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भारतीय मानक मसौदा
मॉड्यूलर निचले अंग ऑर्थोटिक घटकों के लिए विशिष्टि
भाग 1 स्टीरप्स

[IS 9471 (Part 1): 1980 का पहला पुनरीक्षण]

Draft Indian Standard

Specification for Modular lower limb Orthotic Components
Part 1 Stirrups

[First revision of IS 9471 (Part 1): 1980]

ICS 11.180.10

Artificial Limbs, Rehabilitation Appliances and
Equipment for the Persons with Disability
Sectional Committee, MHD 09

Last date for comments: **03 July 2024**

FOREWORD

(Formal clauses will be added later)

This standard was originally published in 1980. The first revision of this standard has been brought out to align the standard with the latest style and format of Indian Standards. This revision incorporates Amendment No.1 issued in February 1993. Also, cross-references to Indian Standards have been updated.

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 same as that of the specified value in this standard.

1 SCOPE

This standard specifies the dimensional and other requirements of full stirrups for modular lower limb braces.

2 REFERENCES

The standards given 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 agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of these standards.

IS No.	Title
IS 513 (Part 1): 2016	Cold reduced carbon steel sheet and strip Part 1 cold forming and drawing purpose (<i>sixth revision</i>)
IS 1079: 2017	Hot rolled carbon steel sheet, plate and strip – Specification (<i>seventh revision</i>)
IS 6911: 2017	Stainless steel plate, sheet and strip – Specification (<i>second revision</i>)
IS 1573: 1986	Specification for electroplated coatings of zinc on iron and steel (<i>second revision</i>)
IS 1068: 1993	Electroplated coatings of nickel plus chromium and copper plus nickel plus chromium – Specification (<i>third revision</i>)

3 TYPES

Four types of stirrups (according to their lobe configurations) shall be as follows:

- a. Type 1 — Free motion,
- b. Type 2 — Limited motion,
- c. Type 3 — Foot drop, and
- d. Type 4 — Double action.

3.1 The general configurations of stirrup lobes for the types given in **3** shall be as indicated in Fig. 1.

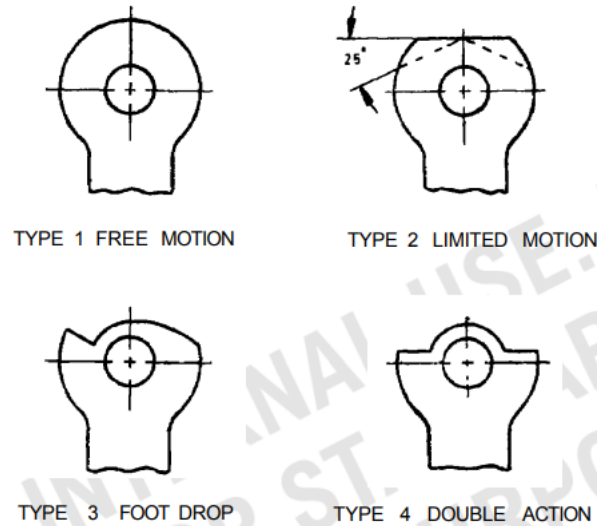


FIG. 1 TYPES OF STIRRUPS

4 MATERIAL

Mild steel sheet strip, cold rolled annealed CR0 of IS 513 (Part 1) or hot rolled annealed Grade HR0 of IS 1079. Finished thickness of components shall be not less than 3.0 mm. Alternatively, stirrups may be manufactured from stainless steel sheet strip 3.0 mm thick hot cold rolled annealed conforming to designation 04Cr18Ni10 or 07Cr18Ni9 of IS 6911.

5 SHAPE AND DIMENSIONS

5.1 Shape

The typical shape of stirrup (other than the lobe configuration) shall be as given in Fig. 2.

5.2 Overall Dimensions

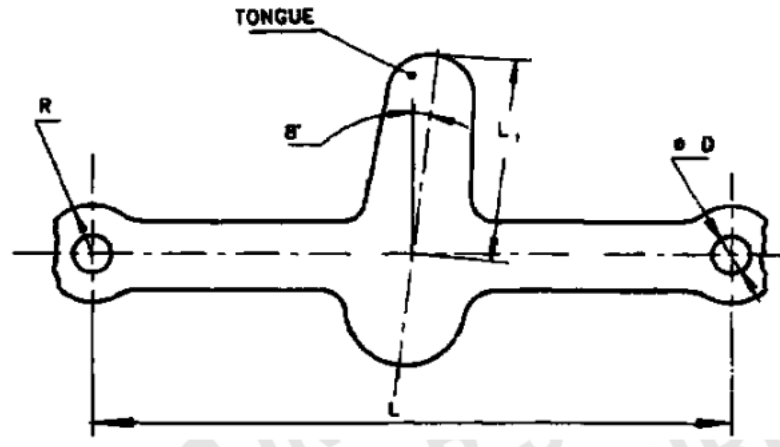
The overall dimensions of the stirrups shall be as given in Fig. 2. These dimensions shall apply to all types of stirrups.

5.3 Dimensions of Lobes

The general lobe configurations for different types are given in Fig 1. The lobe dimensions of each type shall be subject to performance considerations as given in 5.3.1 to 5.3.4. The detailed dimensions shall be arrived at by the manufacturer depending on their individual designs when matched with their ankle.

5.3.1 Free motion (Type 1)

The stirrup shall provide an unrestricted movement of at least 45° in both plantar-flexion and dorsi-flexion when assembled with the ankle joint unit.



Size	$L \pm 2$	$L1 \pm 3$	Lebe Radius $R \pm 0.25$	Hole Dia D. H8
1	140, 160, 180	45	10	7
2	200, 220, 240	52	12	9
3	260, 280, 300	60	15	9

All dimensions in millimetres.

FIG. 2 STIRRUP

5.3.2 Limited motion (Type 2)

The stirrup end shall be finished as shown in Fig 1. Further shaping (as indicated in dotted lines) at the time of fitting shall provide 0 to 25° in plantar or and dorsi-flexion as required.

5.3.3 Foot drop (Type 3)

The lobe shall be so contoured as to provide the following maximum flexion when assembled with its ankle joints at the time of its manufacture.

Plantar-flexion	30°
Dorsi-flexion	15°

Additional flexion of 10° either way shall be obtainable by further manual finishing at the time of fitting.

5.3.4 Double action (Type 4)

The lobe shall be so contoured as to provide equal plantar-flexion of 25° when used with appropriate ankle joint.

6 WORKMANSHIP AND FINISH

All sharp edges shall be deburred. Stirrups shall be free from tool marks, scales, surface flaws and pittings. The stirrups shall be buffed clean and zinc plated to Grade 1 (FeZn5) of IS 1573.

Alternatively, the stirrups may be plated chromium over nickel and the plating shall conform to Service Condition No. 2 of IS 1068. Holes rendered under size in plating shall be acceptable

and be reamed to size at the time of fitting if required. In the case of stainless steel stirrups they shall be buffed smooth, passivated and polished bright.

7 MARKING

7.1 The stirrups shall be marked by putting a label or otherwise with the following:

- a) Manufacturer's name, initials or recognized trademark
- b) Proper identification of the type, size and material

7.2 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 product(s) may be marked with the Standard Mark.

8 PACKING

The stirrups shall be packed as pairs of same size and length in polyethylene bags and ends heat-sealed. The stirrup may also be packed as agreed to between the manufacturer and the purchaser.