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**Aerospace series - Bolts, shouldered, thin hexagonal head, close tolerance shank, short thread, in alloy steel, cadmium plated - Classification: 1 100 MPa (at ambient temperature) / 235°C**

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Luft- und Raumfahrt - Sechskant-Paßschrauben, kleiner Kopf, kurzes Gewinde, aus legiertem Stahl, verkadmet - Klasse: 1 100 MPa (bei Raumtemperatur) / 235 °C

Série aérospatiale - Axes à tête hexagonale basse, tige à tolérance serrée, filetage court, en acier allié, cadmiés - Classification: 1 100 MPa (à température ambiante) / 235 °C

**Ta slovenski standard je istoveten z: EN 2413:1995**

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**ICS:**

49.030.20 Sorniki, vijaki, stebelni vijaki Bolts, screws, studs

**SIST EN 2413:2001**

**en**

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EUROPEAN STANDARD

EN 2413

NORME EUROPÉENNE

EUROPÄISCHE NORM

June 1995

ICS 49.040.20

Descriptors: aircraft industry, aircraft equipment, hinge pin, alloy steel, cadmium, screw thread, specification, characteristic, dimension, mass, dimensional tolerance, surface treatment, designation, marking

English version

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# CEN

European Committee for Standardization  
Comité Européen de Normalisation  
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

## Foreword

This European Standard has been prepared by the European Association of Aerospace Manufacturers (AECMA).

After inquiries and votes carried out in accordance with the rules of this Association, this Standard has successively received the approval of the National Associations and the Official Services of the member countries of AECMA, prior to its presentation to CEN.

This standard was submitted for Formal Vote, and the result was positive.

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of an identical text or by endorsement, at the latest by December 1995, and conflicting national standards shall be withdrawn at the latest by December 1995.

According to the CEN/CENELEC Internal Regulations, the following countries are bound to implement this European Standard:

Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom.

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## 1 Scope

This standard specifies the characteristics of bolts, shouldered, thin hexagonal head, close tolerance shank, short thread, in alloy steel, cadmium plated.

Classification : 1 100 MPa <sup>1)</sup> / 235 °C <sup>2)</sup>

These bolts are intended to be used with washers EN 2414 and nuts EN 2415.

## 2 Normative references

This European Standard incorporates by dated or undated reference provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

ISO 3353	Aerospace - Rolled threads for bolts - Lead and runout requirements
ISO 5855-2	Aerospace - MJ threads - Part 2 : Limit dimensions for bolts and nuts
ISO 7689	Aerospace - Alloy steel bolts with strength classification 1 100 MPa and MJ threads - Procurement specification
ISO 7913	Aerospace - Bolts and screws, metric - Tolerances of form and position
EN 2000	Aerospace series - Quality assurance - EN aerospace products - Approval of the quality system of manufacturers
EN 2133	Cadmium plating of steels with maximum specified tensile strength equal to or less than 1 450 MPa and copper and copper alloys - Aerospace series <sup>3)</sup>
EN 2414	Aerospace series - Washers, chamfered, with counterbore, in alloy steel, cadmium plated <sup>4)</sup>
EN 2415	Nuts, hexagon, slotted/castellated, thin, in steel, cadmium plated - Classification : 900 MPa / 235 °C - Aerospace series <sup>3)</sup>
EN 2424	Aerospace series - Marking of aerospace products
EN 2793	Aerospace series - Phosphating of ferrous alloys <sup>5)</sup>
EN 3042	Aerospace series - Quality assurance - EN aerospace products - Qualification procedure
EN 4016	Aerospace series - Oversized bolts <sup>5)</sup>
TR 3775	Aerospace series - Bolts and pins - National materials <sup>6)</sup>

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 AECMA Standard at the date of publication of this standard

4) Published as AECMA Prestandard at the date of publication of this standard

5) In preparation at the date of publication of this standard

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

### 3 Required characteristics

#### 3.1 Configuration - Dimensions - Masses

See figures 1 and 2 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 (alloy steel, classification 1 100 MPa)

#### 3.4 Surface treatment

##### 3.4.1 External surfaces

EN 2133, 6  $\mu\text{m}$  to 10  $\mu\text{m}$ , on all surfaces which can be contacted by a 20 mm diameter ball. On all other surfaces, a continuous deposit shall be present, but no value is specified.

Black colour option : code B

##### 3.4.2 Hole $\varnothing$ D3

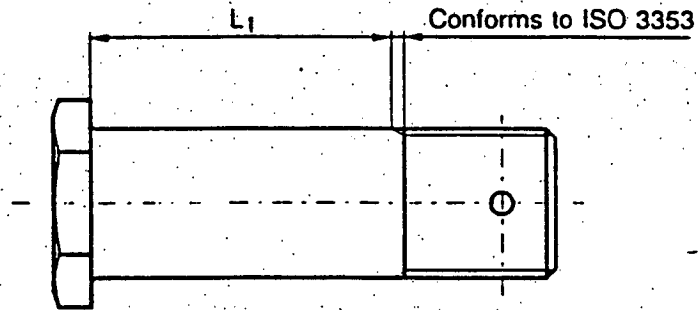
EN 2793 class C, plus anti-corrosion priming coat at the manufacturer's option

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$3,2 \sqrt{0,8}$  Values in micrometres apply prior to surface treatment.  
Break sharp edges 0,1 to 0,4



For non-quoted dimensions, see figure 2.

Figure 1 - Configuration for diameter codes 050 and 060

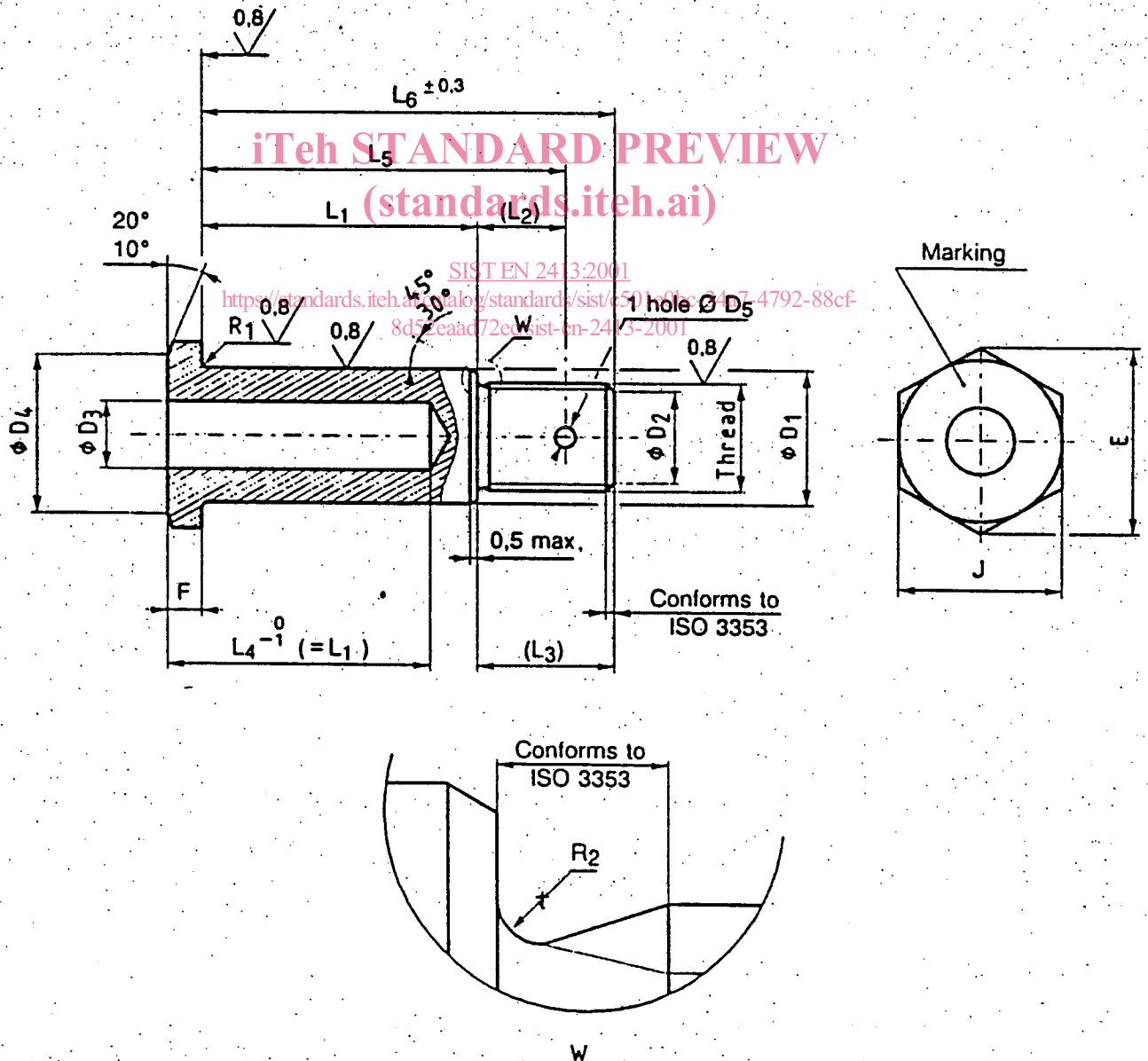


Figure 2 - Configuration for diameter codes 080 to 250

Table 1

Diameter code	Thread 1)	D <sub>1</sub>		D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>5</sub>	E	F	J	L <sub>1</sub> ± 0,2 2) 3)		L <sub>2</sub>	L <sub>3</sub>	R <sub>1</sub>	R <sub>2</sub>	Mass 4)	
		nom.	Tol.								Code	nom.					5)	6)
050	MJ5x0,8-4h6h	5	-0,010	3,4	—	7,4	1,5	8,7	0	8	005 to 050	6	9	0	—	2,76	0,15	
060	MJ6x1-4h6h	6	-0,035	4,2	—	9,4	—	10,9	0,3	10	006 to 060	7	10	—	—	4,47	0,22	
080	MJ8x1-4h6h	8	-0,013	6,2	—	12,3	1,9	14,3	0,3	13	007 to 080	7	10	0,4	0,25	5,85	0,39	
100	MJ10x1-4h6h	10	-0,038	7,9	—	16,3	2,4	18,9	3,5	17	007 to 080	7	10	0,4	0,4	10,97	0,62	
120	MJ12x1,25-4h6h	12	-0,016	9,8	8	18,3	—	21,1	4	19	007 to 080	7	10	0,6	0,6	19,52	0,89	
150	MJ15x1,25-4h6h	15	-0,041	11,5	9	21,3	3	24,5	4	22	007 to 080	7	10	0,6	0,6	27,39	0,99	
170	MJ17x1,5-4h6h	17	-0,020	13,5	10	23,3	—	26,8	5	24	007 to 080	7	10	0,9	0,8	39,36	1,28	
200	MJ20x1,5-4h6h	20	-0,045	15,5	11	26,3	3,8	30,2	5	27	007 to 080	7	10	0,9	0,8	57,80	1,85	
220	MJ22x1,5-4h6h	22	-0,045	17,5	12	29,3	—	33,6	5	30	007 to 080	7	10	0,9	0,8	76,17	2,24	
250	MJ25x1,5-4h6h	25	-0,045	17,5	12	29,3	—	33,6	5	30	007 to 080	7	10	0,9	0,8	100,79	2,97	

1) In accordance with ISO 5855-2, except the thread major diameter "d" max. which, for diameter codes 050 and 060, shall be equal to D<sub>1</sub> min. - 0,025.

2) Increments:

1 for L<sub>1</sub> ≤ 30

2 for L<sub>1</sub> > 30

3) If greater lengths are required, they shall be chosen using increments of 2 mm. The length code corresponds to the length L<sub>1</sub>, completed by one or two zeros to the left, where necessary, to obtain a three digit code.

4) Approximate values (kg/1 000 pieces), calculated on the basis of 7,85 kg/dm<sup>3</sup>, given for information purposes only

5) Value for head and first L<sub>6</sub>

6) Increase for each additional millimetre of L<sub>6</sub>.