

INTERNATIONAL
STANDARD

ISO
3186

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1994-10-01

**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**

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ISO 3186:1994
*Aéronautique et espace — Vis à tête bihexagonale large, avec tige normale
et filetage MJ court ou de longueur moyenne, en matériau métallique,
revêtues ou non revêtues, des classes de résistance 1 250 MPa à
1 800 MPa — Dimensions*



Reference number
ISO 3186:1994(E)

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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.

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

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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.

It is intended for the drawing up of aerospace product standards.

ISO 286-2:1988, *ISO system of limits and fits — Part 2: Tables of standard tolerance grades and limit deviations for holes and shafts.*

ISO 3353:1992, *Aerospace — Rolled threads for bolts — Lead and runout requirements.*

ISO 4095:1978, *Fasteners for aerospace construction — Bi-hexagonal wrenching configuration.*

ISO 5855-2:1988, *Aerospace — MJ threads — Part 2: Limit dimensions for bolts and nuts.*

ISO 7913:1994, *Aerospace — Bolts and screws, metric — Tolerances of form and position.*

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

3 Configuration and dimensions

See figure 1 and table 1. Dimensions and tolerances are expressed in millimetres. They are applicable after any surface coating, but before the application of any lubricant.

Tolerances of form and position are specified in ISO 7913.

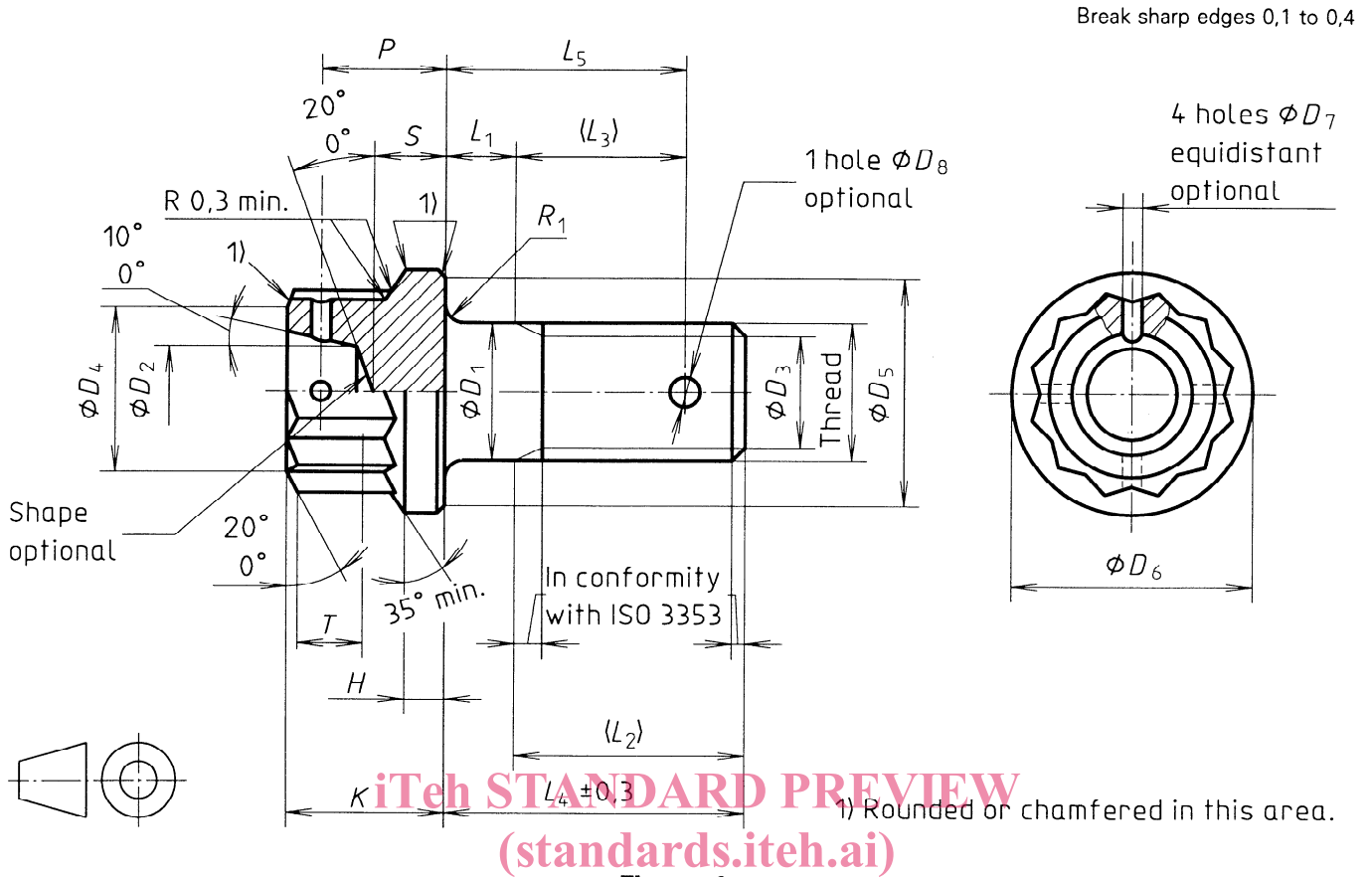


Figure 1

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Table 1

Diameter code	Thread 1)	D ₁						D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈
		nom.	Coated bolts		Uncoated bolts									
			tol. close	tol. large	tol. close	tol. large								
050	MJ5×0,8 – 4h6h	5	-0,010 -0,035	h12 2)	f7 2)	h12 2)	+1 0	± 0,5	min.	min.	max.	H13 2)	H13 2)	
060	MJ6×1 – 4h6h	6					2,5	3,4	6,8	9,5	10,3	1	1,5	
070	MJ7×1 – 4h6h	7	3,2				4,2	7,8	11	11,8	1,4	1,9		
080	MJ8×1 – 4h6h	8	-0,013 -0,038				3,9	5,2	8,8	12,5			13,3	
100	MJ10×1,25 – 4h6h	10					4,5	6,2	9,8	14	14,8	2,4		
120	MJ12×1,25 – 4h6h	12	-0,016 -0,041				6,1	7,9	11,8	17,3	18,3			
140	MJ14×1,5 – 4h6h	14					7,7	9,8	13,7	20,9	22			
160	MJ16×1,5 – 4h6h	16	-0,020 -0,045				1,6	3	3,8	10,3	11,5	16,7	23,9	25
180	MJ18×1,5 – 4h6h	18								11,9	13,5	18,6	27,4	28,5
200	MJ20×1,5 – 4h6h	20								14,5	15,5	21,6	30,4	31,5
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	
			21,2	20,9	29,6	39,4				40,5				

Diameter code	H min.	K h15 2)	L ₁ 3) ± 0,2	L ₂			L ₃		P	R ₁ 0 -0,2	S +0,4 0	T min.	Wrenching dash number 4)
				short	Thread		short	medium					
					medium								
					strength class (MPa)								
			1 250	> 1 250									
050	1,5	7,4	3 to 50	9	12	12,5	6	7,5	5,3	0,8	3,3	2,8	07
060	1,7	8,4	3 to 60	10	14	15	7	8,5	6,1	1	3,8	3,5	08
070	1,9	9,2	4 to 70	11	15	16		9,5	6,7		4,2	3,8	09
080	2,1	9,8	4 to 80	11,5	16,5	17	7,5	10,5	7,2		4,6	3,9	10
100	2,5	11,6	5 to 100	14,5	20,5	21	9	13	8,5		1,2	5,5	4,2
120	2,9	12,9	6 to 120	16	22,5	23,5	10	14,5	9,6	1,4	6,4	4,5	14
140	3,3	14,3	7 to 140	19	26	27,5	12	17	10,8		7,1	5,1	17
160	3,7	15,8	8 to 160	20,5	28,5	30	13	18,5	12,4	1,8	8,4	5,3	19
180	4,1	17,1	9 to 180	22,5	31	33	14,5	21	13,9		9,4	6,1	22
200	4,5	18,6	10 to 200	24,5	33,5	35,5	15	22,5	15,3		10,5	6,6	24
220	4,9	19,9	11 to 220	26	36	38	16	24	16,8		11,6	7,4	27
240	5,3	21,9	12 to 240	29,5	41	43,5	17,5	26,5	18,3	12,7	8,2	30	

1) In conformity with ISO 5855-2, except for the maximum major diameter "d" of bolts with a close tolerance on D₁, which shall be equal to D₁ min. - 0,025.

2) See ISO 286-2.

3) Increments:

- 1 for L₁ ≤ 30
- 2 for 30 < L₁ ≤ 100
- 4 for L₁ > 100

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

4) In conformity with ISO 4095 over T min.

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