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**Aerospace — Bolts, large bihexagonal head, normal shank, short or medium length MJ threads, metallic material, coated or uncoated, strength classes 1 250 MPa to 1 800 MPa — Dimensions**

*Aéronautique et espace — Vis à tête bihexagonale large, avec tige normale et filetages MJ courts ou de longueur moyenne, en matériau métallique, revêtues ou non revêtues, des classes de résistance 1 250 MPa à 1 800 MPa — Dimensions*



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## Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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

ISO 3186 was prepared by Technical Committee ISO/TC 20, *Aircraft and space vehicles*, Subcommittee SC 4, *Aerospace fastener systems*.

This second edition cancels and replaces the first edition (ISO 3186:1994), which has been technically revised.

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# Aerospace — Bolts, large bihexagonal head, normal shank, short or medium length MJ threads, metallic material, coated or uncoated, strength classes 1 250 MPa to 1 800 MPa — Dimensions

## 1 Scope

This International Standard specifies the dimensions of large bihexagonal head bolts, with close or large tolerance normal shank and short or medium length MJ threads, in metallic material, coated or uncoated, with strength classes 1 250 MPa to 1 800 MPa.

This International Standard is applicable to the compilation of aerospace product standards.

## 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.

ISO 286-2, *ISO system of limits and fits — Part 2: Tables of standard tolerance grades and limit deviations for holes and shafts*

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

ISO 4095, *Aerospace — Bihexagonal drives — Wrenching configuration — Metric series*

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*

## 3 Configuration and dimensions

See Figure 1 and Table 1.

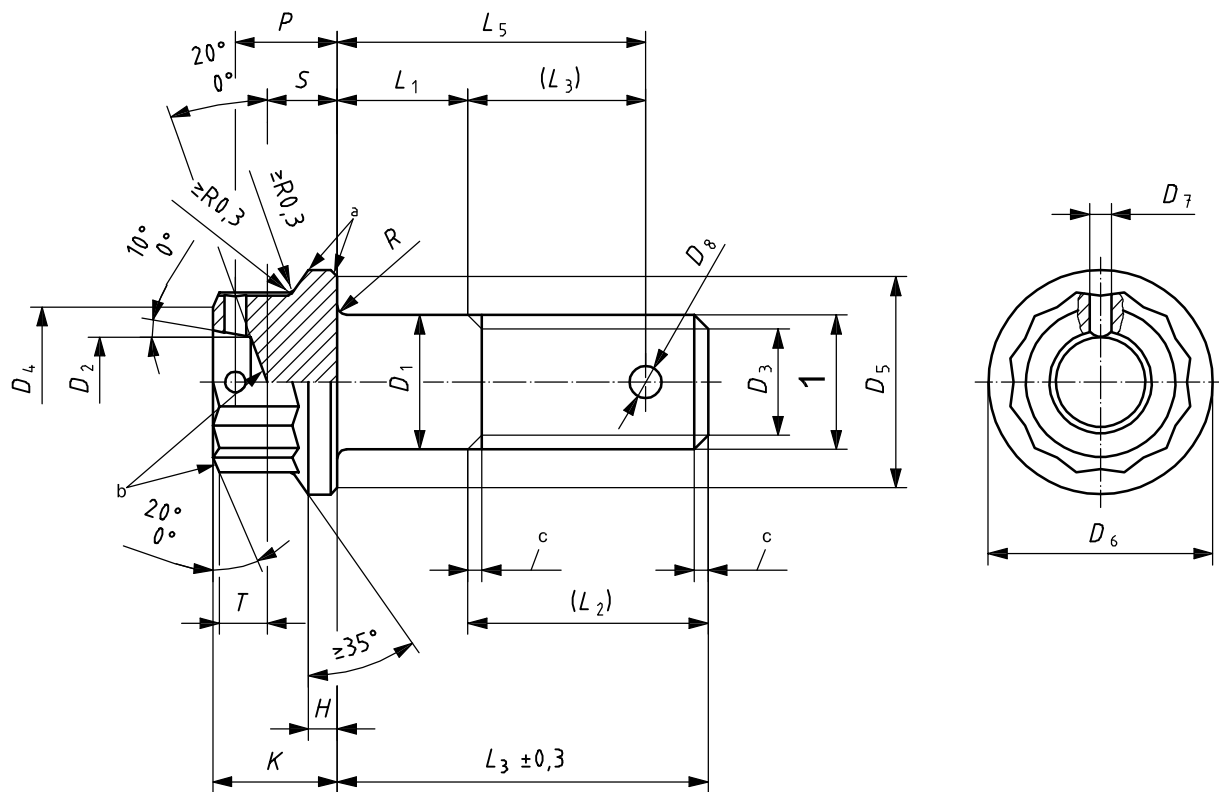
Dimensions and tolerances are expressed in millimetres. They are applicable after any coating (tolerance on shank diameter before coating is also specified for heat cured matrix coatings), but before the application of any lubricant.

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

Tolerances of form and position shall be as specified in ISO 7913 if not otherwise stated on product standard.

Dimensions in millimetres

Break sharp edges 0,1 to 0,4



**Key**

- 1 thread
- a Rounded or chamfered in this area.
- b Shape optional.
- c In accordance with ISO 3353-1.

**Figure 1**

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Table 1

Diameter code	Thread <sup>a</sup>	nom.	<i>D</i> <sub>1</sub>					<i>D</i> <sub>2</sub>	<i>D</i> <sub>3</sub>	<i>D</i> <sub>4</sub>	<i>D</i> <sub>5</sub>	<i>D</i> <sub>6</sub>	<i>D</i> <sub>7</sub> Four holes equidistant optional	<i>D</i> <sub>8</sub> One hole, optional
			Coated bolts			Uncoated bolts								
			Tol.			Tol.								
			before coating <sup>b</sup>	close	large	close	large							
050	MJ5 × 0,8-4h6h	5	-0,030 -0,045	-0,010 -0,035	h12 <sup>c</sup>	f7 <sup>c</sup>	h12 <sup>c</sup>	+1 0	± 0,5	min.	min.	max.	1	1,5
060	MJ6 × 1-4h6h	6	-0,033 -0,048	-0,013 -0,038				3,2	4,2	7,8	11	11,8	1,4	1,9
070	MJ7 × 1-4h6h	7						3,9	5,2	8,8	12,5	13,3		
080	MJ8 × 1-4h6h	8	-0,036 -0,051	-0,016 -0,041				4,5	6,2	9,8	14	14,8	1,6	2,4
100	MJ10 × 1,25-4h6h	10						6,1	7,9	11,8	17,3	18,3		
120	MJ12 × 1,25-4h6h	12						7,7	9,8	13,7	20,9	22		
140	MJ14 × 1,5-4h6h	14						10,3	11,5	16,7	23,9	25		
160	MJ16 × 1,5-4h6h	16	-0,040 -0,055	-0,020 -0,045				11,9	13,5	18,6	27,4	28,5	3	
180	MJ18 × 1,5-4h6h	18						14,5	15,5	21,6	30,4	31,5		
200	MJ20 × 1,5-4h6h	20	21,2	20,9				29,6	39,4	40,5	3,8			
220	MJ22 × 1,5-4h6h	22			16	17,5	23,6					33,4	34,5	
240	MJ24 × 2-4h6h	24			18,6	19,5	26,6					36,4	37,5	



Table 1 (continued)

<i>H</i> min.	<i>K</i> h15 <sup>c</sup>	$L_1 \pm 0,2^d$	$L_2$			$L_3$		<i>P</i>	<i>R</i> $\begin{matrix} 0 \\ -2 \end{matrix}$	<i>S</i> $\begin{matrix} +0,4 \\ 0 \end{matrix}$	<i>T</i> min.	Wrenching dash number <sup>e</sup>
			Thread			Thread						
			short	medium		short	medium					
				Strength class MPa								
1 250	> 1 250											
1,5	7,4	3 to 50	9	12	12,5	6	7,5	5,3	0,8	3,3	2,8	07
1,7	8,4	3 to 60	10	14	15	7	8,5	6,1	1	3,8	3,5	08
1,9	9,2	4 to 70	11	15	16		9,5	6,7		4,2	3,8	09
2,1	9,8	4 to 80	11,5	16,5	17	7,5	10,5	7,2		4,6	3,9	10
2,5	11,6	5 to 100	14,5	20,5	21	9	13	8,5	1,2	5,5	4,2	12
2,9	12,9	6 to 120	16	22,5	23,5	10	14,5	9,6	1,4	6,4	4,5	14
3,3	14,3	7 to 140	19	26	27,5	12	17	10,8		7,1	5,1	17
3,7	15,8	8 to 160	20,5	28,5	30	12,5	18,5	12,4	1,8	8,4	5,3	19
4,1	17,1	9 to 180	22,5	31	33	14,5	21	13,9		9,4	6,1	22
4,5	18,6	10 to 200	24,5	33,5	35,5	15	22,5	15,3		10,5	6,6	24
4,9	19,9	11 to 220	26	36	38	16	24	16,8		11,6	7,4	27
5,3	21,9	12 to 240	29,5	41	43,5	17,5	26,5	18,3		12,7	8,2	30

<sup>a</sup> In conformity with ISO 5855-2, except for the maximum thread major diameter,  $d_{max}$ , of bolts with a close tolerance on  $D_1$ , which shall be equal to  $(D_{1,min} - 0,025)$ .

<sup>b</sup> Heat cured organic matrix coatings for close tolerance normal shanks.

<sup>c</sup> See ISO 286-2.

<sup>d</sup> Increments: 1 for  $L_1 \leq 30$ ;  
2 for  $30 < L_1 \leq 100$ ;  
4 for  $L_1 > 100$ .

If greater lengths are required, they shall be chosen using these increments.

<sup>e</sup> In conformity with ISO 4095 over  $T$  min.

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