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BRITISH STANDARD

BS 5315:1991
Incorporating Amendment No. 1

Specification for

Hose clamps (worm drive type) for general purpose use (metric series)

ICS 23.040.60

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BSI
British Standards

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This British Standard, having been prepared under the direction of the Piping Systems Components Standards Policy Committee, was published under the authority of the Standards Board and comes into effect on 31 October 1991

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The following BSI references relate to the work on this standard:
Committee reference PSE/6
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Amendments issued since publication

Amd. No.	Date	Comments
17275	31 August 2007	Foreword text updated. Clause **6** reference updated. Subclause **9.4.1** changed. Publications referred to updated.

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Foreword

This British Standard has been prepared under the direction of the Piping Systems Standards Policy Committee. It supersedes BS 5315:1976 and BS 3628:1963 which are withdrawn.

The start and finish of text introduced or altered by Amendment No.1 is indicated in the text by tags A1 A1.

This edition introduces technical changes but it does not reflect a full review and revision of the standard, which will be undertaken in due course. Additional text has been included which applies specifically to clamp sizes greater than 140 mm.

Differences in the text between this edition and BS 5315:1976 are indicated by a sideline in the margin.

Product certification. Users of this British Standard are advised to consider the desirability of third party certification of product conformity with this British Standard based on testing and continuing surveillance, which may be coupled with assessment of a supplier's quality systems against the appropriate Part of BS 5750.

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Compliance with a British Standard cannot confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 6, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

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1 Scope

This British Standard specifies the requirements for worm drive hose clamps for general purpose use in the size range commencing at 12 mm.

NOTE 1 Hose clamps above size 140 mm are used for a variety of purposes including strapping.

NOTE 2 The titles of the publications referred to in this standard are listed on the inside back cover.

2 Nomenclature

For the purposes of this British Standard the nomenclature given in Figure 1 has been adopted.

3 Designating size

3.1 Clamp sizes up to and including 140 mm

The designating size of a clamp shall be equal to the maximum external diameter of the component which the clamp is designed to secure.

3.2 Clamp sizes greater than 140 mm

The clamps shall be designated by the maximum working diameter in millimetres having a minimum working range of 30 mm.

4 Materials

The materials used in the manufacture of worm drive clamps shall be selected at the manufacturer's discretion provided that the finished clamps are capable of passing the tests specified in clause **9**.

5 General requirements

5.1 General

When the loop is completed as in Figure 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 a clockwise direction and increased in diameter by turning the screw in a counter-clockwise direction. 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 component for which the clamp is designed and so permit easy fitting or removal of the clamp by passing the clamp over the component in situ without disturbing any connection.

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

5.2 Screw

The screw shall be held captive in the clamp housing.

5.3 Band

The band shall have a thread form commencing at the free end 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.

5.4 Housing

The housing shall not be readily removable from the band.

6 Finish

All component parts of the clamp shall be smooth and free from harmful burrs and sharp edges. Clamps other than those manufactured from corrosion resistant materials shall be protected against corrosion such that they shall meet the requirements of the salt spray test specified in A1 BS EN ISO 9227:2006 A1, without significant corrosion of the base metal. The duration of the test shall be 48 h.

Plating shall be applied after any welding operation and prior to final assembly.

7 Range of sizes and dimensions

For the size range 12 mm up to and including 140 mm, sizes and dimensions shall be as given in Table 1 and Figure 1.

NOTE 1 This British Standard specifies tests that are performed on each size of clamp using a specified size and type of hose. The tests ensure that all makes of clamp 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 clamp chosen is compatible with the hose diameter and type.

NOTE 2 For clamp sizes greater than 140 mm, the range of sizes may be in increments of 20 mm, starting at size 160 mm.

8 Marking

Each clamp shall be permanently and indelibly marked with the following:

a) the name or trade mark of the manufacturer;

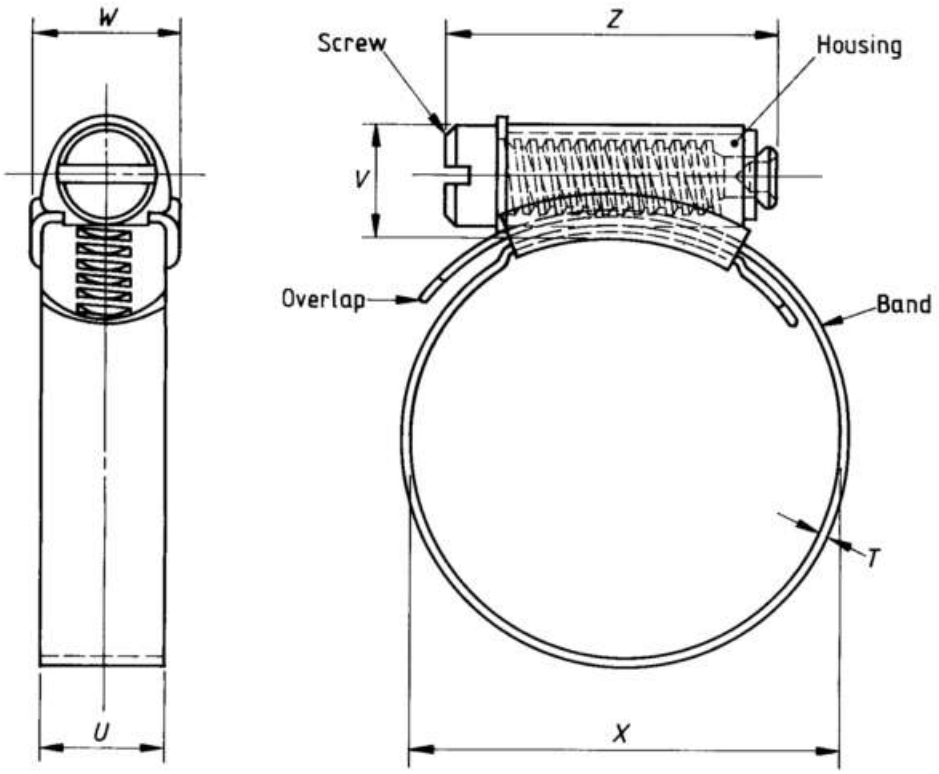
b) the appropriate designating size;

c) the number and date of this British Standard, i.e. BS 5315:1991[1)].

NOTE The application of any other marking is to be the subject of agreement between the purchaser and the manufacturer.

[1)] Marking BS 5315:1991 on or in relation to a product represents a manufacturer's declaration of conformity, i.e. a claim by or on behalf of the manufacturer that the product meets the requirements of the standard. The accuracy of the claim is therefore solely the responsibility of the person making the claim. Such a declaration is not to be confused with third party certification of conformity, which may also be desirable.

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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.

Figure 1 — Typical design and nomenclature of hose clamp

9 Testing

9.1 General

9.1.1 *Clamp sizes* 12 mm *up to and including* 140 mm

Each clamp shall be capable of passing the tests described in **9.2**, **9.3.1** and **9.4**.

9.1.2 *Clamp sizes greater than* 140 mm

Each clamp shall be capable of passing the tests described in **9.2** and **9.3.2**.

9.2 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 N·m.

9.3 Torque test

9.3.1 *Torque test for clamp sizes* 12 mm *up to and including* 140 mm

The test shall be conducted with the hose clamp in the 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 Figure 2. Alternative methods of applying the torque load are permissible provided that the conditions imposed by the torque rig shown in Figure 2 are simulated exactly.

The clamp shall be tightened to 75 % of the appropriate torque load as shown in Table 2. On release of the torque load, visual examination of the assembly shall reveal no sign of permanent distortion of the housing nor damage detrimental to the efficient functioning of the clamp. The clamp shall then be retightened until permanent distortion or failure occurs. The torque load at permanent distortion or failure shall be in excess of the appropriate value shown in Table 2.

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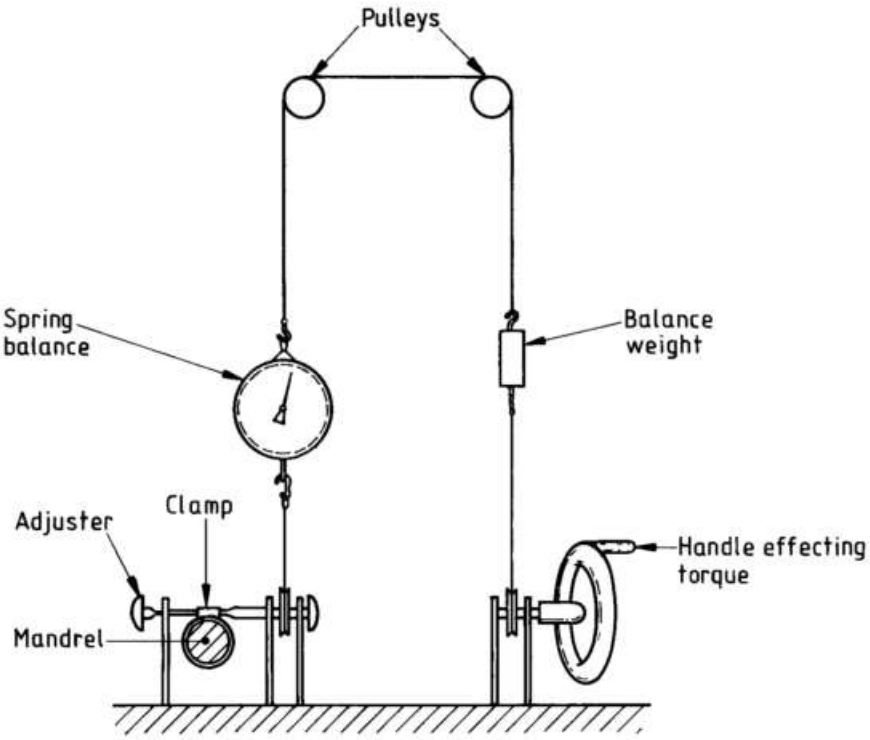


Figure 2 — Arrangement of a typical test rig for torque testing hose clamps

Table 1 — Dimensions of clamps

Designating size	Working range *X*		*Z*
	min.	max.	max.
mm	mm	mm	mm
12	9.5	12	25
16	11	16	25
20	13	20	25
22	16	22	25
25	18	25	25
30	22	30	29
35	25	35	29
40	30	40	29
45	35	45	33
50	35	50	32
55	40	55	33
60	45	60	33
70	55	70	33
80	60	80	33
90	70	90	33
100	85	100	33
120	90	120	33
140	120	140	33

Table 2 — Torque test valves

size	Torque
mm	N·m
12 to 20 inclusive	4.5
22 and 25	5.6
30 to 45 inclusive	6.8
50 to 60 inclusive	7.9
70 to 140 inclusive	9.0

9.3.2 ***Band tension and torque test for clamp sizes greater than*** **140 mm**

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

When a torque of 6.8 N·m is applied to the screw, the minimum indicated tension in the band shall be 1.5 kN. Further tightening to 7.9 N·m shall be possible without permanent distortion or failure.

The housing shall be a free sliding fit after the test.

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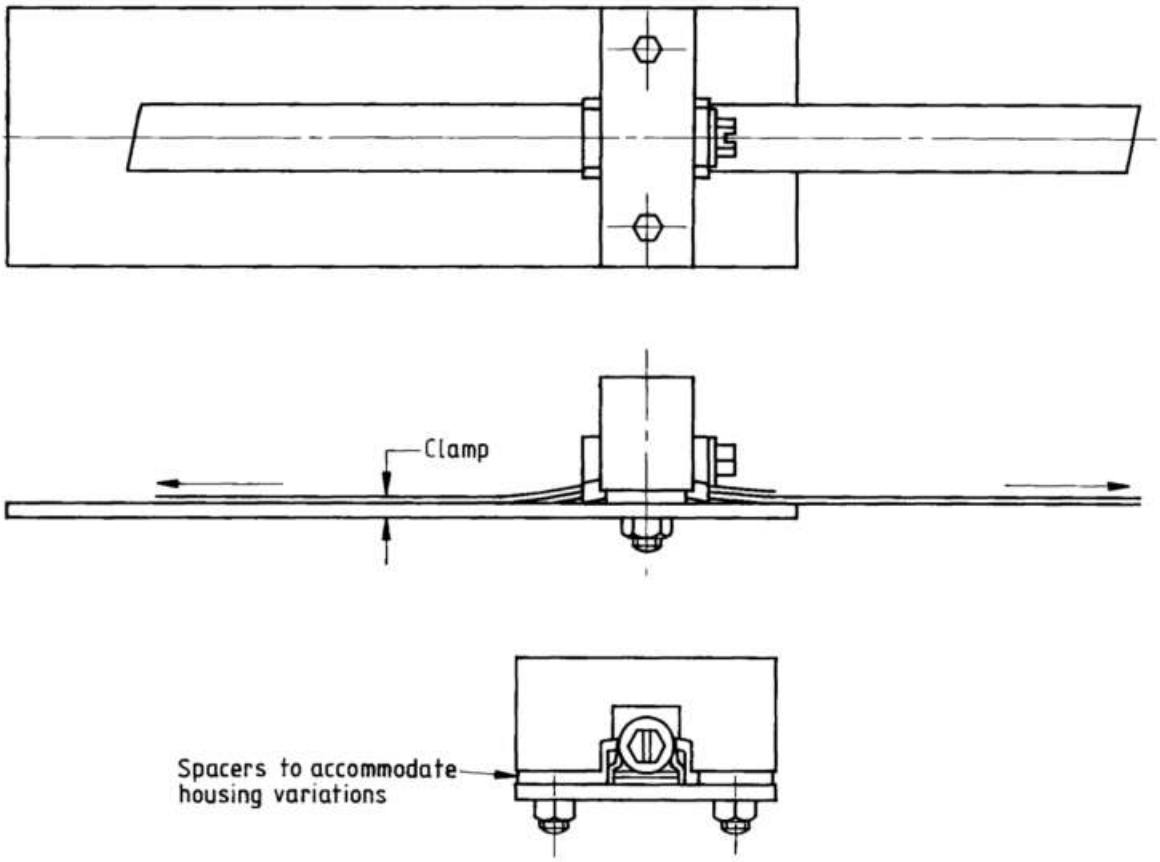


Figure 3 — Band tension and torque test fixture

9.4 Hydraulic pressure test

9.4.1 *General*

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

A1 The hose shall be rubber or PVC and have a working pressure of at least that specified in Table 3, have a smooth bore outside and have no metallic reinforcing. A1

The fluid used for the test shall be water at room temperature.

9.4.2 *Method of test*

The hose and clamps shall be assembled on an unbeaded, externally smooth and polished metal mandrel as illustrated in Figure 4.

NOTE The mandrel should be a sliding fit in the hose.

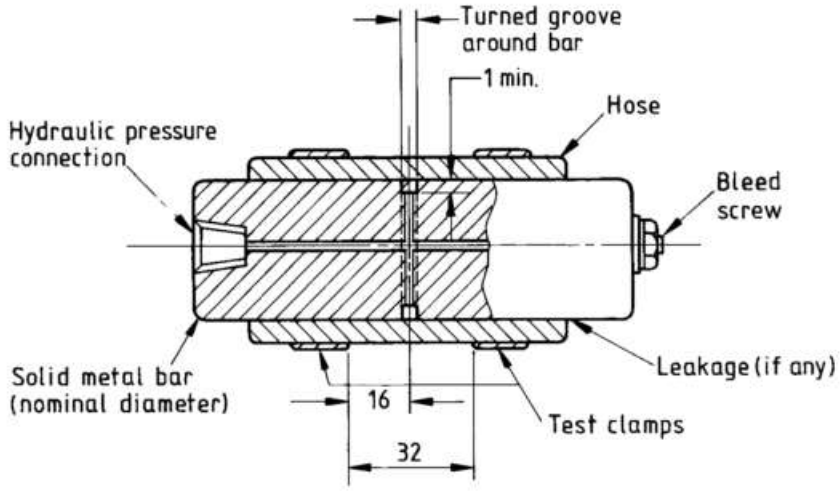
The torque applied when tightening the clamps shall not exceed 75 % of the appropriate torque value specified in Table 2.

Pressure shall be applied gradually from an external source until leakage or other failure occurs, at which stage the pressure shall be not less than the appropriate value specified in Table 3.

Table 3 — Hydraulic pressure test values

Size	Pressure
mm	MPa
12 to 30 inclusive	1.4
35 to 70 inclusive	0.7
80 to 140 inclusive	0.3

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All dimensions are in millimetres.

Figure 4 — Hydraulic pressure test rig

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Publication(s) referred to

A1 *Text deleted* A1

BS 5466, *Methods for corrosion testing of metallic coatings.*

A1 *Text deleted* A1

A1 BS EN ISO 9227, *Corrosion tests in artificial atmospheres – Salt spray tests.* A1

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