इंटरनेट मानक

Disclosure to Promote the Right To Information

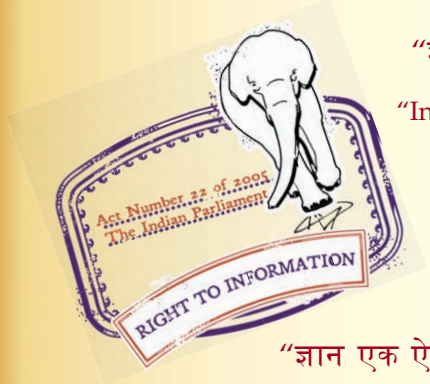
Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

"जानने का अधिकार, जीने का अधिकार"
Mazdoor Kisan Shakti Sangathan
"The Right to Information, The Right to Live"

"पुराने को छोड नये के तरफ"
Jawaharlal Nehru
"Step Out From the Old to the New"

IS 4762 (2002): Worm Drive Hose Clamps for General Purposes
[PGD 31: Bolts, Nuts and Fasteners Accessories]

"ज्ञान से एक नये भारत का निर्माण"
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"

BLANK PAGE

PROTECTED BY COPYRIGHT

भारतीय मानक

बंधन सामग्री — सामान्य कार्यों के लिए वर्म ड्राइव हौज क्लैम्प — विशिष्टि

(दूसरा पुनरीक्षण)

Indian Standard

FASTENERS — WORM DRIVE HOSE CLAMPS FOR GENERAL PURPOSES — SPECIFICATION

(Second Revision)

ICS 21.060.70

© BIS 2002

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

December 2002

Price Group 3

FOREWORD

This Indian Standard (Second Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Bolts, Nuts and Fasteners Accessories Sectional Committee had been approved by the Basic and Production Engineering Division Council.

This standard was first published in 1968 and subsequently revised in 1984. In view of the experience gained by the Indian industry in this field and to make it in line with BS 5315 : 1991 'Hose clamps (worm drive type) for general purpose use (metric series)', issued by the British Standards Institution, this revision has been brought out. While preparing this second revision considerable assistance has been taken from BS 5315 : 1991.

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)*'. 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

FASTENERS—WORM DRIVE HOSE CLAMPS FOR GENERAL PURPOSES—SPECIFICATION

(Second Revision)

1 SCOPE

This standard covers the requirements of worm drive hose clamps for general purpose use in the size range from 12 mm up to and including 140 mm. Hose clamps above sizes 140 mm are used for variety of purposes including strapping.

2 REFERENCES

The following standards contain provisions which through reference in this text, constitute provision 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 indicated below:

IS No.	*Title*
397	Method for statistical quality control during production:
(Part 1) : 1972	Control charts for variables (*first revision*)
(Part 2) : 1985	Control charts for attributes and count of defects (*second revision*)
444 : 1987	General purpose rubber water hose (*fourth revision*)
1572 : 1986	Specification for electroplated coatings of cadmium on iron and steel (*second revision*)
1573 : 1986	Specification for electroplated coatings of zinc on iron and steel (*second revision*)

3 NOMENCLATURE

For the purpose of this standard, the nomenclature given in Fig. 1 shall apply.

4 DIMENSIONS AND RANGE OF SIZES

4.1 The dimensions of the hose clamps for the sizes from 12 mm up to and including 140 mm, shall be as given in Table 1.

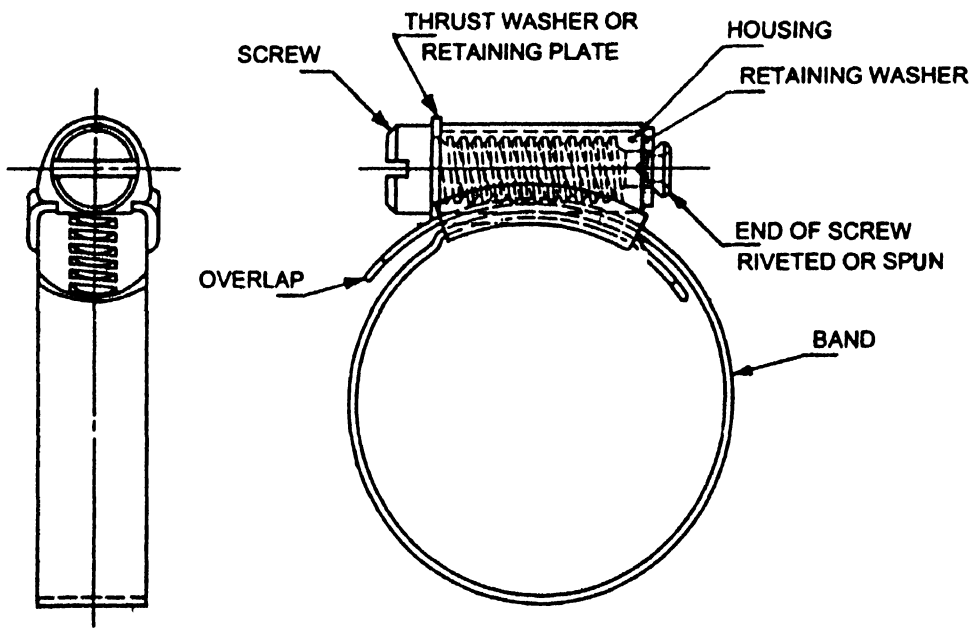
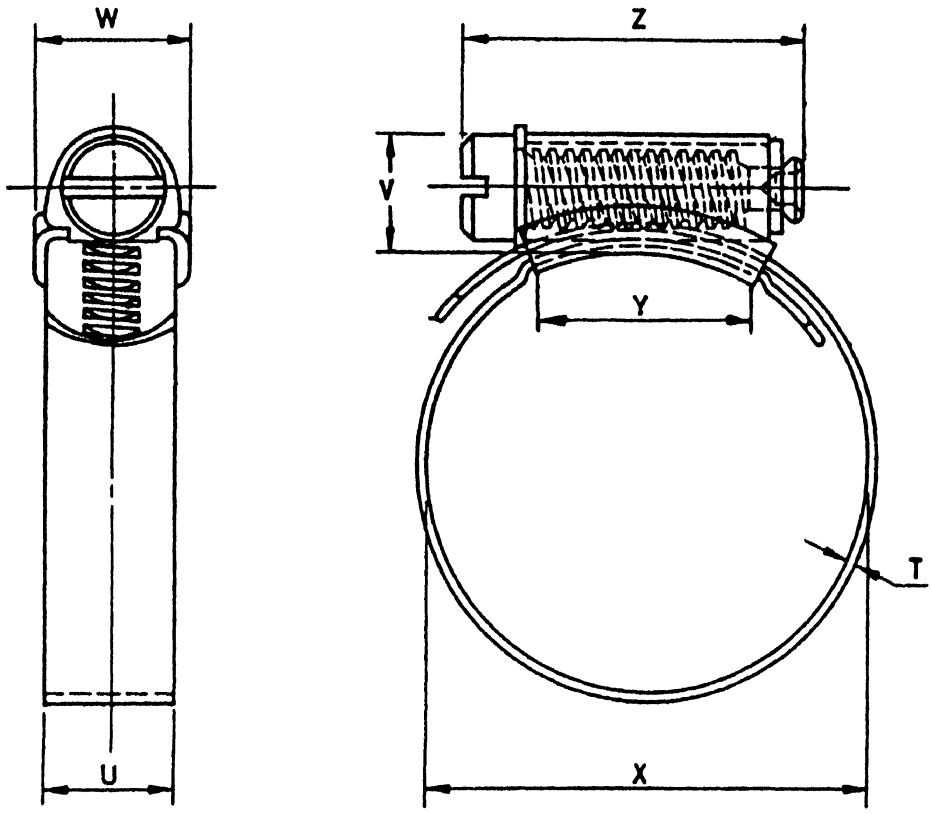


FIG. 1 TYPICAL DESIGN AND NOMENCLATURE OF HOSE CLAMPS

Table 1 Dimensions and Range of Sizes

(*Clause* 4.1)

All dimensions in millimetres



Housing width, V = 14 mm, *Max*
Overall width, W = 16.5 mm, *Max*
Band material thickness, T = 1 mm, *Max*
Band width, U = 13.5 mm, *Max*

Sizes	Working Range X		Y	Z	Sizes	Working Range X		Y	Z
	Min	*Max*	*Max*	*Max*		*Min*	*Max*	*Max*	*Max*
(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
12	9 5	12	14	25	60	45	60	28	33
16	11	16	14	25	65	50	65	28	33
20	13	20	14	25	70	55	70	28	33
22	16	22	20	25	80	60	80	28	33
25	18	25	20	25	90	70	90	28	33
30	22	30	25	30	100	85	100	28	33
35	25	35	25	30	110	90	110	28	33
40	30	40	25	30	115	95	115	28	33
45	35	45	28	33	120	100	120	28	33
50	35	50	28	33	130	110	130	28	33
55	40	55	28	33	140	120	140	28	33

4.2 This standard specifies tests that are performed on each size of clamp using a specified size and type of hose.

4.2.1 The tests ensure that all makes of clamps are of equivalent performance but do not ensure that clamps will satisfactorily hold hoses of diameters at the extremities of a clamp's working range, particularly when used with a non-standard hose. The user should ensure that the size of clamps choosen in compatible with the hose diameter and type.

4.3 For the hose clamps above 140 mm sizes, the range of sizes may be in the increments of 20 mm, starting at size 160 mm.

5 MATERIAL

The materials used in the manufacture of worm drive hose clamps shall be selected at the manufacturer's discretion provided that the finished clamps meet the test requirements given in **10**.

6 MANUFACTURE

6.1 Screws

The screws shall be held captive in the clamp housing.

6.2 Band

The band shall have thread form commencing at the free and extending for a length sufficient to enable the clamp to be tightened on to the smallest diameter of component within the working range for which it is designed.

6.3 Housing

The housing shall not be readily removable from the band.

7 DESIGNATION

7.1 Clamps of Sizes Up to and Including 140 mm

The hose clamp shall be designated by the maximum external diameter of the component for which the clamp is designed and number of this Indian Standard.

Example

A hose clamp of size 25 mm shall be designated as:

Hose clamp 25 IS 4762

7.2 Clamps of Sizes Above 140 mm

The hose clamps shall be designated by the maximum working diameter, minimum working range and No. of this Indian Standard.

Example

A hose clamp of size 180 mm and minimum working range of 30 mm shall be designated as:

Hose clamp 180/30 IS 4762

8 GENERAL REQUIREMENTS

8.1 When the loop is formed, as shown in Fig.1, the screw shall be held firmly in engagement with the band during tightening and the clamp shall be capable of being decreased in diameter by turning the screw in clockwise direction and increased in diameter by turning the screw in anti-clockwise direction.

8.2 After expanding until the band is disconnected from the screw, it shall be possible to open clamps of size 35 mm and above to provide a gap equal to the largest diameter of the hose for which the clamp is designed and so permit easy fitting and removal of the clamp by passing the clamp over the hose in position without disturbing any connection.

8.3 The clamps shall be so designed that when tightened on the hose, it shall remain positively secured in position without the need for any additional locking device and in firm engagement with the hose on which it is fitted.

9 FINISH

9.1 All component parts of the clamps shall be smooth and free from burrs and sharp edges. The clamps other than those manufactured from corrosion-resistant materials shall be protected against corrosion by electroplating in accordance with classification No. Cd 8 of IS 1572, or classification No. Fe Zn 12 of IS 1573.

9.2 The minimum duration of the salt spray test cycle shall be of 48 h. Plating shall be applied after any welding operation and prior to final assembly.

10 TESTS

10.1 General

10.1.1 *Clamps of Sizes 12 mm and Up to and Including 140 mm*

Each clamp shall be capable of passing the tests as per **10.2**, **10.3.1**, **10.4** and **10.5**.

10.1.2 *Clamps of Sizes Above 140 mm*

Each clamp shall be capable of passing the tests as per **10.2**, **10.3.2**, **10.4** and **10.5**.

10.2 Free-Turning Torque Test

This test shall be conducted to ensure the smooth action of the lubricated clamp in its free turning state. For this purpose, the torque required to move the screw in either direction shall not exceed 1.5 Nm.

10.3 Torque Test

10.3.1 *Torque Test for Clamps Sizes 12 mm Up to and Including 140 mm*

The tests shall be conducted with the hose clamp in

lubricated condition mounted on a rigid mandrel of a diameter equal to the designating size of the clamp. A suitable test rig is shown in Fig. 2. Alternative methods of applying the torque are permissible provided that the conditions imposed by the torque rig illustrated in Fig. 2 are simulated exactly. The clamp shall be tightened to 75 percent of the appropriate torque (*see* Table 2). On release of the torque, visual examination of the assembly shall reveal no sign of permanent distortion of the housing and no damage detrimental to the efficient functioning of the clamp. The clamp shall then be re-lightened until permanent distortion or failure occurs. The torque load at permanent distortion or failure shall be in excess of the appropriate value given in Table 2.

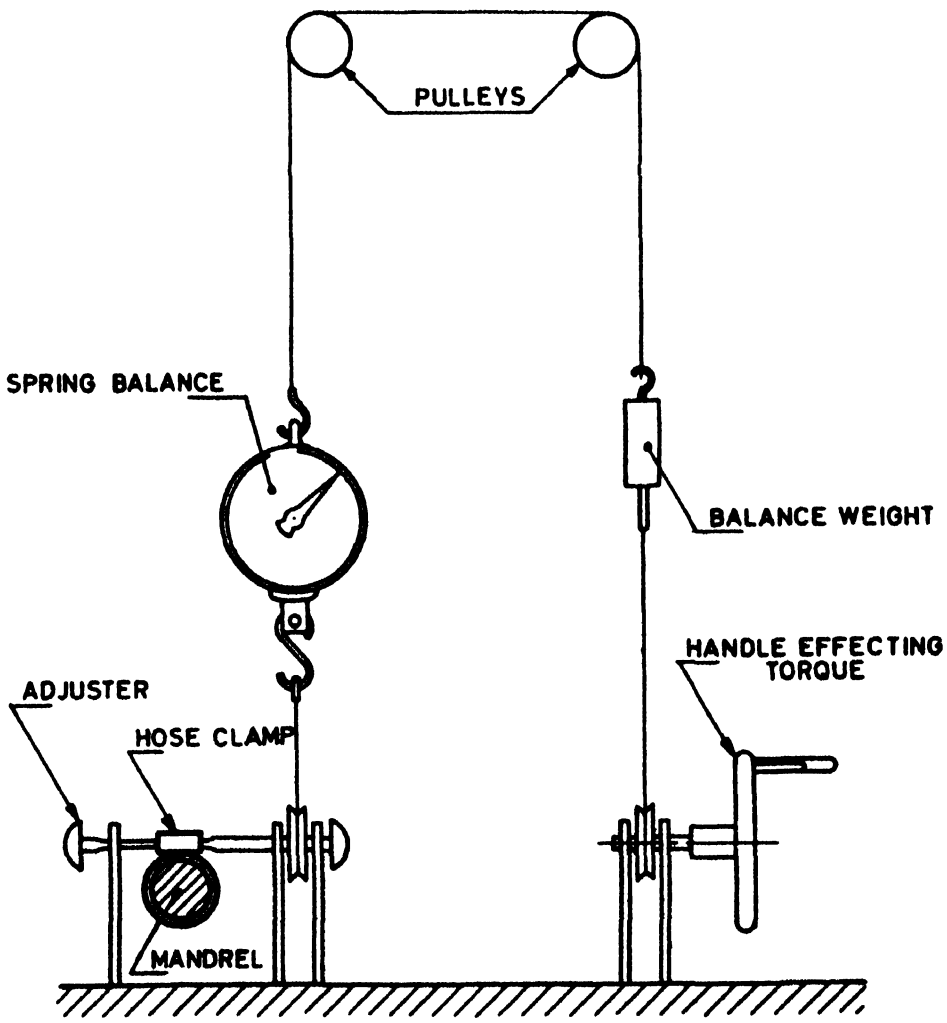
Table 2 Torque Test Values

(*Clause* 10.3.1)

Sl No.	Sizes mm	Torque Nm
i)	From 12 to 20	4.5
ii)	Above 20 to 25	5.6
iii)	Above 25 to 45	6.8
iv)	Above 45 to 60	7.9
v)	Above 60 to 140	9.0

10.3.2 *Band Tension and Torque Test for Clamps Sizes Above 140 mm*

The test shall be conducted with the housing mounted



All dimensions in millimetres.

FIG. 2 ARRANGEMENT OF A TYPICAL TEST RIG FOR TORQUE TESTING HOSE CLAMPS

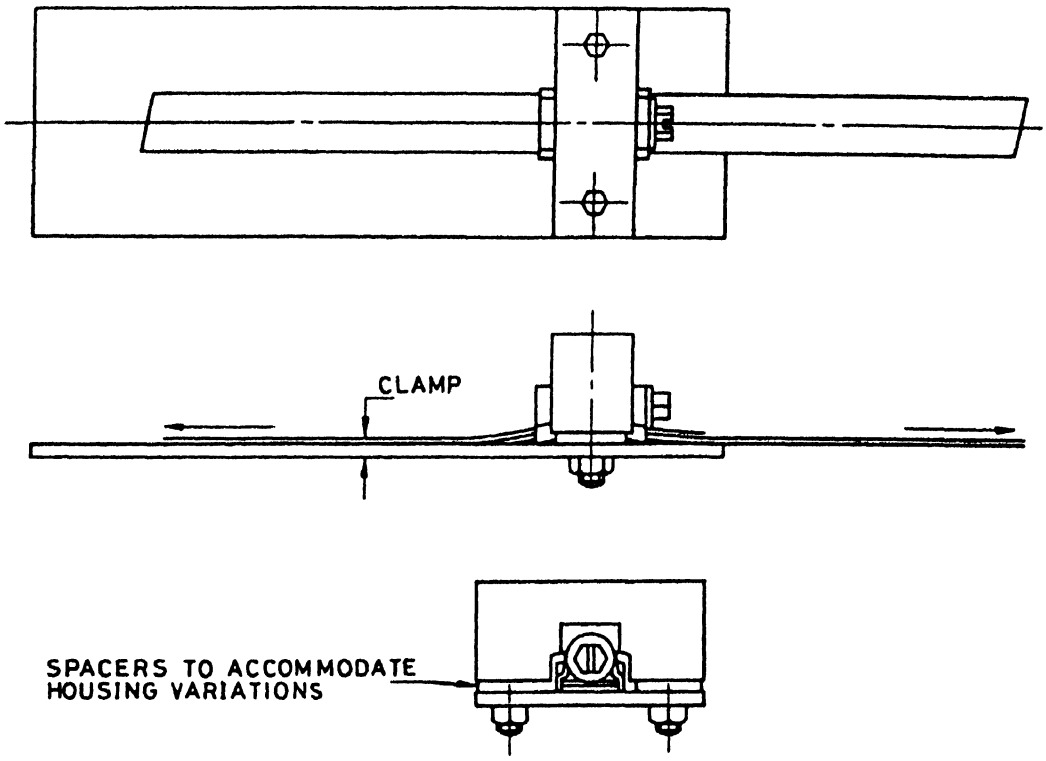


FIG 3 BAND TENSION AND TORQUE TEST FIXTURE

in the anti-twist fixture and the fixed and moving parts of the band attached to a tensile test fixture as shown in Fig 3 The housing shall be checked to ensure that it is a free sliding fit

When a torque of 6 8 Nm is applied to the screw, the minimum indicated tension in the band shall be 1 5 kN Further tightening to 7 9 Nm shall be possible without permanent distortion or failure The housing shall be a free sliding fit after the test

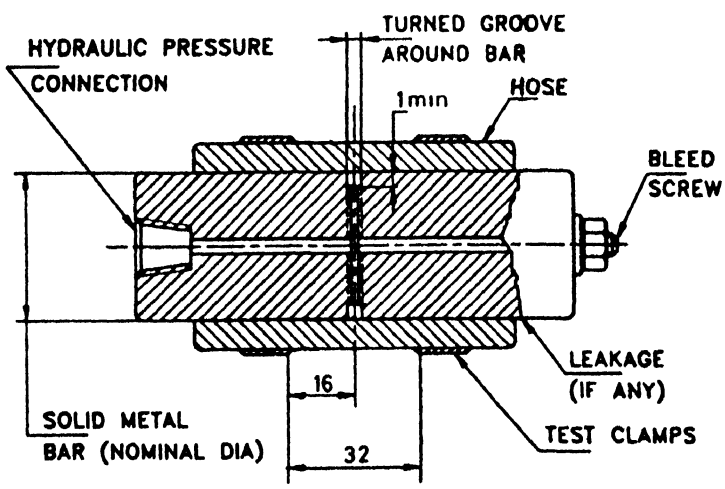
10.4 Fatigue Torque Loading Test

The test shall be conducted with the same set up described in **10.3.1**. The clamp shall then be subjected to a torque loading and release of torque loading to the values specified in **10.3.1** atleast 10 times, without resulting in any distortion or permanent deformation of the clamp as a whole.

10.5 Hydraulic Pressure Test

10.5.1 *General*

The test shall be conducted using the apparatus shown in Fig 4 using a hose of outside diameter nearest to the mean value of the working range of the clamp.



All dimensions in millimetres

FIG 4 HYDRAULIC PRESSURE TEST RIG

The hose shall comply with the requirements of IS 444. Two samples of each size clamp shall be tested in accordance with the procedure described in 10.5.2. The fluid used for the test shall be water at room temperature.

10.5.2 *Test Procedure*

The hose and clamps shall be assembled on an unleaded externally smooth and polished metal mandrel as illustrated in Fig. 4. The mandrel should be a sliding fit in the hose.

Torque applied when tightening the clamps shall not exceed 75 percent of the appropriate torque value specified in Table 2.

Pressure shall be applied gradually from an external source until leakage or other failure occur, at which stage the pressure shall not be less than the appropriate value specified below:

Sizes mm	*Minimum Pressure* MPa
12 to 30	1.4
35 to 70	0.7
80 to 140	0.3

11 SAMPLING AND ACCEPTANCE CRITERIA

11.1 In order to ensure the quality and reliability of the assembly, it is necessary that all its components conform rigidly to the specified requirements. It is recommended that the method given in IS 397(Parts 1 and 2) be used to control the quality of component during production. This will also ensure the homogeneity of the product which is necessary for successful operation of the sampling procedure given below.

11.2 In any consignment, all the hose clamps of the same size manufactured under essentially similar condition shall be grouped together to constitute a lot.

11.3 The hose clamps shall be selected and examined for each lot separately for ascertaining their conformity to the requirements of this standard.

11.4 The number of hose clamps to be selected shall depend on the size of the lot and shall be in accordance with col 1 and 2 of Table 3. These shall be selected at random.

11.5 Number of Tests and Criteria for Conformity

11.5.1 The hose clamps selected according to 11.4 shall be examined for dimensions (*see* 4), screws (*see* 6.1), band (*see* 6.2), housing (*see* 6.3), general requirements (*see* 8) and finish (*see* 9). If the number of hose clamps failing to meet the requirements for any one or more of the above characteristics is less than or equal to the acceptance number given in col 3 of Table 3, the lot shall be considered as conforming to the requirements of these characteristics.

11.5.2 In case of those lots which have been found satisfactory according to 11.5.1, the number of hose clamps each equivalent to the sub-sample size indicated in col 4 of Table 3 shall be chosen and subjected to the torque tests (*see* 10.2, 10.3 and 10.4) and hydraulic pressure test (*see* 10.5). The lot shall be considered and conforming to the requirements of above characteristics if none of the hose clamps subjected to either of the tests, fails to meet the specified requirements.

11.5.3 The lot shall be considered as conforming to the requirements of this standard, if conditions given in 11.5.1 and 11.5.2 are satisfied.

Table 3 Sample Size and Criteria for Conformity

(*Clauses* 11.4, 11.5.1 *and* 11.5.2)

Sl No.	Lot Size	Sample Size	Acceptance Number[1)]	Sub-Sample Size
(1)	(2)	(3)	(4)	(5)
i)	Up to 100	5	0	2
ii)	101 to 150	8	0	2
iii)	151 to 300	13	1	3
iv)	301 to 500	20	1	5
v)	501 to 1 000	32	2	8
vi)	1 001 and above	50	3	13

[1)] To ensure that the lot containing 2.5 percent or less defective will be accepted most of the times.

12 MARKING

12.1 The hose clamps shall be permanently and indelibly marked with the following information:

a) The name or trade-mark of the manufacturer;

b) The designation, size; and

c) Number of this Indian Standard.

12.2 BIS Certification Marking

The product may also be marked with the Standard Mark.

12.2.1 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act*, 1986 and the Rules and Regulations made thereunder. The details of conditions under which the license for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act*, 1986 to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country

Copyright

BIS has the copyright of all its publications' No part of these publications may be reproduced in any form without the prior permission in writing of BIS This does not preclude the free use, in the course of implementing the standard, of necessary details, such as symbols and sizes, type or grade designations Enquiries relating to copyright be addressed to the Director (Publication), BIS

Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments Standards are also reviewed periodically, a standard along with amendments is reaffirmed when such review indicates that no changes are needed, if the review indicates that changes are needed, it is taken up for revision Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards Monthly Additions'

This Indian Standard has been developed from Doc No BP 33 (0096).

Amendments Issued Since Publication

Amend No	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones 323 01 31, 323 3375, 323 94 02

Telegrams Manaksanstha
(Common to all offices)

Regional Offices		Telephone
Central	Manak Bhavan, 9 Bahadur Shah Zafar Marg NEW DELHI 110002	323 76 17, 323 38 41
Eastern	1/14 C I T Scheme VII M, V I P Road, Kankurgachi KOLKATA 700054	337 84 99, 337 85 61 337 86 26, 337 91 20
Northern	SCO 335-336, Sector 34-A, CHANDIGARH 160022	60 38 43 60 20 25
Southern	C I T Campus, IV Cross Road, CHENNAI 600113	254 12 16, 254 14 42 254 25 19, 254 13 15
Western	Manakalaya, E9 MIDC, Marol, Andheri (East) MUMBAI 400093	832 92 95, 832 78 58 832 78 91, 832 78 92
Branches	AHMEDABAD BANGALORE BHOPAL BHUBANESHWAR COIMBATORE FARIDABAD GHAZIABAD GUWAHATI HYDERABAD JAIPUR KANPUR LUCKNOW NAGPUR NALAGARH PATNA PUNE RAJKOT THIRUVANANTHAPURAM VISAKHAPATNAM	

Printed at Simco Printing Press, Delhi