

Steps for underground man entry chambers — Requirements, marking, testing and evaluation of conformity

The European Standard EN 13101:2002 has the status of a
British Standard

ICS 97.145

National foreword

This British Standard is the official English language version of EN 13101:2002.

EN 13101 is a candidate “harmonized” European Standard and fully takes into account the requirements of the European Commission mandate M118 “Waste water engineering products”, given under the EU Construction Products Directive (89/106/EEC), and intended to lead to CE marking. The date of applicability of EN 13101 as a harmonized European Standard, i.e. the date after which this standard may be used for CE marking purposes, is subject to an announcement in the *Official Journal of the European Communities*.

The Commission in consultation with Member States have agreed a transition period for the co-existence of harmonized European Standards and their corresponding national standard(s). It is intended that this period will comprise a period, usually nine months, after the date of availability of the European Standard, during which any required changes to national regulations are to be made, followed by a further period, usually of 12 months, for the implementation of CE marking. At the end of this co-existence period, the national standard(s) will be withdrawn.

EN 13101 is the subject of transitional arrangements agreed under the Commission mandate. In the UK, the corresponding national standards are:

- BS 1247-1:1990, *Specification for galvanized ferrous or stainless steel manhole steps*.
- BS 1247-2:1990, *Specification for plastics encapsulated manhole steps*.
- BS 1247-3:1991, *Specification for aluminium manhole steps*.

and based on this transition period of twenty-one months, BS 1247-1:1990, BS 1247-2:1990 and BS 1247-3:1991 would be withdrawn in June 2004.

NOTE This date is approximate. Users of this standard should contact BSI Customer Services for confirmation of withdrawal.

The UK participation in its preparation was entrusted to Technical Committee B/505, Wastewater engineering, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this committee can be obtained on request to its secretary.

This British Standard, having been prepared under the direction of the Building and Civil Engineering Sector Policy and Strategy Committee, was published under the authority of the Standards Policy and Strategy Committee on 14 November 2000

Amendments issued since publication

© BSI 14 November 2002

Amd. No.	Date	Comments

ISBN 0 580 40726 8

Cross-references

The British Standards which implement international or European publications referred to in this document may be found in the BSI Catalogue under the section entitled “International Standards Correspondence Index”, or by using the “Search” facility of the *BSI Electronic Catalogue* or of British Standards Online.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Summary of pages

This document comprises a front cover, an inside front cover, page i, a blank page, the EN title page, pages 2 to 35 and a back cover.

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English version

Steps for underground man entry chambers - Requirements, marking, testing and evaluation of conformity

Echelons de trou d'homme - Prescriptions, marquage,
essai, et évaluation de la conformité

Steigeisen für Steigeisengänge in Schächten -
Anforderungen, Kennzeichnung, Prüfung und Beurteilung
der Konformität

This European Standard was approved by CEN on 1 August 2002.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
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Foreword

This document (EN 13101:2002) has been prepared by Technical Committee CEN /TC 165, "Waste water engineering" the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by April 2003, and conflicting national standards shall be withdrawn at the latest by July 2004.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

In this European Standard the Annexes A to F and H are normative and the Annexes G and I are informative.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This standard specifies general requirements and testing methods for steps manufactured from cast iron, steel or aluminium, for use in manholes and other underground man entry chambers as a means of access.

This standard specifies performance criteria for mechanical stability and resistance providing protection against falling. Corresponding test methods and evaluation of conformity are included.

The steps specified in this European Standard are suitable for use in sewage, surface water and, subject to the requirements of national regulations, potable water environments.

Where steps are to be used in particular corrosive environments, e.g. industrial effluents, additional protection may be required.

This standard does not apply for steps moulded in prefabricated manholes of the same material.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 197-1, *Cement - Part 1: Composition, specifications and conformity criteria for common cements*.

EN 573-3:1994, *Aluminium and aluminium alloys - Chemical composition and form of wrought products - Part 3: Chemical composition*.

EN 1561, *Founding – Grey cast irons*.

EN 1562, *Founding - Malleable cast irons*.

EN 1563, *Founding - Spheroidal graphite cast irons*.

EN 2101, *Aerospace series; Chromic acid anodizing of aluminium and wrought aluminium alloys*.

EN 2284, *Aerospace series; Sulphuric acid anodizing of aluminium and wrought aluminium alloys*.

EN 10025, *Hot rolled products of non-alloy structural steels; - Technical delivery condition*.

ENV 10080:1995, *Steel for the reinforcement of concrete weldable ribbed reinforcing steel B 500 - Technical delivery conditions for bars, coils and welded fabric*.

EN 10088-1, *Stainless steels - Part 1: List of stainless steels*.

EN 10088-3, *Stainless steels - Part 3: Technical delivery conditions for semi-finished products, bars, rods, wire, sections and bright products of corrosion resisting steels for general and construction purposes*.

EN ISO 1461, *Hot dip galvanized coatings on fabricated iron and steel articles – Specifications. (ISO 1461:1999)*

ISO 1183, *Plastics; Methods for determining the density and relative density of non-cellular plastics*

ISO 3599, *Vernier callipers reading to 0,1 and 0,05 mm*).

ISO 3893:1977, *Concrete; Classification by compressive strength*.

3 Terms and definitions

For the purposes of this European Standard, the following terms and definitions apply.

3.1

step

component which is capable of being fixed into or attached to the wall of an underground man entry chamber or manhole to facilitate safe entry and exit

3.2

single step

step which is designed to support one foot or hand, and is intended to be installed in a staggered configuration with other such steps

3.3

double step

step which is designed to support two feet or two hands next to each other, and is intended to be installed in a single vertical alignment with other such steps

3.4

replaceable step

step designed to allow removal and replacement

3.5

tread

top surface of a step to accommodate a foot or hand

3.6

plastic encapsulation

polymeric material providing protection of a metal core

3.7

stand-off-distance

horizontal distance from the vertical face of the manhole or other chamber to the front of the step after fixing (see Figure 1)

3.8

upstand

raised part of a step designed to stop the foot slipping laterally off the edge of the step

4 Requirements

4.1 General

Steps shall conform to the requirements of this clause. Where a fixing system is supplied as part of the step, the system shall conform to the requirements of this standard.

Steps shall be installed in accordance with the manufacturer's instructions. For the installation of the steps, national regulations shall be observed.

4.2 Materials

4.2.1 Metals

Steps shall be manufactured from the following metals:

- a) Aluminum alloys according to designation 6 060 or 6 106 of EN 573-3:1994.
- b) cast Iron:

- malleable cast iron conforming to EN 1562;
- spheroidal graphite (ductile) cast iron conforming to EN 1563;
- flake graphite (grey) cast iron conforming to EN 1561.

c) Steel:

- steel conforming to EN 10025 or ENV 10080:1995;
- austenitic stainless steel conforming to EN 10088-1 or EN 10088-3, minimum grade X6CrNiTi18-10.

NOTE Grade X6CrNiMoTi17-12-2 or better should be used for particularly corrosive environments. Advice should be sought from the step manufacturer.

4.2.2 Plastics encapsulation

The material for encapsulating steps in plastics shall be polyethylene of minimum density 0,935 g/cm³ (as tested in accordance with ISO 1183) or equivalent qualities of polypropylene copolymer.

NOTE If encapsulated steps are to be installed or stored where they will be subjected to prolonged exposure to direct sunlight, they should be protected from the degradation effects of ultraviolet light. This can be achieved by the use of suitable pigments and/or stabilizers. Advice should be sought from the step manufacturer.

4.3 Design requirements

4.3.1 Types

Steps shall be one of the following types:

- Type A : Circular tread without patterned surface, without upstand;
- Type B: Circular tread without patterned surface, with upstand;
- Type C: Any shape tread with patterned surface, without upstand;
- Type D: Any shape tread with patterned surface, with upstand.

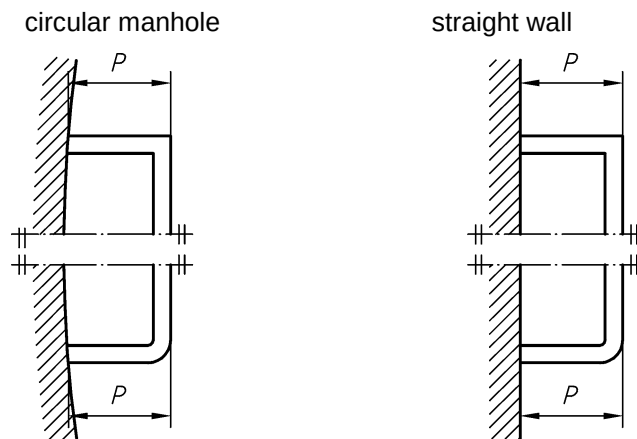
It is permissible for steps to incorporate a facility for attaching handrails or safety devices.

NOTE The purpose of the patterned surface is to provide some additional resistance to the foot slipping on the tread. Any design of the patterned surface, e.g. ribbing or chequering is at the step manufacturer's discretion.

4.3.2 Dimensions

4.3.2.1 General

Steps shall conform to the relevant dimensions given in 4.3.2 (see Figure 1, Figure 2 and Figure 3) and to dimensions and tolerances declared by the producer and shall be measured to the nearest 0,1mm.

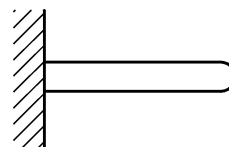
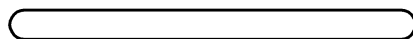


Key

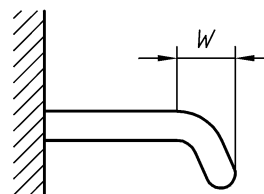
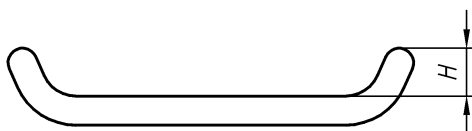
P Stand-off-distance (see 4.2.2.2 e)

Figure 1 — Stand-off-distance

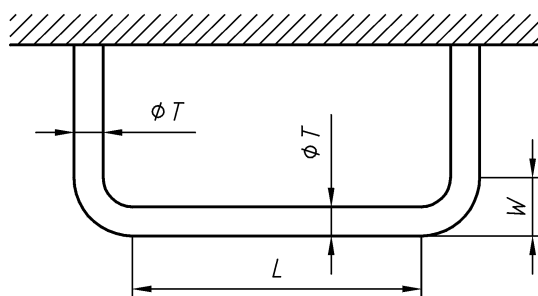
Side elevation
no upstand



Side elevation
upstand



Plan view



Key

T Width of tread

H Height of upstand

W Length of upstand

L Length of tread

Figure 2 — Dimensions for double and single steps; Example for Circular tread