

© British Standards Institution. No part of this publication may be photocopied or otherwise reproduced without the prior permission in writing of BSI

British Standard Specification for Hand operated square drive socket wrenches and accessories

Douilles à main à carré d'entraînement et accessoires — Spécifications

Handbetätigte Steckschlüssel mit Innenvierkant und Zubehörteile

Foreword

This British Standard has been prepared under the direction of the Machine, Engineers and Hand Tools Standards Committee.

The main features of this revision are:

- (a) metrication of all dimensions other than across flats on imperial sized sockets;
- (b) metric sockets have been included;
- (c) some rationalization of drive and socket sizes has been made;
- (d) types included reflect the demand for the improved design of socket now available.

This standard supersedes BS 4006 : Part 1 : 1966 and BS 4006 : Part 1 : Supplement No. 1 : 1968 which are withdrawn.

Socket wrenches and accessories are identified and specified by their drive size in metric measures. To avoid any confusion therefore, the inch drive size in each of the tables is placed alongside in brackets.

When selecting socket wrenches and accessories for a particular operation, care should be taken to ensure that the drive size is adequate for the load requirement and that either the single or the bi-hexagonal socket is defined. In this respect note should be taken of the proof loads specified in the tables.

Ratchet handles should not be used for final tightening or initial releasing of tightened fasteners, since this may damage the square drive or mechanism. For precision tightening a torque wrench is recommended.

The illustrations in this standard are examples only and are not intended to affect manufacturers' designs.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Contents

	Page		Page
Foreword		Inside front cover	
Committees responsible		Back cover	
Specification			
1 Scope	2	13 Dimensions of sockets with 12.5 mm ($\frac{1}{2}$ in) square drives for metric hexagons	17
2 Definitions	2	14 Dimensions of sockets with 12.5 mm ($\frac{1}{2}$ in) square drives for Unified inch hexagons	18
3 Materials	2	15 Dimensions of sockets with 12.5 mm ($\frac{1}{2}$ in) square drives for B.S.F. and B.S.W. hexagons (BS 916 and BS 1083) and Whitworth hexagons	19
4 Hardness	2	16 Dimensions of long sockets with 12.5 mm ($\frac{1}{2}$ in) square drives for metric hexagons	20
5 Design and manufacture	2	17 Dimensions of long sockets with 12.5 mm ($\frac{1}{2}$ in) square drives for Unified inch hexagons	21
6 Finish	3	18 Dimensions of long sockets with 12.5 mm ($\frac{1}{2}$ in) square drives for B.S.F. and B.S.W. hexagons (BS 916 and BS 1083) and Whitworth hexagons	22
7 Dimensions and tolerances	3	19 Dimensions of bi-square sockets with 12.5 mm ($\frac{1}{2}$ in) square drives for normal inch series	23
8 Torque	4	20 Dimensions of sockets with 20 mm ($\frac{3}{4}$ in) square drives for metric hexagons	24
9 Gauging	4	21 Dimensions of sockets with 20 mm ($\frac{3}{4}$ in) square drives for Unified inch hexagons	25
10 Designation and marking	4	22 Dimensions of sockets with 20 mm ($\frac{3}{4}$ in) square drives for B.S.F. and B.S.W. hexagons (BS 916 and BS 1083) and Whitworth hexagons	26
Appendix		23 Dimensions of sockets with 25 mm (1 in) square drives for metric hexagons	27
A Torque test	5	24 Dimensions of sockets with 25 mm (1 in) square drives for Unified inch hexagons	28
Tables		25 Dimensions of sockets with 25 mm (1 in) square drives for B.S.F. and B.S.W. hexagons (BS 916 and BS 1083) and Whitworth hexagons	29
1 Minimum detachment forces for nominal size of drive	3	26 Dimensions of 'T' handle square drives	30
2 Dimensions of male square drive plug ends	6	27 Dimensions of swivel handle nut spinner	31
3 Dimensions of female square drive socket ends	7	28 Dimensions of extensions	32
4 Dimensions of sockets with 6.3 mm ($\frac{1}{4}$ in) square drives for metric hexagons	8	29 Dimensions of flexible extensions	33
5 Dimensions of sockets with 6.3 mm ($\frac{1}{4}$ in) square drives for Unified inch hexagons	9	30 Dimensions of universal joints	34
6 Dimensions of sockets with 6.3 mm ($\frac{1}{4}$ in) square drives for B.S.F. and B.S.W. hexagons (BS 916 and BS 1083) and Whitworth hexagons	10	31 Dimensions of speed braces	35
7 Dimensions of sockets with 6.3 mm ($\frac{1}{4}$ in) square drives for B.A. hexagons (BS 57)	11	32 Dimensions of ratchet handles	36
8 Dimensions of sockets with 10 mm ($\frac{3}{8}$ in) square drives for metric hexagons	12	33 Dimensions of spinner handles	37
9 Dimensions of sockets with 10 mm ($\frac{3}{8}$ in) square drives for Unified inch hexagons	13	34 Dimensions of ratchet unit adaptors	38
10 Dimensions of sockets with 10 mm ($\frac{3}{8}$ in) square drives for B.S.F. and B.S.W. hexagons (BS 916 and BS 1083) and Whitworth hexagons	14	35 Dimensions of solid converters	39
11 Dimensions of long sockets with 10 mm ($\frac{3}{8}$ in) square drives for metric hexagons	15		
12 Dimensions of long sockets with 10 mm ($\frac{3}{8}$ in) square drives for Unified inch hexagons	16		

Specification

1 Scope

This British Standard specifies dimensional, testing and design requirements for hand operated square drive socket wrenches and accessories for metric, Unified inch and British Standard hexagonal sizes of bolts, nuts and machine screws specified in BS 57, BS 916, BS 1083, BS 1768, BS 1769, BS 1981, BS 3139, BS 3692, BS 4183, BS 4190, BS 4395, ISO 272 and for aerospace series hexagonal headed bolts specified in British Standards 2A 24; 2A 25; 2A 26; 2A 27; 2A 29; 2A 30; 2A 57; 2A 58; 2A 59; 2A 60; 2A 61; 3A 102; 3A 103; 3A 104; 3A 105; 3A 107; 3A 108; 2A 109; 2A 110; 3A 111; and nuts specified in 3A 125 to 3A 132, 3A 136 to 3A 143, 3A 147 to 3A 168, 3A 180, 3A 181, 3A 186, 3A 187, 3A 192, 3A 193, 3A 200, 3A 201, 2A 213 to 2A 216; 2A 210; A 233–A 236; A 237–A 240; A 242; A 246; A 249 and A 250–A 253.

NOTE. The titles of the publications referred to in this standard are listed on the inside back cover.

2 Definitions

For the purpose of this British Standard, the following definitions apply.

2.1 socket wrench. A wrench consisting of the assembly of a socket with its driving components, designed solely for the purpose of applying a torque to screwed fasteners with hexagonal or square heads.

2.2 socket. A steel component of cylindrical form having at one end a female form to suit the head of a screwed fastener and at the other end a female driven square for receipt of the male square on a driving component.

2.3 drive. An arrangement whereby a male driving square fits into a female driven square in such a manner that abutment between the surfaces on the male square and corresponding surfaces in the female square prevents either member from rotating separately and enables torque applied to one member to be transmitted to the other member.

2.4 bi-hexagon. Two internal hexagons formed coaxially at 30° radial displacement to each other.

2.5 bi-square. Two internal squares formed coaxially at 45° radial displacement to each other.

2.6 retaining device. A means of ensuring that the socket is retained on the driving square when a socket wrench is assembled. Two types can be used:

(a) a detachable retaining device, consisting of a spring loaded ball or plunger fitted to one face of the square drive plug and engaging in a groove or hole in the driven square of the socket and detachable in accordance with 5.1.3;

(b) a lock-on retaining device, consisting of a spring loaded plunger fitted to one face of the male square drive and engaging in a hole in the female driven square of the socket, thus giving a positive lock-on facility detachable only by depressing the plunger through the hole in the side of the socket to obtain release in accordance with 5.1.4.

2.7 'T' handle square drive. A male driving square having an eye through which a torque bar slides.

2.8 swivel handle nut spinner. A male driving square to which a steel bar is hinged.

2.9 extension bar. A bar having a male driving square at one end and a female driven square at the other, the component being designed to form an extension coupling piece between a socket and a drive attachment.

2.10 flexible extension. An extension intended to serve a similar purpose to an extension bar, but so designed that the driving ends are joined to a flexible extension component.

2.11 universal joint square drive. A universal joint one component of which has a female driven square and the other component a male driving square.

2.12 speed brace. A cranked bar having a male driving square at one end for driving a socket, and a hand grip at the other. The axis of the hand grip is coincidental with the driving square.

2.13 ratchet handle. A means of applying a driving torque to a threaded fastener in one direction so that, when the handle is rotated in the opposite direction, it does not apply any significant reverse torque to the threaded fastener.

NOTE. Thus the driving torque may be reapplied at pre-determined angular positions of the ratchet handle and complete rotation of the threaded fastener can be effected without the need for complete rotation of the ratchet handle.

2.14 spinner handle. A component consisting of a bar having a male driving square formed integrally at one end and a hand grip at the other.

2.15 adaptor. A component for connecting different drive sizes.

3 Materials

Hand operated square drive socket wrenches and accessories shall be manufactured from any alloy steel having the mechanical properties required to ensure that the wrenches and accessories satisfy the requirements of this standard.

4 Hardness

Sockets and accessories shall have hardness values within the range 39 HRC to 46 HRC inclusive.

5 Design and manufacture

5.1 General requirements

5.1.1 The sockets, and all accessories shall be free from cracks, flashes, scale and other deleterious defects.

5.1.2 The socket openings shall be formed centrally within the body of the socket.

NOTE. The outer end of the hexagon, bi-hexagon or bi-square opening may be slightly chamfered at a 120° inclusive angle from the across-corners dimension to facilitate engagement onto the fastener

5.1.3 Form A detachable sockets and accessories shall be so designed and manufactured that the male square drive can be readily inserted into the corresponding female square drive. Each male square drive shall be fitted with a retaining device in the form of a spring loaded ball and each female square drive shall have a hole or groove in one or more faces, for the purpose of accepting the locking ball.

The minimum force required to detach a socket from a component of corresponding drive size shall be in accordance with table 1. The minimum detachment force shall be met with the locking device engaged under any combination of the specified dimensions (see table 2).

Table 1. Minimum detachment forces for nominal size of drive		
Nominal size of drive		Minimum detachment force
mm	in	N
6.3	1/4	9
10	3/8	18
12.5	1/2	27
20	3/4	44
25	1	53

NOTE. The force values do not include the weight of the socket or component.

5.1.4 Form B lock-on sockets and accessories shall be so designed and manufactured that the male square drive can be readily inserted into the corresponding female square drive. Each male square drive shall be fitted with a retaining device in the form of a spring loaded plunger and each female square drive shall have a hole in one or more faces, for the purpose of accepting the locking device and ensuring that the socket can only be detached by depressing the plunger through the hole in the side of the socket to obtain release.

5.2. Individual requirements

5.2.1 'T' handle square drive. The driving member shall have a hole bored at 90° relative to the longitudinal axis of the male square drive to accept the handle.

5.2.2 Swivel handle. The handle shall be permanently hinged to the driving member in such a manner that torque can be transmitted to an attached socket through 360° when the handle is offset from the longitudinal axis of the driving member and socket by any amount not exceeding 90°.

5.2.3 Extension bar. The extension bar shall have a male square drive at one end and a female square drive at the other.

5.2.4 Flexible extension. The extension shall have a male square drive at one end and a female square drive at the other, and shall be so designed and manufactured that torque can be transmitted through 360° to an attached socket when either drive member is offset from the common longitudinal axis of the extension by any amount up to 45°.

The extension shall be capable of being bent through 90° and returned to the free position without suffering permanent distortion or damage.

5.2.5 Universal joint. The joint shall have a male square at one end hinged to a female square at the other and shall be so designed and manufactured that torque can be transmitted through 360° to an attached socket when the drive is offset from the common axis of the joint components by any amount not exceeding 45°.

5.2.6 Speed brace. The brace shall have a male square drive at one end and a handgrip at the other.

NOTE. The handgrip may be of tubular rotating form. The cranked portion of the brace may also carry a rotatable handgrip.

5.2.7 Ratchet handle. The ratchet mechanism shall be either integral with, or detachable from, the handle. The mechanism shall comprise a hardened ratchet toothed gear, mounted on the male square and in engagement with a hardened pawl or pawls. The gear and pawls shall be totally enclosed. The mechanism shall be designed to permit torque to be applied in either direction of rotation.

6 Finish

All sharp edges shall be removed and wrenches shall be free from cracks, burrs and any other defects which may adversely affect the performance of the wrench or may, during proper use of the wrench, give rise to the risk of injury to the operator. Any protective finish shall, where applicable, be in accordance with the appropriate British Standard.

7 Dimensions and tolerances

7.1 The dimensions and tolerances of sockets shall be as specified in the following tables.

Male square drive plug ends Table 2

Female square drive plug ends Table 3

Sockets with 6.3 mm (1/4 in) square drives

Metric	Table 4	Range 3.2	to 15.0
Unified inch	Table 5	Range 3/16	to 1/2
BS and Whitworth	Table 6	Range 1/4	to 3/16 BS
B.A.	Table 7	Range 0	to 8

Sockets with 10 mm (3/8 in) square drives

Metric	Table 8	Range 7	to 22
Unified inch	Table 9	Range 5/16	to 7/8
BS and Whitworth	Table 10	Range 1/4	to 1/2 BS

Sockets (deep) with 10 mm (3/8 in) square drives

Metric	Table 11	Range 7	to 22
Unified inch	Table 12	Range 3/8	to 7/8

Sockets with 12.5 mm (1/2 in) square drives

Metric	Table 13	Range 10	to 32
Unified inch	Table 14	Range 3/8	to 1 1/4
BS and Whitworth	Table 15	Range 1/2	to 1 1/2 BS

Sockets (deep) with 12.5 mm ($\frac{1}{2}$ in) square drives

Metric	Table 16	Range 10	to 32
Unified inch	Table 17	Range $\frac{1}{2}$	to $1\frac{1}{8}$
BS and Whitworth	Table 18	Range $\frac{1}{4}$	to $1\frac{1}{16}$ BS

Bi-square sockets with 12.5 mm ($\frac{1}{2}$ in) square drives

Unified inch	Table 19	Range $\frac{3}{8}$	to $1\frac{5}{16}$
--------------	----------	---------------------	--------------------

Sockets with 20 mm ($\frac{3}{4}$ in) square drives

Metric	Table 20	Range 21	to 55
Unified inch	Table 21	Range $\frac{3}{4}$	to $2\frac{1}{4}$
BS and Whitworth	Table 22	Range $\frac{7}{16}$	to $1\frac{1}{2}$ BS

Sockets with 25 mm (1 in) square drives

Metric	Table 23	Range 36	to 80
Unified inch	Table 24	Range $1\frac{5}{16}$	to $2\frac{15}{16}$
BS and Whitworth	Table 25	Range $\frac{7}{8}$	to $2\frac{1}{4}$ BS

7.2 The dimensions of driving handles and components shall be as specified in the following tables.

'T' handle square drive	Table 26
Swivel handle nut spinners	Table 27
Extension bars	Table 28
Flexible extensions	Table 29
Universal joint square drives	Table 30
Speed braces	Table 31
Ratchet handles	Table 32
Spinner handles	Table 33
Ratchet unit adaptors	Table 34
Convertors	Table 35

8 Torque

When tested in accordance with appendix A, sockets and accessories shall show no sign of distortion and visual examination shall reveal no sign of cracks, damage or other defects.

9 Gauging

Across flats dimensions of bi-hexagonal and hexagonal sockets and driving accessories shall be measured by means of a hexagon go/no go plug gauge and square and bi-square sockets and driving accessories shall be measured by a square go/no go plug gauge.

10 Designation and marking

Each socket and driving component shall be plainly and indelibly marked with the manufacturer's name or trademark.

Sockets shall also be marked with the designating size in accordance with the following.

(a) Sockets for metric or Unified inch hexagons and squares. The marking shall be the nominal size across flats of the hexagon in millimetres or imperial as appropriate, e.g. metric: 10 mm; or imperial: $\frac{1}{2}$ A/F.

(b) All sockets for B.S.F. and B.S.W. hexagons complying with BS 1083 and BS 916 shall be marked with a fraction representing the nominal diameter of a bolt having a head the dimensions of which are specified in either BS 1083 or BS 916. This shall be followed by the symbol BS, e.g. $\frac{3}{8}$ BS.

In addition, it is permissible to mark B.S.F. and B.S.W. hexagons with a second fraction representing the nominal diameter of a bolt having a head, the dimensions of which correspond with those of the Whitworth hexagon sizes. This shall be followed by the symbol W, e.g.

$\frac{3}{8}$ BS

$\frac{5}{16}$ W

(c) Sockets for B.A. hexagons complying with BS 57 shall be marked with the appropriate designating number followed by the symbol B.A., e.g. 2 B.A., 6 B.A.

Appendix

Appendix A. Torque test

A.1 Test blocks and bars

All test blocks and bars shall be heat treated to give a hardness of not less than 55 HRC.

The across flats size of test blocks shall be equal to the nominal dimension across flats of the bolt head, as specified in tables 4 to 25.

The across flats size of test bars shall be equal to the maximum across flats dimension of the appropriate male square drive as specified in table 2.

A.2 Sockets

Place the socket on a rigidly held test block of hexagonal or square section, whichever is appropriate.

Insert a square test bar into the driving square of the socket and apply the proof torque appropriate to the nominal size of socket as given in tables 4 to 25 to the socket through the medium of the test bars.

A.3 Accessories

A.3.1 General

Insert the male square drive of each accessory into a female square formed in a rigidly held test block.

The across flats dimensions and depth of the female square shall be equal to the maximum dimensions appropriate to the nominal size of female square of the socket for which the accessory under test is suitable (see table 3).

Apply the proof torque appropriate to the type and size of accessory, as given in tables 26 to 35, in both directions of rotation to the accessory through whichever of the media described in A.3.2 to A.3.9 is applicable.

A.3.2 Attachments having a male square drive at one end and a female square drive at the other

Apply the torque through the medium of a test bar inserted into the female square drive.

A.3.3 Flexible extensions and universal joints

Apply the torque as described in A.3.2 with the male and female components of the attachment offset at the maximum operating angle as given in 5.2.4 and 5.2.5.

A.3.4 Attachments having a male square drive at one end and a torque bar hole at the other

Apply the torque through the medium of a torque bar of appropriate length inserted into the hole.

A.3.5 'T' handle square drive

Apply the torque by means of the handle.

A.3.6 Spinner handle

Apply the torque through the medium of a torque bar rigidly clamped to the handgrip.

A.3.7 Speed brace

Apply the torque by direct application to the cranked portion of the brace, with the rotating handgrip firmly supported.

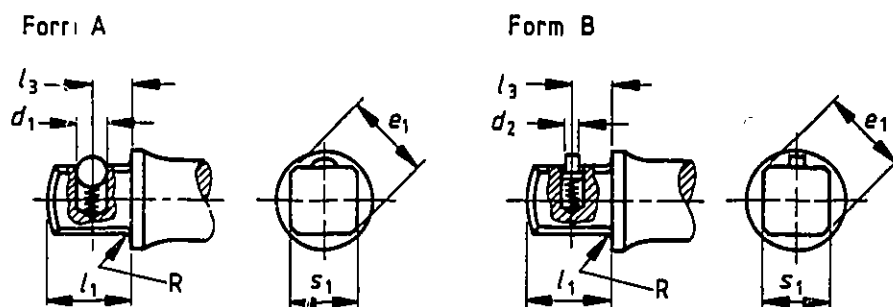
A.3.8 Swivel handle nut spinner flex head

Apply the torque by means of the handle. The load shall be applied with the handle at the maximum operating angle as given in 5.2.2.

A.3.9 Ratchet handle

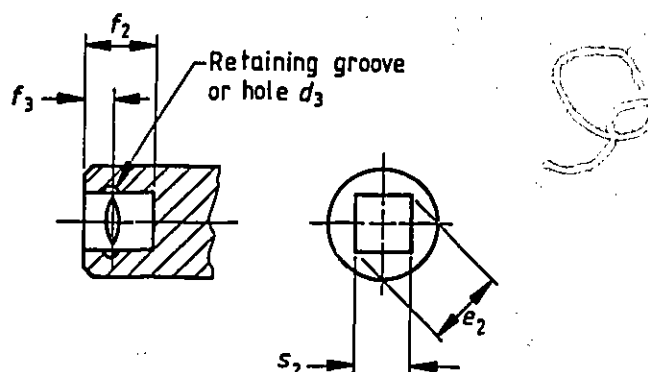
Apply the torque by means of the handle which forms part of the tool.

Table 2. Dimensions of male square drive plug ends

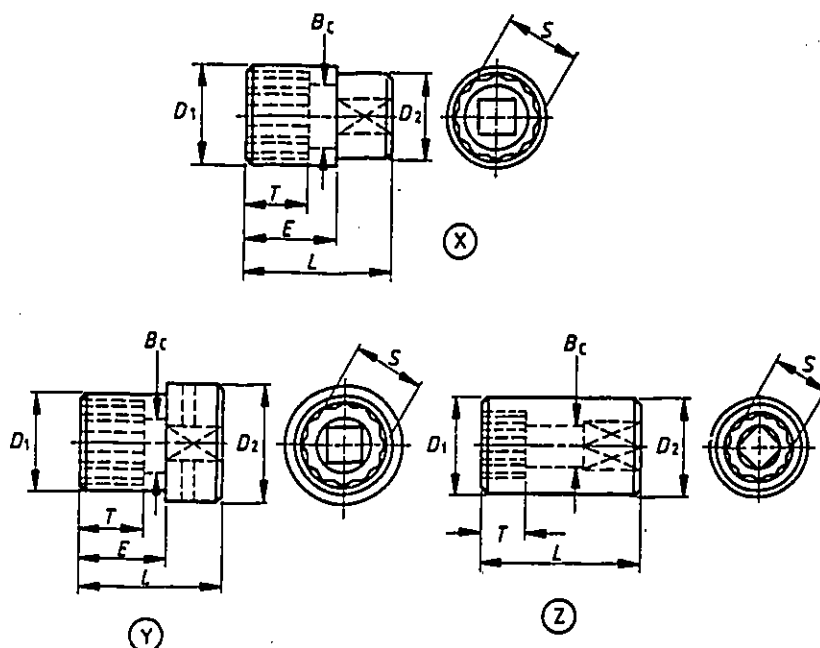


1	2	3	4	5	6	7	8	9	10	11	12
Nominal square drive across flats	Across flats s_1		Across corners e_1		Length l_1		Ball or plunger to shoulder l_3		Form A ball nominal diameter d_1	Form B lock-on plunger diameter d_2	Radius
	min.	max.	min.	max.	min.	max.	min.	max.		max.	min.
mm (in) 6.3 ($1/4$)	mm 6.260	mm 6.350	mm 8.0	mm 8.4	mm 7.1	mm 7.5	mm 3.82	mm 4.18	mm 3	mm 2.0	mm 0.5
10 ($3/8$)	9.435	9.525	12.2	12.7	10.3	11.0	5.32	5.68	5	2.6	0.6
12.5 ($1/2$)	12.590	12.700	16.3	16.9	14.3	15.5	7.80	8.22	6	3.0	0.8
20 ($3/4$)	18.920	19.050	24.4	25.4	19.0	23.0	9.93	10.47	7	4.3	1.2
25 (1)	25.270	25.400	32.4	34.0	25.4	28.0	14.73	15.27	7	5.0	1.6

Table 3. Dimensions of female square drive socket ends

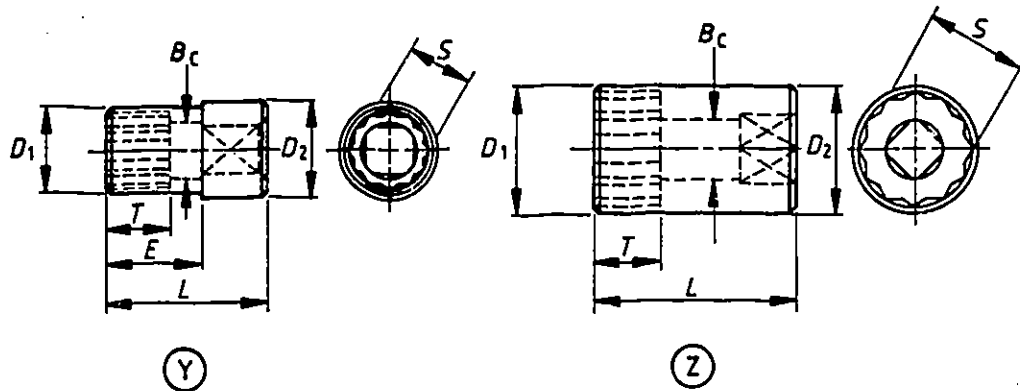


1	2	3	4	5	6	7	8
Nominal square drive across flats	Across flats s_2		Across corners e_2	Full square depth f_2	Face to hole or groove f_3		Hole diameter for lock on d_3
	min.	max.			min.	max.	
mm (in)	mm	mm	mm	mm	mm	mm	mm
6.3 ($\frac{1}{4}$)	6.405	6.625	8.5	8.0	3.82	4.18	2.65
10 ($\frac{3}{8}$)	9.580	9.800	12.9	11.5	5.32	5.68	4.3
12.5 ($\frac{1}{2}$)	12.755	13.025	17.1	16.0	7.80	8.22	5.6
20 ($\frac{3}{4}$)	19.105	19.435	25.6	24.0	9.93	10.47	6.0
25 (1)	25.455	25.785	34.3	29.0	14.73	15.27	6.5

Table 4. Dimensions of sockets with 6.3 mm ($\frac{1}{4}$ in) square drives for metric hexagons

1	2	3	4	5	6	7	8	9	10	11
Key	Nominal sizes across flats	Across flats		Outside diameter socket and D_1	Outside diameter square drive and D_2	Depth T	Overall length L	Turning moment for proof test	Turn down length hexagon and E	Bolt clearance B_C
		S	S							
		min.	max.	max.	max.	min.	max.	min.	min.	min.
Y	mm	mm	mm	mm	mm	mm	mm	N·m	mm	mm
Y	3.2	3.22	3.33	5.9	12.7	1.6	25	7.08	5.0	2.5
Y	4.0	4.02	4.15	6.9	12.7	2.0	25	10.4	5.0	3.0
Y	4.5	4.52	4.65	7.5	12.7	2.3	25	12.6	5.0	3.5
Y	5.0	5.02	5.15	8.2	12.7	2.5	25	15.1	5.0	3.5
Y	5.5	5.52	5.65	8.8	12.7	3.0	25	18.0	5.5	4.0
Y	6.0	6.03	6.18	9.4	12.7	3.3	25	21.0	5.5	4.0
Y	7.0	7.03	7.18	11.0	12.7	4.0	25	27.0	6.0	5.0
Y	8.0	8.03	8.18	12.2	12.7	5.0	25	34.0	7.0	6.0
Y	9.0	9.03	9.18	13.5	14.0	5.0	25	41.0	7.0	6.0
Y	10.0	10.04	10.24	14.7	15.0	6.0	25	49.0	7.0	7.0
Z	11.0	11.04	11.24	16.0	16.0	7.0	25	58.0	—	8.0
Z	12.0	12.04	12.30	17.0	17.0	8.0	25	67.0	—	8.0
Y	13.0	13.04	13.30	18.5	19.0	8.0	25	69.0	—	9.0
Y	14.0	14.05	14.35	19.7	20.0	10.0	25	69.0	—	9.0
X	15.0	15.05	15.35	20.9	20.0	10.0	25	69.0	—	11.0

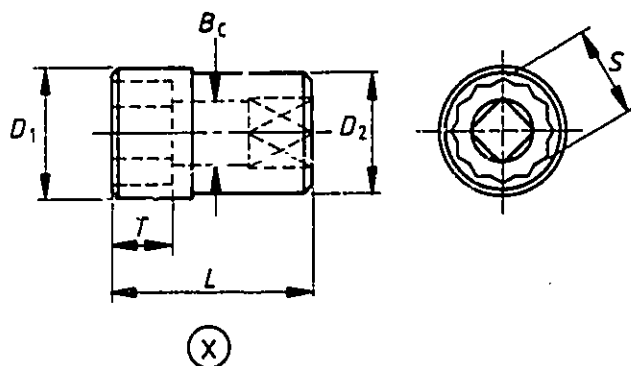
NOTE. Sockets may be supplied with either single hexagons or bi-hexagons (see foreword).

Table 5. Dimensions of sockets with 6.3 mm ($\frac{1}{4}$ in) square drives for Unified inch hexagons

1	2	3	4	5	6	7	8	9	10	11
Key	Nominal sizes across flats	Across flats		Outside diameter socket end D_1	Outside diameter square drive end D_2	Depth	Overall length	Turning moment for proof test	Turn down length hexagon end E	Bolt clearance B_c
		S								
		min.	max.	max.	max.	min.	max.	min.	min.	min.
Y	in $\frac{3}{16}$	0.189	0.194	7.9	12.7	2.5	25	14	5.0	3.0
Y	in $\frac{1}{4}$	0.251	0.257	9.8	12.7	3.5	25	23	5.5	5.0
Y	in $\frac{5}{16}$	0.314	0.320	12.1	12.7	5.0	25	33	7.0	6.0
Y	in $\frac{11}{32}$	0.345	0.351	13.1	14.0	5.0	25	39	7.0	6.0
Y	in $\frac{3}{8}$	0.376	0.382	14.1	15.0	6.0	25	45	7.0	7.0
Z	in $\frac{7}{16}$	0.440	0.447	16.0	16.0	7.0	25	59	—	7.5
Z	in $\frac{1}{2}$	0.502	0.512	18.0	18.0	8.0	25	69	—	9.0

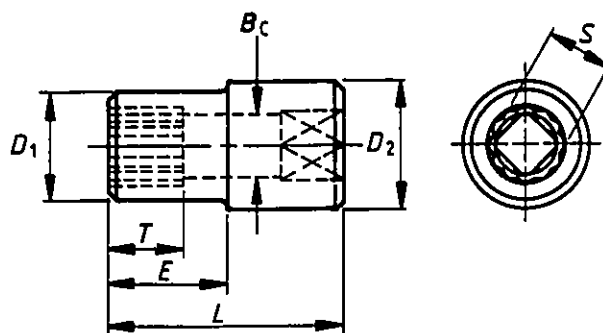
NOTE. Sockets may be supplied with either single hexagons or bi-hexagons (see foreword).

Table 6. Dimensions of sockets with 6.3 mm ($\frac{1}{4}$ in) square drives for B.S.F. and B.S.W. hexagons (BS 916 and BS 1083) and Whitworth hexagons



1	2	3	4	5	6	7	8	9	10	11
Key	Nominal size		Across flats		Outside diameter socket end D_1	Outside diameter square drive end D_2	Depth	Overall length	Turning moment for proof test	Bolt clearance
	BS 916 and BS 1083	Whitworth	S				T	L		B_c
			min.	max.	max.	max.	min.	max.	min.	min.
X	in	in	in	in	mm	mm	mm	mm	N·m	mm
X	$\frac{1}{4}$	$\frac{3}{16}$	0.448	0.451	16.2	16	7	25	62	7.5
X	$\frac{5}{16}$	$\frac{1}{4}$	0.529	0.533	18.7	18	7	25	68	9.0

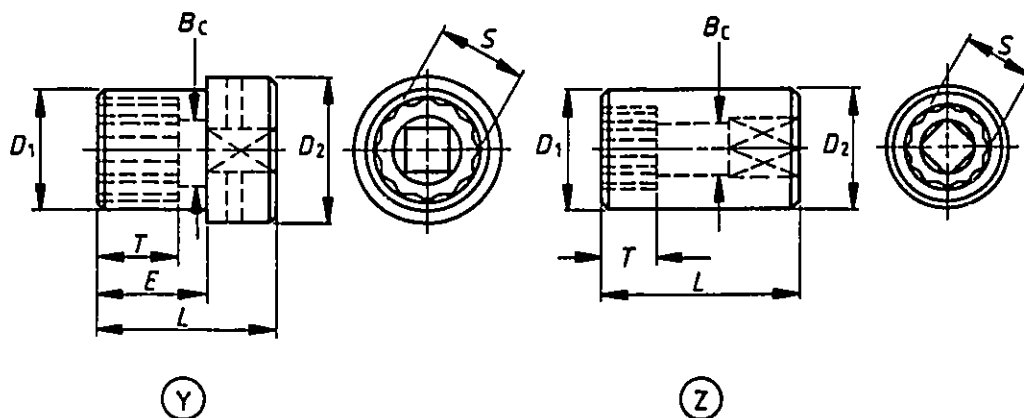
NOTE. Sockets may be supplied with either single hexagons or bi-hexagons (see foreword).

Table 7. Dimensions of sockets with 6.3 mm ($\frac{1}{4}$ in) square drives for B.A. hexagons (BS 57)

(Y)

1	2	3	4	5	6	7	8	9	10	11
Key	Nominal sizes across flats	Across flats		Outside diameter socket end D_1	Outside diameter square drive end D_2	Depth	Overall length	Turning moment for proof test	Turn down length hexagon end E	Bolt clearance
	B.A. No.	min.	max.	max.	max.	min.	max.	min.	min.	min.
		in	in	in	mm	mm	mm	N·m	mm	mm
Y	8	0.154	0.157	6.7	12.7	1.6	25	6.0	5.0	3.0
Y	7	0.174	0.177	7.4	12.7	2.3	25	8.5	5.0	3.5
Y	6	0.195	0.198	8.0	12.7	2.5	25	14.0	5.0	3.5
Y	5	0.222	0.225	8.9	12.7	3.0	25	17.0	5.5	4.0
Y	4	0.250	0.253	9.8	12.7	3.5	25	23.0	5.5	5.0
Y	3	0.284	0.287	11.2	12.7	4.0	25	28.0	6.0	5.0
Y	2	0.326	0.329	12.5	12.7	5.0	25	34.0	7.0	6.0
Y	1	0.367	0.370	13.8	14.0	5.0	25	62.0	7.0	7.0
Y	0	0.415	0.418	15.3	16.0	7.0	25	62.0	8.0	7.0

NOTE. Sockets may be supplied with either single hexagons or bi-hexagons (see foreword).

Table 8. Dimensions of sockets with 10 mm ($\frac{3}{8}$ in) square drives for metric hexagons

1	2	3	4	5	6	7	8	9	10	11
Key	Nominal sizes across flats	Across flats		Outside diameter socket end D_1	Outside diameter square drive end D_2	Depth	Overall length	Turning moment for proof test	Turn down length hexagon end E	Bolt clearance
		S				T	L			B_c
		min.	max.	max.	max.	min.	max.	min.	min.	min.
Y	mm	mm	mm	mm	mm	mm	mm	N·m	mm	mm
Y	7	7.03	7.18	11.0	20.0	4	32	33	5	5
Y	8	8.03	8.18	12.2	20.0	5	32	46	5	6
Y	9	9.03	9.18	13.5	20.0	5	32	60	6	6
Y	10	10.04	10.24	14.7	20.0	6	32	77	7	7
Y	11	11.04	11.24	16.0	20.0	7	32	96	7	8
Y	12	12.04	12.30	17.2	20.0	8	32	120	7	8
Y	13	13.04	13.30	18.5	20.0	8	32	145	7	9
Y	14	14.05	14.35	19.7	20.0	10	32	170	7	9
Z	15	15.06	15.35	21.0	21.0	10	35	200	—	11
Y	16	16.06	16.35	22.2	23.0	10	35	225	8	11
Y	17	17.06	17.40	23.5	24.0	10	35	225	8	11
Z	18	18.06	18.40	24.7	24.7	12	35	225	—	13
Z	19	19.06	19.46	26.0	26.0	12	35	225	—	13
Z	21	21.06	21.46	26.5	28.5	12	35	225	—	13
Z	22	22.06	22.46	29.7	29.7	14	38	225	—	13

NOTE. Sockets may be supplied with either single hexagons or bi-hexagons (see foreword).