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**Footstools for hospital use — Specification**



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This African Standard was prepared by ARSO TC 78, Medical devices and equipment

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## Footstools for hospital use — Specification

### 1 Scope

This standard specifies the requirements for single-step and double-step footstools suitable for use in hospital and health care institutions.

### 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 6272-1, *Paints and varnishes -- Rapid-deformation (impact resistance) tests – Part 1: Falling-weight test, large-area indenter*

### 3 Terms and definitions

For the purpose of this standard the following definitions apply.

#### **acceptable**

recognised by the relevant authority administering this specification, or to the parties concluding the purchase contract, as relevant

### 4 Requirements

#### 4.1 Materials

##### 4.1.1 Mild steel sheets and sections

Mild steel sheets and sections shall be of a good quality mild steel and shall be free from cracks, fins, laminations and other defects.

##### 4.1.2 Steel tubes

Round steel tubes shall comply with the relevant requirements in Table 1.

**Table 1: Grade and Mechanical properties for tube**

Grade	Minimum yield strength, ( $R_{eH}$ ), MPa	Minimum ultimate tensile strength, MPa
275	275	410
355	350	450

##### 4.1.3 Stainless steel

Stainless steel used shall be of 18/8 (AISI Type 304) stainless steel or other acceptable austenitic stainless steel of weldable quality.

##### 4.1.4 Epoxy-powder coatings

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Epoxy-powder coatings shall be based on a compounded epoxy resin that is suitable for application by means of an aerostatic spray process (applicable to mild steel).

## 4.1.5 Nylon-powder coatings

Nylon-powder coatings shall be based on a nylon formulation that is suitable for application by means of an aerostatic spray process.

## 4.2 Joints

The parts of each permanent joint shall be close-fitting and in correct alignment. In the case of a welded joint, the whole joint shall be welded.

## 4.3 Welds

Welds shall be fusion welds or braze welds. Weld faces shall be smooth, clean and free from porosity, cavities and trapped slag. They shall merge smoothly into the surface of the parent metal without overlap or undue undercut. The weld metal, heat-affected zone and adjacent parent metal shall be free from cracks. Where welding is done from one side only, there shall be full penetration of the joint.

## 4.4 Types

The footstool shall be of one of the following types as specified by the purchaser:

- a) **Type A**, a single-step footstool (suitable for general use);
- b) **Type B**, a double-step footstool (suitable for general use); or
- c) **Type C**, a single-step footstool for theatre use.

## 4.5 General design

### 4.5.1 General design for type A and type B footstools

- a) The design of a footstool shall generally be similar to that shown in figure 1(a) for a type A footstool and to that shown in figure 1(b) for a type B footstool.

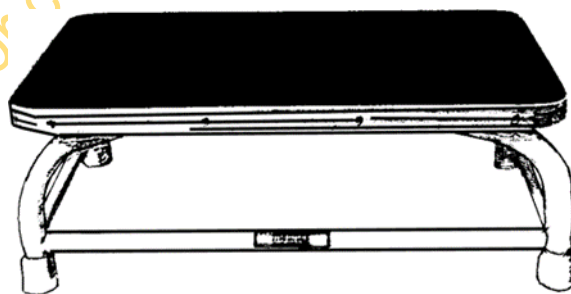


Figure 1(a) — Single-step type A (general use)



Figure 1(b) — Double-step type B (general use)

Figure 1 — Foot stools

- b) The footstool frame (excluding bracing tubes and bars) shall be constructed of steel tubes having a nominal size of at least 25 mm and a nominal wall thickness of at least 1.6 mm.
- c) The footstool step(s) shall be constructed by the formation of mild steel sheets of thickness at least 1.2 mm and, where necessary, shall be suitably strengthened. The top of the step(s) shall be covered with either black or grey coloured rubber sheeting of thickness at least 3 mm. The top surface of the rubber sheeting shall have an anti-slip pattern. The edge sides of the step(s) shall be enclosed to a depth of at least 30 mm with either stainless steel or aluminium, which shall be robustly secured to the step and shall have well rounded corners (viewed from above)
- d) The projection of the outer perimeter of the step(s) (viewed from above) shall fall **inside** the outer perimeter formed by the legs where the legs contact the ground surface.
- e) The ends of the footstool legs shall be permanently closed and shall be fitted with rubber ferrules (see 4.6).

#### 4.5.2 General design for type C footstools

- a) A type C footstool shall be a single-step footstool of design generally similar to that shown in figure 1(a) for type A.
- b) The footstool frame (excluding bracing tubes and bars) shall be constructed of stainless steel tubes having a nominal size of at least 25 mm and a nominal wall thickness of at least 1.20 mm. Bracing tubes and bars shall be of stainless steel.
- c) The step shall be constructed of chequered (anti-slip) plate (aluminium or stainless steel) (of thickness at least 4 mm, if unsupported). The edges along the length of the step shall be curved (or shall project) downwards to a depth of not less than 30 mm, measured from the edge to the top surface of the step. The step shall be so secured, and shall so cover the supporting frame, that any fluid spilt from above cannot become trapped in any part of the members or joints of the stool.
- d) The projection of the outer perimeter of the step(s) (viewed from above) shall fall **inside** the outer perimeter formed by the legs where the legs contact the ground surface.
- e) The ends of the footstool legs shall be permanently closed and shall be fitted with rubber ferrules (see 4.6).
- f) The foot shall be so designed and constructed that all of its external surfaces can be easily cleaned and that the stool will be free from potential dirt traps.

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## 4.6 Leg ferrules

Leg ferrules shall be of an acceptable non-marking black, white or grey vulcanized rubber, which contains enough suitable non-staining anti-oxidant to counteract crazing during service. They shall fit onto the ends of the footstool legs securely and shall be of overall height at least 20 mm, of wall thickness (at the top) at least 2,5 mm, and of base thickness at least 4 mm.

## 4.7 Dimensions

The dimensions of a footstool shall be in accordance with those given in (a) or (b) below, as relevant:

### a) Single-step footstool (type A and type C)

#### 1) Step size

Length in the range 500 – 600 mm and width in the range 300 – 330 mm.

#### 2) Height of top surface of step above floor level

In the range 145 – 155 mm

### b) Double-step footstool (type B)

#### 1) Lower step size

Length in the range 500 – 520 mm and width in the range 230 – 250 mm.

#### 2) Top step size

Length in the range 500 – 520 mm and width in the range 300 – 330 mm.

#### 3) Height of top surface of lower step above floor level

In the range 165 – 175 mm.

#### 4) Height of top surface of top step above floor level

In the range 345 – 355 mm

## 4.8 Structural strength

When a 250 kg mass piece (with a contact surface of diameter approximately 250 mm) is loaded onto any part of the step(s), no discernable permanent deformation shall occur.

## 4.9 Finish

### 4.9.1 General

All metal surfaces shall be clean, smooth and free from pits, deep scratches, scale, laps, buckles, crimps and other defects. Mild steel surfaces shall have either an epoxy-powder or a nylon-powder coated finish. The colour of the coated finish shall be as specified by the purchaser.

### 4.9.2 Epoxy-powder and nylon-powder coatings

#### 4.9.2.1 Colour and appearance

A powder coating shall be glossy, shall be uniform in colour, and shall cover the metal surfaces completely and uniformly. The coating shall be free from grittiness and cratering and shall show not more than a slight orange-peel texture.

#### 4.9.2.2 Thickness of epoxy-powder coatings

The thickness of an epoxy-powder coating film, when determined in accordance with A.3, shall be at least 60 µm.



**4.9.2.3 Scratch resistance**

When a powder coating is tested in accordance with A.4, the scratch produced shall be free from ragged edges and shall not have penetrated to the underlying metal.

**4.9.2.4 Impact resistance**

When tested in accordance with A.5, a powder coating shall withstand a direct impact without cracking, flaking or showing loss of adhesion.

**4.9.2.5 Resistance to salt spray**

When tested in accordance with A.6, the coated surface of the test panel shall show no sign of corrosion.

**5 Marking**

The footstool shall be legibly and indelibly marked with the manufacturer's name or trademark.

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**Annex A  
(normative)**

**Inspection and method of tests**

**A.1 Inspection**

Visually examine and measure the footstool for compliance with all the relevant requirements of the specification for which tests to assess compliance are not given in A.3 – A.6 (inclusive).

**A.2 Test panels**

For the tests given in A.3 – A.6, use test panels of cold-rolled steel of thickness 0,6 – 0,9 mm and of size at least 150 mm × 100 mm, each having a coating of epoxy powder or nylon powder, as relevant, applied under conditions identical with those used for the coating of the unplated mild steel surfaces of the footstool under test.

**A.3 Determination of thickness of epoxy-powder coating film**

**A.3.1 Apparatus**

A suitable magnetic flux type apparatus.

**A.3.2 Procedure**

**A.3.2.1** Calibrate the instrument, using a non-magnetic shim (of approximately the same thickness and profile as those of the film on the coated part under test) placed in full contact with a piece of clean steel of the same thickness as, and of an identical shape to, those of the part under test.

**A.3.2.2** Place the operating head of the instrument on the film to be tested and read off the thickness. Repeat the reading three times at different places on the film surface and record the average of the readings. Check for compliance with 4.9.2.2.

**A.4 Scratch resistance**

Use a test panel as described in A.2. Apply a mass-load of 2 000 g. Check for compliance with 4.9.2.3.

**A.5 Impact resistance of coated films**

**A.5.1** Use ISO 6272-1 but use a test panel as described in A.2. Place the test panel on the baseplate, with the coated side upwards, and drop the mass piece onto it from a height of  $634 \pm 2$  mm (equivalent to an impact energy of 5.6 J).

**A.5.2** When examining the dented part of the panel, ignore cracks that do not extend through the thickness of the coating. Check for compliance with 4.9.2.4.

**A.6 Resistance to salt spray**

Use a test panel as described in A.2. Expose the test panel for 200 h. Check for compliance with 4.9.2.5.

## Bibliography

CKS 617:2009 Footstools for hospital use

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