



**International
Standard**

ISO 6397

**Aerospace — Test bolts, hexagonal
head, metallic material, coated or
uncoated**

*Aéronautique et espace — Vis d'essai, tête hexagonale, filetages
MJ, matériau métallique, revêtues ou non revêtues*

**First edition
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Contents

	Page
Foreword.....	iv
1 Scope.....	1
2 Normative references.....	1
3 Terms and definitions.....	2
4 Configuration and dimensions.....	2
5 Requirements.....	4
6 Designation.....	5
7 Marking.....	5

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Foreword

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

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Aerospace — Test bolts, hexagonal head, metallic material, coated or uncoated

1 Scope

This document specifies the dimensions of hexagonal head bolts, with MJ threads, metallic, coated or uncoated. It is applicable to test bolts for torque and tension tests.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 2859-1:1999, *Sampling procedures for inspection by attributes — Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection*

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 8080, *Aerospace — Anodic treatment of titanium and titanium alloys — Sulfuric acid process*

AMS 2411, *Plating, Silver, for High Temperature Applications*

AMS 2700, *Passivation of Corrosion Resistant Steels*

AMS 4967, *Titanium Alloy, Bars, Wires, Forgings, and Rings, 6,0Al-4,0V, Annealed, Heat Treatable*

AMS 5853, *Steel, Corrosion and Heat Resistant, Bars and Wire 15Cr-25,5Ni-1,2Mo-2,1Ti-0,006B-0,30V, Consumable Electrode Melted 1 800 °F (982 °C) Solution Treated and Work-Strengthened 160 ksi (1 103 MPa) Tensile Strength*

AMS 6322, *Steel Bars, Forgings, and Rings 0,50Cr - 0,55Ni - 0,25Mo (0,38 - 0,43C) (SAE 8740)*

AMS 6325, *Steel Bars and Forgings 0,50Cr - 0,55Ni - 0,25Mo (0,38 - 0,43C) (SAE 8740). Heat Treated, 105 ksi (724 MPa) Tension Strength*

AMS 6327, *Steel Bars, Forgings 0,50Cr - 0,55Ni - 0,25Mo (0,38 - 0,43C) (SAE 8740). Heat Treated, 125 ksi (862 MPa) Tension Strength*

AMS 6382, *Steel Bars, Forgings, and Rings 0,95Cr - 0,20Mo (0,38-0,43C) (SAE 4140) (Annealed)*

AMS 6415, *Steel Bars, Forgings, and Tubing 0,80Cr - 1,8Ni - 0,25Mo (0,38 - 0,43C) (SAE 4340)*

AMS 6484, *Steel Bars, Forgings, and Tubing 0,80Cr - 1,8Ni - 0,25Mo (0,38 - 0,43C) (SAE 4340). Normalized and tempered*

AMS-QQ-P-416, *Plating, cadmium (Electrodeposited)*

ASME B1.3, *Screw Thread Gaging System for Acceptability: Inch and Metric Screw Threads*

EN 2424, *Aerospace series — Marking of aerospace products*

EN 4473, Aerospace series — Aluminium Pigmented Coating for Fasteners — Technical Specification

EN 6118, Aerospace series — Pure Aluminium IVD Coating for Fasteners

NAS 4006, Aluminium coating

ATA iSpec 2200, Information Standards for Aviation Maintenance

MIL-DTL-5541, Chemical Conversion Coatings on Aluminum and Aluminum Alloys

MIL-DTL-83488, Detail Specification, Coating, Aluminum, High purity

3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at <https://www.iso.org/obp>

— IEC Electropedia: available at <https://www.electropedia.org/>

4 Configuration and dimensions

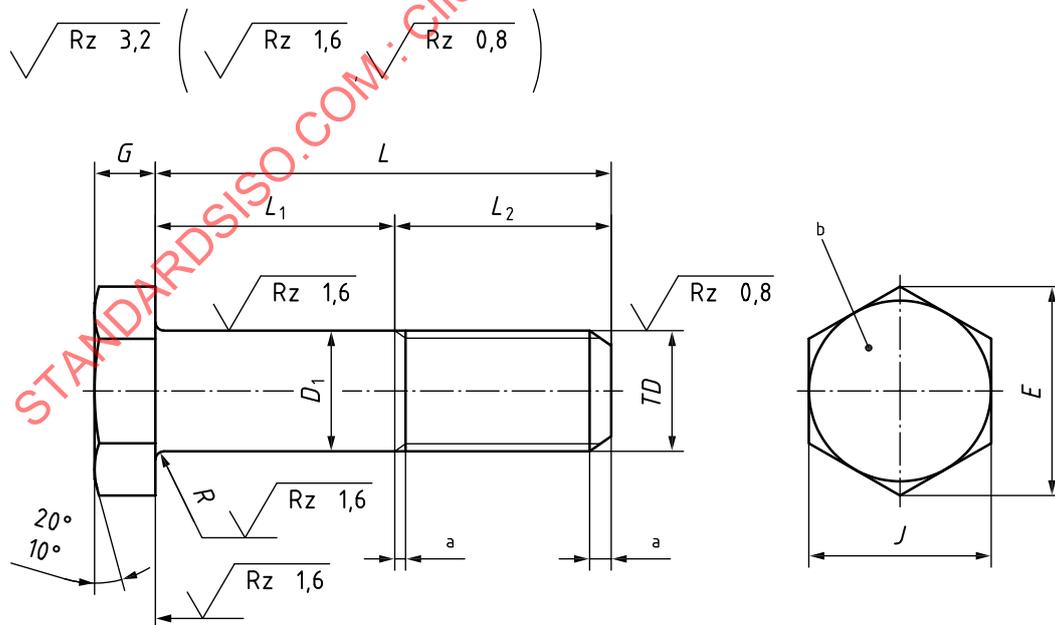
Test bolt configuration and dimensions shall be in accordance with [Figure 1](#) and [Table 1](#).

Dimensions and tolerances are expressed in millimetres. They are applicable after any coating, but before application of any lubricant. Details of form not stated are left to the manufacturer's discretion.

Tolerances of form and position not stated in this document shall be in accordance with ISO 7913.

Surface roughness: Values in micrometres apply prior to surface treatment.

Break sharp edges with a radius between 0,1 mm and 0,4 mm.



a Shall conform to ISO 3353-1.

b Marking.

Figure 1 — Configuration

Table 1 — Test bolt dimensions

Diameter Code	Thread	E min.	J		G	D ₁	L ₁	L ₂	R	Modified major diameter (TD)		Pitch diameter (PD)					
			Nom. (max.)	Tol.						ref.	h12	min.	max.	Low (L)		Middle (M)	
03	MJ3×0,5	6,5	6		2	3		7,5	0,4	2,80	2,88	min.	max.	min.	max.	min.	max.
04	MJ4×0,7	7,6	7	h12	2,5	4		10	0,4	3,77	3,85	2,627	2,643	2,641	2,657	2,675	
05	MJ5×0,8	8,7	8		3	5		12	0,5	4,77	4,85	3,489	3,509	3,507	3,527	3,545	
06	MJ6×1	10,9	10		3,5	6		14	0,7	5,77	5,85	4,42	4,44	4,44	4,46	4,48	
08	MJ8×1	14,3	13		4,5	8		16,5	0,7	7,74	7,84	5,279	5,304	5,302	5,327	5,35	
10	MJ10×1,25	18,9	17		5	10	a	20,5	0,8	9,74	9,84	7,279	7,304	7,302	7,327	7,35	
12	MJ12×1,25	21,1	19		6	12		22,5	0,9	11,71	11,84	9,113	9,138	9,138	9,163	9,188	
14	MJ14×1,5	24,5	22	h13	7	14		26	1,1	13,71	13,84	11,103	11,128	11,133	11,158	11,188	
16	MJ16×1,5	26,8	24		8	16		28,5	1,1	15,69	15,84	12,936	12,966	12,966	12,996	13,026	
18	MJ18×1,5	30,2	27		9	18		31	1,3	17,69	17,84	14,936	14,966	14,966	14,996	15,026	
20	MJ20×1,5	33,6	30		10	20		33,5	1,3	19,69	19,84	16,936	16,966	16,966	16,996	17,026	

^a Grip length shall be determined by manufacturer; grip length increases:
 — 1 for L₁ ≤ 30;
 — 2 for 30 < L₁ ≤ 100;
 — 4 for L₁ > 100.

5 Requirements

Materials and finishes requirements shall be in accordance with [Table 2](#), [Table 3](#), [Table 4](#) and [Table 5](#).

Table 2 — Requirements for materials

Code	Material (alloy)	Strength class σ_b (MPa)	Material specification
V	Titanium alloy (6AL-4V)	1 100 to 1 300	AMS 4967
C	Corrosion resistant steel	1 100 to 1 300	AMS 5853
-	Alloy steel (4340)	1 240 to 1 380	AMS 6415 or AMS 6484
	Alloy steel (4140)	1 240 to 1 380	AMS 6382 or AMS 6415
	Alloy steel (8740)	1 240 to 1 380	AMS 6322 or AMS 6325 or AMS 6327
	Alloy steel (30CrMnSiA)	1 100 to 1 280	-

Table 3 — Surface finish options for material code V (titanium alloy)

Surface finish code	Surface finish	Surface finish specification	Chemical conversion coating
A	Aluminium coating	NAS 4006 class NC or EN 4473, type IV	n/a
E	IVD	EN 6118, type II without cetyl alcohol or MIL-DTL-83488, class 2, type II	MIL-DTL-5541, type II, class 1A
N	Anodize	ISO 8080	n/a

Table 4 — Surface finish options for material code C (corrosion resistant steel)

Surface finish code	Surface finish	Surface finish specification	Chemical conversion coating
P	Passivation	AMS 2700, method 1, type 8, or AMS 2700 method 2	n/a
L	Silver plating	AMS 2411	n/a

Table 5 — Surface finish options for material code “-” (alloy steel)

Surface finish code	Surface finish	Surface finish specification	Chemical conversion coating
D	Cadmium plating	AMS-QQ-P-416, type II, grade B, class 2.	n/a

Inspection requirements shall be in accordance with [Table 6](#).

Each basic package shall only contain test bolts from the same lot number. Packaging shall ensure that the parts are not damaged during transport.