इंटरनेट मानक

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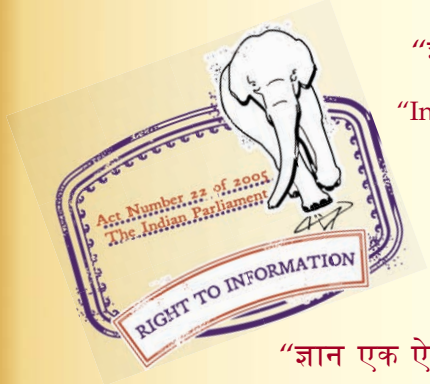
IS 7993 (1988): Power Operated Square Drive Socket Wrenches (Impact) [PGD 5: Assembly Hand Tools]



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Satyanarayan Gangaram Pitroda
"Invent a New India Using Knowledge"

"ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है"
Bhartṛhari—Nītiśatakam
"Knowledge is such a treasure which cannot be stolen"

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Indian Standard (Reaffirmed 2003)

SPECIFICATION FOR POWER OPERATED SQUARE DRIVE SOCKET WRENCHES (IMPACT)

(First Revision)

Hand Tools Sectional Committee, EDC 12; Spanners and Pliers Subcommittee, EDC 12 : 7 [Ref : Doc : EDC 12 (4735)]

1. Scope — Covers the requirements for power operated square drive socket wrenches (impact), having hexagonal separating end.

2. Dimensions

2.1 *Square Drive Socket* — Shall be as given in Table 1.

2.2 *Connecting Pin and O-Ring* — Shall be as given in Table 2.

2.3 *Tolerance on Width Across Flat* (*s*) — Tolerances on width across flats *s* shall be in conformity with the tolerances for socket openings given in IS : 2027-1980 'Width across flats for spanners and sockets (*second revision*)'. The manufacturers are free to choose the series of deviations.

3. Material

3.1 *Square Drive Socket* — Suitable alloy steels, meeting the requirements laid down in **4**.

Example:

T50Cr4V2 of IS : 3749-1978 'Specification for tool and die steel for cold work (*first revision*)'

3.2 *Connecting Pin* — Steel to designation 13S25 of IS : 4431-1978 'Specification for carbon and carbon-manganese free cutting steels (*first revision*)'. Content of lead shall be between 0·15 and 0·30 percent.

3.3 *O-Ring* — Oil resistant rubber with hardness 70 *IRHD* [*see* IS : 3400 (Part 2)-1965 Method of test for vulcanized rubbers: Part 2 Hardness].

4. Hardness

For Driving Square Size, mm	Hardness, *HRC*	
	Min	*Max*
6·3, 10, 12·5, 16 and 20	38	50
25 and 40	35	48

5. Workmanship and Finish

5.1 Square drive sockets shall be free from burrs, scales and cracks.

5.2 The sockets shall be given any suitable anti-corrosive coating. The type of anti-corrosive coating shall depend upon the manufacturer, unless specifically indicated by the user.

5.2.1 The following plating thicknesses in case of nickel-chromium and cadmium plating are considered suitable:

" Nickel-chromium plating	5 μm, *Min*, thickness of nickel coating [*see* IS : 1068-1985 Specification for electroplated coatings of nickel plus chromium and copper plus nickel plus chromium on iron and steel (*second revision*)].
Cadmium plating	8 μm, *Min*, thickness of cadmium coating [*see* IS : 1572-1968 Specification for electroplated coatings of cadmium on iron and steel (*first revision*)].

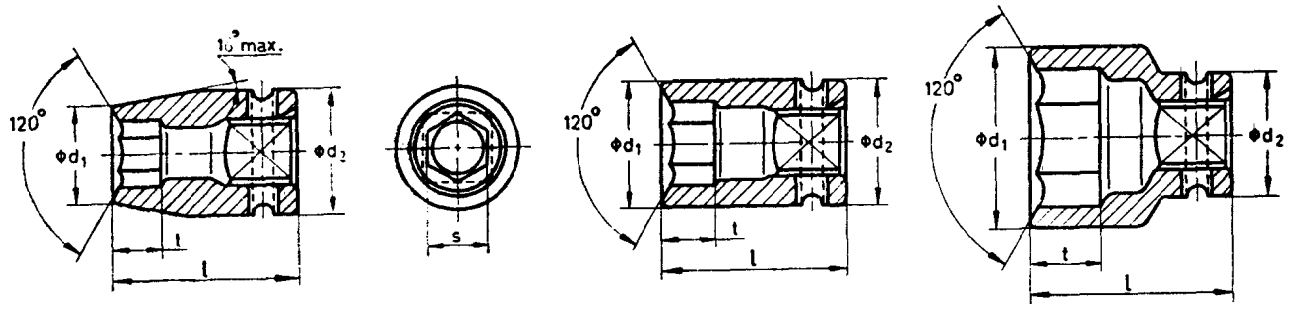
Adopted 7 July 1988

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

TABLE 1 DIMENSIONS FOR POWER-OPERATED SQUARE DRIVE SOCKET WRENCHES

(*Clause* 2.1)

All dimensions in millimetres.



$d_1 < d_2$ $d_1 = d_2$ $d_1 > d_2$

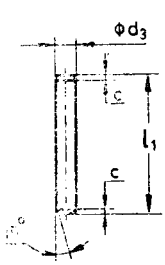
Nominal Size S*	t Min	Driving square†																					
		6·3			10			12·5			16			20			25			40		
		d_1 Max	d_2 Max	l Max	d_1 Max	d_2 Max	l Max	d_1 Max	d_2 Max	l Max	d_1 Max	d_2 Max	l Max	d_1 Max	d_2 Max	l Max	d_1 Max	d_2 Max	l Max	d_1 Max	d_2 Max	l Max
3·2	1·1	6·8	14	25																		
4	1·4	7·8																				
5	1·7	9·1																				
5·5	2·1	9·7																				
(6)	2·4	10·3																				
7	2·8	11·6			12·8	20	34	15·3	28	40												
8	3·5	12·8			14·1			16·5														
(9)	3·5	14·1	16		15·3			17·8														
10	4·2	15·3			16·6			19·0														
11	4·9	16·6			17·8			20·3														
(12)	5·6	17·8			19·1			21·5			25·0	35	48	32·4	48	51						
13		19·1			20·3	28		22·8	37		26·3			33·6								
(14)					21·6			24·0			27·5			36·1								
15	7·0				22·8			25·3			28·8			37·4								
16					24·1			26·5			30·0			39·9			46·7	58	60			
(17)					25·3			27·8			31·3			43·6		54	50·4		62			
18	8·4				26·6			29·0			33·8			47·4			52·9		63			
(19)					27·8			31·5			35·0			49·9			55·4					
21	9·8							32·8			37·5	42	51	52·4	58	57	57·9		67	64·2	86	78
(22)								35·3		45	41·3			54·9			64·2		70	70·4		80
24	11·2							39·0		50	45·0			61·1		58	70·4	68	76	76·7		84
27	12·6										47·5			67·4		63	75·4		82	81·7		88
30	14·0										50·0						81·7		87	87·9		90
(32)	15·4										52·5						87·9		91	94·2		95
34																	93		94	99·2		102
36	16·8																99·3		97	105·5		108
41	18·9																105·5		105	111·7		111
46	21·2																			118		115
50	23·1																			124·2		118
55	25·2																			130·5		127
60	27·3																			136·7		133
65	34																			143		140
70	36																			149·2		143
75	38																			155·5		146
80	42																			161·7		149
85	45																			168		152
90	48																			180·5		156
95	51																			186·7		160
100	54																					
105	58																					
110	61																					
115	64																					
120	68																					
130	72																					
135	76																					

*Nominal Size s is the nominal width across flats of the hexagonal operating end.
†According to IS : 7996-1976 'Driving Squares for power socket wrenches'.
Note — Nominal Size given in parenthesis ( ) are non-preferred.

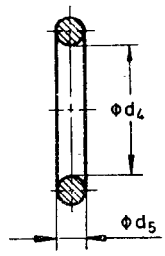
TABLE 2 DIMENSIONS FOR CONNECTING PIN AND O-RING FOR THE USE OF POWER OPERATED SQUARE DRIVE SOCKET WRENCHES

(*Clause* 2.2)

All dimensions in millimetres.



CONNECTING PIN



O-RING

Driving Square* s_1		Connecting Pin			O-Ring	
		d_3 h11	l_1 js14	c Approx	d_4	d_5
6·3		1·5	10	0·3	9	2·5
10	$s \leq 12$	2·5	14	0·4	13	3·5
10	$s > 12$	2·5	16	0·4	16	3·5
12·5	$s \leq 14$	3	20	0·5	19	4
12·5	$s > 14$	3	25	0·5	24	4
16		3·5	30	0·5	28	4·5
20		4·5	35	0·63	36	5
25		5	45	0·8	45	7
40		6	75	1·2	75	10

*As per IS : 7996-1976 Driving Squares for power socket wrenches.

6. Designation

6.1 A power operated square drive socket wrench with hexagon of nominal size (nominal width across flats) 36 mm and used for 40 mm driving square shall be designated as:

Socket Wrench 36 × 40, IS : 7993

6.2 A power operated square drive socket wrench with hexagon of nominal size (nominal width across flats) 36 mm and used for 40 mm driving square with connecting pin and O-ring shall be designated as:

Socket Wrench 36 × 40 C, IS : 7993

6.3 A connecting pin of diameter d_3 = 3 mm and length l_1 = 30 mm, shall be designated as:

Connecting Pin 3 × 30, IS : 7993

6.4 An O-ring of diameter d_4 = 28 mm, shall be designated as:

O-Ring 28, IS : 7993

7. Packing

Each socket or a number of sockets may be wrapped in non-absorbent paper and packed in a carton.

8. Sampling

8.1 *Lot* — All the power operated square drive socket wrenches of the same type and size in a consignment shall be grouped together to constitute a lot.

8.2 Unless otherwise agreed to between the buyer and the seller, the procedure given in IS : 2500 (Part 1)-1973 'Sampling inspection tables· Part 1 Inspection by attributes and by count of defects (*first revision*)' shall be followed for sampling inspection.

8.2.1 To determine the conformity for the requirements of this standard, the single sampling plan corresponding to Inspection Level IV and Acceptable Quality Level (AQL) 2·5 percent given in Tables 1 and 2 of IS : 2500 (Part 1)-1973 shall be followed for sampling inspection.

9. Marking

Each socket wrench shall be marked with nominal size, that is, the width across flats, the size of the driving square, manufacturer's name, initials and/or recognized trade-mark.

9.1 *Standard Marking* — Details available with the Bureau of Indian Standards.

EXPLANATORY NOTE

The diameters d_1 at the operating end has been calculated on the basis of the following formula:

$$d_1, Max = 1{\cdot}25\ s\ Max + a$$

where

a is the drive margin and its values are as follows:

Driving Square s_1	Nominal Size, mm						
	6·3	10	12·5	16	20	25	40
Drive margin, *a* mm	2·5	3·6	4·8	6·8	9·0	11·8	18·0

The diameter d_2 at the drive end are stepped in a manner so as to reduce the number of connecting pins and O-rings.

The diameter for the free space behind the hexagon is roughly 1 mm less than the corresponding nominal width across flats. It shall not fall short of a certain minimum when cap nuts or castle nuts with neck are to be tightened.

The depth of the hexagon socket of the socket wrench has been calculated on the basis $t, Min = 0{\cdot}7\ d$, when d is the thread diameter of the corresponding hexagon head screw or hexagon nut.

No test criteria could be laid down in this standard because of the uncontrollable forces generated in the case of impact type drives and the difficulties of measurement when testing dynamically stressed socket wrenches.

The power socket wrenches have a through pin hole and a ring groove for seating an O-ring to hold the connecting pins. For safety reasons, the dimensions and material of the connecting pins and O-rings have been included in this standard.

This standard was first issued in 1976. The present revision has been taken up in order to include the sockets of nominal sizes 6, 9, 15, 16, 18, 21 and 34 mm, since these sizes are also prevalent in the country. Other sizes from 65 to 135 mm which also find prevalent use in the country, but not covered in ISO 2725-1987 have also been included.

While revising this standard, considerable assistance has been taken from the following standards:

ISO 2725-1987 — Assembly Tools for Screws and Nuts — Machine and Hand Operated, Square Drive Socket — Metric Series, issued by the International Organization for Standardization (ISO).

DIN 3129-1982 — Power Square Drive Socket Wrenches, issued by the Deutsches Institut für Normung.

Reprography Unit, BIS, New Delhi, India