
**Fasteners — Hexagon socket
countersunk head screws with
reduced loadability**

*Fixations — Vis à tête fraisée à six pans creux à capacité de charge
réduite*

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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).

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).

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.

This document was prepared by Technical Committee ISO/TC 2, *Fasteners*, Subcommittee SC 11, *Fasteners with metric external thread*.

This third edition cancels and replaces the second edition (ISO 10642:2004), which has been technically revised. It also incorporates the Amendment ISO 10642:2004/Amd.1:2012. The main changes compared to the previous edition are as follows:

- the whole standard has been improved to clearly point out that these hexagon socket countersunk head screws have reduced loadability because of their head design (head dimensions and penetration of the hexagon socket);
- screws made of stainless steel have been added;
- detailed head configuration has been added (see [Figure 4](#));
- M2 and M2,5 have been added; as their minimum ultimate tensile loads for full loadability are not specified in ISO 898-1 and ISO 3506-1, they have been calculated with the same formulae accordingly (see [Annex A](#));
- the reference threaded length b has been increased to $3d$ for partially threaded screws M14 to M20, so that these screws can be tensile tested in accordance with ISO 3506-1 ($b \geq 3d$ is required to tensile test screws with reduced loadability);
- head height k_{\min} has been added as reference dimension in [Tables 1](#) and [2](#);
- wall thickness between driving feature and bearing face w_{\min} has been replaced by the depth of the internal driving feature t_{\max} (same method as for hexalobular internal drive);
- D_a , D_k and F are pointed out as gauge dimensions in [Table 3](#) (see also [Figure 5](#));
- the minimum nominal lengths of the standardized range have been determined in accordance with footnote g of [Tables 1](#) and [2](#) and therefore the shorter lengths for M4 to M20 were deleted.

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.

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Fasteners — Hexagon socket countersunk head screws with reduced loadability

1 Scope

This document specifies the characteristics of hexagon socket countersunk head screws with reduced loadability due to head design, in steel and stainless steel, with metric coarse pitch threads M2 to M20, and with product grade A.

NOTE 1 Other dimensional options are given in ISO 888, ISO 965-1 and ISO 4753.

NOTE 2 The reduced loadability (related to the countersunk head dimensions in combination with penetration of the hexagon socket specified in this document) implies a limitation of ultimate tensile load; see [Table 5](#).

NOTE 3 Particular attention is needed to ensure alignment of the countersunk head with the bearing surface of the countersink in the assembly.

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 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 965-1, *ISO general purpose metric screw threads — Tolerances — Part 1: Principles and basic data*

ISO 1891-4, *Fasteners — Vocabulary — Part 4: Control, inspection, delivery, acceptance and quality*

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 coating systems*

ISO 4753, *Fasteners — Ends of parts with external ISO metric thread*

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 6157-3, *Fasteners — Surface discontinuities — Part 3: Bolts, screws and studs for special requirements*

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

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

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>

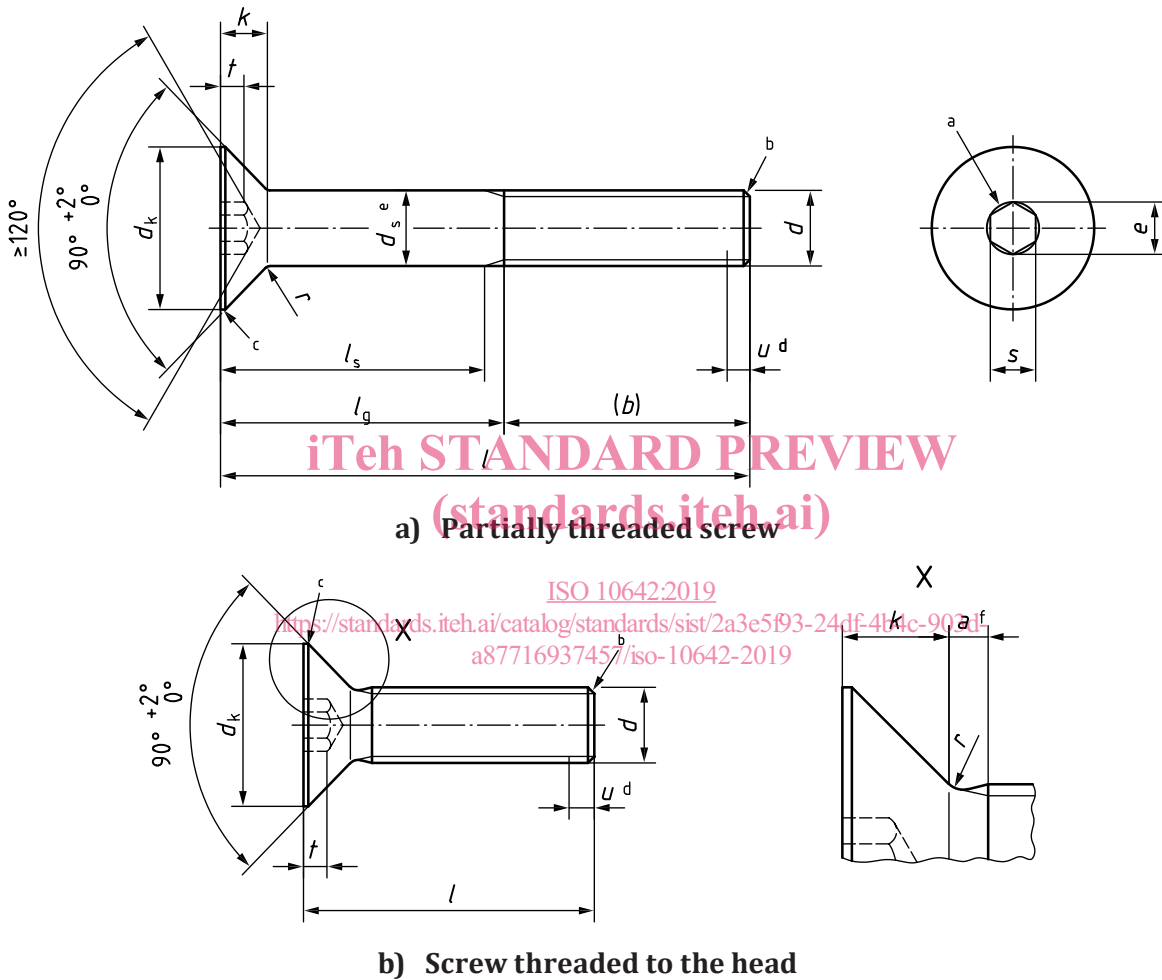
— IEC Electropedia: available at <http://www.electropedia.org/>

4 Dimensions and gauging of head

4.1 Dimensions

Dimensions shall be in accordance with [Figures 1 to 4](#) and [Tables 1](#) and [2](#).

Symbols and descriptions of dimensions are defined in ISO 225.



Key

- a A slight rounding or countersink at the mouth of the socket is permissible.
- b In accordance with ISO 4753, chamfered end or, for sizes $\leq M4$, as-rolled end.
- c Edge of the head flat or rounded.
- d Incomplete thread $u \leq 2P$.
- e d_s applies when values for $l_{s,min}$ are specified in [Tables 1](#) and [2](#).
- f $a \leq 2P$.

Figure 1 — Hexagon socket countersunk head screws

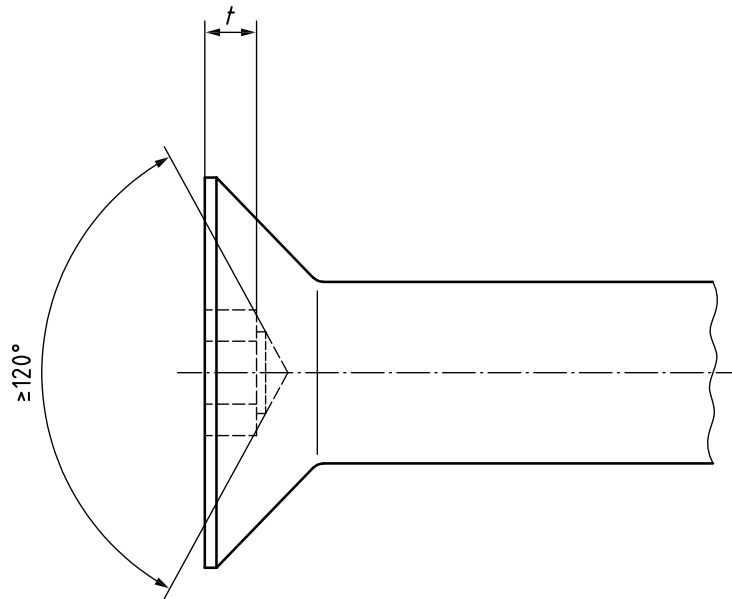


Figure 2 — Permissible alternative form of socket (broached socket)

For broached sockets which are at the maximum limit of size, the overcut resulting from drilling shall not exceed 1/3 of the length of any flat of the socket which is $e/2$ (see [Figure 3](#)).

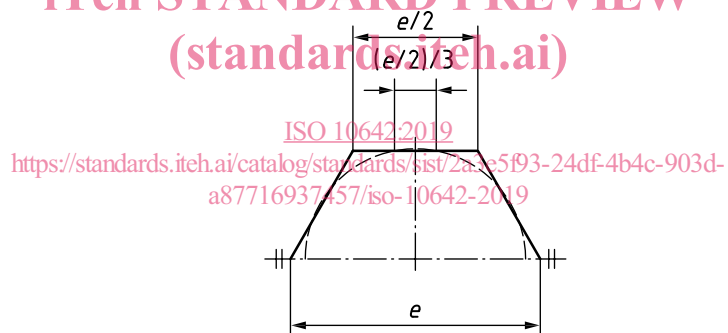


Figure 3 — Detail: Broached socket

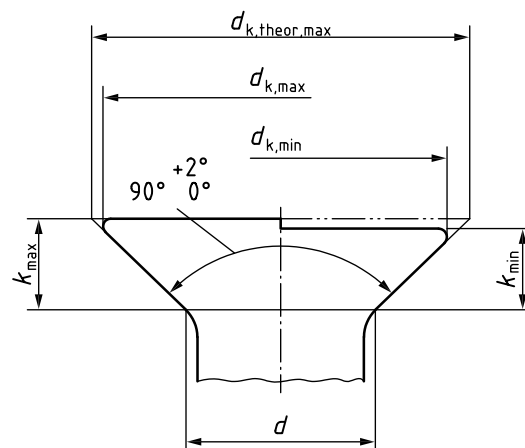


Figure 4 — Countersunk head configuration