

**SRI LANKA STANDARD 597:1982**  
**UDC 621.643.44**

**SPECIFICATION FOR**  
**WORM DRIVE TYPE HOSE CLAMPS**

**BUREAU OF CEYLON STANDARDS**



SPECIFICATION FOR WORM DRIVE TYPE HOSE CLAMPS FOR  
GENERAL PURPOSE USE

SLS 597:1982

Gr. 7

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SPECIFICATION FOR WORM DRIVE TYPE HOSE CLAMPS FOR  
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**FOREWORD**

This Sri Lanka Standard Specification was authorised for adoption and publication by the Council of the Bureau of Ceylon Standards on 1982-11-24, after the draft, finalised by the Drafting Committee on Hose Clamps has been approved by the Mechanical Engineering Divisional Committee.

This standard covers the requirements for worm drive type hose clamps intended for general purpose industrial, domestic and automobile use.

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 CS 102. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

The valuable assistance derived from the publications of the British Standards Institution, Indian Standards Institution and the South African Bureau of Standards in the preparation of this standard, is gratefully acknowledged.

**1 SCOPE**

1.1 This standard specifies the requirements for worm drive hose clamps for general purpose use.

1.2 This standard does not cover requirements for worm drive hose clamps for aircraft use.

**2 REFERENCES**

- ISO 2081 Electroplated coatings of zinc on iron or steel.
- ISO 2082 Electroplated coatings of cadmium on iron or steel.
- BS 2952 Rubber hose for internal combustion engine cooling systems.

3 DEFINITIONS AND NOMENCLATURE

For the purpose of this standard, the following definitions and the nomenclature given in Fig. 1 shall apply :

3.1 band : A strip metal component that is intended to encircle a hose and has serrations or slots and to which the housing is fixed. (Fig. 1)

3.2 housing : A component that accomodate the screw (Fig. 1)

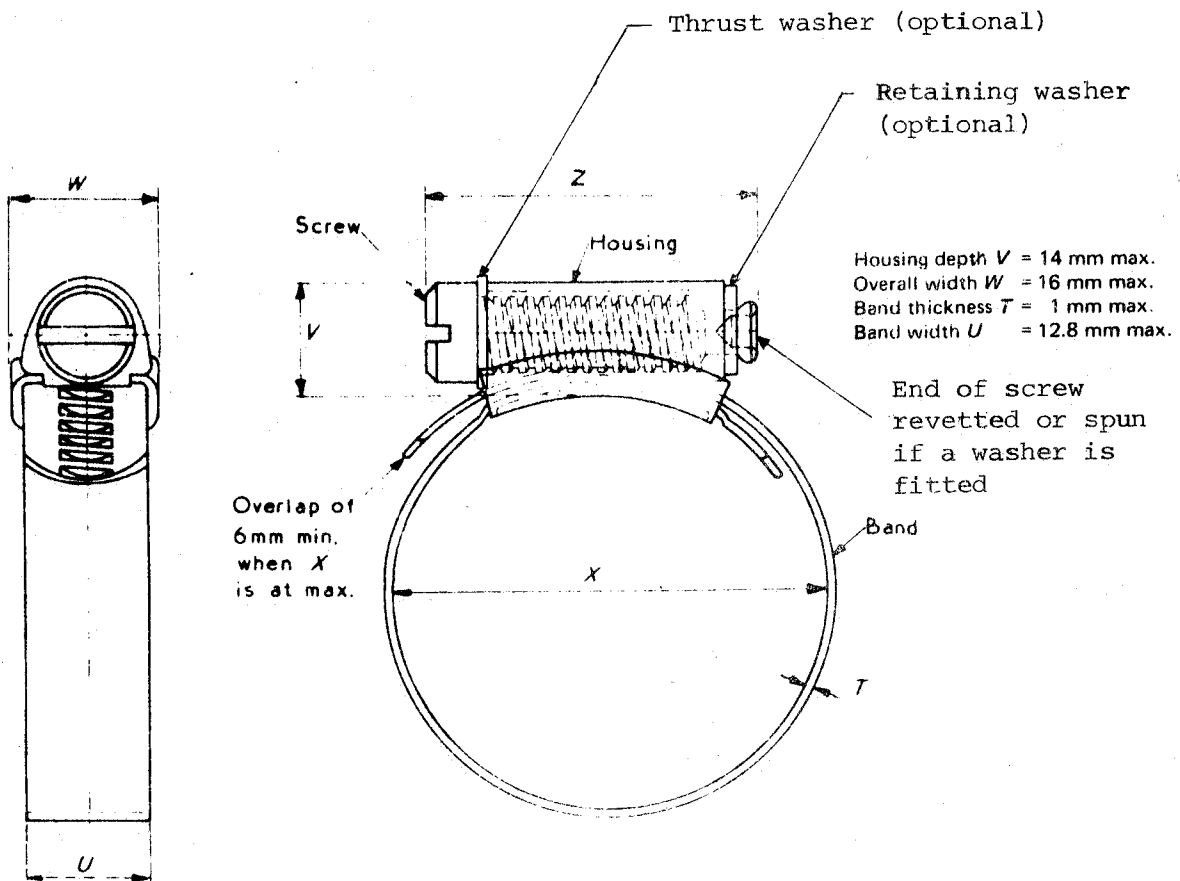


FIGURE 1 - Typical design and nomenclature of hose clamp

#### 4 REQUIREMENTS

##### 4.1 Materials

The materials used in the manufacture of worm drive clamps shall be steel provided that the finished clamps are capable of passing the tests specified in 6.

##### 4.2 Range of size and dimensions

4.2.1 The preferred range of sizes and dimensions of clamps are listed in Table 1.

TABLE 1 - Dimensions of clamps

Designating size mm	Working range (mm)		
	X		Z
	min	max	max
9.5- 12	9.5	12	25
11 - 16	11	16	25
13 - 20	13	20	25
16 - 22	16	22	25
18 - 25	18	25	25
22 - 30	22	30	29
25 - 35	25	35	29
27 - 40	27	40	29
35 - 45	35	45	33
35 - 50	35	50	33
40 - 55	40	55	33
45 - 60	45	60	33
55 - 70	55	70	33
60 - 80	60	80	33
70 - 90	70	90	33
85 - 100	85	100	33
90 - 120	90	120	33
120 - 140	120	140	33

4.2.2 This 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 clamps are of equivalent performance but do not ensure that clamps will satisfactorily hold hoses of diameters at the extremities of a clamps 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.

#### 4.3 Designating size

The designating size of a clamp shall given minimum and maximum external diameters of the component which the clamp is designed to secure.

Example :

A hose clamp which can secure components having external diameters from 22 mm to 30 mm shall be designated as ; Hose Clamp 22 - 30

#### 4.4 Design and construction

##### 4.4.1 *General*

4.4.1.1 When the loop is completed as 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 a clockwise direction and increased in diameter by turning the screw in a counter clockwise direction.

4.4.1.2 After expanding until the band is disconnected from the screw it shall be possible to open clamps of size 25 mm to 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.

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

##### 4.4.2 *Band*

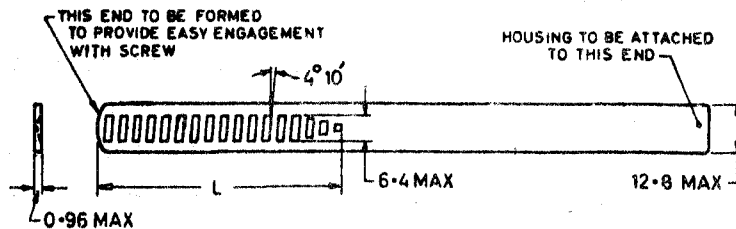
The band shall have transverse serrations or slots commencing at the free end and extending for length (depending upon the size of the clamp) sufficient to enable the clamp to be tightened on to the smallest diameter of hose for which it is designed.

##### 4.4.2.1 Serrated bands

The serrations shall be either rolled or milled. They shall not penetrate through the band nor shall they be longer than half the width of the band. The form and pitch of the serrations shall be



suited to the form and pitch of the screw (See 4.4.3 (a)) and the dimensions of the band shall be in accordance with Fig. 2.

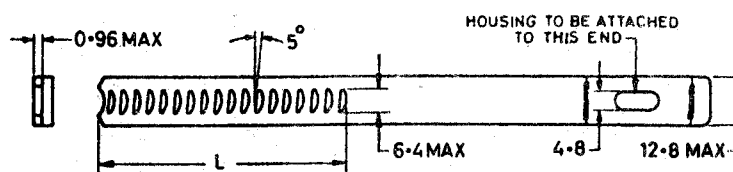


*All dimensions in millimetres*

**FIGURE 2 - Dimensions for band with milled or rolled serrations**

#### 4.4.2.2 Pierced bands

The pierced slots shall not be longer than half the width of the band. The form and pitch of the slot shall be suited to the form and pitch of the screw (See 4.4.3 (b)) and the dimensions of the band shall be in accordance with Fig. 3.



*All dimensions in millimetres*

**FIGURE 3 - Dimensions for band with pierced slots**

#### 4.4.3 Screw

The screw shall conform to the following requirements :

- a) On the hose clamps with serrated bands, the minimum size of the screw shall be 8 mm thread diameter 1.75 mm pitch right hand thread of square trapezoid form.

b) On the hose clamps with pierced bands, the minimum size of the screw shall be 8 mm thread diameter having 2.5 mm pitch right-hand thread of square or buttress form.

4.4.3.1 The screws may generally be of slotted head type, but other form of screw head may also be used provided the hose clamps meet the other requirements specified in this standard.

4.4.4 *Assembly*

The housing shall be securely held in position on the plain end of the band. In the case of an assembly that has a plated finish, any welding or method of assembly which may damage a plated finish shall have been done before the assembly was plated. The assembled hose clamp consisting of the housing (with band in position), screw and, if applicable, washer(s) shall be such that, when the loop is properly and completely formed, the screw is held firmly in engagement with the serrations or slots in the band and any axial and lateral movements of the screw are as small as practicable.

4.5 **Strength**

4.5.1 *Initial torque*

When determined in accordance with 6.2.1 the torque required for the first tightening and loosening of a lubricated clamp shall not exceed 1.5 N.m .

*NOTE - This test is conducted to ensure the smooth action of the lubricated clamp in its free-turning state.*

4.5.2 *Ultimate torque*

4.5.2.1 After subjecting to the torque test given in 6.2.2.1, 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.

4.5.2.2 When tested in accordance with 6.2.2.2 the torque at permanent distortion or failure shall be in excess of the appropriate value given in Table 2.

TABLE 2 - Ultimate torque test values

Designating size (mm)	Torque N.m
9.5 - 12 to 13 - 20	4.5
16 - 22 to 18 - 25	5.6
22 - 30 to 35 - 50	6.8
40 - 55 to 45 - 60	7.9
55 - 70 to 120 - 140	9.0

### 4.5.3 Hydraulic pressure

When a clamp is tested in accordance with 6.2.3 the joints between the hose and the mandrel shall withstand without leaking a hydraulic pressure not less than the appropriate value given in Table 3.

TABLE 3 - Hydraulic pressure test values

Designating size mm	Pressure MPa
9.5 - 12 to 22 - 30	1.4
25 - 35 to 55 - 70	0.7
60 - 80 to 120 - 140	0.3

### 4.6 Finish

4.6.1 All component parts of the clamp shall be smooth and free from harmful burns and sharp edges.

4.6.2 Clamps other than those manufactured from corrosion resistant materials shall be protected against corrosion by electroplating in accordance with ISO 2081:1973 or ISO 2082:1973.

## 5 PACKING AND MARKING

### 5.1 Packing

Unless otherwise specified by the purchaser, clamps shall be packed in acceptable containers, and only clamps of the same designating size, material(s), design and finish shall be packed together in a container.

### 5.2 Marking

#### 5.2.1 Clamps

Each clamp shall be permanently and indelibly marked with the manufacturer's name or trade mark and the appropriate designating size.

#### 5.2.2 Containers

Each container shall be legibly and indelibly marked (or bear a label so marked) with the following information :

- a) The name and address of the manufacturer;
- b) The trade name or trade mark, if any;
- c) The designating size of clamps;
- d) The material and finish of clamps; and
- e) The quantity of clamps.

## 6 INSPECTION AND METHODS OF TESTS

### 6.1 Inspections

Visually examine and measure each hoseclamps in the sample taken in accordance with 7.1 for compliance with the relevant requirements of 4.1, 4.2, 4.3, 4.4, 4.6.1 and 5.

### 6.2 Methods of test

#### 6.2.1 Initial torque test

Lubricate the screw mechanism of the clamp under test and hold the clamp in a suitable manner. Then using an apparatus capable of applying a pure torque to the screw of the clamp, check the torque required to tighten and loosen the clamp for compliance with requirements of 4.5.1.

#### 6.2.2 Ultimate torque test

6.2.2.1 By means of a suitable solvent lubricate the hose clamp to be tested. Place the hose clamp on the rigid mandrel of diameter equal to the maximum size of the clamp given in 4.3. Using the test rig shown in Fig. 4 apply to the screw 75 per cent of the appropriate torque given in Table 2. Then loosen the clamp and examine it for compliance with 4.5.2.1.

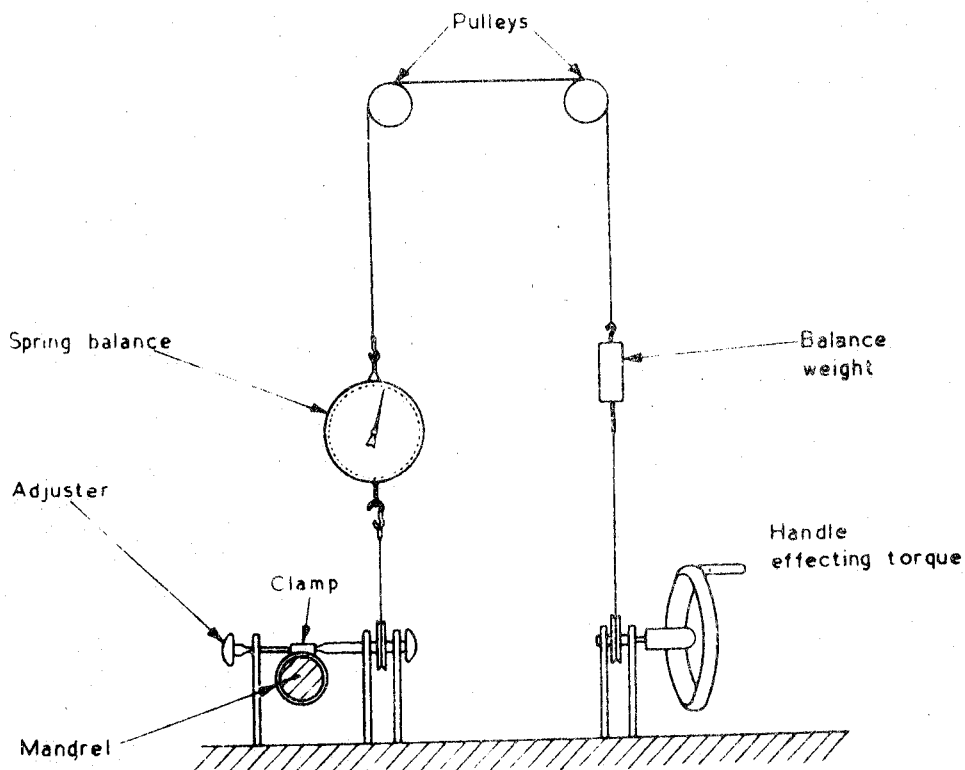


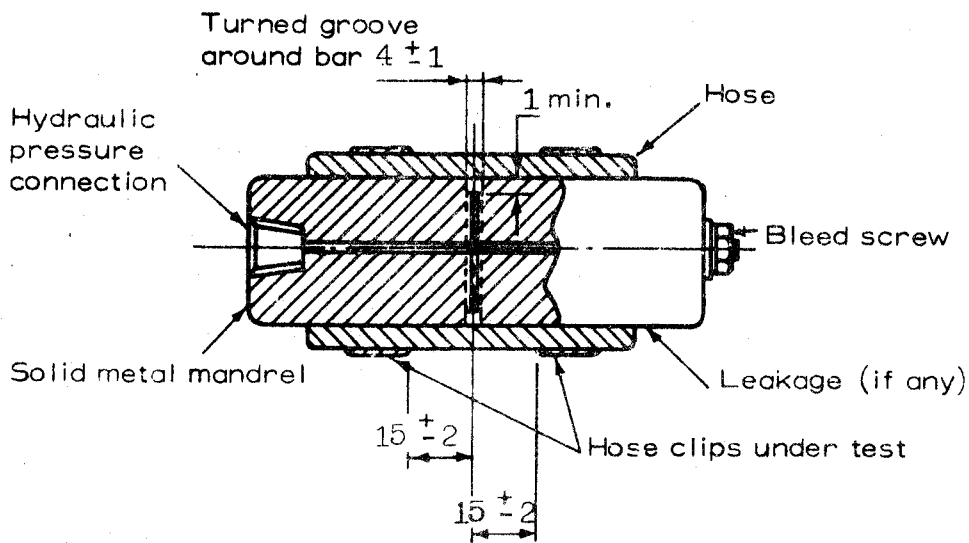
FIGURE 4 - Arrangement of a typical test rig for torque testing hose clamps

6.2.2.2 Replace the clamp on the mandrel and retighten the screw until the permanent distortion or failure occurs.

### 6.2.3 Hydraulic pressure test

#### 6.2.3.1 Test apparatus

The test apparatus shall be as shown in Fig. 5. The hose shall be type 1 as specified in BS 2952, and shall have an external diameter equal to the mean value of the working range of the clamp under test.



*Dimensions in millimetres*

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

**FIGURE 5 - Hydraulic pressure test device**

#### 6.2.3.2 Procedure

The torque applied tightening the clamps shall not exceed 75 per cent of the appropriate 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.

*NOTE - Two samples of each size clamp shall be tested in accordance with the above procedure.*

## 7 SAMPLING

### 7.1 Lot

In any consignment all the hose clamps of same size, designation and belonging to one batch of manufacture shall be grouped to form a lot.

### 7.2 Scale of sampling

7.2.1 The conformity of a lot to the requirements of this standard shall be determined on the basis of tests carried out on the samples selected from the lot.

7.2.2 The number of samples to be selected from the lot shall be in accordance with Column 1 and Column 2 of Table 4.

7.2.3 If clamps are packed in containers, the samples shall be drawn from five containers or 20 per cent of the total containers which ever is more. As far as possible an equal number of clamps shall be drawn from each container so as to form a sample of size as given under Column 2 of Table 4.

TABLE 4 - Scale of sampling for hose clamps

No. of clamps in the lot  (1)	No. of clamps to be selected  (2)	Size of the sub sample  (3)	Acceptance number  (4)
Up to 500	20	03	01
501 to 1 200	32	04	01
1 201 to 3 200	50	05	02
3 201 to 10 000	80	06	03
10 001 and above	125	08	05

7.2.4 The containers and clamps shall be drawn at random. In order to ensure randomness of selection, random number tables as given in SLS 428 shall be used.

### 7.3 Testing of samples

7.3.1 Each clamp selected as in 7.2.2 shall be inspected for requirements specified in 6.1 of this standard.

7.3.2 The lot having been found satisfactory according to 7.3.1 shall be tested for requirements specified in 6.2. For this purpose, 3 sub-samples of each having size as given in Column 3 of Table 4 shall be drawn and subjected to the following tests.

- Sub sample 1 - Initial torque test
- Sub sample 2 - Ultimate torque test
- Sub sample 3 - Hydraulic pressure test

#### 7.4 Conformity to standard

The lot shall be declared as conforming to the requirements of this standard if the following conditions are satisfied :

7.4.1 Each clamp examined as in 7.3.1 satisfies the relevant requirement.

7.4.2 The number of clamps not conforming to any one or more of the requirements when examined as in 7.3.1 is less than or equal to the corresponding acceptance number given in Column 4 of Table 4.

7.4.3 The clamps of each sub sample satisfy the relevant requirements.





## **SLS CERTIFICATION MARK**

*The Sri Lanka Standards Institution is the owner of the registered certification mark shown below. Beneath the mark, the number of the Sri Lanka Standard relevant to the product is indicated. This mark may be used only by those who have obtained permits under the SLS certification marks scheme. The presence of this mark on or in relation to a product conveys the assurance that they have been produced to comply with the requirements of the relevant Sri Lanka Standard under a well designed system of quality control inspection and testing operated by the manufacturer and supervised by the SLSI which includes surveillance inspection of the factory, testing of both factory and market samples.*

*Further particulars of the terms and conditions of the permit may be obtained from the Sri Lanka Standards Institution, 17, Victoria Place, Elvitigala Mawatha, Colombo 08.*



## **SRI LANKA STANDARDS INSTITUTION**

The Sri Lanka Standards Institution (SLSI) is the National Standards Organization of Sri Lanka established under the Sri Lanka Standards Institution Act No. 6 of 1984 which repealed and replaced the Bureau of Ceylon Standards Act No. 38 of 1964. The Institution functions under the Ministry of Science & Technology.

The principal objects of the Institution as set out in the Act are to prepare standards and promote their adoption, to provide facilities for examination and testing of products, to operate a Certification Marks Scheme, to certify the quality of products meant for local consumption or exports and to promote standardization and quality control by educational, consultancy and research activity.

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All members of the Technical and Sectoral Committees render their services in an honorary capacity. In this process the Institution endeavours to ensure adequate representation of all view points.

In the International field the Institution represents Sri Lanka in the International Organization for Standardization (ISO), and participates in such fields of standardization as are of special interest to Sri Lanka.