



# SLOVENSKI STANDARD

## oSIST prEN 124-7:2025

01-april-2025

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### **Pokrovi za odtoke in jaške na voznih površinah in površinah za pešce - 7. del: Pokrovi za odtoke in jaške iz poliamida**

Gully tops and manhole tops for vehicular and pedestrian areas - Part 7: Gully tops and manhole tops made of polyamide

Aufsätze und Abdeckungen für Verkehrsflächen - Teil 7: Aufsätze und Abdeckungen aus Polyamid

Dispositifs de couronnement et de fermeture pour les zones de circulation utilisées par les piétons et les véhicules - Partie 7: Dispositifs de couronnement et de fermeture en polyamide

**Ta slovenski standard je istoveten z: prEN 124-7**

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#### **ICS:**

|           |                                  |                                  |
|-----------|----------------------------------|----------------------------------|
| 93.080.30 | Cestna oprema in pomožne naprave | Road equipment and installations |
|-----------|----------------------------------|----------------------------------|

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English Version

## Gully tops and manhole tops for vehicular and pedestrian areas - Part 7: Gully tops and manhole tops made of polyamide

Dispositifs de couronnement et de fermeture pour les zones de circulation utilisées par les piétons et les véhicules - Partie 7: Dispositifs de couronnement et de fermeture en polyamide

Aufsätze und Abdeckungen für Verkehrsflächen - Teil 7: Aufsätze und Abdeckungen aus Polyamid

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 165.

If this draft becomes a European Standard, 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.

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

**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

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## European foreword

This document prEN 124-7:2024 has been prepared by Technical Committee Technical Committee CEN/TC 165 “Waste water engineering”, the secretariat of which is held by DIN.

This document is currently submitted to the CEN Enquiry.

The standard series 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 or aluminium alloy
- 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), Polypropylene with mineral modifiers (PP-MD), Polyethylene (PE) or Polyvinyl-chloride (PVC-U)
- Part 7: Gully tops and manhole tops made of polyamide
- Part 700: Factory production control, third party monitoring and certification for gully tops and manhole tops made of polyamide

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**prEN 124-7:2024 (E)****1 Scope**

This document applies to gully tops and manhole tops with a clear opening up to and including 1 000 mm for installation within areas subjected to pedestrian and/or vehicular traffic.

It applies for manhole tops and gully tops of classes A 15 to D 400 made from polyamide (PA 6 and PA 6.6) by casting or injection-moulding.

This document is only applicable in combination with EN 124-1 and prEN 124-700.

This document does not apply

- for fillings installed on site, e.g. concrete, paving blocks etc.,
- for gratings as part of prefabricated drainage channels according to EN 1433,
- to floor and roof gullies in buildings which are specified in EN 1253 (all parts) and to surface boxes.

**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.

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*

EN 124-5:2015, *Gully tops and manhole tops for vehicular and pedestrian areas — Part 5: Gully tops and manhole tops made of composite materials*

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 513:2018, *Plastics — Poly(vinyl chloride) (PVC) based profiles — Determination of the resistance to artificial weathering*

EN 1433, *Drainage channels for vehicular and pedestrian areas — Classification, design and testing requirements, marking and evaluation of conformity*

EN ISO 868:2003, *Plastics and ebonite — Determination of indentation hardness by means of a durometer (Shore hardness) (ISO 868:2003)*

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

EN ISO 8256:2023, *Plastics — Determination of tensile-impact strength (ISO 8256:2023)*

EN 13501-1:2018, *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 175, *Plastics — Methods of test for the determination of the effects of immersion in liquid chemicals (ISO 175)*

EN ISO 4892-1, *Plastics — Methods of exposure to laboratory light sources — Part 1: General guidance and requirements (ISO 4892-1)*

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

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

EN ISO 291:2008, *Plastics — Standard atmospheres for conditioning and testing (ISO 291:2008)*

### 3 Terms and definitions Teh Standards

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

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at <https://www.iso.org/obp/>

— IEC Electropedia: available at <https://www.electropedia.org/>

<https://standards.iteh.ai/catalog/standards/sist/7507b638-62df-41e4-b11b-d57cf1270fff/osist-pren-124-7-2025>

#### 3.1

##### **polyamide**

##### **PA**

polymers made of macromolecules having in the chain recurring amide linkages which are joined to aliphatic or cycloaliphatic or partial aromatic units

Note 1 to entry: Polyamides are generally defined in EN ISO 16396. Further specifications see 3.2 and 3.3.

#### 3.2

##### **cast polyamide**

##### **CP**

type of polyamide produced by an anionic polymerization process in which a melted solution of monomer and up to 20 % modifiers (e.g. stabilisers, colour pigments, demoulding agents, catalysts, additives) is transformed in heated moulds into polymeric material under the melting temperature of the polymer in a mould

Note 1 to entry: Caprolactam is an organic substance which is used as monomer in anionic polymerization to obtain PA 6.

## prEN 124-7:2024 (E)

### 3.3 injection mouldable polyamide IP

granules of compounded thermoplastic polyamide (PA) containing up to 60 % (by mass) of glass fibres and up to 5 % of modifiers (e.g. stabilisers, colour pigments, demoulding agents) which can be processed by injection moulding

### 3.4 conditioning

preparation of a part or sample which is required for certain tests according to this document

Note 1 to entry: Further specifications see 4.3.1 and 4.3.3.

## 4 Materials

### 4.1 General

Materials in accordance with this document 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 inclusion of metal components that contribute to the structural performance of the manhole top or gully top shall not be permitted.

Components such as metal key and lifting housing can be incorporated within the structure but shall not be part of the structural design. The material used for any metallic fixing shall be resistant to corrosion.

Any element made of the materials specified in 4.2 can be used in combination with elements of materials specified in EN 124-2:2015, EN 124-3:2015, EN 124-4:2015, EN 124-5:2015 or EN 124-6:2015. 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, EN 124-5 or EN 124-6 as applicable. Each element shall be marked accordingly. The load 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.

### 4.2 Types of polyamide materials

#### 4.2.1 General

Depending on the production process, the polyamide materials shall be distinguished as cast polyamide (CP) or injection mouldable polyamide (IP).

#### 4.2.2 Cast Polyamide (CP)

Manhole tops and gully tops made of cast polyamide shall be produced by anionic polymerization of flake or melted caprolactam. CP manufacturers of different materials shall declare that their products contain at least 80 % of PA 6 made by anionic polymerization of caprolactam.

Cast polyamide shall not contain reinforcing fibres.

#### 4.2.3 Injection mouldable polyamide (IP)

Manhole tops and gully tops made of injection mouldable polyamide shall be made by injection moulding thermoplastic PA 6 or PA 6.6 granules. Polyamide for injection moulding can contain reinforcing fibres encapsulated within the matrix.



### 4.3 Requirements for polyamide materials

#### 4.3.1 General

Some properties like Young's modulus, material strength, tensile strain and toughness are affected by the humidity within the product. Therefore, some tests will require a defined conditioning, others may be carried out on part which were just manufactured (these are always dry).

#### 4.3.2 Conditioning procedure of polyamide products for testing

Elements to be tested shall be conditioned to water absorption, aiming to reach the equilibrium moisture content in standard atmosphere ( $23 \pm 2$ ) °C/ ( $50 \pm 1$ ) % relative humidity and a sufficiently homogeneous distribution of water-molecules within the polymer.

Part testing (type testing) shall be carried out latest 4 weeks after completing conditioning using either Method A or Method B below. The part shall be stored in an environment not more than 30 °C and without direct exposure to sun light or other heating sources. These storage conditions also apply to potential transport to a testing institute and storage there.

Definitions:

$V$  is the volume of the cover or grating [ $\text{mm}^3$ ]

$S$  is the total surface of the cover or grating [ $\text{mm}^2$ ]

$h$  is the equivalent thickness of the cover or grating [mm]

$t_1$  is the maximum initial time step in hours (Method A)

$t_2$  is the conditioning time in days (Method B)

$t_3$  time step in hours in days (Method B)

$C$  is 0,5 [hours/ $\text{mm}^2$ ]

$M$  is the target moisture content [%]

$M_0$  is 3,0 % for PA6 and 2,8 % for PA6.6

GF is the Glass Fibres Content [%]

#### **Method A – Accelerated procedure**

APPARATUS:

Water tank heated at controlled temperature of ( $60 \pm 2$ ) °C

Balance, accurate to 0,1 % of the element's weight

PROCEDURE:

Weigh the element to be conditioned as manufactured, no later than 15 days from date of manufacturing. If metal inserts are used, subtract their mass and determine the mass ( $m$ ) of the Polyamide.

Determine the equivalent thickness  $h$  [mm] of the element to be tested using the formula:

$$h = 2V/S \quad (1)$$

Define maximum time step  $t_1$ , which is a function of the average wall thickness:

$$t_1 = C \cdot h^2$$

Water absorption shall be measured as percentage of mass increase relative to dry polyamide. The following table indicates the conditioning values in terms of mass increase of the polyamide mass  $m$  to achieve after conditioning:

**Table 1 — Target equilibrium moisture content after conditioning**

|                | Glass Fibres Content |                  |                  |                  |                  |                  |
|----------------|----------------------|------------------|------------------|------------------|------------------|------------------|
|                | 0 %                  | 10 %             | 20 %             | 30 %             | 40 %             | 50 %             |
| <b>PA6</b>     | (3,0 ± 0,1)<br>%     | (2,7 ± 0,1)<br>% | (2,4 ± 0,1)<br>% | (2,1 ± 0,1)<br>% | (1,8 ± 0,1)<br>% | (1,5 ± 0,1)<br>% |
| <b>PA6.6</b>   | (2,8 ± 0,1)<br>%     | (2,5 ± 0,1)<br>% | (2,2 ± 0,1)<br>% | (2,0 ± 0,1)<br>% | (1,7 ± 0,1)%     | (1,4 ± 0,1)<br>% |
| <b>Cast PA</b> | (3,0 ± 0,1)<br>%     | n. a.            | n. a.            | n. a.            | n. a.            | n. a.            |

The target equilibrium moisture content after conditioning for glass fibre content outside the Table 1 values is calculated by:

$$M = M_0 \cdot (1 - GF) \quad (2)$$

### Step 1 - Absorption

This step is aiming to raise the moisture content by immersion in water at  $(60 \pm 2) ^\circ\text{C}$ . The duration of absorption will depend on the equivalent thickness of the element, and type of Polyamide. The absorption step is aiming to achieve the target mass increase according to Table 1. Diagrams in Figure 1 provide guidance for the expected duration of the absorption step.

Immerse the element in a water tank kept at constant temperature of  $(60 \pm 2) ^\circ\text{C}$ . Weigh the element at regular time steps  $\leq t_1$  and plot values to predict the absorption duration to reach the target. Before every weight measurement water should be removed from the surface using a dry cloth. Once the target mass increase  $M$  (%) is reached proceed to step 2.

Values in Table 1 or in Formula (1) are intended as minimum thresholds, mass increase can exceed the values in the table.

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