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## Hexalobular socket cheese head screws

*Vis à métaux à tête cylindrique basse à six lobes internes*

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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 14580 was prepared by Technical Committee ISO/TC 2, *Fasteners*, Subcommittee SC 10, *Product standards for fasteners*.

This second edition cancels and replaces the first edition (ISO 14580:2001), of which it constitutes a minor revision. It also incorporates the Technical Corrigendum ISO 14580:2001/Cor.1:2004.

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# Hexalobular socket cheese head screws

## 1 Scope

This International Standard specifies the characteristics of hexalobular socket cheese head screws of product grade A and with thread sizes from M2 up to and including M10.

If, in special cases, specifications other than those listed in this International Standard are required, they can be selected from existing International Standards, for example ISO 261, ISO 888, ISO 898-1, ISO 965-2, ISO 3506-1 and ISO 4759-1.

## 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 225, *Fasteners — Bolts, screws, studs and nuts — Symbols and descriptions of dimensions*

ISO 261, *ISO general-purpose metric screw threads — General plan*

ISO 898-1, *Mechanical properties of fasteners made of carbon steel and alloy steel — Part 1: Bolts, screws and studs with specified property classes — Coarse thread and fine pitch thread*

ISO 965-2, *ISO general purpose metric screw threads — Tolerances — Part 2: Limits of sizes for general purpose external and internal screw threads — Medium quality*

ISO 1207, *Slotted cheese head screws — Product grade A*

ISO 3269, *Fasteners — Acceptance inspection*

ISO 3506-1, *Mechanical properties of corrosion-resistant stainless steel fasteners — Part 1: Bolts, screws and studs*

ISO 4042, *Fasteners — Electroplated coatings*

ISO 4759-1, *Tolerances for fasteners — Part 1: Bolts, screws, studs and nuts — Product grades A, B and C*

ISO 6157-1, *Fasteners — Surface discontinuities — Part 1: Bolts, screws and studs for general requirements*

ISO 8839, *Mechanical properties of fasteners — Bolts, screws, studs and nuts made of non-ferrous metals*

ISO 8992, *Fasteners — General requirements for bolts, screws, studs and nuts*

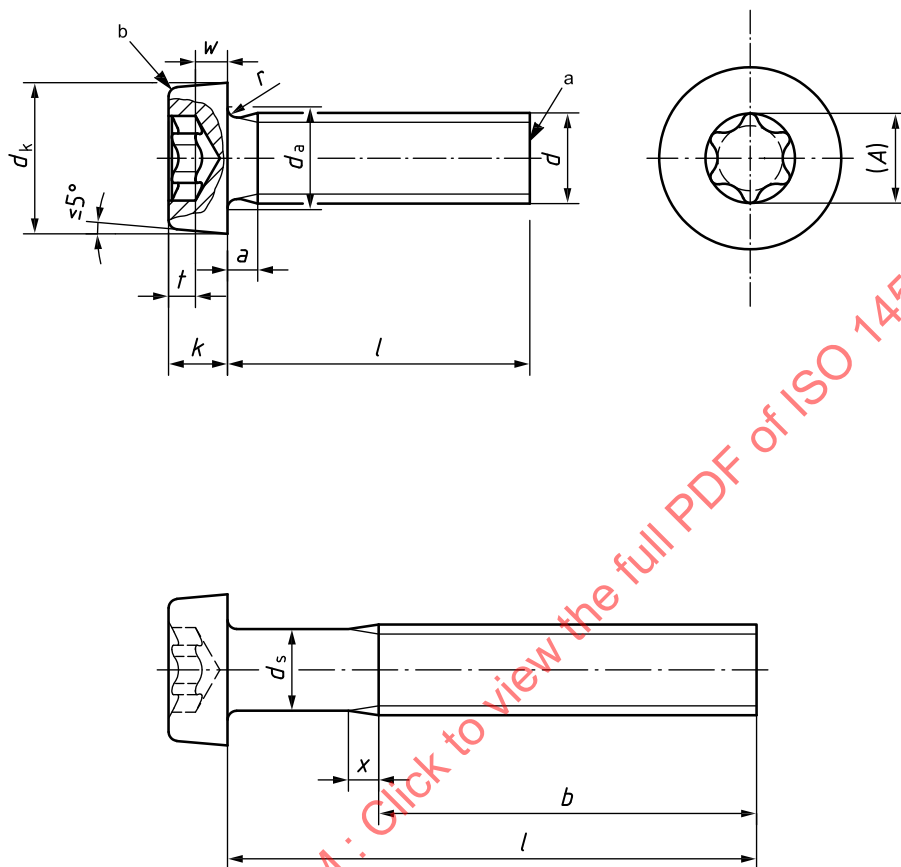
ISO 10664, *Hexalobular internal driving feature for bolts and screws*

ISO 10683, *Fasteners — Non-electrolytically applied zinc flake coatings*

### 3 Dimensions

See Figure 1 and Table 1.

Symbols and descriptions of dimensions are specified in ISO 225.



NOTE The shank diameter,  $d_s$ , is approximately equal to the pitch diameter or equal to the major thread diameter.

a As-rolled end.

b Edge may be rounded or flat.

Figure 1

Table 1 — Dimensions

Dimensions in millimetres

| Thread, <i>d</i>                                                                                                                  |             |       | M2                                                                                                          | M2,5     | M3        | (M3,5) <sup>a</sup> | M4        | M5        | M6        | M8        | M10       |
|-----------------------------------------------------------------------------------------------------------------------------------|-------------|-------|-------------------------------------------------------------------------------------------------------------|----------|-----------|---------------------|-----------|-----------|-----------|-----------|-----------|
| <i>P</i> <sup>b</sup>                                                                                                             |             |       | 0,4                                                                                                         | 0,45     | 0,5       | 0,6                 | 0,7       | 0,8       | 1         | 1,25      | 1,5       |
| <i>a</i>                                                                                                                          | max.        |       | 0,8                                                                                                         | 0,9      | 1         | 1,2                 | 1,4       | 1,6       | 2         | 2,5       | 3         |
| <i>b</i>                                                                                                                          | min.        |       | 25                                                                                                          | 25       | 25        | 38                  | 38        | 38        | 38        | 38        | 38        |
| <i>d<sub>k</sub></i>                                                                                                              | nom. = max. |       | 3,80                                                                                                        | 4,50     | 5,50      | 6,00                | 7,00      | 8,50      | 10,00     | 13,00     | 16,00     |
|                                                                                                                                   | min.        |       | 3,62                                                                                                        | 4,32     | 5,32      | 5,82                | 6,78      | 8,28      | 9,78      | 12,73     | 15,73     |
| <i>d<sub>a</sub></i>                                                                                                              | max.        |       | 2,6                                                                                                         | 3,1      | 3,6       | 4,1                 | 4,7       | 5,7       | 6,8       | 9,2       | 11,2      |
| <i>k</i> <sup>c</sup>                                                                                                             | nom. = max. |       | 1,55                                                                                                        | 1,85     | 2,40      | 2,60                | 3,10      | 3,65      | 4,40      | 5,80      | 6,90      |
|                                                                                                                                   | min.        |       | 1,41                                                                                                        | 1,71     | 2,26      | 2,46                | 2,92      | 3,47      | 4,10      | 5,50      | 6,54      |
| <i>r</i>                                                                                                                          | min.        |       | 0,1                                                                                                         | 0,1      | 0,1       | 0,1                 | 0,2       | 0,2       | 0,25      | 0,4       | 0,4       |
| <i>w</i>                                                                                                                          | min.        |       | 0,5                                                                                                         | 0,7      | 0,75      | 1,0                 | 1,1       | 1,3       | 1,6       | 2         | 2,4       |
| <i>x</i>                                                                                                                          | max.        |       | 1,0                                                                                                         | 1,1      | 1,25      | 1,50                | 1,75      | 2,0       | 2,5       | 3,2       | 3,8       |
| Hexalobular<br>socket <sup>d</sup>                                                                                                | Socket no.  |       | <b>6</b>                                                                                                    | <b>8</b> | <b>10</b> | <b>15</b>           | <b>20</b> | <b>25</b> | <b>30</b> | <b>45</b> | <b>50</b> |
|                                                                                                                                   | <i>A</i>    | ref.  | 1,75                                                                                                        | 2,4      | 2,8       | 3,35                | 3,95      | 4,5       | 5,6       | 7,95      | 8,95      |
|                                                                                                                                   |             | max.  | 0,84                                                                                                        | 0,91     | 1,27      | 1,33                | 1,66      | 1,91      | 2,29      | 3,05      | 3,43      |
|                                                                                                                                   |             | min.  | 0,71                                                                                                        | 0,78     | 1,01      | 1,07                | 1,27      | 1,52      | 1,90      | 2,66      | 3,04      |
| <i>l</i> <sup>e</sup>                                                                                                             |             |       | Approximate mass of carbon steel screws, in kilograms per 1 000 pieces<br>( $\rho = 7,85 \text{ kg/dm}^3$ ) |          |           |                     |           |           |           |           |           |
| nom. <sup>a</sup>                                                                                                                 | min.        | max.  |                                                                                                             |          |           |                     |           |           |           |           |           |
| <b>3</b>                                                                                                                          | 2,8         | 3,2   | 0,160                                                                                                       | 0,272    |           |                     |           |           |           |           |           |
| <b>4</b>                                                                                                                          | 3,76        | 4,24  | 0,179                                                                                                       | 0,302    | 0,515     |                     |           |           |           |           |           |
| <b>5</b>                                                                                                                          | 4,76        | 5,24  | 0,198                                                                                                       | 0,332    | 0,560     | 0,786               | 1,09      |           |           |           |           |
| <b>6</b>                                                                                                                          | 5,76        | 6,24  | 0,217                                                                                                       | 0,362    | 0,604     | 0,845               | 1,17      | 2,06      |           |           |           |
| <b>8</b>                                                                                                                          | 7,71        | 8,29  | 0,254                                                                                                       | 0,422    | 0,692     | 0,966               | 1,33      | 2,30      | 3,56      |           |           |
| <b>10</b>                                                                                                                         | 9,71        | 10,29 | 0,291                                                                                                       | 0,482    | 0,780     | 1,08                | 1,47      | 2,55      | 3,92      | 7,85      |           |
| <b>12</b>                                                                                                                         | 11,65       | 12,35 | 0,329                                                                                                       | 0,542    | 0,868     | 1,20                | 1,63      | 2,80      | 4,27      | 8,49      | 14,6      |
| <b>(14)</b>                                                                                                                       | 13,65       | 14,35 | 0,365                                                                                                       | 0,602    | 0,956     | 1,32                | 1,79      | 3,05      | 4,62      | 9,13      | 15,6      |
| <b>16</b>                                                                                                                         | 15,65       | 16,35 | 0,402                                                                                                       | 0,662    | 1,04      | 1,44                | 1,95      | 3,30      | 4,98      | 9,77      | 16,6      |
| <b>20</b>                                                                                                                         | 19,58       | 20,42 | 0,478                                                                                                       | 0,782    | 1,22      | 1,68                | 2,25      | 3,78      | 5,69      | 11,0      | 18,6      |
| <b>25</b>                                                                                                                         | 24,58       | 25,42 |                                                                                                             | 0,932    | 1,44      | 1,98                | 2,64      | 4,40      | 6,56      | 12,6      | 21,1      |
| <b>30</b>                                                                                                                         | 29,58       | 30,42 |                                                                                                             |          | 1,66      | 2,28                | 3,02      | 5,02      | 7,45      | 14,2      | 23,6      |
| <b>35</b>                                                                                                                         | 34,5        | 35,5  |                                                                                                             |          |           | 2,57                | 3,41      | 5,62      | 8,25      | 15,8      | 26,1      |
| <b>40</b>                                                                                                                         | 39,5        | 40,5  |                                                                                                             |          |           |                     | 3,80      | 6,25      | 9,20      | 17,4      | 28,6      |
| <b>45</b>                                                                                                                         | 44,5        | 45,5  |                                                                                                             |          |           |                     |           | 6,88      | 10,0      | 18,9      | 31,1      |
| <b>50</b>                                                                                                                         | 49,5        | 50,5  |                                                                                                             |          |           |                     |           | 7,50      | 10,9      | 20,6      | 33,6      |
| <b>(55)</b>                                                                                                                       | 54,4        | 55,6  |                                                                                                             |          |           |                     |           |           | 11,8      | 22,1      | 36,1      |
| <b>60</b>                                                                                                                         | 59,4        | 60,6  |                                                                                                             |          |           |                     |           |           | 12,7      | 23,7      | 38,6      |
| <b>(65)</b>                                                                                                                       | 64,4        | 65,6  |                                                                                                             |          |           |                     |           |           |           | 25,2      | 41,1      |
| <b>70</b>                                                                                                                         | 69,4        | 70,6  |                                                                                                             |          |           |                     |           |           |           | 26,8      | 43,6      |
| <b>(75)</b>                                                                                                                       | 74,4        | 75,6  |                                                                                                             |          |           |                     |           |           |           | 28,3      | 46,1      |
| <b>80</b>                                                                                                                         | 79,4        | 80,6  |                                                                                                             |          |           |                     |           |           |           | 29,8      | 48,6      |
| NOTE Preferred lengths are the ones between the solid, bold, stepped lines.                                                       |             |       |                                                                                                             |          |           |                     |           |           |           |           |           |
| <sup>a</sup> Sizes in parentheses should be avoided, if possible.                                                                 |             |       |                                                                                                             |          |           |                     |           |           |           |           |           |
| <sup>b</sup> <i>P</i> is the pitch of the thread.                                                                                 |             |       |                                                                                                             |          |           |                     |           |           |           |           |           |
| <sup>c</sup> The head height is increased against the screws, in accordance with ISO 1207, in order to improve the head strength. |             |       |                                                                                                             |          |           |                     |           |           |           |           |           |
| <sup>d</sup> For the acceptance of the hexalobular socket and for gauges, see ISO 10664.                                          |             |       |                                                                                                             |          |           |                     |           |           |           |           |           |
| <sup>e</sup> Screws with nominal lengths above the discontinuous, stepped line are threaded up to the head ( $b = l - a$ ).       |             |       |                                                                                                             |          |           |                     |           |           |           |           |           |

## 4 Specifications and reference International Standards

See Table 2.

**Table 2 — Specifications and reference International Standards**

| Material             |                        | Steel              | Stainless steel              | Non-ferrous metal |
|----------------------|------------------------|--------------------|------------------------------|-------------------|
| General requirements | International Standard | ISO 8992           |                              |                   |
|                      | Tolerance class        | 6g                 |                              |                   |
| Thread               | International Standard | ISO 261, ISO 965-2 |                              |                   |
|                      | Property class         | 4.8, 5.8           | A2-50, A2-70<br>A3-50, A3-70 | As agreed         |
| Mechanical property  | International Standard | ISO 898-1          | ISO 3506-1                   | ISO 8839          |
|                      | Product grade          | A                  |                              |                   |
| Tolerance            | International Standard | ISO 4759-1         |                              |                   |
|                      | International Standard | ISO 10664          |                              |                   |
| Hexalobular socket   | International Standard | ISO 10664          |                              |                   |
|                      | International Standard | ISO 10664          |                              |                   |
| Finish — Coating     | International Standard | ISO 10664          |                              |                   |
|                      | International Standard | ISO 10664          |                              |                   |
| Surface integrity    | International Standard | ISO 10664          |                              |                   |
|                      | International Standard | ISO 10664          |                              |                   |
| Acceptability        | International Standard | ISO 10664          |                              |                   |
|                      | International Standard | ISO 10664          |                              |                   |

## 5 Designation

EXAMPLE A hexalobular socket cheese head screw with thread M5, nominal length  $l = 20$  mm and property class 4.8 is designated as follows:

**Hexalobular socket cheese head screw ISO 14580 - M5 × 20 - 4.8**