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Assembly tools for screws and nuts — Technical specifications —

Part 2: Machine-operated sockets (impact)

Outils de manoeuvre pour vis et écrous — Spécifications techniques — Partie 2: Douilles à machine (impact)

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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).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 29, *Small tools,* Subcommittee SC 10, *Assembly tools for screws and nuts, pliers and nippers*.

This second edition cancels and replaces the first edition (ISO 1711-2:2005), which has been technically revised with the following changes:

— additional widths across flat sizes not covered by ISO 272 included in Table 3, in order to better reflect the current market situation;

— range of values for width across flats adapted in Table 1 due to above changes in Table 3.

ISO 1711 consists of the following parts, under the general title *Assembly tools for screws and nuts — Technical specifications*:

— *Part 1: Hand-operated wrenches and sockets*

— *Part 2: Machine-operated sockets ("impact")*

Introduction

When testing machine-operated impact sockets, there are three types of testing that could be relevant:

— torsional testing;

— impact testing;

— endurance testing.

This part of ISO 1711 covers only torsional testing of machine-operated sockets. Presently, the torsional test and hardness values given in this part of ISO 1711 ensure sockets will last a reasonable impact life if the appropriate tool is used.

An impact test or endurance test is desired, but at present, there is no procedure suitable for standardisation available. This will be an issue for a future revision of this part of ISO 1711.

Assembly tools for screws and nuts — Technical specifications —

Part 2: Machine-operated sockets (impact)

1 Scope

This part of ISO 1711 specifies hardness and minimum torsional strength for machine-operated square drive sockets in accordance with ISO 2725-2 intended for use with impact wrenches.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 2725-2, *Assembly tools for screws and nuts — Square drive sockets — Part 2: Machine-operated sockets ("impact")*

ISO 6508-1, *Metallic materials — Rockwell hardness test — Part 1: Test method (scales A, B, C, D, E, F, G, H, K, N, T)*

3 Materials

Sockets, driving squares, and all accessories shall be manufactured from steel.

The chemical composition and heat treatment shall be to produce tools conforming to requirements specified hereinafter.

4 Hardness testing

The hardness test shall be carried out in accordance with ISO 6508-1.

Sockets and attachments shall be hardened and tempered to Rockwell hardness values given in Table 1.

Table 1 — Rockwell hardness values for machine-operated sockets as function of driving square and hexagon width across flats, s[a]

Hardness	Driving square nominal size[b]					
HRC	6,3	10	12,5	20	25	40
40 + 8	$3{,}2 \le s \le 16$	$7 \le s \le 14$	$8 \le s \le 14$	—	—	—
38 + 8	—	$15 \le s \le 24$	$15 \le s \le 34$	$17 \le s \le 60$	$27 \le s \le 70$	$36 \le s \le 70$

[a] Width across flats s are according to ISO 272.

[b] For dimensions of driving squares, see ISO 1174-2.

5 Torque testing

5.1 Method

The minimum test torsion torque values to be applied are given in Table 2.

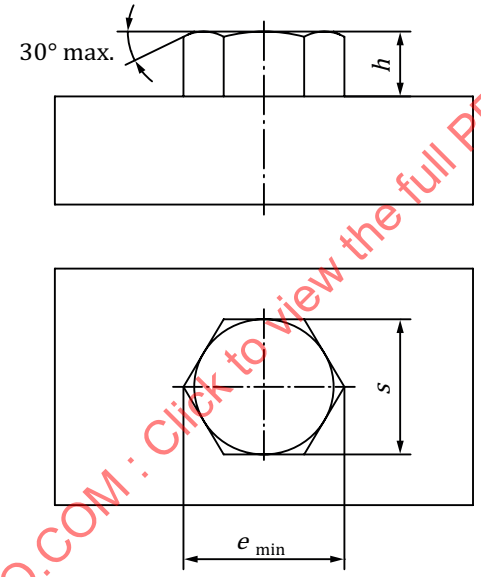
The socket shall be fully engaged in a hexagon test mandrel as shown in Figure 1. The height, h, and the width across corners, $e_{min.}$, of the mandrel are specified in Table 2.

Smoothly apply the load until the minimum testing torque as given in Table 2 is reached.

The nominal across-flats dimension of the test mandrel shall be equal to the nominal dimension, s, with a tolerance of h8. The mandrel shall be hardened to not less than hardness 55 HRC.

A device in which the mandrel can be rotated at a certain torque determined with an accuracy of ±2,5 % can also be used for this test.

Following the application of the minimum test torsion torque, any possible damage or deformation shall not affect the usability of the tool.



NOTE The use of the 30 degree chamfer will reduce the effective engagement which might affect the ultimate test torque.

Figure 1 — Test mandrel height, h, and width across flats, s

5.2 Test of machine-operated square drive sockets

A square mandrel of hardness not less than 55 HRC shall be used for driving the socket for nominal width across flats 22 mm and smaller. A square mandrel of hardness not less than 50 HRC shall be used for driving the socket for nominal width across flats 24 mm and larger. The nominal width across-flats dimension of this mandrel shall be equal to the maximum dimension, with a tolerance of h8, of the corresponding square drive.

The axis of the two mandrels and the axis of the socket shall remain coaxial during the test.

Table 2 — Minimum test torsion torque and test mandrel height as a function of width across flats

Nominal width across flats *s*	Minimum test torsion torque[b] *M* N·m						Test mandrel mm	
	Driving square nominal size[c]							
	6,3	10	12,5	20	25	40	**Height *h*** h13	**Width across corners[e]** $e_{min.}$
3,2	7,1	—	—	—	—	—	1,3	3,62
3,5 [a]	8,2	—	—	—	—	—	1,4	3,96
4	10,4	—	—	—	—	—	1,6	4,52
4,5 [a]	12,6	—	—	—	—	—	1,8	5,09
5	15,1	—	—	—	—	—	2	5,65
5,5	17,8	—	—	—	—	—	2,4	6,22
6 [a]	20,6	23,2	—	—	—	—	2,8	6,78
7	26,8	33,3	—	—	—	—	3,2	7,91
8	33,6	45,5	94,1	—	—	—	4	9,04
9 [a]	41,1	60	119,2	—	—	—	4,4	10,17
10	49,2	76,7	147,1	—	—	—	4,8	11,30
11	57,8	96	178	—	—	—	5,6	12,43
12 [a]	67,0	117,5	211,8	—	—	—	6	13,56
13	68,6	141,8	249	—	—	—	6,4	14,69
14 [a]	68,6	168,6	288,3	—	—	—	7	15,82
15	68,6 [d]	215	400	—	—	—	7,4	16,95
16	68,6 [d]	260	500	—	—	—	8	18,08
17 [a]	68,6 [d]	265,6	600	—	—	—	8,8	19,21
18	—	280 [d]	650	—	—	—	9,6	20,34
19 [a]	—	280 [d]	650 [d]	—	—	—	10,2	21,47
20 [a]	—	280 [d]	650 [d]	—	—	—	10,7	22,6
21	—	280 [d]	650 [d]	930	—	—	11,2	23,73
22 [a]	—	280 [d]	650 [d]	972	—	—	11,8	24,86
23 [a]	—	280 [d]	650 [d]	1 015	—	—	12,3	25,99
24	—	280 [d]	650 [d]	1 085 [d]	—	—	12,8	27,12
25 [a]	—	280 [d]	650 [d]	1 160 [d]	—	—	13,3	28,25
26 [a]	—	—	650 [d]	1 240 [d]	—	—	13,8	29,38
27	—	—	650 [d]	1 580 [d]	1 695	—	14,4	30,51
28 [a]	—	—	650 [d]	1 695 [d]	1 955	—	14,9	31,64

[a] Not according to ISO 272.

[b] Hexagons larger than tabled sizes are required to pass the highest tabled test torsion torque value shown for the applicable driving square.

[c] In accordance with ISO 1174-2.

[d] The test torsion torque values have been limited due to the strength of the driving square for that hexagon size.

[e] $e_{min.} = s_{nom.} \times 1{,}13$ values of $e_{min.}$ are rounded with two decimals.