भारतीय मानक

Indian Standard

IS 4123 : 2024

चेन पाइप रिंच — विशिष्टि

(दूसरा पुनरीक्षण)

Chain Pipe Wrenches — Specification

(Second Revision)

ICS 25.140.30

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September 2024 **Price Group 5**

Hand Tools Sectional Committee, PGD 34

FOREWORD

This Indian Standard (Second Revision) was adopted by the Bureau of Indian Standards after the draft finalized by the Hand Tools Sectional Committee had been approved by the Production and General Engineering Division Council.

This standard was first published in 1967 and was subsequently revised in 1982. This revision has been brought out to keep pace with the latest technological developments and international practices.

In this revision, the following changes have been made:

a) References have been updated;

b) Material designations have been updated as per the latest Indian Standard;

c) Clause on Hardness has been modified; and

d) Table 1 has been modified.

This standard covers the requirements for chain pipe wrenches. Basically, Chain pipe wrenches are generally employed for turning pipes of large diameters. This tool works in one direction only but may be turned back partly around the work and a fresh hold may be taken without forcing the chain. To reverse the operation, the grip is taken on the opposite side of the head. The head is double-ended and may be reversed when the teeth on one end are worn out.

The composition of the Committee, responsible for the formulation of this standard is given in Annex A.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 2022 ‘Rules for rounding off numerical values (*second revision*)’. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

CHAIN PIPE WRENCHES — SPECIFICATION

(Second Revision)

1 SCOPE

This standard specifies the requirements for chain pipe wrenches.

2 REFERENCES

The standards given below contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent edition of these standards:

IS No.	*Title*
IS 1239 (Part 1) : 2004	Steel tubes, tubulars and other wrought steel fittings — Specification (*sixth revision*)
IS 1367 (Part 3) : 2017/ISO 893-1 : 2013	Technical supply condition for threaded steel: Part 3 Mechanical properties of fasteners made of carbon steel and bolts, screws and studs (*fifth revision*)
IS 1501 (Part 1) : 2020/ ISO 6507-1 : 2018	Metallic materials — Vickers hardness test: Part 1 Test method (*fifth revision*)
IS 1570 (Part 2/Sec 1) : 1979	Schedules for wrought steels: Part 2 Carbon steels (unalloyed steels), Section 1 Wrought products (other than wires) with specified chemical composition and related properties (*first revision*)
IS 1865 : 1991	Iron castings with spheroidal or nodular graphite — Specification (*third revision*)
IS 2500 (Part 1) : 2000/ISO 2859-1 : 1999	Sampling procedure for inspection by attributes: Part 1 Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection (*third revision*)

3 TERMINOLOGY

For the purpose of this standard, the following definitions shall apply:

3.1 Nominal Size — It is the size (outside diameter) of the pipe for which the tool is designed.

3.2 Capacity — It is the minimum and maximum outside diameter of the pipe that shall be gripped with safety.

4 DIMENSIONS

The dimensions shall be as given in Table 1.

5 MATERIAL

5.1 Material for the construction of different components of chain pipe wrenches (general purpose) shall be as given in Table 2.

5.2 Chemical composition of 31CrV3 and 40Cr used in the handle and movable jaw shall be as given in Table 3.

6 HARDNESS

The hardness of jaws when measured at any point within half the depth of the tooth from the root of tooth as per IS 1501 (Part 1) shall not be less than 420 HV or 42 HRC.

Table 1 Dimensions for Chain Pipe Wrenches

(*Foreword* Clauses 4 *and* 7.1)

All dimensions are in millimetres.

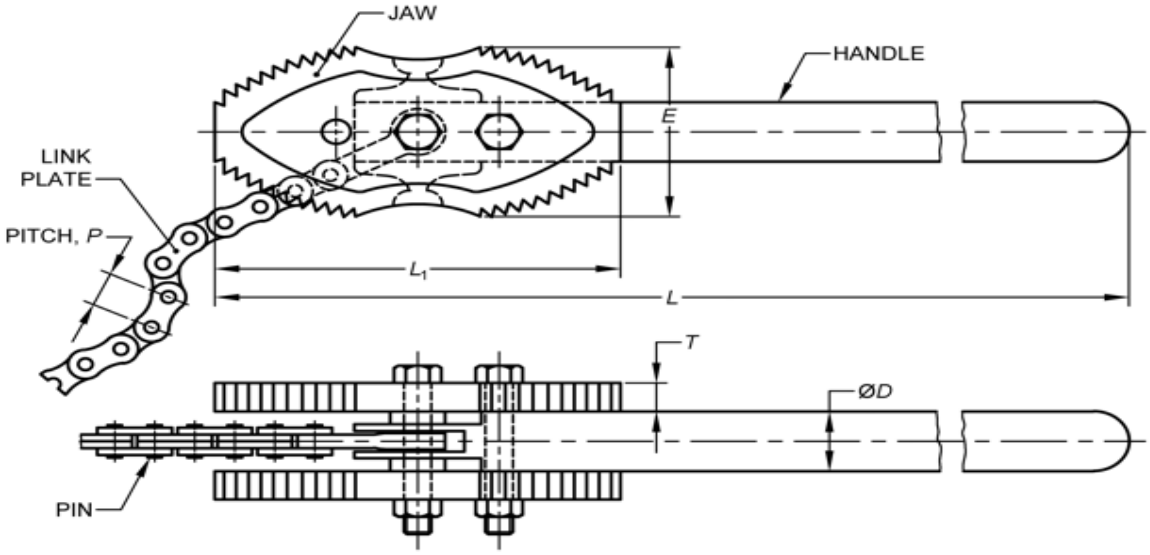

FIG. 1 SOLID HANDLE

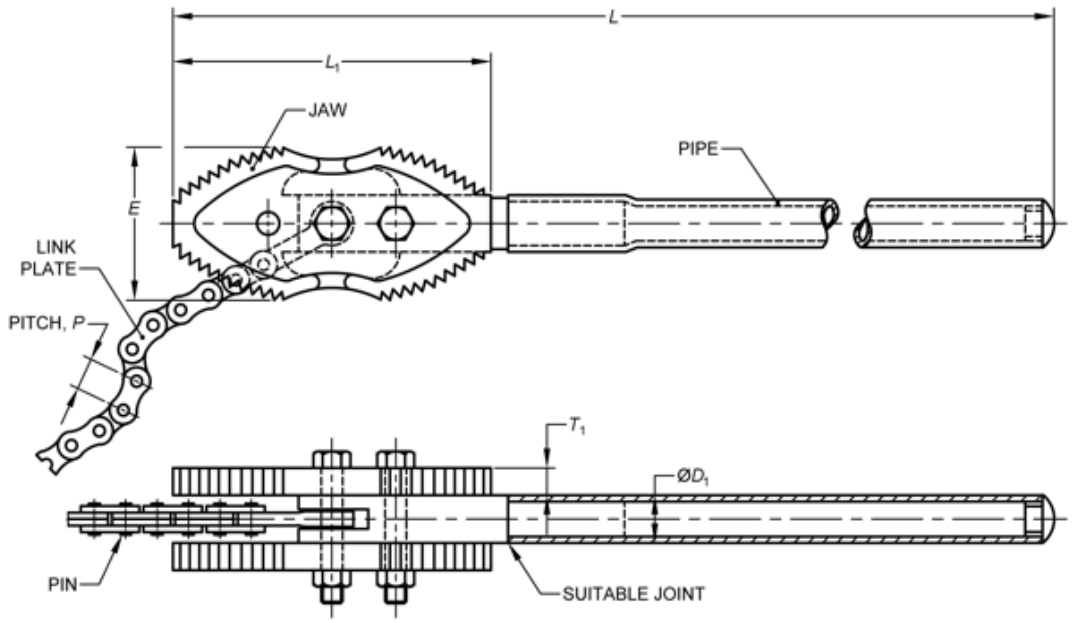

FIG. 2 HOLLOW HANDLE

Sl No.	Capacity		*L* ± 10	L_1 *Min*	*E* *Min*	*D* *Min* for solid handle	*T* *Min* for solid handle	D_1 *Min* for hollow handle	T_1 *Min* for hollow handle	Chain		Breaking Load
	Nominal Size	Range								Length *Min*	Pitch *P* *Min*	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
i)	50	10 to 60	510	125	55	22	9.5	26.5	2.6	385	19.05	3 500
ii)	80	15 to 90	710	150	60	28	11.0	26.5	2.6	465	19.05	3 500
iii)	100	27 to 115	920	170	75	28	11.5	33.3	3.2	565	25.40	3 600
iv)	150	35 to 165	1 100	180	80	30	13.5	33.3	3.2	800	25.40	4 000
v)	200	50 to 220	1 250	200	85	30	15.0	33.3	3.2	975	25.40	4 500
vi)	250	50 to 250	1 435	225	95	32	15.5	33.3	4.0	1 050	31.75	5 000
vii)	300	50 to 300	1 610	250	105	32	16.5	33.3	4.0	1 350	31.75	6 000
viii)	350	50 to 350	1 715	240	105	32	17.5	42.0	4.0	1 625	31.75	6 000
ix)	400	75 to 400	1 870	290	120	34	17.5	42.0	4.0	1 850	31.75	6 000
x)	450	75 to 450	1 930	290	120	34	17.5	42.0	4.0	2 150	31.75	6 000
xi)	600	100 to 600	1 950	330	140	38	20	47.9	4.0	2 425	31.75	6 000
xii)	900	150 to 900	2 050	330	140	38	20	47.9	4.0	3 225	31.75	6 000
xiii)	1 200	200 to 1 200	2 150	330	140	38	20	47.9	4.0	4 225	31.75	6 000

Table 2 Material Used for Various Parts of Chain Pipe Wrenches (General Purpose)

(*Clause* 5.1)

Sl No.	Component	Material
(1)	(2)	(3)
i)	Handle	20C8, 25C4, 25C8 of IS 1570 (Part2/Sec 1), SG Iron grade SG 500/7, 450/10 of IS 1865 or Steel tube of IS 1239 (Part-1)
ii)	Jaw	35C4, 45C8, 50C4, 55C4 of IS 1570 (Part 2/Sec 1), 31CrV3 or 40 Cr and for large diameter above 200 mm nominal size chain pipe wrench Jaw shall be made from SG Iron grade SG 500/7, 450/10 of IS 1865 duly hardened
iii)	Bolt	Property class 8.8 or higher grade of IS 1367 (Part 3)

Table 3 Chemical Composition of Steel Grades

(*Clause* 5.2)

Sl No.	Grade	C	Si	Mn	S *Max*	P *Max*	Cr	V
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
i)	31CrV3	0.28 to 0.35	0.25 to 0.40	0.40 to 0.60	0.030	0.030	0.40 to 0.70	0.07 to 0.12
ii)	40Cr	0.37 to 0.44	0.17 to 0.37	0.50 to 0.80	0.030	0.030	0.80 to 1.10	Nil

NOTE — Composition limit in weight percent maximum, unless shown as a range or a minimum.

7 CONSTRUCTION

7.1 The wrenches shall consist of a handle, a set of serrated jaws, and a length of leaf chain as shown in Table 1. The leaf chains shall be able to withstand the following breaking load requirements:

Nominal Size, mm	50	80	100	150	200	250	300
Breaking Load, N	3 500	3 500	3 600	4 000	4 500	5 000	6 000

Two sets of nuts and bolts are required to assemble the above-mentioned parts so as to permit their easy disassembly when required.

7.2 Handle

The Handle shall be one solid piece of the shape as shown in Fig. 1 or a combination of solid piece extended by pipe press joined as shown in Fig. 2 and for large diameter above 200 mm nominal size handle shall be of two pieces due to long length difficult to machining.

7.3 Jaws

The jaws shall be forged to shape and the teeth shall be properly shaped so that they do not slip over the pipe surface under service conditions and for large diameter, Jaws shall be made from forged or SG Iron grade as mentioned in Table 2 under **5.1**.

7.4 Chain

The leaf chain shall be secured to the handle so as to enable it to function efficiently and without adjustment when set to grip a pipe in conjunction with the teeth.

8 WORKMANSHIP AND FINISH

8.1 The chain pipe wrenches shall be free from defects, such as flaws, cranks, rust, burrs and other manufacturing defects.

8.2 All un-machined and machined surfaces other than the chain shall be either painted or shall be protected by rust preventive treatment. The chain, however, shall be properly greased or lubricated with high-viscosity oils.

9 SAMPLING

The representative samples of wrenches for attributed defects and test shall be drawn as prescribed in IS 2500 (Part1).

10 TEST

The chain pipe wrench shall be made to grip a test bar having hardness 240 HV to 270 HV of suitable diameter as shown in Table 4 and properly supported to prevent rotation**.** The test load shall be applied to the wrench handle near its hand-grip end so as to produce the torque as indicated in Table 4 and Fig. 3.

11 DESIGNATION

The chain pipe wrench shall be designated by its name, capacity and IS of this standard.

Example:

A chain pipe wrench of 200 mm capacity shall be designated as:

Chain pipe wrench 200 — IS 4123

12 MARKING

12.1 The pipe wrench shall be marked with designation, manufacturer's name and/or trademark and month and year of manufacture/batch no.

12.2 BIS Certification Marking

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed there under, and the products may be marked with the Standard Mark.

13 PACKING

Chain pipe wrenches shall be wrapped in wax paper or polyethylene sheet.

Table 4 Test Data for Chain Pipe Wrenches

(*Clause* 10)

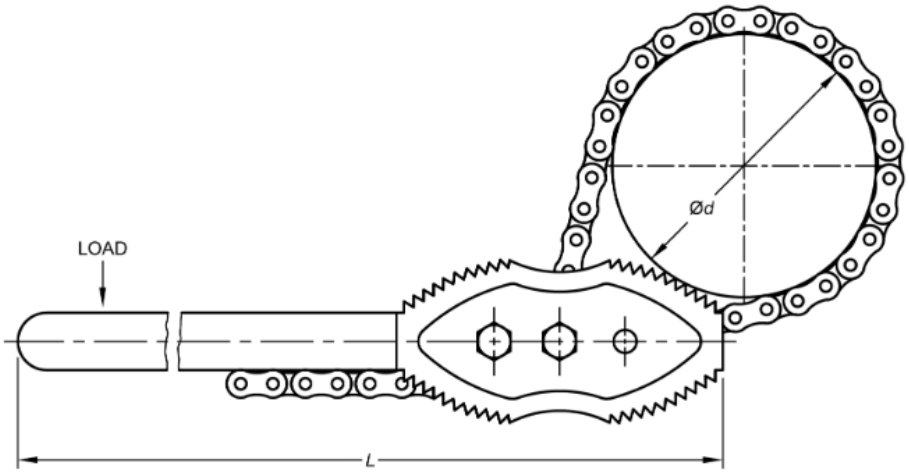

FIG. 3 TORQUE TEST FOR CHAIN PIPE WRENCHES

Sl No.	Nominal Size mm	Diameter of Test Bar *d* mm	Torque N-m
(1)	(2)	(3)	(4)
i)	50	50	300
ii)	80	80	550
iii)	100	100	900
iv)	150	150	1 550
v)	200	200	1 800
vi)	250	250	1 950
vii)	300	300	2 100

ANNEX A

(*Foreword*)

COMMITTEE COMPOSITION

Hand Tools Sectional Committee, PGD 34

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Institute For Auto Parts And Hand Tools Technology, Ludhiana	SHRI SANJEEV KATOCH **(*Chairperson*)**
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SCIENTIST 'B'/ASSISTANT DIRECTOR
(PRODUCTION AND GENERAL ENGINEERING), BIS

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