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Doc: PGD 14 (27124)WC
January 2025

भारतीय मानक मसौदा

स्टेपल्स – विशिष्टि
(IS 5348 का दूसरा पुनरीक्षण)

Draft Indian Standard

Staples — Specifications
(*Second Revision of IS 5348*)

ICS 21.060.70

Consumer Products And Allied Equipment's Sectional Committee, PGD 14	Last date for receipt of comment is 22 February 2025
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FOREWORD

(Formal clauses will be added later on)

This Indian Standard was first published in 1969 and was subsequently revised in 1981. The major changes in this revision are as follows:

- a) Table on dimensions has been revised to include new sizes;
- b) Performance tests have been revised; and
- c) References have been updated.

In the preparation of this standard assistance has been derived from JIS S 6036 : 1992 “Staples”.

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.

Draft Indian Standard

STAPLES — SPECIFICATION

(Second Revision)

1 SCOPE

1.1 This standard covers the requirements of stationery staples for use in stapling machines.

1.2 This standard does not cover the requirements of industrial staple pins.

2 REFERENCE

The standards listed 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 agreement based on this standard are encouraged to investigate the possibility of applying the most recent edition of the standards indicated below:

<i>IS No.</i>	<i>Title</i>
IS 1608 (Part 1) : 2022/ ISO 6892-1 : 2019	Metallic materials — Tensile testing: Part 1 Method of test at room temperature (<i>fifth revision</i>)
IS 4826 : 2023	Hot-dip galvanized coatings on round steel wires — Requirements (<i>second revision</i>)
IS 4905 : 2015	Random sampling and randomization procedures (<i>first revision</i>)
IS 5528 : 2024/ ISO 9227 : 2022	Corrosion tests in artificial atmospheres — Salt spray tests (<i>second revision</i>)
IS 7887 : 1992	Mild steel wire rod for general engineering purposes — Specification (<i>first revision</i>)
IS 14490 : 2024	Plain copier paper — Specification (<i>second revision</i>)

3 TYPES

The staples shall be of the following types:

- a) Light duty, and
- b) Heavy duty.

4 MATERIAL

4.1 The staple shall be pre-formed from tinned, galvanized or copper coated wires with the chemical composition as specified in Table 1.

Table 1 Chemical Composition of Staple Wire
(Clause 4.1)

Sl No.	Material	Chemical Composition Conforming to Grade
(1)	(2)	(3)
i)	Mild steel	Any of the grades confirming to IS 7887
ii)	High carbon steel	Grade HC 38, HC 42, HC 58, HC 62, HC 68 or HC 72 confirming to IS 7904

4.2 Based on the type (*see 3*) of staple, the staple wire shall conform to the ultimate tensile strength requirement as specified in Table 2. The method of testing shall be in accordance with IS 1608 (Part 1).

Table 2 Ultimate Tensile Strength of Staple Wire
(Clause 4.2)

Sl No.	Type of Staple	Ultimate Tensile Strength N/mm ²
(1)	(2)	(3)
i)	Light duty	685-980
ii)	Heavy duty	1150-2000

5 SHAPE AND DIMENSIONS

The dimensions of staples shall be as given in Fig. 1 and Table 3.

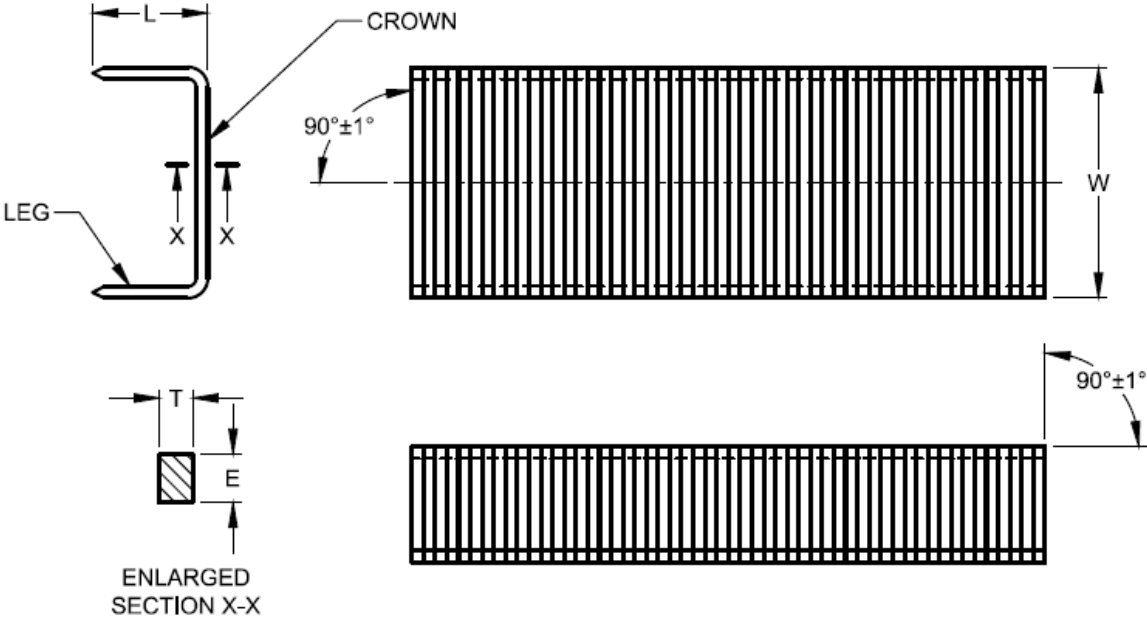


FIG. 1 STAPLES

Table 3 Dimensions
(Clause 5)

All dimensions are in millimeters.

SI No. (1)	Type (2)	$W \pm 0.1$ (3)	L (4)	After Fabrication	
				$T \pm 0.03$ (5)	$E \pm 0.03$ (6)
i)	Light Duty	9.3	4.8 ± 0.2	0.35	0.50
		9.4	4.85 ± 0.2	0.305	0.49
		12.70	6.10 ± 0.2	0.38	0.51
		12.70	8.0 ± 0.2	0.38	0.51
		12.80	6.0 ± 0.2	0.37	0.68
		12.80	6.0 ± 0.2	0.45	0.68
		12.80	8.0 ± 0.2	0.37	0.68
		13	6.0 ± 0.2	0.45	0.70
		13 ¹⁾	6.0 ± 0.2	0.61	0.75
		13 ¹⁾	8.0 ± 0.2	0.55	0.75
		13 ¹⁾	8.0 ± 0.2	0.61	0.75
		13 ¹⁾	10.0 ± 0.3	0.55	0.80
		ii)	Heavy Duty	13	10.0 ± 0.3
13	12.0 ± 0.3			0.55	0.80
13	12.0 ± 0.3			0.61	0.75
13 ¹⁾	13.0 ± 0.3			0.61	0.75
13	15.0 ± 0.4			0.55	0.80
13	15.0 ± 0.4			0.61	0.75
13	16.0 ± 0.4			0.61	0.75
13	17.0 ± 0.4			0.55	0.80
13	17.0 ± 0.4			0.61	0.75
13.1	20 ± 0.4			0.68	0.76
13.1	24 ± 0.4			0.68	0.76
13.5	16.0 ± 0.4			0.55	0.75

¹⁾These sizes are common for both industrial as well as stationery staples.

6 WORKMANSHIP AND FINISH

6.1 The staples shall be pre-formed and cemented together, one behind the other, in the form of a channel. Both ends of staples shall have chiseled point ends. The cementing of staples shall be smooth and even, such that the staples adhere to each other without loosening in handling while being fitted into the stapler. Also the cementing shall be such as to afford easy exit of the staples from the vertical chute without clogging and jamming the stapler.

6.2 One link (magazine) of staples shall be free from injurious defects in use such as uneven rows of legs, camber, chippings, distortion of legs, clearances and ill adhesion.

6.3 The tip end of the staple shall be made chiseled point.

6.4 The temper of the wire shall be such as to permit penetration and clinching to a firm seat without buckling or fracturing of the crown or leg when tested in accordance with **7.1.1** and **7.1.2**.

7 TESTS

7.1 Performance Tests

7.1.1 Light Duty Staples

A complete magazine of light duty staples shall be inserted in a light duty stapler or plier type stapler to produce the standard clinch. Fifty staples shall be driven and clinched to a firm seat through 12 sheets for 4.8 mm and 4.85 mm leg staples, 15 sheets for 6 mm and 6.1 mm leg staples and 20 sheets for 8 mm leg staples of 75 gsm copier paper conforming to IS 14490. The staple shall penetrate and clinch to the set of sheets without buckling or fracturing of the crown or leg and shall not show any malformation.

7.1.2 Heavy Duty Staples

A complete magazine of heavy duty staples shall be inserted in a heavy duty stapler. The staple shall be driven and clinched to a firm seat through a number of sheets of paper as specified in Table 4. The paper shall be of 75 gsm conforming to IS 14490. The staples shall penetrate and clinch to a firm seat without buckling or fracturing of the crown or leg and shall not show any malformation.

Table 4 Number of Sheets
(Clause 7.1.2)

Sl No.	Leg Length of Staple	No. of Sheets
(1)	(2)	(3)
i)	6	20
ii)	8	30
iii)	10	40
iv)	12	60
v)	13	70
vi)	15	80
vii)	16	85
viii)	17	100
ix)	20	130
x)	24	160

7.1.3 Holding Power Test

The number of 75 gsm copier paper sheets conforming to IS 14490 as mentioned in Table 5 shall be used for this test. The set of sheets shall be folded and stapled. One end of the set of sheets shall be fixed and on the other a pull is applied as shown in Fig. 2. The staples shall not bend or get damaged when the pulls as mentioned in Table 5 are applied.

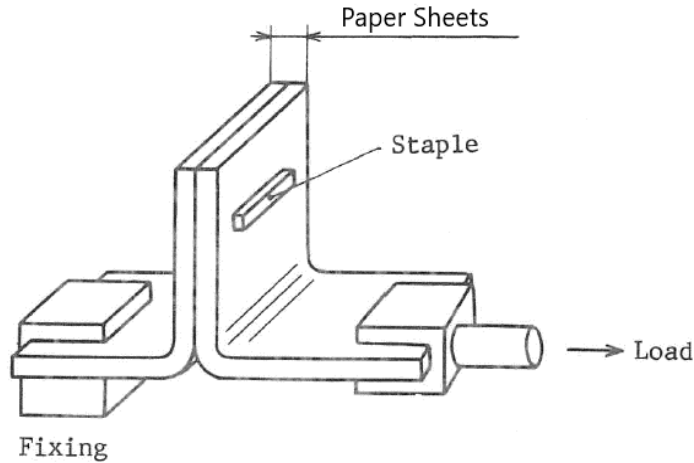


FIG. 2 HOLDING POWER TEST FOR STAPLE

Table 5 Performance Test Pull Parameters
(Clause 7.1.3)

Sl. No	Type	Staple (Leg Size) mm	No. of 75 gm Copier Paper	Pull kgf (N)
(1)	(2)	(3)	(4)	(5)
i)	Light Duty	4.8	8	1.0 (10)
		4.85	8	1.0 (10)
		6.0	10	2.0 (20)
		6.10	10	2.0 (20)
		8.0	10	2.0 (20)
ii)	Heavy Duty	6.0	10	2.0 (20)
		8.0	13	2.4 (24)
		10.0	20	2.8 (28)
		12.0	40	3.4 (34)
		13.0	40	3.4 (34)
		15.0	60	4.0 (40)
		16.0	80	4.6 (46)
		17.0	80	4.6 (46)
20.0	80	4.6 (46)		
24.0	80	4.6 (46)		

7.2 Corrosion Resistance Test

When tested in accordance with the neutral salt spray (NSS) test as specified in IS 5528 for 3 h, the test surface shall remain free from red corrosion products when examined by the unaided eye or with normal corrected vision. Slight staining shall not be a cause for rejection.

8 FINISH

8.1 The material shall be supplied in bright drawn, copper coated, galvanized or tin coated finish as agreed to between the user/purchaser and the manufacturer.

8.2 The galvanized coating of the steel wire shall conform to the requirements of light coating as specified in IS 4826. The coating test for other finishes shall be as agreed to between the user/purchaser and the manufacturer.

9 SAMPLING

Unless otherwise agreed to between the purchaser and the supplier, the sampling procedure given in Annex A shall be followed.

10 MARKING

10.1 Each packet shall be marked with manufacturer's name (initials) or trade-mark.

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.

ANNEX A
(Clause 9)

SAMPLING AND CRITERIA FOR CONFORMITY OF STAPLES

A-1 LOT

A-1.1 In any consignment, all the packets containing the staples of the same type and size, manufactured by the same factory, during the same period and under similar conditions of production shall be grouped together to constitute a lot.

A-1.2 Number of packets to be selected from each lot shall depend upon the size of the lot and shall be in accordance with column 2 and 3 of Table 6.

A-1.2.1 These packets shall be selected from the lot at random. In order to ensure the randomness of the selection, procedure as given in IS 4905 shall be followed.

A-2 NUMBER OF TESTS AND CRITERIA FOR CONFORMITY

A-2.1 From each of the selected packets, 3 magazines shall be selected at random, so that the number of magazines selected from each lot shall be in accordance with column 2 and 4 of Table 6. The magazines so selected from each lot shall then be divided into 2 groups at random, one containing two-third of magazines (for dimensional requirements) and another containing one-third of magazines (for performance test).

A-2.2 From each of the magazines selected in **A-2.1** for dimensional requirements, select 2 staples at random, so that the number of staples to be selected from each lot shall be in accordance with column 2 and 6 of Table 6. These staples shall be examined for dimensional requirements. A staple failing to satisfy these requirements shall be termed as defective. The lot shall be considered as conforming to dimensional requirements if the number of defectives found in the sample is less than or equal to corresponding permissible number of defectives (*see* column 7 of Table 3).

A-2.3 The lot which has been found as conforming to dimensional requirements, shall then be tested for performance tests.

A-2.3.1 For the requirements given in **7.1.1** or **7.1.2**, the number of magazines as selected in **A-2.1** and permissible number of defectives shall be in accordance with column 7 and 8 of Table 6.

A-2.3.2 For holding power test, the number of staples and the permissible number of defectives are given in column 10 and 11 of Table 6.

A-2.4 A lot which has been found as conforming to dimensional requirements and performance tests shall then be tested for corrosion resistance. For this purpose, 20 staples shall be selected from the lot at random and subjected to this test. The lot shall be considered as conforming to the requirement if none of the staples show any sign of rusting.

A-2.5 The lot shall be accepted if **A-2.2**, **A-2.3** and **A-2.4** are satisfied, otherwise the lot shall be rejected.

Table 6 Sample Size and Permissible Number of Defectives
(Clauses A-1.2, A-2.1, A-2.2, A-2.3.1 and A-2.3.2)

Sl No.	Lot size (Number of Packets)	Sample Size		For Dimensional Requirements			Performance Test (see 7.1.1 and 7.1.2)		Holding Power Test (see 7.1.3)	
		Number of Packets	Number of Magazines	Sample Size (No. of Magazine)	Sample Size (No. of Staples)	Permissible No. of Defectives	Sample Size (No. of Magazines)	Permissible No. of Defectives	Sample Size (No. of Staples)	Permissible No. of Defectives
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
i)	Up to 100	5	15	10	20	1	5	0	5	0
ii)	101 to 300	8	24	16	32	2	8	0	8	0
iii)	301 to 1000	13	39	26	52	3	13	0	13	0
iv)	1000 and above	20	60	40	80	5	20	1	20	1