BRITISH STANDARD

BS EN 4499:2009

Aerospace series — Screws, 100° countersunk reduced head, offset cruciform recess, close tolerance normal shank, short thread, in titanium alloy, anodized, with aluminium pigmented coating — Classification: 1 100 MPa (at ambient temperature) / 315 °C

ICS 49.030.20

BSI
British Standards

National foreword

This British Standard is the UK implementation of EN 4499:2009.

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.

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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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 4499

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ICS 49.030.20

English Version

Aerospace series - Screws, 100° countersunk reduced head, offset cruciform recess, close tolerance normal shank, short thread, in titanium alloy, anodized, with aluminium pigmented coating - Classification: 1 100 MPa (at ambient temperature) / 315° C

Série aérospatiale - Vis à tête fraisée 100° réduite, à empreinte cruciforme déportée, fût normal à tolérance serrée, filetage court, en alliage de titane, anodisées, avec revêtement alumino-organique - Classification: 1 100 MPa (à température ambiante) / 315° C

Luft- und Raumfahrt – 100° Senk-Paßschrauben, mit kleinem Kopf, mit Flügelkreuzschlitz, kurzes Gewinde, aus Titanlegierung, anodisiert,mit Aluminium pigmenttete Beschichtung - Klasse: 1 100 MPa (bei Raumtemperatur) / 315° C

This European Standard was approved by CEN on 21 June 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 4499:2009) 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 screws, 100° countersunk reduced head, offset cruciform recess, close tolerance normal shank, short thread, in titanium alloy, anodized, with aluminium pigmented coating.

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 — Aerospace series — Marking of aerospace products*

EN 4016, *Aerospace series — Oversized bolts* [3]

EN 4473, *Aerospace series — Aluminium pigmented coatings — Technical specification* [3]

EN 4474, *Aerospace series — Aluminium pigmented coatings — Coating methods* [3]

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

ISO 7994 [4], *Aerospace — Internal drive, offset cruciform recess* (Torq-Set®) *for rotary fastening devices — Metric series*

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

ISO 13921, *Aerospace — Screws, 100 degrees reduced 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 14275, *Aerospace — Drives, internal, offset cruciform, ribbed — Metric series*

ISO 14277, *Aerospace — Drivers, ribbed, for internal offset cruciform ribbed or unribbed drives — Metric series*

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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 coating.

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

4) Withdrawal, see ISO 14275, ISO 14277 and EN 14278.

ISO 14278, *Aerospace — Gauges, for internal offset cruciform ribbed or unribbed drives — Metric series*

SAE AS87132, *Lubricant, Cetyl Alcohol, 1-Hexadecanol, Application to Fasteners.* [5)]

TR 3775, *Aerospace series — Bolts and pins — Materials*. [6)]

3 Required characteristics

3.1 Configuration - Dimensions - Masses

See Figure 1 and Table 1.

Dimensions and tolerances are: in conformity with ISO 13921, expressed in millimetres and apply after coating (tolerance on shank diameter before coating is also specified).

Details of form not stated are left to the manufacturer's discretion.

3.2 Tolerances of form and position

ISO 7913

3.3 Materials

TR 3775 (titanium alloy, strength class 1 100 MPa).

3.4 Surface treatments

EN 4473 and EN 4474

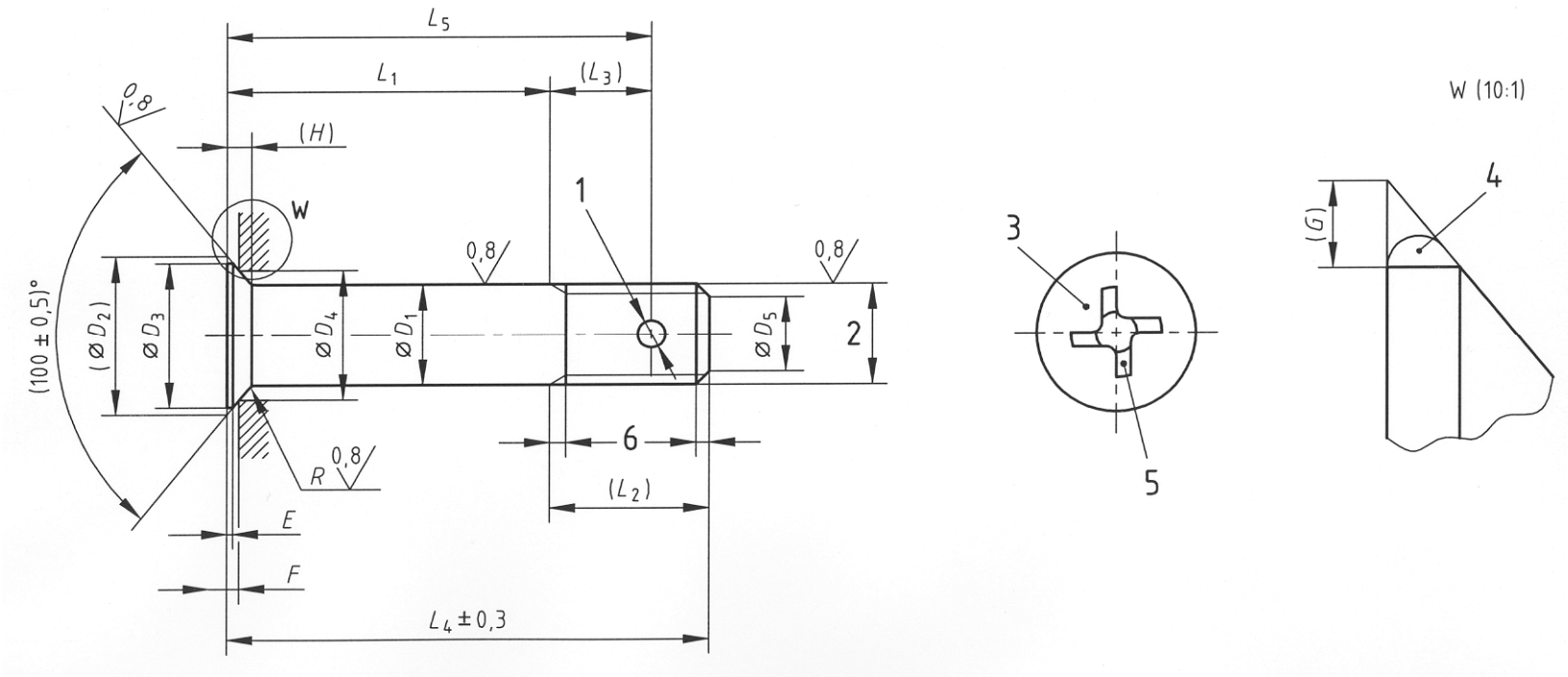
Lubrication with cetylic alcohol (chlorine free) according to SAE AS87132.

5) Published by: Society of Automotive Engineers Inc.(SAE), 400 Commonwealth Drive, Warrendale, PA 15096-0001 USA.

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

3,2 [0,8] Values in micrometres apply prior to surface treatment.

Break sharp edges 0,1 to 0,4.



Key

1 One hole diameter D_6 (optional)
2 Thread
3 Marking
4 Blended convex form permitted
5 Drive: see Table 3.
6 Conforms to ISO 3353-1

Figure 1

Table 1

Diameter code	Thread [a]	D_1 nom.	D_1 Before coating Tol.	D_1 After coating Tol.	D_2 max.	D_3 min.	D_4	D_5 nom.	D_5 Tol.	D_6 H13	E min.	F $^{0}_{-0,08}$	G	H max.	$L_1 \pm 0,2$ [b] [c] Code	$L_1 \pm 0,2$ [b] [c] nom.	L_2	L_3	R nom.	R Tol.	Mass [d] [e]	Mass [d] [f]
040	MJ4×0,7-4h6h	4	– 0,030 – 0,045	– 0,010 – 0,035	6,25	5,45	4,82	3	$^{0}_{-0,5}$	1,1	0,08	0,6	0,4	0,95	003 to 040	3 to 40	7,5	5	0,4		0,24	0,05
050	MJ5×0,8-4h6h	5			7,8	6,8	5,79	3,4		1,5		0,85	0,5	1,18	004 to 050	4 to 50	9	6	0,5		0,49	0,09
060	MJ6×1-4h6h	6			9,4	8,2	7,71	4,2				0,71		1,43	005 to 060	5 to 60	10	7	0,7	$^{0}_{-0,2}$	0,87	0,13
070	MJ7×1-4h6h	7	– 0,033 – 0,048	– 0,013 – 0,038	10,95	9,75	9	5,2		1,9		0,82		1,67	006 to 070	6 to 70	11				1,43	0,17
080	MJ8×1-4h6h	8			12,5	11,3	10,28	6,2				0,93		1,9	006 to 080	6 to 80	11,5	7,5			1,96	0,22
100	MJ10×1,25-4h6h	10			15,6	14,4	12,86	7,9		2,4		1,15		2,36	008 to 100	8 to 100	14,5	9	0,8		4,02	0,35
120	MJ12×1,25-4h6h	12	– 0,036 – 0,051	– 0,016 – 0,041	18,75	17,55	15,43	9,8	± 0,5		0,1	1,4	0,6	2,85	010 to 120	10 to 120	16	10	0,9	$^{0}_{-0,3}$	7,20	0,51
140	MJ14×1,5-4h6h	14			21,85	20,65	18	11,5		3		1,62		3,31	010 to 140	10 to 140	19	12	1,1		10,31	0,69
160	MJ16×1,5-4h6h	16			25	23,8	20,57	13,5				1,87		3,8	010 to 160	10 to 160	20,5	12,5			14,20	0,90
180	MJ18×1,5-4h6h	18			28,1	26,9	23,14	15,5		3,8		2,09		4,27	011 to 180	11 to 180	22,5	14,5	1,3		19,97	1,14
200	MJ20×1,5-4h6h	20	– 0,040 – 0,055	– 0,020 – 0,045	31,2	30	25,71	17,5				2,32		4,74	012 to 200	12 to 200	24,5	15			27,12	1,40

[a] In accordance with ISO 5855-2, except the thread major diameter "d max." which shall be equal to D_1 min. – 0,025.

[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 length L_1, completed by one or two zeros to the left, where necessary, to obtain a three digit code.

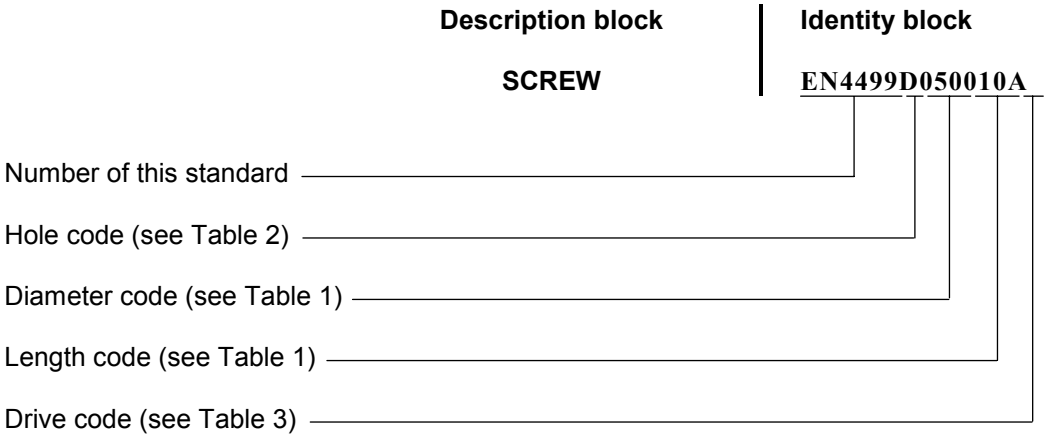
[d] Approximate values (kg/1 000 pieces), calculated on the basis of 4,45 kg/dm^3, for information purposes only. They apply to screws without holes.

[e] Value for first L_4.

[f] Increase for each additional millimetre of L_4.

4 Designation

EXAMPLE



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

Table 2

Holes	Code
With	D
Without	– (hyphen)

Table 3

Drive	Code
ISO 7994	R
ISO 7994 unribbed	A

5 Marking

See Table 4 and Figure 1, indented.

Table 4

Diameter code	EN 2424 Style
040	N
050 to 200	C + MJ

6 Technical specification

6.1 General

ISO 9152, with the following modifications:

6.2 Approval of manufacturers

EN 9100

6.3 Qualification of bolts

EN 9133

6.4 Requirement deleted

Double shear strength

7 Oversized bolts

EN 4016

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