



BSI Standards Publication

**Aerospace series — Screws
100° countersunk normal
head, offset cruciform recess,
coarse tolerance normal shank,
medium length thread, in
alloy steel, cadmium plated -
Classification: 1 100 MPa (at
ambient temperature) / 235°C**

National foreword

This British Standard is the UK implementation of EN 4162:2016. It supersedes BS EN 4162:2009 which is withdrawn.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.

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ISBN 978 0 580 90781 4

ICS 49.030.20

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This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 March 2016.

Amendments issued since publication

Date	Text affected
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EUROPEAN STANDARD

EN 4162

NORME EUROPÉENNE

EUROPÄISCHE NORM

March 2016

ICS 49.030.20

Supersedes EN 4162:2009

English Version

**Aerospace series - Screws 100° countersunk normal head,
offset cruciform recess, coarse tolerance normal shank,
medium length thread, in alloy steel, cadmium plated -
Classification: 1 100 MPa (at ambient temperature) / 235
°C**

Série aérospatiale - Vis à tête fraisée 100° normale, à
empreinte cruciforme déportée, tige normale à
tolérance large, filetage moyen, en acier allié, cadmiées
- Classification: 1 100 MPa (à température ambiante) /
235 °C

Luft- und Raumfahrt - 100° Senkschrauben mit
Flügelkreuzschlitz, mittlere Gewindelänge, aus
legiertem Stahl, erkadmet - Klasse: 1 100 MPa (bei
Raumtemperatur) / 235 °C

This European Standard was approved by CEN on 27 September 2015.

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European Foreword

This document (EN 4162:2016) 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of an identical text or by endorsement, at the latest by September 2016 and conflicting national standards shall be withdrawn at the latest by September 2016.

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1 Scope

This European Standard specifies the characteristics of screws, 100° countersunk normal head, offset cruciform recess, coarse tolerance normal shank, medium length thread, in alloy steel, cadmium plated.

Classification: 1 100 MPa¹⁾ / 235 °C²⁾.

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 2133, *Aerospace series — Cadmium plating of steels with specified tensile strength $\leq 1\,450$ MPa, copper, copper alloys and nickel alloys*

EN 2137, *Steel FE-PL75 — $1100\text{ MPa} \leq R_m \leq 1250\text{ MPa}$ — Bars $D_e \leq 100\text{ mm}$ — Aerospace series*

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

EN 2442, *Steel FE-PL711 — $1100\text{ MPa} \leq R_m \leq 1300\text{ MPa}$ — Bars and wires — $D_e \leq 25\text{ mm}$ ³⁾*

EN 3514, *Steel FE-PL711 — Hardened and tempered — $1100\text{ MPa} \leq R_m \leq 1300\text{ MPa}$ — Bar and wire for bolts — $D_e \leq 25\text{ mm}$*

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*

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

ISO 5856, *Aerospace — Screws, 100 degrees normal countersunk head, internal offset cruciform ribbed or unribbed drive, 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 7689, *Aerospace — Bolts, with MJ threads, made of alloy steel, strength class 1 100 MPa — Procurement specification*

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) For new design, see EN 3514.

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

ISO 14275, *Aerospace — Drives, internal, offset cruciform, ribbed — Metric series*

ISO 14276, *Aerospace — Drives, internal, offset cruciform — Metric series*

TR 3775, *Aerospace series — Bolts and pins — Materials*

3 Required characteristics

3.1 Configuration - Dimensions - Masses

See Figure 1 and Table 1.

Dimensions and tolerances are in conformity with ISO 5856, expressed in millimetres and apply after surface treatment.

3.2 Tolerances of form and position

ISO 7913.

3.3 Materials

EN 2137 and EN 2442

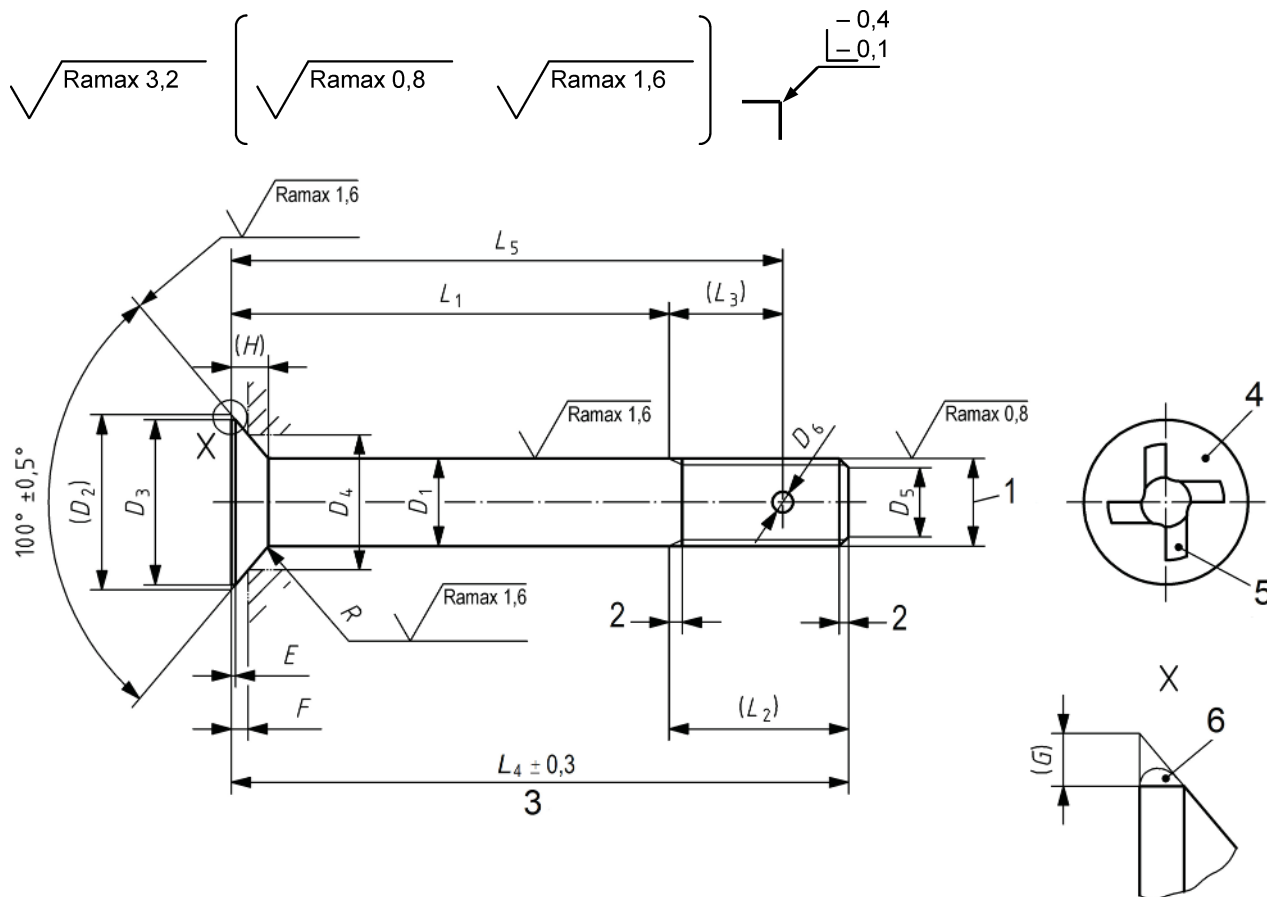
or

TR 3775: alloy steel, classification 1 100 MPa

3.4 Surface treatment

EN 2133, thickness 8 µm to 14 µm on all surfaces which can be contacted by a 20 mm diameter ball. On all other surfaces, a continuous cadmium plating shall be present, but no value is specified.

Black colour option: code B.



Key

- 1 Thread
- 2 Conforms to ISO 3353-1
- 3 $L_4 = L_1 + (L_2)$
- 4 Marking
- 5 Drive
- 6 The rounded angle accepted or blended convex form permitted

Figure 1

Table 1

Diameter code	Thread ^a	D_1	D_2	D_3	D_4	D_5		D_6	E	F
		h12	max.	min.		nom.	Tol.	h13	min.	0 -0,08
030	MJ3×0,5-4h6h	3	6	5,4	4,50	2,3	0 -0,5	—	0,06	0,63
040	MJ4×0,7-4h6h	4	8	7,2	5,78	3,0		1,1	0,08	0,93
050	MJ5×0,8-4h6h	5	10	9,0	7,71	3,4	±0,5	1,5	0,10	0,96
060	MJ6×1-4h6h	6	12	10,8	9,00	4,2				1,26
070	MJ7×1-4h6h	7	14	12,8	10,28	5,2		1,57		
080	MJ8×1-4h6h	8	16	14,8	12,21	6,2		1,60		
100	MJ10×1,25-4h6h	10	20	18,8	15,43	7,9		1,93		
120	MJ12×1,25-4h6h	12	24	22,8	18,00	9,8		2,53		
140	MJ14×1,5-4h6h	14	28	26,8	20,57	11,5		3,14		
160	MJ16×1,5-4h6h	16	32	30,8	24,43	13,5		3,20		
180	MJ18×1,5-4h6h	18	36	34,8	25,71	15,5		4,35		
200	MJ20×1,5-4h6h	20	40	38,8	28,92	17,5		4,68		

Diameter code	G	H	$L_1 \pm 0,2^{b,c}$		L_2	L_3	R		Mass ^d	
			Length code	nom.			max.	min.	e	f
030	0,3	1,27	003 to 030	3 to 30	7,5	—	0,4	0,2	0,606	0,055
040	0,4	1,69	003 to 040	3 to 40	10,0	6,0			1,324	0,099
050	0,5	2,12	004 to 050	4 to 50	12,0	7,5	0,5	0,3	2,581	0,153
060	0,6	2,54	005 to 060	5 to 60	14,0	8,5	0,7	0,5	4,426	0,222
070		2,96	006 to 070	6 to 70	15,0	9,5			6,825	0,302
080		3,39	006 to 080	6 to 80	16,5	10,5			9,375	0,395
100		4,23	008 to 100	8 to 100	20,5	13,0	0,8	0,6	19,323	0,616
120		5,08	010 to 120	10 to 120	22,5	14,5	0,9		32,516	0,887
140		5,93	010 to 140	10 to 140	26,0	17,0	1,1	0,8	48,123	1,208
160		6,77	010 to 160	10 to 160	28,5	18,5			70,136	1,578
180		7,62	011 to 180	11 to 180	31,0	21,0	1,3	1,0	98,292	1,997
200		8,47	012 to 200	12 to 200	33,5	22,5			133,086	2,466

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.

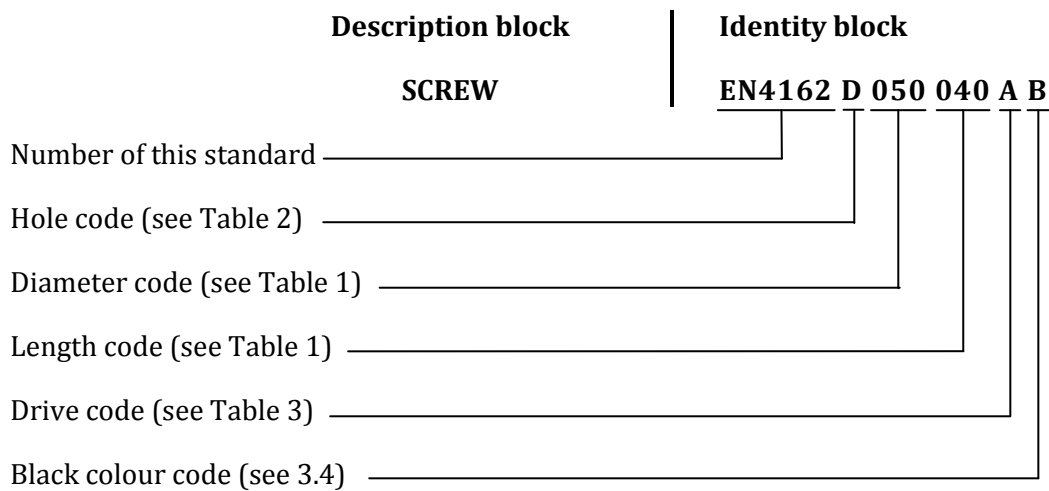
d Approximate values (kg/1 000 pieces), calculated on the basis of $7,85 \text{ kg/dm}^3$, given for information purposes only. They apply to screws without holes.

e Value for first L_4 .

f Increase for each additional millimetre of L_4 .

4 Designation

EXAMPLE



NOTE If necessary the originator code 19005 shall be placed between the description block and the identity block.

Table 2

Hole	Code
With	D
Without	- (hyphen)

Table 3

Drive	Code
ISO 14276	None
ISO 14275	A

5 Marking

See Table 4 and Figure 1.

Table 4

Diameter code	EN 2424 Style
030 and 040	N
050 to 120	B
140 to 200	A

6 Technical specification

6.1 General

ISO 7689 except for clauses.

6.2 Approval of manufacturers

EN 9100.

6.3 Qualification of screws

EN 9133.

Annex A
 (informative)

Standard evolution form

MODIFICATION	REASON AND VALIDATION
<p><i>Replacement</i></p> <p>Tolerance for L_4 quotation (total length) is not mentioned on Figure 1 page 14.</p> <p>Add $\pm 0,3$ for L_4 quotation and “d” for L_4 definition.</p>	<p>L_4 should have this tolerance because it is the summary of:</p> <p>$L_1 \pm 0,2 + L_2$</p>
<p>EN 2000 is cancelled and replaced by EN 9100</p>	<p>EN 2000 updated</p>
<p>ISO 7994 replaced by ISO 14275 and ISO 14276</p>	
<p>Roughness symbol inside and above the drawing.</p> <p>Add to all symbols: max</p> <p>e.g. Ramax 3,2 Ramax 0,8</p>	<p>Modify symbols according to ISO 1302.</p>

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