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Draft Indian Standard
PIPE VICES (HINGED TYPE) — SPECIFICATION
(First Revision)

ICS 25.140.30

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FOREWORD

This Indian Standard (*first revision*) will be adopted by the Bureau of Indian Standards, after the draft is finalized by the Hand Tools Sectional Committee and approval by the Production and General Engineering Division Council (PGDC).

This standard was first published in 1971. The first revision has been taken up to keep pace with the latest technological developments and international practices.

In this revision, the following changes have been made:

- a) Clause on references has been added;
- b) Material designations have been updated;
- c) BIS product certification marking clause has been updated.

This standard covers requirements for hinged type pipe vices generally used for plumbing jobs and erection of pipelines. For open side type and fixed sides type pipe vices please refer IS 2587: 1964 'Specification for pipe vices (open side type and fixed sides type) '.

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 : 1960 'Rules for rounding off numerical values (revised) '.

Draft Indian Standard
PIPE VICES (HINGED TYPE) — SPECIFICATION
(First Revision)

1 SCOPE

1.1 This standard covers the requirements for hinged type pipe vices commonly used for clamping pipes.

2 REFERENCES

2.1 The following standards 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 editions of the standards listed below:

<i>IS No.</i>	<i>Title</i>
1501 (Part 1) : 2020	Metallic Materials — Vickers hardness test: Part 1 Test Method (<i>fifth revision</i>)
1586 (Part 1) : 2018	Metallic materials — Rockwell hardness test: Part 1 Test method (<i>fifth revision</i>)
1570 (Part 1) : 1978	Schedules for wrought steels: Part 1 Steels specified by tensile and/or yield properties (<i>fifth revision</i>)
1570 (Part 6) : 1996	Schedules for wrought steels: Part 6 Carbon and Alloy Tool Steels (<i>first revision</i>)
IS 1030 : 1998	Carbon Steel Castings for General Engineering Purposes — Specification (<i>fifth revision</i>)
IS 210 : 2009	Grey Iron Castings — Specification (<i>fifth revision</i>)
IS 4694 : 1968	Basic dimensions for square threads (<i>Withdrawn</i>)
4905 : 2015	Random sampling and randomization procedures (<i>first revision</i>)
7008 (Part 1) : 1999	ISO metric trapezoidal screw threads: Part 1 basic profile and maximum material profile (<i>second revision</i>)

3 MATERIAL

3.1 The materials for the manufacture of different components of vices shall be such as to fulfil the requirement laid down in 3 and 11. Some of the suitable materials for the manufacture of various components of vices are as given below:

Component	Materials
Base, frame, hook and jaw crosshead	Steel casting conforming to Grade 230-450N of IS 1030 : 1998
	Or Gray cast iron conforming to Grade FG 350 of IS 210 : 2009

Jaws	Tool steel conforming to designation TC 6 of IS 1570 (Part 6) : 1996
Screw spindle and handle	Steel conforming to designation Fe 410 of IS 1570 (Part 1) : 1978

4 HARDNESS

4.1 The hardness measured at the jaws shall be within the range of 43 to 52 HRC or 450 to 550 HV when determined in accordance with IS 1586 (Part 1) or IS 1501 (Part 1) as applicable.

5 SHAPES AND DIMENSIONS

5.1 The dimensions of the vices shall be as given in Table 1 and Fig. 1.

5.2 The main dimensions for jaws shall be as given in Table 2 and Fig 2.

5.3 The shapes given in the Fig. 1 and Fig. 2 are only to illustrate the dimensions, the actual shape and other design details are left to the discretion of manufacturer. The untoleranced dimension may have a variation of ± 2 percent.

6 MANUFACTURE

6.1 Base

The vertical upright section of the base shall be provided with holes for the mounting of the frame, and shall have provisions on both sides for automatic engagement of the latch hook. The upright section shall be symmetrical about the vertical centre line to provide for hinging the frame from either the right or left side. The lower jaw mounting shall be so designed as to allow the vice to clamp the minimum pipe-size capacity of the vice as indicated in Table 1.

6.2 Frame and Hook

The open ends of the frame shall have mounting bolt-holes to align with the bolt holes in the uprights of the base. The closed end shall have provision for an internal threaded hole in the centre. One of the legs shall have a hole for mounting the latch hook and shall be such designed as to automatically lock the frame in the closed position. The assembled frame shall be so designed as to be reversible in a vertical plane to the base to provide for hinging the frame either from the right or left side of the base. The inside edge of the frame either from the right or left side of the base. The inside edge of the frame shall have smooth and parallel ways free of burrs and fins to act as guides for the jaw crosshead and shall permit the crosshead to slide freely over the entire length of adjustment without binding.

6.3 Jaw Crosshead

The top of the crosshead shall be provided with means to allow the end of the screw spindle to swivel and be designed to both raise and lower the crosshead by action of the screw spindle.

6.4 Jaw

The gripping surface shall be V or semicircular in shape and have mill cut V-shaped teeth.

6.5 Screw Spindle

The screw spindle shall have square or ISO metric trapezoidal screw threads as per IS 7008 (Part 1). One end of the screw spindle shall have a head which shall be either an integral part of the screw or welded to the screw in a permanent manner. The head shall be provided with a hole to receive the handle. The screw spindle shall engage the full length of the threaded bearing of the body when the jaw is at maximum opening indicated in Table 1.

6.6 Handle

The handle shall be straight and shall slide freely in the hole of the screw spindle head with means provided at each end of the handle to prevent disengagement from the screw spindle head.

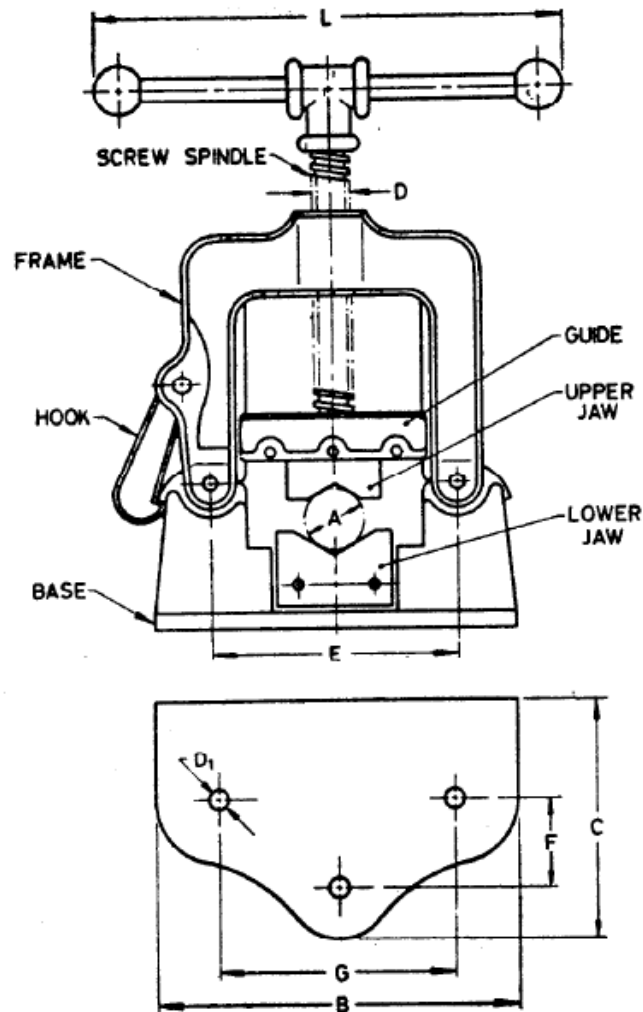


Fig. 1 Dimensions for Pipe Vices (Hinged Type)

TABLE 1 Dimensions for Pipe Vices (Hinged Type)

(Clauses 5.1, 6.1 and 6.5 and Fig. 1)

All dimensions in millimetres.

Nominal Size (Jaw Opening)	Capacity (Outside Pipe Diameter)	B <i>Max</i>	C <i>Max</i>	D	D ₁ + 0.2 - 0	E ± 1.2	F	G ± 1.2	L
80	10 to 77	165	115	T _r 22 × 5 Or SQ 22 × 5*	14	130	40 ± .7	120	220
105	10 to 102	210	145	T _r 25 × 5 Or SQ 26 × 5*	15	155	53 ± .7	150	270
130	10 to 128	250	165	T _r 25 × 5 Or SQ 26 × 5*	15	185	63 ± .7	180	300
170	21 to 166	300	180	T _r 28 × 5 Or SQ 28 × 5*	16	240	70 ± 1.2	215	350

* According to IS 4694: 1968

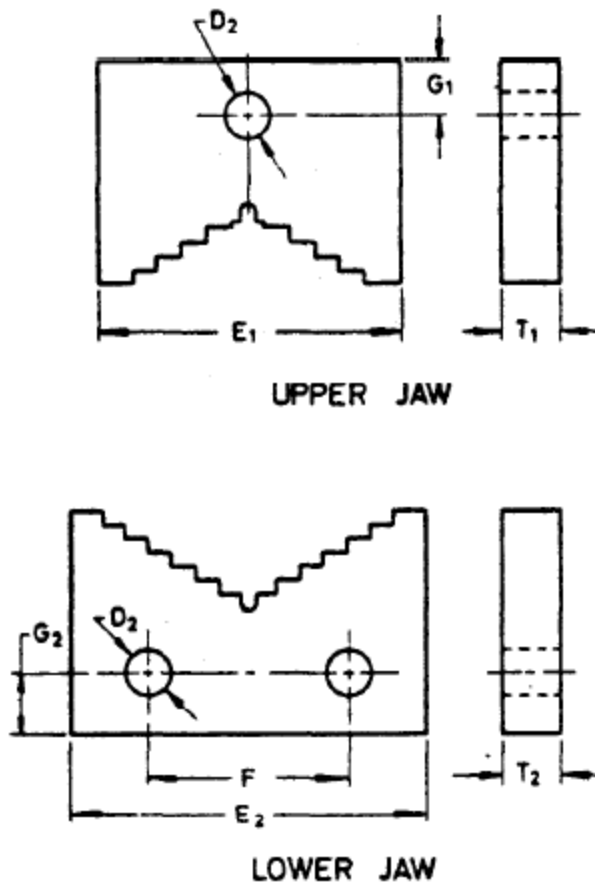


Fig. 2 Dimensions for Jaws

TABLE 2 Dimensions for Jaws

(Clause 5.2 and Fig. 2)

All dimensions in millimetres.

Nominal Size	D_2 + 0.2 - 0	E_1 <i>Min</i>	E_2 <i>Min</i>	F_1 ± 1	G_1 ± 1.5	G_2 ± 1.5	T_1 + 1.5 - 0	T_2 + 1.5 - 0
80	10	55	65	35	12	12	11	10
105	10	68	80	45	12	14	13	12
130	13	85	105	60	14	16	15	13
170	13	110	130	70	16	16	16	14

7 WORKMANSHIP AND FINISH

7.1 The vices shall be smooth all over, and shall be free from burrs, cracks or other manufacturing defects. The screw spindle shall provide for proper alignment of the jaws, and the jaws shall distribute even pressure over the entire area of contact. The movement of the spindle shall be easy without undue slackness or resistance throughout the opening, and the backlash shall not exceed the one-eighth of the pitch of the screw.

8 PRESERVATIVE TREATMENT

8.1 The vices shall be painted on all non-working surfaces. The working surfaces shall be covered with rust-proofing material.

9 DESIGNATION

9.1 The pipe vices (hinged type) shall be designated by:

- a) commonly used name,
- b) nominal size, and
- c) the number of this standard.

Example:

A pipe vice (hinged type) of 105 mm nominal size shall be designated as:

Pipe Vice 105, IS 6007

10 MARKING

10.1 The vices shall be marked with the manufacturer's name, initials or recognized trade-mark and the nominal size.

10.2 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 thereunder, and the products may be marked with the Standard Mark.

11 SAMPLING

11.1 Unless otherwise agreed upon between the supplier and the purchaser the sampling plan as given in Annex A shall be followed.

12 TESTS

12.1 Clamping Test

A bar of 30 mm diameter and of smooth surface having a hardness not less than 50 HRC or 510 HV shall be gripped in the vice and a turning moment as given in Table 3 shall be applied to the screw spindle. The bar shall then be twisted with a turning moment as given in Table 3. The bar shall not rotate and the vice shall not show any sign of damage.

TABLE 3 Turning Moment for Pipe Vices (Hinged Type)
(Clause 12.1)

Nominal Size	Turning Moment			
	To be Applied to Screw Spindle		To be Applied to Test Bar	
	N.m	(kgf.m)	N.m	(kgf.m)
80	69	(7)	98	(10)
105	88	(9)	118	(12)
130	88	(9)	128	(13)
170	98	(10)	137	(14)

12.1.1 A mild steel bar of 30 mm diameter and of smooth surface shall be gripped in the vice and then removed. After removal of the bar the lines on the bar shall show a uniform pressure throughout the contact area.

Annex A
(Clause 11.1)

SAMPLING OF PIPE VICES AND CRITERIA FOR CONFORMITY

A-1. SCALE OF SAMPLING

A-1.1 Lot — In any consignment all the pipe vices of the same designation and manufactured under essentially similar conditions shall be grouped together to constitute a lot.

A-1.2 For ascertaining the conformity of the lot to the requirements of this specification test shall be carried out for each lot separately. The number of pipe vices to be selected at random for this purpose shall be in accordance with col 1 and 2 of Table 4. To ensure the randomness of selection, IS 4905: 2015 shall be followed.

TABLE 4 SCALE OF SAMPLING
(Clause A-1.2)

No. of Vices in The Lot	No. of Vices To Be Selected
N	<i>n</i>
(1)	(2)
Up to 5	All
6 to 25	5
26 to 50	8
51 to 100	13
101 and above	20

A-2. NUMBER OF TESTS AND CRITERIA FOR CONFORMITY

A-2.1 Vices selected according to **A-1.2** shall be examined for the requirements of this specification. In none of the sample vices fails to meet these requirements, the lot shall be declared to conform to this specification.