
**Assembly tools for screws and nuts —
Technical specifications —**

Part 2:
Machine-operated sockets (“impact”)

*Outils de manœuvre pour vis et écrous — Spécifications techniques —
Partie 2: Douilles à machine («impact»)*



PDF disclaimer

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

STANDARDSISO.COM : Click to view the full PDF of ISO 1711-2:2005

© ISO 2005

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

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.

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 1711-2 was prepared by Technical Committee ISO/TC 29, *Small tools*, Subcommittee SC 10, *Assembly tools for screws and nuts, pliers and nippers*.

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. The torsional test and hardness values given in this part of ISO 1711 will ensure that sockets have 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 standardization available. This will be a subject of consideration in a future revision of this part of ISO 1711.

STANDARDSISO.COM : Click to view the full PDF of ISO 1711-2:2005

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 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 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 such as to produce tools conforming to the requirements specified in Clauses 4 and 5.

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

Dimensions in millimetres

Hardness HRC	Driving square nominal size ^a								
	6,3	10	12,5	16	20	25	40	63	90
	Width across flats, s ^b								
40 to 48	$3,2 \leq s \leq 16$	$7 \leq s \leq 13$	$8 \leq s \leq 13$						
38 to 46		$15 \leq s \leq 24$	$15 \leq s \leq 34$	$15 \leq s \leq 36$	$18 \leq s \leq 60$	$27 \leq s \leq 70$	$36 \leq s \leq 70$		

^a According to ISO 1174-2.
^b According to ISO 272.

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.

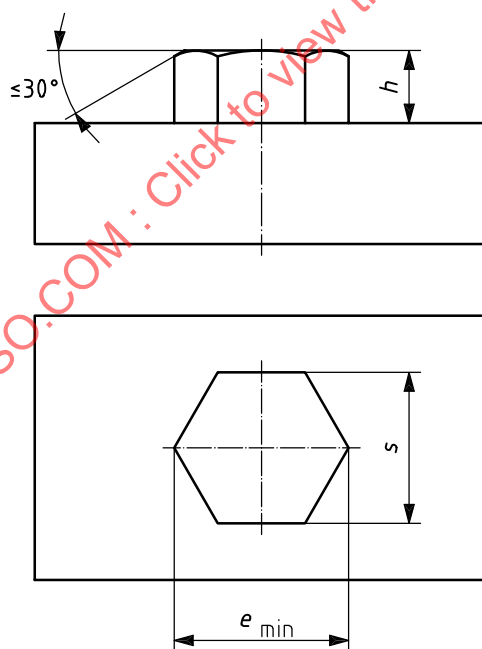


Figure 1 — Test mandrel height, h , and width across flats, s

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 $\pm 2,5\%$ may 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.

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

Dimensions in millimetres

Nominal width across flats ^a	Minimum test torsion torque ^b							Test mandrel	
	M N·m							Height ^c	Width across corners ^d
s	6,3	10	12,5	16	20	25	40	h_{13}	$e_{\min}$
3,2	7,08							1,3	3,62
4	10,4							1,6	4,52
5	15,1							2	5,65
5,5	17,8							2,4	6,22
7	26,8	33,2						3,2	7,91
8	33,6	45,5	94					4	9,04
10	49,1	76,7	147					4,8	11,30
11	57,8	96	178					5,6	12,43
13	68,6	141	249					6,4	14,69
15	68,6 ^e	215	400	850				7,4	16,95
16	68,6 ^e	260	500	930				8	18,08
18		280 ^e	650	1 220	1 320			9,6	20,34
21		280 ^e	650 ^e	1 220 ^e	2 000			11,2	23,73
24		280 ^e	650 ^e	1 220 ^e	2 200 ^e			12,8	27,12
27			650 ^e	1 220 ^e	2 200 ^e	3 600		14,4	30,51
30			650 ^e	1 220 ^e	2 200 ^e	4 000		16	33,90
34			650 ^e	1 220 ^e	2 200 ^e	4 000 ^e		17,6	38,42
36				1 220 ^e	2 200 ^e	4 000 ^e	15 100	19,2	40,68
41					2 200 ^e	4 000 ^e	15 100 ^e	21,6	46,33
46					2 200 ^e	4 000 ^e	15 100 ^e	24	51,98
50					2 200 ^e	4 000 ^e	15 100 ^e	26,4	56,50
55					2 200 ^e	4 000 ^e	15 100 ^e	28,8	62,15
60					2 200 ^e	4 000 ^e	15 100 ^e	31,2	67,80
65						4 000 ^e	15 100 ^e	33,6	73,45
70						4 000 ^e	15 100 ^e	36	79,10

^a 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 According to ISO 1174-2.

^d $e_{\min} = s_{\text{nom}} \times 1,13$. Values of $e_{\min}$ are rounded to two decimal places.

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

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

STANDARDSISO.COM : Click to view the full PDF of ISO 1711-2:2005