

# Manhole steps —

## Part 2: Specification for plastics encapsulated manhole steps

# Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Health Care Standards Policy Committee (RDB/-) to Technical Committee RDB/35, upon which the following bodies were represented:

- Association of London Borough Engineers and Surveyors
- British Foundry Association
- British Precast Concrete Federation Ltd.
- Clay Pipe Development Association Ltd.
- Consumer Policy Committee of BSI
- County Surveyors' Society
- Department of the Environment (Property Services Agency)
- Department of Transport (Engineering Policy and Programme Division)
- Ductile Iron Pipe Committee
- Electricity Supply Industry in England and Wales
- Industry of British Foundrymen
- Institute of Building Control
- Institute of Mechanical Engineers
- Institution of Water and Environment Management (IWEM)
- Institution of Works and Highways Management
- Water Authorities Association

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## Foreword

This Part of BS 1247 has been prepared under the direction of the Road Engineering Standards Policy Committee. It supplements BS 1247-1 which deals with galvanized ferrous and stainless steel manhole steps.

Previous editions of BS 1247 specified rigid dimensions for steps but this Part specifies performance criteria based on test requirements and only key dimensions have been included.

As in BS 1247-1, double steps (also known as rung irons) have been included and this Part deals with plastics encapsulated steel and aluminium steps. It is intended to prepare a further part covering aluminium steps with plastics fixings.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

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### Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 10, 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.

## 1 Scope

This Part of BS 1247 specifies the essential dimensions and general requirements for plastics totally encapsulated manhole steps.

These types of plastics encapsulated manhole steps are for use in structures such as concrete manholes and inspection chambers in foul and surface water sewers or where the environment may include concentrated levels of acid and alkalis.

NOTE 1 This Part of BS 1247 not intended to cover steps which are subject to prolonged exposure to ultraviolet light.

NOTE 2 A summary of items to be agreed between the manufacturer and the purchaser is given in Appendix A.

NOTE 3 The titles of the publications referred to in this standard are listed on the inside back cover.

## 2 Materials

### 2.1 Plastics

The plastics used in steps shall be a polyolefin to BS 3412 or BS 5139.

### 2.2 Metal

**2.2.1 Steel** Steel used in steps shall be one of the following:

- a) steel complying with BS 970-1, BS 3100, BS 4360 or BS 4449; or
- b) stainless steel complying with BS 970-1.

### 2.2.2 Aluminium

Aluminium used in steps shall comply with grade 6060, 6063 or 6082 of BS 1474.

## 3 Design features

### 3.1 Design and dimensions

**3.1.1** Steps shall comply with the appropriate dimensions given in Figure 1 and Figure 2.

**3.1.2** The minimum thickness of plastics shall be 3 mm when measured in accordance with Appendix B. The plastics cover shall be permanently moulded around the metal core.

### 3.2 Treads

**3.2.1** Slip resistance of the treads shall be achieved by ribbing or chequering at least 2 mm in height.

**3.2.2** Single steps shall have an upstand of at least 5 mm high and 25 mm long on each end of the tread.

**3.2.3** Double steps shall have an upstand of at least 20 mm high and 25 mm long on each end of the tread to act as a boot stop.

NOTE The steps shown in Figure 1 and Figure 2 are examples only of typical configurations and are not intended to fix design.

### 3.3 Design projection

The design projection shall be defined by a change of section (see Figure 1 and Figure 2 for examples).

## 4 Finish

Steps shall be protected from corrosion by being totally encapsulated in plastics and shall be free from projections or sharp edges likely to cause injury.

## 5 Design tests

Steps shall be designed to satisfy the test requirements specified in 3.1 and clause 7.

## 6 Quality control tests

Sample steps shall be tested for compliance with the requirements given in 7.1, 7.2, 7.4 and 7.5.

Sampling procedures shall be in accordance with BS 6001-1 or BS 6002 with a minimum AQL of 1.

## 7 Test requirements

### 7.1 Twist

When supported on three props of equal height on a level surface, as shown in Figure 3, the height ( $H$ ) of the front edge of the tread from that surface shall not vary along its length by more than 3 mm for a single step or more than 5 mm for a double step.

### 7.2 Bending

When tested in accordance with Appendix C the step shall support a load of 2.5 kN without visible cracking and the deflection shall not exceed 5 mm. After removal of the load, the residual deflection shall not exceed 1 mm.

NOTE The residual deflection is intended to allow for a bedding in factor and not for yield in the material. The graphical plots of load against deflection should exhibit a straight line relationship, i.e. loading within the elastic range of the materials.

### 7.3 Pull out test

When tested in accordance with Appendix D steps shall resist a force of 7.5 kN.

### 7.4 Integrity of plastics test

When tested in accordance with Appendix E steps shall show an electrical resistance of at least 1 MΩ.

NOTE For acceptance of the steps there should be no cracking, fracturing or openings through the plastics encasement. An unacceptable casing will be indicated by a resistance of less than 1 MΩ after 30 min in the salt/detergent solution. An acceptable casing will be indicated by a resistance of not less than 1 MΩ after 30 min in the salt/detergent solution.

### 7.5 Impact test

When tested in accordance with Appendix F steps shall absorb an impact from a striker of mass 20 kg dropped from a height of 1 m without fracture. After testing, steps shall comply with 7.4.