

# SVENSK STANDARD

## SS-EN 124-5:2015



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### **Avloppsteknik – Brunnsbeteckningar för trafikområden – Del 5: Brunnslock och lock till nedstigningsbrunnar gjorda av kompositmaterial**

**Gully tops and manhole tops for vehicular and pedestrian  
areas –  
Part 5: Gully tops and manhole tops made of composite  
materials**



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Denna standard ersätter SS-EN 124, utgåva 1.

The European Standard EN 124-5:2015 has the status of a Swedish Standard. This document contains the official English version of EN 124-5:2015.

This standard supersedes the Swedish Standard SS-EN 124, edition 1.

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EUROPEAN STANDARD

**EN 124-5**

NORME EUROPÉENNE

EUROPÄISCHE NORM

June 2015

ICS 93.080.30

Supersedes EN 124:1994

English Version

**Gully tops and manhole tops for vehicular and pedestrian areas -  
Part 5: Gully tops and manhole tops made of composite  
materials**

Dispositifs de couronnement et de fermeture pour les zones  
de circulation utilisées par les piétons et les véhicules -  
Partie 5: Dispositifs de couronnement et de fermeture en  
matériaux composites

Aufsätze und Abdeckungen für Verkehrsflächen - Teil 5:  
Aufsätze und Abdeckungen aus Verbundwerkstoffen

This European Standard was approved by CEN on 12 March 2015.

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 CEN-CENELEC 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 CEN-CENELEC Management Centre has the same status as the official versions.

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EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

**CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels**

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## Foreword

This document (EN 124-5:2015) has been prepared by Technical Committee CEN/TC 165 “Wastewater 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 December 2015 and conflicting national standards shall be withdrawn at the latest by March 2017.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

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 the Regulation (EU) No. 305/2011.

For relationship with EU Regulations, see informative Annex ZA, which is an integral part of this document.

Together with EN 124-1:2015, EN 124-2:2015, EN 124-3:2015, EN 124-4:2015 and EN 124-6:2015, the document will supersede EN 124:1994.

EN 124, *Gully tops and manhole tops for vehicular and pedestrian areas*, consists of the following parts:

- *Part 1: Definitions, classification, general principles of design, performance requirements and test methods;*
- *Part 2: Gully tops and manhole tops made of cast iron;*
- *Part 3: Gully tops and manhole tops made of steel, aluminium alloys;*
- *Part 4: Gully tops and manhole tops made of steel reinforced concrete;*
- *Part 5: Gully tops and manhole tops made of composite materials;*
- *Part 6: Gully tops and manhole tops made of polypropylene (PP), polyethylene (PE) or unplasticized poly(vinyl chloride) (PVC-U).*

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.



## 1 Scope

This European Standard is applicable to manhole tops and gully tops made of composite materials C1, C2 and C3 by using suitably controlled automatic processes that produce a single structure and that do not contain multiple pieces bonded together, with a clear opening up to and including 1 000 mm for covering gullies, manholes and inspection chambers for installation within areas subjected to pedestrian and/or vehicular traffic.

It is applicable to manhole tops and gully tops for use in

- areas which can only be used by pedestrians and pedal cyclists (class A 15),
- pedestrian areas and comparable areas, car parks or car parking decks (class B 125),
- the area of kerbside channels of roads which, when measured from the kerb edge, extends a maximum of 0,5 m into the carriageway and a maximum of 0,2 m into the pedestrian area (class C 250),

and in addition to manhole tops for use in

- carriageways of roads (including pedestrian streets), hard shoulders and parking areas, for all types of road vehicles (class D 400).

This European Standard is not applicable in isolation but only in combination with EN 124-1 and gives guidance for combinations of covers/gratings made of composite materials with frames according to EN 124-2, EN 124-3, EN 124-4 or EN 124-6.

This document is not applicable to:

- manhole tops and gully tops manufactured by means of hand lay-up method;
- gratings/covers as part of prefabricated drainage channels according to EN 1433;
- floor and roof gullies in buildings which are specified in EN 1253 (all parts); and
- surface boxes.

## 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 59, *Glass reinforced plastics — Measurement of hardness by means of a Barcol impressor*

EN 124-1:2015, *Gully tops and manhole tops for vehicular and pedestrian areas — Part 1: Definitions, classification, general principles of design, performance requirements and test methods*

EN 124-2:2015, *Gully tops and manhole tops for vehicular and pedestrian areas — Part 2: Gully tops and manhole tops made of cast iron*

EN 124-3:2015, *Gully tops and manhole tops for vehicular and pedestrian areas — Part 3: Gully tops and manhole tops made of steel or aluminium alloys*

EN 124-4:2015, *Gully tops and manhole tops for vehicular and pedestrian areas — Part 4: Gully tops and manhole tops made of steel reinforced concrete*

**SS-EN 124-5:2015 (E)**

EN 124-6:2015, *Gully tops and manhole tops for vehicular and pedestrian areas — Part 6: Gully tops and manhole tops made of polypropylene (PP), polyethylene (PE) or unplasticized poly(vinyl chloride) (PVC-U)*

EN 13501-1:2007+A1:2009, *Fire classification of construction products and building elements — Part 1: Classification using data from reaction to fire tests*

EN 13823, *Reaction to fire tests for building products — Building products excluding floorings exposed to the thermal attack by a single burning item*

EN ISO 62:2008, *Plastics — Determination of water absorption (ISO 62:2008)*

EN ISO 175:2010, *Plastics — Methods of test for the determination of the effects of immersion in liquid chemicals (ISO 175:2010)*

EN ISO 527-2:2012, *Plastics - Determination of tensile properties — Part 2: Test conditions for moulding and extrusion plastics (ISO 527-2:2012)*

EN ISO 4892-2:2013, *Plastics — Methods of exposure to laboratory light sources — Part 2: Xenon-arc lamps (ISO 4892-2:2013)*

EN ISO 4892-3:2013, *Plastics — Methods of exposure to laboratory light sources — Part 3: Fluorescent UV lamps (ISO 4892-3:2013)*

ISO 1268-7, *Fibre-reinforced plastics — Methods of producing test plates — Part 7: Resin transfer moulding*

ISO 1268-8, *Fibre-reinforced plastics — Methods of producing test plates — Part 8: Compression moulding of SMC and BMC*

ISO 2878, *Rubber, vulcanized or thermoplastic — Antistatic and conductive products — Determination of electrical resistance*

ISO 3127, *Thermoplastics pipes — Determination of resistance to external blows — Round-the-clock method*

### **3 Terms and definitions**

For the purposes of this document, the terms and definitions given in EN 124-1:2015 and the following apply.

#### **3.1**

##### **composite material**

complex material, in which two or more constituent materials (with significantly different physical or chemical properties), are combined to produce structural or functional properties not present in any individual component

### **4 Materials**

#### **4.1 General**

Composite materials in accordance with this European Standard shall consist of a reinforcing fibre encapsulated within a thermoset matrix resin and shall be moulded as a single structure. They shall be produced by using suitably controlled automatic processes that produce a single structure and that do not contain multiple pieces bonded together.

The reinforcing fibre shall be an E-, ECR-, R- or S-Type glass or carbon fibre. The use of aramid fibres is not permitted. The matrix resin shall be based on a polyester, methacrylate, vinylester, epoxy, phenolic or polyurethane resin system. Hybrid resin systems that contain a blend of resins are permitted. Only materials certified as UV resistant shall be used.

The inclusion of metal components that contribute to the structural performance of the manhole top shall not be permitted.

The addition of materials that can be incorporated within and are part of the moulding process shall be permitted. These may include materials to improve surface properties such as surface resistivity or skid resistance. Components such as metal key and lifting housing can be incorporated within the composite structure and shall not be part of the structural design.

Manhole tops and gully tops shall not be machined, drilled, cut, ground after manufacturing.

**NOTE** Neither the matrix resin nor the fibres are specified in European Standards. Compliance with the performance of the materials is ensured by fulfilling the requirements of the tests according to Clause 4 and Clause 5.

Any element made of the materials specified in 4.2 can be used in combination with elements of materials specified in EN 124-2, EN 124-3, EN 124-4 or EN 124-6. In such cases the manhole tops or gully tops shall comply with the relevant design and performance and testing requirements as listed in Table 3.

In addition elements shall comply with the requirements for the material related EN 124-2, EN 124-3, EN 124-4 or EN 124-6, as applicable. Each element shall be marked accordingly. The class to be declared for the combined product shall be restricted to the lower class determined for any constituent element according to the relevant part of EN 124 series.

**EXAMPLE** Where a cover is made of composite materials, class C 250, and the frame is made of steel, class D 400, the manhole top or gully top is marked with EN 124-5 and the class to be declared for the combined product is the class of the cover according to EN 124-5.

## **4.2 Types of composite materials**

### **4.2.1 General**

Depending on the production process, the composite materials shall be distinguished in composite material C1, composite material C2 or composite material C3. The formulation of matrix resin and design of the fibre architecture shall be determined by the manufacturer of the manhole top or gully top.

### **4.2.2 Composite material C1**

Composite material C1 shall consist of long continuous fibres that are constructed in order to optimize the fibre reinforcement within a given macro structure. The macro structure can be both two and three dimensional and can contain non-structural formers to aid construction of the three dimensional elements of the structure. The composite shall have a typical fibre volume fraction of 40 % to 60 % and mechanical performance values, for example tensile strength, shall be highly directional. The matrix resin shall not contain fillers.

### **4.2.3 Composite material C2**

Composite material C2 shall be solid and moulded as a single monolithic product, consisting of long fibres within a matrix resin having a degree of fibre alignment within the structure. The composite solid element shall have a typical fibre weight fraction of 30 % to 60 %. The matrix resin shall not contain fillers.

### **4.2.4 Composite material C3**

Composite material C3 is typically known as fibre reinforced moulding compound. This material consists of a matrix resin, particulate fillers and short reinforcing fibre. The formulation of matrix resin, particulate fillers and fibre combinations shall be determined by the manufacturer of the manhole top or gully top.