition	Publication Date	Modification	Reason and validation
EN 4178	1	11/2009	Add in normative references an Clause 6 b): EN 9133, *Aerospace series — Quality Management Systems — Qualification Procedure for Aerospace Standard Products*	EN 3042 do not exist anymore and has been replaced by EN 9133
			 Key 1 Thread 2 Marking a Conforms to ISO 3353-1 b Radius or chamfer c Two holes optional for diameter codes 030 and 040 d Three holes optional for diameter codes 050 to 120 e L4=L1+(L2)	– L_4 is not defined and has no tolerance values – On the drawing h code is a mistake and has to be replaced by b (chamfer or radius) – Code C and D are not written on the drawing and linked with diameter range
EN 4178	1	11/2009	Roughness symbol inside and above the drawing Add to all symbols : max e.g. Ra max 3,2 Ra max 0,8	Modify symbols according to ISO 1302

Table A.1 — Main changes to previous editions *(2 of 2)*

prEN/EN Number	Edition	Publication Date	Modification	Reason and validation
EN 4178	1	11/2009	Recess EN 3911 code / ~~NAS 1800 number~~ 10 / ~~T10~~ 25 / - 27 / - 30 / ~~T30~~ 45 / - 50 / ~~T50~~ 55 / ~~T55~~	Replace NAS code by EN code for EU applications

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