

**SLOVENSKI STANDARD**  
**SIST EN 4133:2009****01-junij-2009**

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**Aeronavtika - Sorniki, normalna šestroba glava, široka toleranca, dolg navoj, iz titanove zlitine, prevlečeni z aluminijem IVD - Klasifikacija: 1100 MPa (pri temperaturi okolice)/425 °C**

Aerospace series - Bolts, normal hexagonal head, coarse tolerance normal shank, long thread, in titanium alloy, aluminium IVD coated - Classification: 1 100 MPa (at ambient temperature) / 425° C

Luft- und Raumfahrt - Sechskantschrauben, langes Gewinde, aus Titanlegierung, Aluminium IVD beschichtet - Klasse: 1 100 MPa (bei Raumtemperatur) / 425° C

Série aérospatiale - Vis à tête hexagonale normale, tige normale à tolérance large, filetage long, en alliage de titane, revêtues aluminium IVD - Classification : 1 100 MPa (à température ambiante)/425 °C

**Ta slovenski standard je istoveten z: EN 4133:2009**

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**ICS:**

49.025.20	Aluminij	Aluminium
49.025.30	Titan	Titanium
49.030.20	Sorniki, vijaki, stebelni vijaki	Bolts, screws, studs

**SIST EN 4133:2009****en**

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 4133**

April 2009

ICS 49.030.20

English Version

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN Management Centre has the same status as the official versions.

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

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## Foreword

This document (EN 4133:2009) 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of an identical text or by endorsement, at the latest by October 2009, and conflicting national standards shall be withdrawn at the latest by October 2009.

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.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

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**EN 4133:2009 (E)****1 Scope**

This standard specifies the characteristics of bolts, normal hexagonal head, coarse tolerance normal shank, long thread, in titanium alloy, aluminium IVD coated.

Classification: 1 100 MPa <sup>1)</sup> / 425 °C <sup>2)</sup>

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

TR 3775, *Aerospace series — Bolts and pins — Materials* <sup>3)</sup>

MIL-DTL-83488D, *Coating, aluminium, high purity* <sup>4)</sup>

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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.

4) Published by: Department of Defense (DOD), the Pentagon, Washington, D.C. 20301, USA.

### 3 Required characteristics

#### 3.1 Configuration – Dimensions – Masses

See Figure 1 and Table 1.

Dimensions and tolerances are expressed in millimetres and apply after surface treatment.

#### 3.2 Tolerances of form and position

ISO 7913

#### 3.3 Materials

TR 3775 (titanium alloy, classification 1 100 MPa)

#### 3.4 Surface treatment

MIL-DTL-83488D, type II, class 3, 4 µm to 12 µm

After aluminium deposit:

- a) mechanical blasting, followed by a chromate conversion coating within 24 h max. <sup>5)</sup>;
- b) optional lubrication with cethylic alcohol (code E).

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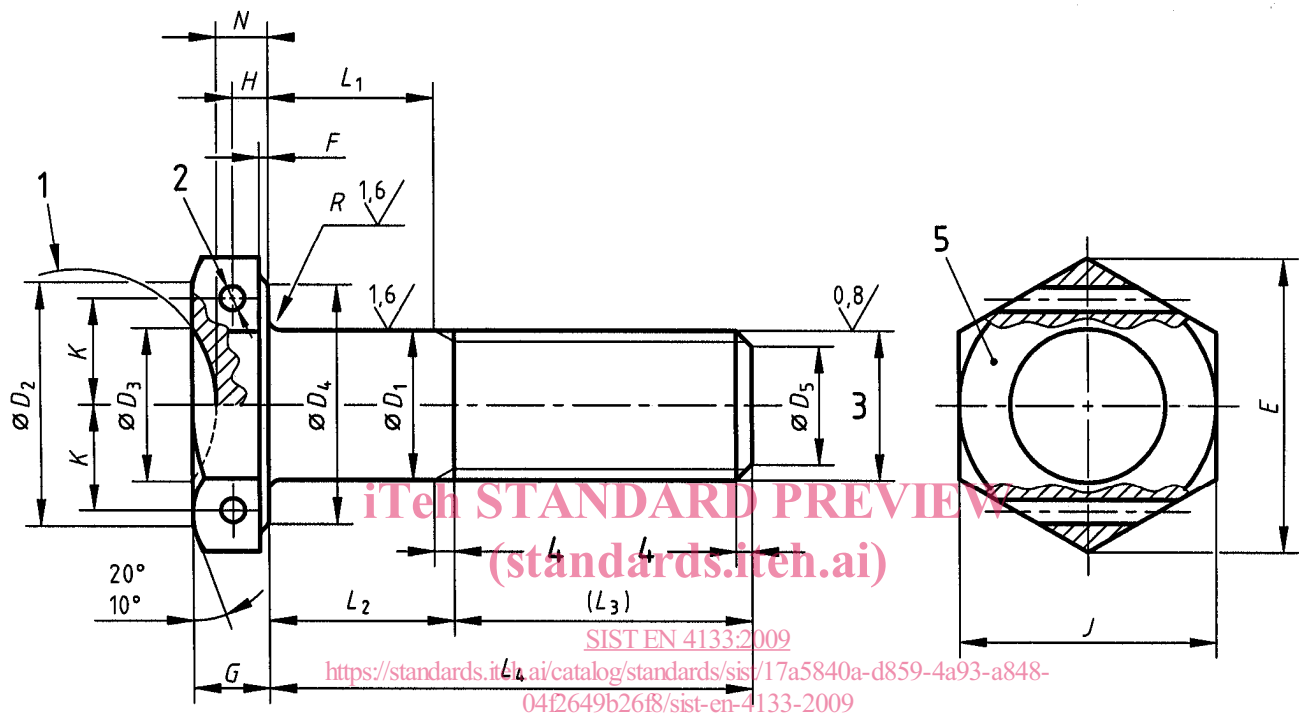
5) Products used shall be in conformity with national regulation into force.

## EN 4133:2009 (E)

$3,2 \sqrt{\quad}$   $\left[ \begin{array}{c} 0,8 \sqrt{\quad} \\ 1,6 \sqrt{\quad} \end{array} \right]$  Values in micrometres apply prior to surface treatment.

Break sharp edges 0,1 to 0,4.

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



## Key

- 1 Continuous surface
- 2 2 hole  $\varnothing D_6$ , optional
- 3 Thread
- 4 Conforms to ISO 3353-1
- 5 Marking

Figure 1



Table 1

Diameter code	Thread <sup>a</sup>	$D_1$	$D_2$	$D_3$	$D_4$ <sup>b</sup>	$D_5$		$D_6$	$E$	$F$		$G$	$H$	
		h12	min.	0 -0,5	min.	nom.	Tol.	H13	min.	max.	min.	0 -0,3		
030	MJ3×0,5 - 4h6h	3	5,5	—	5,4	2,3	0 -0,5	—	6,5	0,4	0,5	0,2	2	—
040	MJ4×0,7 - 4h6h	4	6,4	—	6,4	3		—	7,6					2,5
050	MJ5×0,8 - 4h6h	5	7,4	5,25	7,4	3,4	±0,5	1	8,7	0,5	0,2	3	1,35	
060	MJ6×1 - 4h6h	6	9,4	6,25	9,3	4,2			10,9					3,5
070	MJ7×1 - 4h6h	7	10,3	7,25	10,2	5,2		1,4	12			4	1,85	
080	MJ8×1 - 4h6h	8	12,3	8,25	12,2	6,2			14,3			4,5	2,1	
100	MJ10×1,25 - 4h6h	10	16,3	10,25	16	7,9			18,9	0,6	0,3	5	2,35	
120	MJ12×1,25 - 4h6h	12	18,3	12,25	18	9,8			21,1					6
140	MJ14×1,5 - 4h6h	14	21,3	14,25	21	11,5			24,5			7	3,35	
160	MJ16×1,5 - 4h6h	16	23,3	16,25	23	13,5		1,6	26,8			8	3,85	
180	MJ18×1,5 - 4h6h	18	26,3	18,25	26	15,5			30,2			9	4,35	
200	MJ20×1,5 - 4h6h	20	29,3	20,25	29	17,5			33,6			10	4,85	

Diameter code	$J$		$K$	$L_1$ <sup>c, d, e</sup>		$L_2$ <sup>c, d, e</sup>		$L_3$	$L_4$ <sup>e, f</sup>		$N$	$R$		Mass <sup>g</sup>	
	nom.	Tol.		min.	max.	Length code	nom.		0 -0,3	max.		min.	h	i	
030	6	h12	—	0,4	2	12	014 to 042	14 to 42	—	0,4	0,2	0,5	0,3	0,681	0,062
040	7		—			14	016 to 056	16 to 56	—					1,191	0,110
050	8		3,25	0,5	16	020 to 070	20 to 70	2	2,138	0,172					
060	10	h13	4,1	0,7	4	18	022 to 084	22 to 84	2,3	0,7	0,5	0,8	0,6	3,868	0,248
070	11		4,5			20	024 to 098	24 to 98	2,7					5,317	0,342
080	13		5,35	22	026 to 112	26 to 112	3	8,124	0,448						
100	17		7,1	0,8	6	25	032 to 140	32 to 140	3,4	0,8	1,1	0,8	15,607	0,698	
120	19		7,9	0,9		30	036 to 168	36 to 168	4	0,9			25,216	0,994	
140	22		9,2	1,1		34	040 to 196	40 to 196	4,7	1,3	1	37,666	1,352		
160	24		10,05			38	044 to 224	44 to 224	5,4			55,269	1,768		
180	27		11,3	1,3		42	048 to 252	48 to 252	6	1,3	1	77,483	2,236		
200	30		12,6			46	052 to 280	52 to 280	6,7			105,410	2,760		

<sup>a</sup> In accordance with ISO 5855-2.

<sup>b</sup>  $D_4$  max. shall be less than  $J$ .

<sup>c</sup> First length corresponding to first  $L_4$  length.

<sup>d</sup> Condition  $L_1$  min. and  $L_2$  max. cannot be obtained simultaneously.

<sup>e</sup> Increments:  
- 2 for  $L_4 \leq 100$ ;  
- 4 for  $L_4 > 100$ .

<sup>f</sup> If greater lengths are required, they shall be chosen using the above increments. The length code corresponds to the length  $L_4$ , completed by one or two zeros to the left, where necessary, to obtain a three digit code.

<sup>g</sup> Approximate values (kg/1 000 pieces), calculated on the basis of 4,45 kg/dm<sup>3</sup>, given for information purposes only. They apply to bolts without holes.

<sup>h</sup> value for head and first  $L_4$ .

<sup>i</sup> Increase for each additional 2 mm of  $L_4$ .