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**Aerospace — Bolts, normal  
bihexagonal head, normal shank,  
short or medium length MJ threads,  
metallic material, coated or uncoated,  
strength classes less than or equal to  
1 100 MPa — Dimensions**

*Aéronautique et espace — Vis à tête bihexagonale normale, avec tige normale et filetages MJ courts ou de longueur moyenne, en matériau métallique, revêtues ou non revêtues, des classes de résistance inférieures ou égales à 1 100 MPa — Dimensions*



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## 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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

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

This third edition cancels and replaces the second edition (ISO 3185:2008), which has been technically revised.

The main changes compared to the previous edition are as follows:

- some titles of columns in [Table 1](#) have been corrected;
- the footnotes to [Figure 1](#) and [Table 1](#) have been clarified.

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](http://www.iso.org/members.html).

# Aerospace — Bolts, normal bihexagonal head, normal shank, short or medium length MJ threads, metallic material, coated or uncoated, strength classes less than or equal to 1 100 MPa — Dimensions

## 1 Scope

This document specifies the dimensions of normal 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 less than or equal to 1 100 MPa.

This document is applicable to the compilation of aerospace product standards.

## 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 286-2, *Geometrical product specifications (GPS) — ISO code system for tolerances on linear sizes — Part 2: Tables of standard tolerance classes 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 Terms and definitions

No terms and definitions are listed in this document.

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

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

## 4 Configuration and dimensions

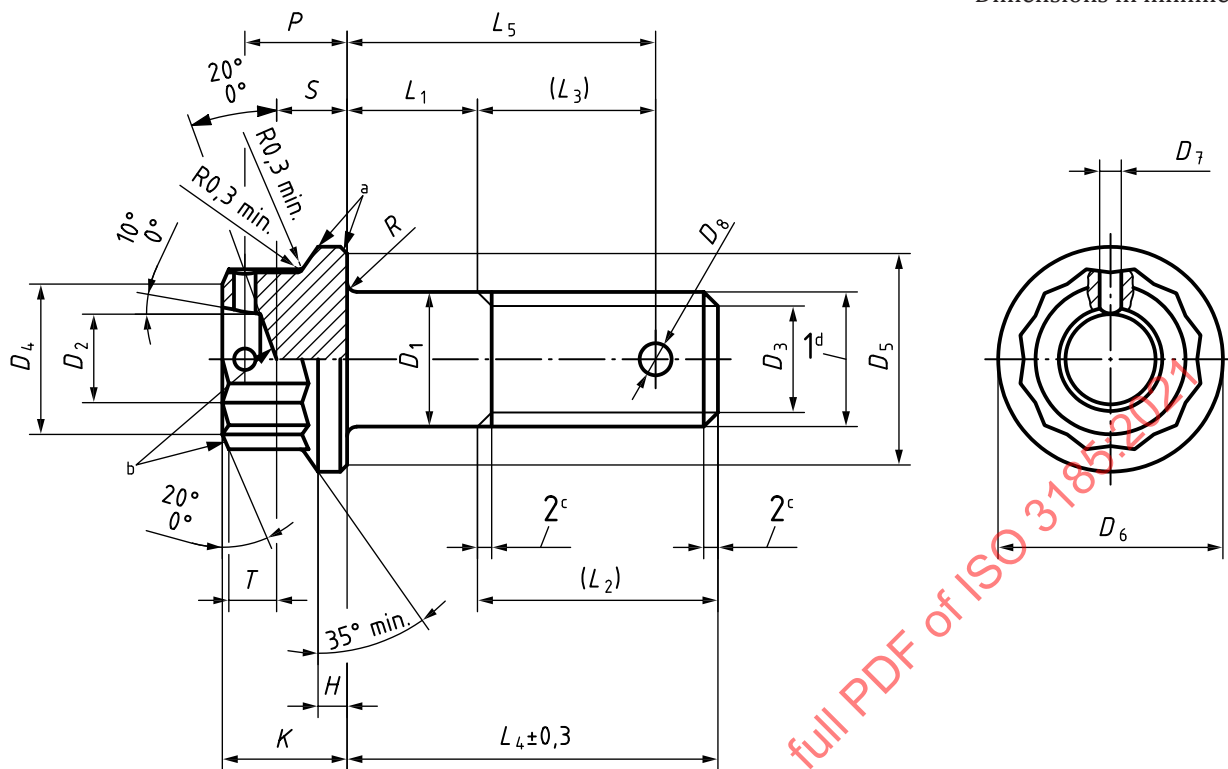
See [Figure 1](#) and [Table 1](#).

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 in accordance with ISO 7913.

Dimensions in millimetres



**Key**

- |   |                                    |   |                                         |
|---|------------------------------------|---|-----------------------------------------|
| 1 | thread                             | 2 | thread run-out                          |
| a | Rounded or chamfered in this area. | c | Shall be in accordance with ISO 3353-1. |
| b | Shape optional.                    | d | Shall be in accordance with ISO 5855-2. |

NOTE Break sharp edges are from 0,1 mm to 0,4 mm.

**Figure 1 — Configuration**

Table 1 — Dimensions

Dimensions in millimetres

| Diameter<br>code | Thread <sup>a</sup> | D <sub>1</sub> |                                |                  |                | D <sub>2</sub> | D <sub>3</sub> |           | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub><br>Four holes,<br>equidistant,<br>optional | D <sub>8</sub><br>One hole,<br>optional |           |       |
|------------------|---------------------|----------------|--------------------------------|------------------|----------------|----------------|----------------|-----------|----------------|----------------|----------------|-----------------------------------------------------------|-----------------------------------------|-----------|-------|
|                  |                     | nom.           | Coated bolts                   |                  | Uncoated bolts |                | nom.           | tol.      |                |                |                |                                                           |                                         |           |       |
|                  |                     |                | before<br>coating <sup>b</sup> | Tolerance        |                |                |                |           |                |                |                |                                                           |                                         | Tolerance |       |
|                  |                     |                |                                | close            | large          |                |                |           |                |                |                |                                                           |                                         | close     | large |
| 040              | MJ4 × 0,7-4h6h      | 4              | -0,030<br>-0,045               | -0,010<br>-0,035 |                | -              | 3              | 0<br>-0,5 | 5,8            | 7,5            | 8,3            | 1                                                         | 1,1                                     |           |       |
| 050              | MJ5 × 0,8-4h6h      | 5              |                                |                  |                | 3,2            | 3,4            |           | 6,8            | 8,3            | 9,1            |                                                           | 1,5                                     |           |       |
| 060              | MJ6 × 1-4h6h        | 6              |                                |                  |                | 4,1            | 4,2            |           | 7,8            | 9,8            | 10,6           |                                                           |                                         |           |       |
| 070              | MJ7 × 1-4h6h        | 7              |                                |                  |                | 4,9            | 5,2            |           | 8,8            | 11,3           | 12,1           | 1,4                                                       | 1,9                                     |           |       |
| 080              | MJ8 × 1-4h6h        | 8              | -0,033<br>-0,048               | -0,013<br>-0,038 |                | 5,2            | 6,2            | ±0,5      | 9,8            | 12,8           | 13,6           |                                                           |                                         |           |       |
| 100              | MJ10 × 1,25-4h6h    | 10             |                                |                  |                | 6,7            | 7,9            |           | 11,8           | 15,7           | 16,7           |                                                           |                                         |           |       |
| 120              | MJ12 × 1,25-4h6h    | 12             | -0,036<br>-0,051               | -0,016<br>-0,041 |                | 8              | 9,8            |           | 13,7           | 18,8           | 19,9           | 1,6                                                       | 2,4                                     |           |       |

Table 1 — (continued)

| Diameter code | H<br>min. | K<br>h15 <sup>c</sup> | $L_1 \pm 0,2^d$ | $L_2$<br>Thread length |        | $L_3$<br>Cotter pin hole position |        | P   | $R$  |           | S   | $T$       |      | Wrenching dash number <sup>e</sup> |
|---------------|-----------|-----------------------|-----------------|------------------------|--------|-----------------------------------|--------|-----|------|-----------|-----|-----------|------|------------------------------------|
|               |           |                       |                 | short                  | medium | short                             | medium |     | nom. | tol.      |     | +0,4<br>0 | min. |                                    |
| 040           | 0,8       | 5,5                   | 2 to 40         | 7,5                    | 10     | 5                                 | 6      | 3,5 | 0,4  |           | –   | 2,5       | 06   |                                    |
| 050           | 1         | 6,5                   | 3 to 50         | 9                      | 12     | 6                                 | 7,5    | 4,5 | 0,5  |           | 2,5 | 2,8       | 07   |                                    |
| 060           | 1,2       | 7,5                   | 3 to 60         | 10                     | 14     | 7                                 | 8,5    | 5,2 | 0,7  | 0<br>–0,2 | 2,8 | 3,5       | 08   |                                    |
| 070           | 1,4       | 8,2                   | 4 to 70         | 11                     | 15     |                                   | 9,5    | 5,9 |      |           | 3,3 | 3,8       | 09   |                                    |
| 080           | 1,6       | 8,6                   | 4 to 80         | 11,5                   | 16,5   | 7,5                               | 10,5   | 6,3 | 0,8  |           | 3,7 | 3,9       | 10   |                                    |
| 100           | 2         | 10,1                  | 5 to 100        | 14,5                   | 20,5   | 9                                 | 13     | 7,7 |      |           | 4,7 | 4,2       | 12   |                                    |
| 120           | 2,4       | 11,4                  | 6 to 120        | 16                     | 22,5   | 10                                | 14,5   | 8,8 | 0,9  | 0<br>–0,3 | 5,6 | 4,5       | 14   |                                    |

<sup>a</sup> The thread shall be in accordance 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> Tolerance, shall be in accordance with 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> The wrenching dash number shall be in accordance with ISO 4095 over  $T$  min.