BS EN 124-5:2015

BSI Standards Publication

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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National foreword

This British Standard is the UK implementation of EN 124-5:2015. Together with BS EN 124-1:2015, BS EN 124-2:2015, BS EN 124-3:2015, BS EN 124-4:2015 and BS EN 124-6:2015, it supersedes BS EN 124:1994 which is withdrawn.

BSI, as a member of CEN, is obliged to publish EN 124-5 as a British Standard. However, attention is drawn to the fact that during the development of this European Standard, the UK committee voted against its approval as a European Standard.

The reasoning behind the response relates to the application of the Construction Products Regulations in respect to subclause 7.3.2.6, as a result of the AVCP Level 1 requirement.

The UK participation in its preparation was entrusted by Technical Committee B/505, Wastewater engineering, to Subcommittee B/505/4, "Manhole Covers, Surface Boxes And Other Road Fittings".

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

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

Published by BSI Standards Limited 2015

ISBN 978 0 580 79321 9

ICS 93.080.30

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 July 2015.

Amendments/corrigenda issued since publication

Date	Text affected

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 124-5

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.

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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*

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.

4.3 Requirements for composite materials

4.3.1 General

The composite materials shall be tested for the properties listed below prior to the introduction of the product to the market. These tests shall be repeated if the composition of the raw materials or the raw material itself is changed.

4.3.2 Hardness

The mean Barcol hardness shall be equal to or greater than 35 when tested in accordance with EN 59.

For composite materials C1 and C2, samples shall be cut from an area of the manhole top that does not contain additional surface material.

For Composite C3 material samples shall either be cut from an area of the manhole top that does not contain additional surface material or prepared according to ISO 1268-7 or ISO 1268-8.

4.3.3 Water absorption

When tested in accordance with EN ISO 62:2008, Method 1, the water absorption of manhole tops or gully tops shall be less than 0,3 %.

At the end of the test the manhole top or gully top shall meet the requirements of permanent set specified in EN 124-1:2015, Table 5, and of the test load according EN 124-1:2015, Table 4. There shall be no visible evidence of cracking after the test.

Differently from EN ISO 62:2008, Method 1, weighing of the samples before and after immersion in water shall be done at the nearest ± 1 g.

4.3.4 Resistance to vehicle fuels

A complete manhole top or gully top shall be conditioned according to EN ISO 175 in either (60 % volume toluene, 40 % volume n-heptane) or diesel at (23 ± 2) °C for (168 ± 2) h. When compared with the original properties the change in mass shall be not more than 0,5 %.

At the end of the conditioning the manhole top or gully top shall meet the requirements of permanent set specified in EN 124-1:2015, Table 5, and of the test load according EN 124-1:2015, Table 4. There shall be no visible evidence of cracking after the test.

Weighing of the samples before and after conditioning in fuel shall be done at the nearest ± 1 g.

4.3.5 Surface resistivity

In the event that safety considerations require that a manhole top or gully top is capable of dispersing a static electrical charge the value of surface resistivity shall be less than 1×10^8 Ohms.

The test shall be carried out according to ISO 2878 where the outer surface of a manhole top shall be tested at a point which provides a flat surface of sufficient surface area to accommodate the electrodes to two areas in accordance with ISO 2878.

NOTE A typical application is the forecourt of a refuelling station.

4.3.6 Weathering resistance

Manhole tops and gully tops shall be resistant to artificial weathering. This shall be ensured by testing specimens with the dimensions (50 ± 3) mm wide, (6 ± 1) mm thick and (150 ± 20) mm long made of pure

resin from the same formulation used for the manufacturing of the manhole top or gully top in accordance with Table 1 or Table 2. After the test, the variation of the tensile modulus measured according to ISO 527-2 shall be no more than 50 %.

If there is no test of pure resin available, the complete manhole top or gully top shall be tested in accordance with Table 1 or Table 2. The requirements of permanent set specified in EN 124-1:2015, Table 5, and of the test load in accordance with EN 124-1:2015, Table 4, shall be achieved.

In case of dispute the Xenon test of the pure resin according to Table 2 shall be applied.

Table 1 — Artificial weathering resistance (QUV)

Parameter		Test method
Exposure time using UVA 351 lamp	Radiation energy 1 600 h	EN ISO 4892-3 (QUV test)
Irradiation	6 h at (50 ± 2) °C	
Condensation	2 h at (40 ± 2) °C	

Table 2 — Artificial weathering resistance with Xenon arc lamps

Parameter		Test method
Exposure time using xenon-arc lamps with daylight filters	Radiation energy 2,6 GJ/m^2	EN ISO 4892-2 (xenon-arc lamps) - Method A
Exposure period	102 min dry 18 min water spray	

5 Requirements

5.1 Design and performance requirements

Manhole tops and gully tops made of composite materials C1, C2 and C3 shall conform to the relevant design and performance and testing requirements in accordance with EN 124-1:2015 as listed in Table 3.

Table 3 — Design, performance and testing requirements of characteristics specified in EN 124–1 for manhole tops and gully tops made of composite materials

Characteristic	Requirements according to EN 124-1:2015, Clause	Testing according to EN 124-1:2015, Clause	Relevant for class			
			A 15	B 125	C 250	D 400 [a]
Related to the design						
Vents in covers	6.1	8.4.1	x	x	x	x
Clear opening of manhole tops for man entry	6.2	8.4.2	x	x	x	x
Depth of insertion	6.3	8.4.3	–	–	–	x
Clearance	6.4	8.4.4	x	x	x	x
Compatibility of seatings	6.5	8.4.5	–	–	–	x
Handling of covers and gratings	6.7	8.4.7	x	x	x	x

Characteristic	Requirements according to EN 124-1:2015, Clause	Testing according to EN 124-1:2015, Clause	Relevant for class			
			A 15	B 125	C 250	D 400 [a]
Slot dimensions of gratings	6.8	8.4.8	x	x	x	x
Dirt pans and dirt buckets	6.9	8.4.9	x	x	x	x
Positioning of covers and gratings	6.10	8.4.10	x	x	x	x
Flatness of manhole covers and gratings	6.11	8.4.11	–	–	–	x
Concaveness of gratings	6.12	8.4.12	x	x	x	x
Surface conditions	6.13	8.4.13	x	x	x	x
Manhole tops with sealing feature	6.14	Visual inspection of presence of anchors	x	x	x	x
Frame bearing area	6.15	8.4.14	x	x	x	x
Frame depth	6.16	8.4.15	–	–	–	x
Opening angle of hinged covers/gratings	6.17	8.4.16	x	x	x	x
Appearance	7.1	Visual inspection	x	x	x	x
Related to the performance						
Load bearing capacity	7.2	8.3	x	x	x	x
Permanent set	7.3	8.2	x	x	x	x
Securing of the cover/grating within the frame	6.6 a) or c)	8.4.6	x	x	x	x
Skid resistance	7.4	8.4.13	x	x	x	x
Child safety	7.5	8.5	x	x	x	x
x To be applied.						
[a] For manhole tops only.						

5.2 Material specific characteristics for gully tops and manhole tops made of composite materials

5.2.1 Reinforcement

The dimensions, position, spacing and jointing of the reinforcement and foam, if applicable, shall be in accordance with the design.

5.2.2 Deflection under load

When tested the complete composite manhole top and gully top in accordance with 6.2 and when subject to F_D = 1/3 F_T, the maximum deflection under load shall be ≤ *CO*/360 for covers to be filled with brittle materials other than concrete. For covers to be filled with concrete, the maximum deflection under load shall be ≤ *CO*/250. For all other covers according to this standard, the maximum deflection under load shall be declared as mm per mm of clear opening (mm/*CO*).

The load deflection curve shall be smooth and progressive without sudden deviations up to the test load.

NOTE During the load testing of composite materials in particular during the first application of load, the composite will make audible cracking noises. These sounds are caused by errant fibres within the structure breaking and do not represent failure of the structure. Cracking noises disappear when further test loads are applied.

5.2.3 Resistance to fatigue

Upon completion of the test according to 6.3, the manhole top or gully top shall meet the requirements of permanent set specified in EN 124-1:2015, 7.3, and of the test load according EN 124-1:2015, 7.2. There shall be no visible evidence of cracking after the test without magnification.

5.2.4 Creep resistance

When tested according to 6.4 the creep resistance of a manhole top or gully top shall meet the requirements for permanent set specified in EN 124-1:2015, 7.3.

5.2.5 Impact resistance

After carrying out the low temperature impact test according to 6.5 there shall be neither visible cracking nor delamination when viewed without magnification at the impacted cover.

5.2.6 Effect of heating

When tested according to 6.6 there shall be no visible defects, blistering, cracks or delamination at the test sample.

5.2.7 Reaction to fire

5.2.7.1 General

Where use of manhole tops or gully tops in accordance with this standard is subject to national regulatory requirements on reaction to fire, their reaction to fire performance shall be considered as that of its components (i.e. material approach). Conversely, where the use of such a unit is not subject to national regulatory requirements on reaction to fire, either the class, determined according to the result of testing, or NPD may be declared.

5.2.7.2 Units classified according to test results

Manhole tops and gully tops shall be classified on the basis of their main elements (cover and frame), meaning regardless of other components (their cushioning inserts or coating).

For the purpose of the reaction to fire performance of the unit each of its constituent materials, shall be classified according to EN 13501-1 and only the lowest class of such materials shall be declared. The class of an individual constituent material shall be obtained as the result of the test method(s), relevant to this class, and as specified in the standards referred to in EN 13501-1.

NOTE 1 A constituent material of the unit is considered as one which has a significant effect on the reaction to fire performance of such a unit. According to the definitions given in EN 13501-1, this can be in the case of:

— a homogeneous unit, its material, or

— a non-homogeneous unit, its substantial component (i.e. a material that constitutes a significant part of such unit). A layer with a mass per unit area ≥ 1,0 kg/m^2 or a thickness ≥ 1,0 mm is considered to be a substantial component.

Test specimen used for the test methods applicable for this classification shall be prepared according to EN 13501-1 and to the relevant standards referred therein. In addition with regard to the SBI test according to EN 13823, when applied, the test specimen used for the test methods, applicable for the classification, shall be prepared according to EN 13501-1 and the relevant standards referred therein.

NOTE 2 In most cases class E is considered to be sufficient as a minimum regulatory requirement for the reaction to fire performance of the constituent material(s) of units used in trafficked areas outside buildings.

5.2.8 Durability

5.2.8.1 General

The basic durability of manhole tops and gully tops made of composite materials C1, C2 and C3 is ensured through compliance with Clause 4 and Clause 5 and EN 124-1:2015, Clause 8.

5.2.8.2 Durability of load bearing capacity

Durability of load bearing capacity of manhole tops and gully tops made of composite shall be determined by:

— ensuring that after passing the fatigue test regime in accordance with 6.3, the manhole top or gully top shall withstand the test load according to EN 124-1:2015, 7.2, when tested in accordance with EN 124-1:2015, 8.3;

— ensuring that after having performed the water absorption test in accordance with 4.3.3, the manhole top or gully top shall withstand the test load according to EN 124-1:2015, 7.2, when tested in accordance with EN 124-1:2015, 8.3;

— ensuring that after having performed the resistance to vehicle fuel test, according to 4.3.4, the manhole top or gully top shall withstand the test load according to EN 124-1:2015, 7.2, when tested in accordance with EN 124-1:2015, 8.3.

5.2.8.3 Durability of securing of cover/grating within the frame

Durability of covers/gratings in the frame against unintended lifting shall be determined by ensuring that after passing the fatigue test, according to 6.3, the manhole top or gully top shall be re-tested according to EN 124-1:2015, 8.4.6.

5.2.8.4 Durability of skid resistance

Where required, the durability of skid resistance of manhole tops and gully tops made of composite shall be determined according to EN 124-1:2015, 8.4.13, and the result declared.

5.2.8.5 Durability of effectiveness of child safety characteristics

Where required, the durability of the child safety characteristics for manhole tops and gully tops made of composite shall be determined by ensuring that after the passing the fatigue test regime, according to 6.3, and after testing the securing in accordance with EN 124-1:2015, 8.4.6, the resistance of manhole tops and gully tops against the removal by children is ensured by re-inspecting if the weight or the locking accessory or the securing feature, as appropriate, is still functional.

5.2.9 Dangerous substances

National regulations on dangerous substances may require verification and declaration on release, and sometimes content, when construction products covered by this standard are placed on those markets. In the absence of European harmonized test methods, verification and declaration on release/content should be done taking into account national provisions in the place of use.

6 Testing

6.1 General

Gully tops and manhole tops according to this standard shall be tested as complete units in their intended position of use where cover/grating is suitably positioned within the frame in accordance with EN 124-1:2015, Clause 8, as listed in Table 3. In addition manhole tops and gully tops made of composites shall be tested according to 6.2 to 6.6. All tested products shall be visually inspected without magnification.

6.2 Deflection under load

A complete manhole top or gully top as would be supplied to the end user that has not previously been subjected to a load test shall be tested for deflection under load in accordance with Annex A and applying a test load F_D = 1/3 F_T.

6.3 Resistance to fatigue

Complete manhole tops or gully tops that have not previously been subjected to a load test shall be tested in accordance with the test equipment described in EN 124-1:2015, Annex A, with the test load and the number of cycles given in Table 4. A suitable apparatus which is capable of receiving the manhole top and applying a cyclic load to the geometric centre of the manhole top or gully top shall be used for the test. The test block shall be in accordance with EN 124-1:2015, Annex A.

The cyclic fatigue test load F_F shall be applied at the appropriate rate and upon reaching the test load it shall be immediately released at the same rate before starting immediately the following cycle.

Table 4 — Number of cycles for fatigue test

Class	Number of cycles	Cyclic fatigue test load F_F kN	Load application rate kN/s
B 125	10 000	43	7 ± 2
C 250	100 000	92	42 ± 14
D 400 [a]	100 000 500 000	136 120	70 ± 20 60 ± 20

[a] Test conditions for class D 400 can be used either or. They both refer to the same stress level. The conditions are selected by the manufacturer.

6.4 Creep resistance

A test equipment according to EN 124-1:2015, Annex A, shall be used. A load shall be applied to a manhole top that has not previously been subjected to any prior form of load test, to the permanent set load specified in EN 124-1:2015, 8.2, for a period of $\left(60^{+1}_{0}\right)$ minutes. A recover for $\left(5^{+0,5}_{0}\right)$ minutes after complete removal of the load shall be allowed. The measurement shall be taken in accordance with EN 124-1:2015, Annex A.

This test is not required to class A 15.

6.5 Impact resistance

Depending on the temperature in the place of use, impact resistance shall be tested in accordance with Table 5 to ensure that the manhole tops and gully tops do not suffer from low temperature embrittlement.

A complete manhole top, as would be supplied to the end user that has not previously been subjected to a load test, shall be used as test specimen and shall be conditioned at (60 ± 3) °C for 30 d. A cooling under ambient conditions for a minimum of 2 h and then a condition at test temperature according to Table 5 for a minimum of 4 h shall be performed. A mass according to Table 5 shall be dropped with a (50 ± 1) mm diameter hemispherical end from a height of (2 000 ± 10) mm onto the flat surface of the manhole top.

The test specimen shall be supported during the test, in such a way that represents the intended installation on site.

NOTE It is not always feasible to include bedding mortar (e.g. around the outside flange).

The following apparatus shall be available for the test:

— a guided rail impact tower similar to that described in ISO 3127;

— an impact nose consisting of a 50 mm wide cylinder with a radius of (50 ± 1) mm. The total mass of the nose and carrier assembly shall be in accordance with Table 5;

— a chill unit capable of holding (–20 ± 3) °C.

Table 5 — Impact resistance

Characteristic	Requirements	Test parameters		Test method
Impact resistance	not visible evidence of cracking	Test/conditioning temperature	(0 ± 3) °C or	ISO 3127
		Test/conditioning temperature	(−20 ± 3) °C[a]	
		Type of striker	d90 according to ISO 3127	
		Mass of striker for		
		— class A 15	(1 ± 0,05) kg	
		— class B 125	(3,75 ± 0,05) kg	
		— class C 250	(4,5 ± 0,05) kg	
		— class D 400	(7,5 ± 0,05) kg	
		Height of striker		
		— class A 15 — class B 125 — class C 250 — class D 400	2,0 m	
		Radius of striker; R_s	50 mm	

[a] Cold climate conditions: Products tested at –20 °C shall be marked with a snow flake symbol.

Set up the apparatus and support to ensure minimum time elapses from removal of test specimen from chill unit to testing. The longitudinal axis of the impact nose shall be aligned at right angles to the surface of installation of the manhole top or gully top.

Condition the test specimen at test temperature for 4 h. Remove and place on support, impact test from a height of 2,0 m from the impact point within 30 s.

Impact test shall be carried out at 7 equally spaced points, at least 4 to be around the periphery. The impact nose shall be directed at those areas that would normally be “exposed” when installed. Return the test specimen to the chill unit for between 10 min and 15 min to recondition if the completion of the 7 impacts exceeds 120 s.

6.6 Effect of heating

Condition a manhole top that has been subjected to impact resistance test according to 6.5 in an oven that has been preheated to a temperature of (150 ± 5) °C. Run the test for $\left(60^{+5}_{0}\right)$ minutes commencing timing as the oven reaches the test temperature and on completion of test period remove manhole top and allow cooling to ambient temperature. The test sample shall be examined with proper light when ascertaining the test result.

7 Assessment and verification of constancy of performance — AVCP

7.1 General

The compliance of gully tops and manhole tops with the requirements of this standard and with the performances declared by the manufacturer in the DoP shall be demonstrated by

— determination of the product type on the basis of type testing,

— factory production control by the manufacturer, including product assessment.

The manufacturer shall always retain the overall control and shall have the necessary means to take responsibility for the conformity of the product with its declared performance(s).

7.2 Type testing

7.2.1 General

All performances related to characteristics included in this standard shall be determined when the manufacturer intends to declare the respective performances unless the standard gives provisions for declaring them without performing tests (e.g. use of previously existing data, classified without further testing (CWFT) and conventionally accepted performance).

Assessment previously performed in accordance with the provisions of this standard, may be taken into account provided that they were made to the same or a more rigorous test method, under the same AVCP system on the same product or products of similar design, construction and functionality, such that the results are applicable to the product in question.

NOTE 1 Same AVCP system means testing by an independent third party, when relevant, under the responsibility of a notified product certification body, when relevant.

For the purposes of assessment, the manufacturer's products may be grouped into families, where it is considered that the results for one or more characteristics from any one product within the family are representative for those same characteristics for all products within the same family.

NOTE 2 Products can be grouped in different families for different characteristics.

Reference to the assessment method standards should be made to allow the selection of a suitable representative sample.

In addition, the determination of the product type shall be performed for all characteristics included in the standard for which the manufacturer declares the performance:

— at the beginning of the production of a new or modified gully top and manhole top (unless a member of the same product range), or

— at the beginning of a new or modified method of production (where this may affect the stated properties), or

— they shall be repeated for the appropriate characteristic(s), whenever a change occurs in the gully top or manhole top design, in the raw material or in the supplier of the components, or in the method of production (subject to the definition of a family), which would affect significantly one or more of the characteristics.

Where components are used whose characteristics have already been determined, by the component manufacturer, on the basis of assessment methods of other product standards, these characteristics need not be re-assessed. The specifications of these components shall be documented.

Products bearing regulatory marking in accordance with appropriate harmonized European specifications may be presumed to have the performances declared in the DoP, although this does not replace the responsibility on the manhole tops and gully tops manufacturer to ensure that the manhole tops and gully tops as a whole are correctly manufactured and its component products have the declared performance values.

7.2.2 Test samples, testing and compliance criteria

The number of samples of gully tops and manhole tops made of composite materials to be tested/assessed shall be in accordance with Table 6. Characteristics for which the performance is to be declared are written in **bold** letters.

Table 6 — Number of samples to be tested and compliance criteria

Characteristic	Requirement	Assessment method	No. of samples[a]	Compliance criteria
for the declared performance:				
Reaction to fire	5.2.7	Not tested	-	NPD
		EN 124–5:2015, 5.2.7.2	3	EN 124–5:2015, 5.2.7
Frame bearing area	5.1	EN 124–1:2015, 8.4.14	3	EN 124–1:2015, 6.15, calculated value $P_b \leq 7{,}5$ N/mm^2
Load bearing capacity	5.1	EN 124–1:2015, 8.3	3	EN 124–1:2015, 7.2, test load for the declared class
Permanent set	5.1	EN 124–1:2015, 8.2	3	EN 124–1:2015, 7.3, permissible value for the declared class
Securing of the cover/grating within the frame	5.1	EN 124–1:2015, 8.4.6	3	EN 124–1:2015, 6.6, a) or c) declared method and value Fv in kN and appropriate h in mm, as applicable
Child safety	5.1	EN 124–1:2015, 8.5	3	EN 124–1:2015, 7.5, declared method or weight
Skid resistance of				
a) Covers with				
— raised pattern	5.1	EN 124–1:2015, 8.4.13 b)	3	EN 124–1:2015, 7.4.2 b), declared as “raised pattern” for the specified raised pattern
— other surface	5.1	EN 124–1:2015, 8.4.13 c)	3	EN 124–1:2015, 7.4.2 c), for the calculated and declared value of USRV
b) Gratings	5.1	EN 124–1:2015, 8.4.13 b)	3	EN 124–1:2015, 7.4.3, declared as “raised pattern” for the specified raised pattern or “slots” for the measured slot dimensions
c) Frames with max. horizontal visible width of: — ≤ 40 mm or — > 40 mm	5.1	EN 124–1:2015, 7.4.4	3	EN 124–1:2015, 7.4.2 a), measured acc. to the requirement clause and expressed as — “NPD” for ≤ 40 mm or — method or value for > 40 mm

Characteristic	Requirement	Assessment method	No. of samples[a]	Compliance criteria
Durability of:				
— **load bearing capacity against** fatigue	5.2.8.2	EN 124–5:2015, 6.3 and EN 124–1:2015, 8.3	1	EN 124–5:2015, 5.2.8.2, declared as "Pass"
— **load bearing capacity against** water absorption	5.2.8.2	EN 124–5:2015, 4.3.3, and EN 124–1:2015, 8.3	1	
— **load bearing capacity against** exposure to vehicle fuels	5.2.8.2	EN 124–5:2015, 4.3.4 and EN 124–1:2015, 8.3	1	
— **cover securing method against** fatigue	5.2.8.3	EN 124–5:2015, 6.3 and EN 124–1:2015, 8.4.6	1	EN 124–5:2015, 5.2.8.3, declared as "Pass"
— **skid resistance against** loss of grip	5.2.8.4	EN 124–1:2015, 8.4.13, b) and c)	3	EN 124–5:2015, 5.2.8.4, declared as "Pass"
— **effectiveness of child safety characteristics**	5.2.8.5	EN 124–5:2015, 6.3	3	EN 124–1:2015, 6.6, declared as "Pass" according to the material used and the method declared.
for the design:				
Vents in covers	5.1	EN 124–1:2015, 8.4.1	3	EN 124–1:2015, 6.1
Clear opening of manhole tops for man entry	5.1	EN 124–1:2015, 8.4.2	3	EN 124–1:2015, 6.2
Depth of insertion	5.1	EN 124–1:2015, 8.4.3	3	EN 124–1:2015, 6.3
Clearance	5.1	EN 124–1:2015, 8.4.4	3	EN 124–1:2015, 6.4
Compatibility of seatings	5.1	EN 124–1:2015, 8.4.5	3	EN 124–1:2015, 6.5
Handling of covers and gratings	5.1	EN 124–1:2015, 8.4.7	3	EN 124–1:2015, 6.7
Slot dimensions of gratings	5.1	EN 124–1:2015, 8.4.8	3	EN 124–1:2015, 6.8
Dirt pans and dirt buckets	5.1	EN 124–1:2015, 8.4.9	3	EN 124–1:2015, 6.9
Positioning of covers and gratings	5.1	EN 124–1:2015, 8.4.10	3	EN 124–1:2015, 6.10
Flatness of manhole covers and gratings	5.1	EN 124–1:2015, 8.4.11	3	EN 124–1:2015, 6.11
Concaveness of gratings	5.1	EN 124–1:2015, 8.4.12	3	EN 124–1:2015, 6.12
Surface conditions	5.1	EN 124–1:2015, 8.4.13	3	EN 124–1:2015, 6.13
Manhole tops with sealing feature	5.1	Visual inspection of presence of anchors	3	EN 124–1:2015, 6.14
Frame depth	5.1	EN 124–1:2015, 8.4.15	3	EN 124–1:2015, 6.16
Opening angle of hinged covers/gratings	5.1	EN 124–1:2015, 8.4.16	3	EN 124–1:2015, 6.17
Appearance	5.1	Visual inspection	3	EN 124–1:2015, 7.1
Deflection under load	5.2.2	EN 124–5:2015, 6.2	3	EN 124–5:2015, 5.2.2

[a] If one of the samples fails, the specific test can be repeated with 5 new samples. All the 5 samples shall pass the test.

For the characteristics shown in Table 6 additional tests shall be carried out on samples and sequences as given in Table 7.

Table 7 — Characteristics and test sequence

Test sequence	Characteristic	Requirement according to	Test according to	Test sample	No. of samples
1st sample	Hardness	EN 124–5:2015, 4.3.2	EN 59	Coupon	1
2nd sample	Water absorption	EN 124–5:2015, 4.3.3	EN ISO 62:1999, Method 1	New manhole top or gully top	1
	— Permanent set	EN 124–1:2015, 8.2	EN 124–1:2015, Annex A	Same product	
	— Load test	EN 124–1:2015, 8.3	EN 124–1:2015, Annex B	Same product	
3rd sample	Resistance to vehicle fuels	EN 124–5:2015, 4.3.4	EN ISO 175	New manhole top or gully top	1
	— Permanent set	EN 124–1:2015, 8.2	EN 124–1:2015, Annex A	Same product	
	— Load test	EN 124–1:2015, 8.3	EN 124–1:2015, Annex B	Same product	
4th sample	Deflection under load 1/3 of test load	EN 124–5:2015, 5.2.2	EN 124–5:2015, Annex A	New manhole top or gully top	3
	— Permanent set	EN 124–1:2015, 8.2	EN 124–1:2015, Annex A	Same product	
	— Load test	EN 124–1:2015, 8.3	EN 124–1:2015, Annex B	Same product	
5th sample	Fatigue	EN 124–5:2015, 5.2.3	EN 124–5:2015, 6.3	New manhole top or gully top	1
	— Permanent set	EN 124–1:2015, 8.2	EN 124–1:2015, Annex A	Same product	
	— Load test	EN 124–1:2015, 8.3	EN 124–1:2015, Annex B	Same product	
6th sample	Creep	EN 124–5:2015, 5.2.4	EN 124–5:2015, 6.4	New manhole top or gully top	1
	— Permanent set	EN 124–1:2015, 8.2	EN 124–1:2015, Annex A	Same product	
7th sample	Impact	EN 124–5:2015, 5.2.5	EN 124–5:2015, 5.2.5	New manhole top or gully top	1
	— Effect of heating	EN 124–5:2015, 5.2.6	EN 124–5:2015, 5.2.6	Same product	
8th sample	Weathering resistance	EN 124–5:2015, 4.3.6	EN 124–5:2015, 4.3.6	New manhole top or gully top	1
The following tests are optional but to be carried out if requested as material performance tests.					
9th sample	Surface resistivity	EN 124–5:2015, 4.3.5	ISO 2878	New manhole top or gully top	1

7.2.3 Test reports

The results of the determination of the product type shall be documented in test reports. All test reports shall be retained by the manufacturer for at least 10 years after the last date of production of the gully top or manhole top to which they relate.

7.2.4 Shared other party results

A manufacturer may use the results of the product type determination obtained by someone else (e.g. by another manufacturer, as a common service to manufacturers, or by a product developer), to justify his own declaration of performance regarding a product that is manufactured according to the same design (e.g. dimensions) and with raw materials, constituents and manufacturing methods of the same kind, provided that:

— the results are known to be valid for products with the same essential characteristics relevant for the product performance;

— in addition to any information essential for confirming that the product has such same performances related to specific essential characteristics, the other party who has carried out the determination of the product type concerned or has had it carried out, has expressly accepted to transmit to the manufacturer the results and the test report to be used for the latter's product type determination, as well as information regarding production facilities and the production control process that can be taken into account for FPC;

— the manufacturer using other party results accepts to remain responsible for the product having the declared performances and he also:

  — ensures that the product has the same characteristics relevant for performance as the one that has been subjected to the determination of the product type, and that there are no significant differences with regard to production facilities and the production control process compared to that used for the product that was subjected to the determination of the product type; and

  — keeps available a copy of the determination of the product type report that also contains the information needed for verifying that the product is manufactured according to the same design and with raw materials, constituents and manufacturing methods of the same kind.

7.3 Factory production control (FPC)

7.3.1 General

The manufacturer shall establish, document and maintain an FPC system to ensure that the products placed on the market comply with the declared performance of the essential characteristics.

The FPC system shall consist of procedures, regular inspections and tests and/or assessments and the use of the results to control raw and other incoming materials or components, equipment, the production process and the product.

All the elements, requirements and provisions adopted by the manufacturer shall be documented in a systematic manner in the form of written policies and procedures.

This factory production control system documentation shall ensure a common understanding of the evaluation of the constancy of performance and enable the achievement of the required product performances and the effective operation of the production control system to be checked. Factory production control therefore brings together operational techniques and all measures allowing maintenance and control of the compliance of the product with the declared performances of the essential characteristics.

The formulation applicable to a specific manhole top or gully top that has been submitted to the notified body, shall be recorded by the manufacturer and shall become part of a quality control system.

7.3.2 Requirements

7.3.2.1 General

The manufacturer is responsible for organizing the effective implementation of the FPC system in line with the content of this product standard. Tasks and responsibilities in the production control organization shall be documented and this documentation shall be kept up-to-date.

The responsibility, authority and the relationship between personnel that manages, performs or verifies work affecting product constancy, shall be defined. This applies in particular to personnel that need to initiate actions preventing product non-constancies from occurring, actions in case of non-constancies and to identify and register product constancy problems.

Personnel performing work affecting the constancy of performance of the product shall be competent on the basis of appropriate education, training, skills and experience for which records shall be maintained.

In each factory the manufacturer may delegate the action to a person having the necessary authority to:

— identify procedures to demonstrate constancy of performance of the product at appropriate stages;

— identify and record any instance of non-constancy;

— identify procedures to correct instances of non-constancy.

The manufacturer shall draw up and keep up-to-date documents defining the factory production control. The manufacturer's documentation and procedures should be appropriate to the product and manufacturing process. The FPC system should achieve an appropriate level of confidence in the constancy of performance of the product. This involves:

a) the preparation of documented procedures and instructions relating to factory production control operations, in accordance with the requirements of the technical specification to which reference is made;

b) the effective implementation of these procedures and instructions;

c) the recording of these operations and their results;

d) the use of these results to correct any deviations, repair the effects of such deviations, treat any resulting instances of non-conformity and, if necessary, revise the FPC to rectify the cause of non-constancy of performance.

Where subcontracting takes place, the manufacturer shall retain the overall control of the product and ensure that he receives all the information that is necessary to fulfil his responsibilities according to this European Standard.

If the manufacturer has part of the product designed, manufactured, assembled, packed, processed and/or labelled by subcontracting, the FPC of the subcontractor may be taken into account, where appropriate for the product in question.

The manufacturer who subcontracts all of his activities may in no circumstances pass the above responsibilities on to a subcontractor.

NOTE Manufacturers having an FPC system, which complies with EN ISO 9001 standard and which addresses the provisions of the present European Standard are considered as satisfying the FPC requirements of the Regulation (EU) No. 305/2011.

7.3.2.2 Equipment

7.3.2.2.1 Testing

All weighing, measuring and testing equipment shall be calibrated and regularly inspected according to documented procedures, frequencies and criteria.

7.3.2.2.2 Manufacturing

All equipment used in the manufacturing process shall be regularly inspected and maintained to ensure use, wear or failure does not cause inconsistency in the manufacturing process. Inspections and maintenance shall be carried out and recorded in accordance with the manufacturer's written procedures and the records retained for the period defined in the manufacturer's FPC procedures.

7.3.2.3 Raw materials and components

The specifications of all incoming raw materials and components shall be documented, as shall the inspection-scheme for ensuring their compliance. In case supplied kit components are used, the constancy of performance system of the component shall be that given in the appropriate harmonized technical specification for that component.

7.3.2.4 Traceability and marking

Individual products shall be identifiable and traceable with regard to their production origin. The manufacturer shall have written procedures ensuring that processes related to affixing traceability codes and/or markings are inspected regularly.

7.3.2.5 Controls during manufacturing process

The manufacturer shall plan and carry out production under controlled conditions.

For components used for the assembly of manhole tops and gully tops, such as cushioning inserts, bolts etc. not specified in this standard and coating materials, the supplier's documentation shall be checked at every delivery for compliance with the manufacturer's specification. The documents shall be retained for a period of 10 years.

For all materials in accordance with Clause 4, used for the manufacturing process of manhole tops and gully tops, specified in this standard the supplier's documentation shall be checked at every delivery for compliance with the manufacturer's specification.

NOTE For deliveries from suppliers having an established quality management system, the frequency of inspection can be reduced at the discretion of the manufacturer.

The following raw materials shall be checked at every delivery for compliance with the manufacturer's specification and in accordance with Table 8:

For composite materials C1 and C2:

— reinforcement quantity, quality and positioning;

— temperature of the mould;

— foam positioning, if applicable;

— resin injection time and pressure;

— trimming of flash.

For composite materials C3:

— composites pressing conditions (temperature, pressure and time);

— trimming of flash.

Table 8 — Material delivery inspection

Aspect of inspection	Requirement	Frequency of inspection	Conformity criteria	Document retention period
Receiving inspection of composite materials C1 and C2				
Constituent materials	4.1, 4.2.2 and 4.2.3	every delivery	Supplier's document in accordance with manufacturer's design, material and process instructions for each product	5 years
Receiving inspection of composite materials C3				
Constituent materials	4.1 and 4.2.4	every delivery	Supplier's document in accordance with manufacturer's design, material and process instructions for each product	5 years

7.3.2.6 Product testing and evaluation

The manufacturer shall establish procedures to ensure that the stated values of the characteristics for which he declares the performance given in Table 9 in **bold letters**, are maintained. The characteristics and the means of control shall be given in Table 9:

Table 9 — Product testing of finished products

Characteristic	Requirement	Assessment method	Minimum frequency of inspection	Document retention period
for the declared performance:				
Reaction to fire	5.2.7	EN 124–5:2015, 5.2.7, or NPD	–	10 years
Frame bearing area	5.1	Calculation acc. to EN 124–1:2015, 8.4.14	1:5 000 [a]	10 years
Load bearing capacity	5.1	EN 124–1:2015, 8.3	1:5 000 [a]	10 years
Permanent set	5.1	EN 124–1:2015, 8.2	1:5 000 [a]	10 years
Securing of the cover/grating within the frame	5.1	EN 124–1:2015, 8.4.6	1:5 000 [a]	10 years
Child safety	5.1	EN 124–1:2015, 8.5	1:5 000 [a]	10 years
Skid resistance	5.1	EN 124–1:2015, 8.4.13	1:5 000 [a]	10 years
Durability of load bearing capacity against:				
— fatigue	5.2.8.2	EN 124–5:2015, 6.3 and EN 124–1:2015, 8.3	1:5 000 [c]	10 years
— water absorption	5.2.8.2	EN 124–5:2015, 4.3.3 and EN 124–1:2015, 8.3	1:5 000 [a]	10 years
— resistance to vehicle fuels	5.2.8.2	EN 124–5:2015, 4.3.4 and EN 124–1:2015, 8.3	1:5 000 [a]	10 years

Durability of cover securing method against:				
— fatigue	5.2.8.3	EN 124–5:2015, 6.3 and EN 124–1:2015, 8.4.6	1:5 000 [c]	10 years
Durability of effectiveness of child safety characteristics against:				
— fatigue	5.2.8.5	EN 124–5:2015, 6.3	1:5 000 [c]	10 years
Durability of skid resistance against				
— loss of grip	5.2.8.4	EN 124–1:2015, 8.4.13 b), and c)	1:5 000 [a]	10 years
for the design:				
Vents in covers	5.1	EN 124–1:2015, 8.4.1 Visual inspection	Every cover	5 years
Clear opening of manhole tops for man entry	5.1	EN 124–1:2015, 8.4.2 Measurement	1:5 000 [a, b]	5 years
Depth of insertion	5.1	EN 124–1:2015, 8.4.3 Measurement	1:5 000 [a, b]	5 years
Clearance	5.1	EN 124–1:2015, 8.4.4 Measurement	1:5 000 [a, b]	5 years
Compatibility of seatings	5.1	EN 124–1:2015, 8.4.5 Measurement	1:5 000 [a, b]	5 years
Handling of covers and gratings	5.1	EN 124–1:2015, 8.4.7	1:5 000 [a, b]	5 years
Slot dimensions of gratings	5.1	EN 124–1:2015, 8.4.8 Measurement	1:5 000 [a, b]	5 years
Dirt pans and dirt buckets	5.1	EN 124–1:2015, 8.4.9	1:5 000 [a, b]	5 years
Positioning of covers and gratings	5.1	EN 124–1:2015, 8.4.10	1:5 000 [a, b]	5 years
Flatness of manhole covers and gratings	5.1	EN 124–1:2015, 8.4.11	1:5 000 [a, b]	5 years
Concaveness of gratings	5.1	EN 124–1:2015, 8.4.12	1:5 000 [a, b]	5 years
Manhole tops with sealing feature	5.1	Visual inspection	1:5 000 [a, b]	5 years
Frame depth	5.1	EN 124–1:2015, 8.4.15 Measurement	1:5 000 [a, b]	5 years
Opening angle of hinged covers/gratings	5.1	EN 124–1:2015, 8.4.16	1:5 000 [a, b]	5 years
Appearance	5.1	Visual inspection	1:5 000 [a]	5 years
Marking	9	Visual inspection	Every product	5 years
Deflection under load	5.2.2	EN 124–5:2015, 6.2	1:5 000 [c]	5 years

[a] At least every 6 months.

[b] At every modification of mould or design.

[c] At least every 2 years.

7.3.2.7 Non-complying products

The manufacturer shall have written procedures which specify how non-complying products shall be dealt with. Any such events shall be recorded as they occur and these records shall be kept for the period defined in the manufacturer's written procedures.

Where the product fails to satisfy the acceptance criteria, the provisions for non-complying products shall apply, the necessary corrective action(s) shall immediately be taken and the products or batches not complying shall be isolated and properly identified.

Once the fault has been corrected, the test or verification in question shall be repeated.

The results of controls and tests shall be properly recorded. The product description, date of manufacture, test method adopted, test results and acceptance criteria shall be entered in the records under the signature of the person responsible for the control/test.

With regard to any control result not meeting the requirements of this European Standard, the corrective measures taken to rectify the situation (e.g. a further test carried out, modification of manufacturing process, throwing away or putting right of product) shall be indicated in the records.

7.3.2.8 Corrective action

The manufacturer shall have documented procedures that instigate action to eliminate the cause of non-conformities in order to prevent recurrence.

7.3.2.9 Handling, storage and packaging

The manufacturer shall have procedures providing methods of product handling and shall provide suitable storage areas preventing damage or deterioration.

7.3.3 Product specific requirements

The FPC system shall address this European Standard and ensure that the products placed on the market comply with the declaration of performance.

The FPC system shall include a product specific FPC, which identifies procedures to demonstrate compliance of the product at appropriate stages, i.e.

a) the controls and tests to be carried out prior to and/or during manufacture according to a frequency laid down in the FPC test plan

and/or

b) the verifications and tests to be carried out on finished products according to a frequency laid down in the FPC test plan.

If the manufacturer uses only finished products, the operations under b) shall lead to an equivalent level of compliance of the product as if FPC had been carried out during the production.

If the manufacturer carries out parts of the production himself, the operations under b) may be reduced and partly replaced by operations under a). Generally, the more parts of the production that are carried out by the manufacturer, the more operations under b) may be replaced by operations under a).

In any case the operation shall lead to an equivalent level of compliance of the product as if FPC had been carried out during the production.

NOTE Depending on the specific case, it can be necessary to carry out the operations referred to under a) and b), only the operations under a) or only those under b).

The operations under a) refer to the intermediate states of the product as on manufacturing machines and their adjustment, and measuring equipment etc. These controls and tests and their frequency shall be chosen based on product type and composition, the manufacturing process and its complexity, the sensitivity of product features to variations in manufacturing parameters, etc.

The manufacturer shall establish and maintain records that provide evidence that the production has been sampled and tested. These records shall show clearly whether the production has satisfied the defined acceptance criteria and shall be available for at least three years.

7.3.4 Initial inspection of factory and of FPC

Initial inspection of factory and of FPC shall be carried out when the production process has been finalized and in operation. The factory and FPC documentation shall be assessed to verify that the requirements of 7.3.2 and 7.3.3 are fulfilled.

During the inspection it shall be verified:

a) that all resources necessary for the achievement of the product characteristics included in this European Standard are in place and correctly implemented; and

b) that the FPC-procedures in accordance with the FPC documentation are followed in practice; and

c) that the product complies with the product type samples, for which compliance of the product performance to the DoP has been verified.

All locations where final assembly or at least final testing of the relevant product is performed, shall be assessed to verify that the above conditions a) to c) are in place and implemented. If the FPC system covers more than one product, production line or production process, and it is verified that the general requirements are fulfilled when assessing one product, production line or production process, then the assessment of the general requirements does not need to be repeated when assessing the FPC for another product, production line or production process.

All assessments and their results shall be documented in the initial inspection report.

7.3.5 Continuous surveillance of FPC

Surveillance of the FPC shall be undertaken 6 times per year. Surveillance of the FPC can be reduced to a minimum of twice per year, if no irregularity occurred during 3 consecutive years.

Surveillance of the FPC previously performed in accordance with the provisions of this standard, shall be taken into account provided that they were made to the same or a more rigorous test method, under the same AVCP system on the same product or products of similar design, construction and functionality, such that the results are applicable to the product in question.

The surveillance of the FPC shall include a review of the FPC test plan(s) and production processes(s) for each product to determine if any changes have been made since the last assessment or surveillance. The significance of any changes shall be assessed.

Checks shall be made to ensure that the test plans are still correctly implemented and that the production equipment is still correctly maintained and calibrated at appropriate time intervals.

The records of tests and measurement made during the production process and to finished products shall be reviewed to ensure that the values obtained still correspond with those values for the samples submitted to the determination of the product type and that the correct actions have been taken for non-compliant products.

7.3.6 Procedure for modifications

If modifications are made to the product, production process or FPC system that could affect any of the product characteristics declared according to this standard, then all the characteristics for which the manufacturer declares performance, which may be affected by the modification, shall be subject to the determination of the product type, as described in 7.2.1.

Where relevant, a re-assessment of the factory and of the FPC system shall be performed for those aspects, which may be affected by the modification.

All assessments and their results shall be documented in a report.

8 Designation

Where required for specification and documentation purposes, product designation in accordance with this European Standard shall consist of:

a) name of product (manhole top or gully top);

b) European Standard number (EN 124-5);

c) load class (see 5.1);

d) material (Composite material C1, Composite material C2 or Composite material C3);

e) code related to the number of the parts of EN 124 series to which the cover and the frame complies according to Table 10;

Table 10 — Designation according to the material of frame and cover/grating

Designation	Cover/grating in accordance with	Frame in accordance with
5/5	EN 124–5	EN 124–5
5/2	EN 124–5	EN 124–2
5/3	EN 124–5	EN 124–3
5/4	EN 124–5	EN 124–4
5/6	EN 124–5	EN 124–6

f) clear opening (CO in mm), e.g. 400 indicates CO 400 mm;

g) securing method:

   1) securing feature (F);

   2) other methods (O);

h) skid resistance:

   1) defined raised pattern (RP);

   2) measured value of USRV (e.g. 40).

Manhole tops and gully tops consisting of a combination of elements in accordance with EN 124-2, EN 124-3, EN 124-4, EN 124-5 and EN 124-6 shall be designated with the number of the standard and the material for which the cover meets the requirements of the relevant standard.

EXAMPLE 1 Designation of a manhole top according to EN 124–5, load class (C 250), cover and frame made of Composite C1 (C1) (5/5), with a clear opening CO 400 mm (400), other securing method (O), skid resistance (RP)

Manhole Top EN 124–5 — C 250 – C1 – 5/5 – 400 – O – RP

EXAMPLE 2 Designation of a manhole top according to EN 124–5, load class (A 15), consisting of a combination of a cover made from Composite C2 according to EN 124–5, with a frame made of steel according to EN 124–3 (5/3), with a clear opening CO 600 mm (600), securing feature (F), skid resistance (USRV 40)

Manhole Top EN 124–5 — A 15 – C2 – 5/3 – 600 – F – 40

NOTE The designation provides a standardized pattern of designation from which a rapid and unequivocal description of an item is communicated.

9 Marking

Gratings, covers and frames of manhole tops and gully tops according to this European Standard shall be marked as follows:

a) number of this European Standard, i.e. EN 124-5;

b) appropriate class (e.g. B 125);

c) name and/or identification mark of the manufacturer;

d) factory of manufacture which may be in code;

e) date or week and year of manufacture (coded or not coded);

In addition gratings, covers and frames of manhole tops and gully tops according to this European Standard can be marked with:

f) additional markings relating to the intended application of the user;

g) product identification (name and/or catalogue number).

Markings a) to f) of covers, gratings and frames shall be clear, permanent and an integral part of it. These markings shall not be applied by riveting, bolting or chemical adhesives.

All markings shall, where possible, be visible on the upper side (visible from the trafficked area) after the unit is installed. If this is not possible they may be placed on the underside of each element.

Markings a) and b) shall always be on the upper side of cover/grating.

Where regulatory marking provisions (see ZA.3) require information on some or all items listed in this clause, the provisions of this clause concerning those common items are deemed to be met and the information needs not be repeated for the purpose of this clause.

Annex A
(normative)

Test of deflection under load

A.1 Test Samples

Gully tops and manhole tops shall be tested as complete units in their condition of service. Units tested shall be new units that have not been subjected to any other load tests, and shall be randomly selected.

A.2 Deflection test load, F_D

A test load F_D = 1/3 F_T of the test load shown in EN 124-1:2015, 7.2, Table 4, shall be applied for each class for all clear openings.

A.3 Apparatus

A.3.1 Testing machine

The testing machine, preferably a hydraulic test press, shall be capable of applying a load at least 25 % greater than the respective test load for classes A 15 to D 400. A tolerance of ± 3 % of the test load shall be maintained. Except for multiple units, the dimensions of the bed of the testing machine shall be greater than the bearing area of the unit to be tested.

A.3.2 Test blocks

The dimensions and shape of test blocks shall be as shown in EN 124-1:2015, Table A.1.

A.3.3 Deflection measurement device(s)

The deflection measurement device(s) shall have a measurement range of at least 10 mm with a resolution of at least 0,01 mm and have a maximum overall accuracy of ± 5 %.

A.4 Procedure

A.4.1 Procedure for testing rectangular and circular covers/gratings

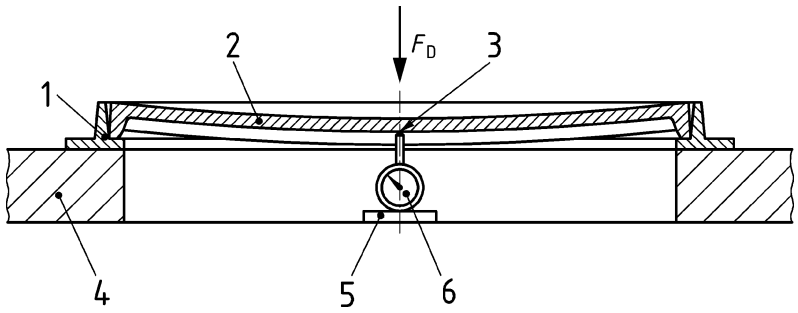
The test sample shall be placed on the test machine bed. The test sample shall be supported on the bed of the test machine in such a way as to ensure that when the cover or grating is deflected under the test load, it shall remain unsupported, and not in contact with the bed of the test machine. The cover or grating of the test sample shall rest normally in its frame.

The test block shall be placed on the geometric centre of the cover/grating with its vertical axis perpendicular to the surface (e.g. see EN 124-1:2015, Figure A.1).

The test load shall be uniformly distributed over the whole surface of the test block and any irregularities compensated for by means of an appropriate intermediate layer, e.g. softwood, fibre board, felt or similar material positioned between the cover or the grating and the test block. The dimensions of this intermediate layer shall not be larger than those of the test block.

When testing gully tops or manhole tops with a non-flat surface, the contact face of the test block shall be shaped to match the grating or cover. Patterns as defined in EN 124-1:2015, 7.4, and small deviations from a flat surface do not require a shaped contact face of the test block.

Measurement of deflection shall be made on the underside of the gully grating or manhole cover as shown in Figure A.1 in the same place as the applied test load. The deflection measurement device(s) shall be positioned within ± 5 % of the geometrical centre of the clear opening of the cover or grating.



Key

1 frame

2 cover or grating

3 geometric centre

4 bed of testing machine

5 measuring device support

6 measuring device

F_D deflection test load

Figure A.1 — Measurement of deflection under load

A conditioning load of maximum 1/3 of F_D shall be applied to bed the system in, and may be held for no more than 5 s and subsequently fully released. After the conditioning load is released and before F_D is applied, the deflection measurement device(s) shall be set such that it is in contact with the underside of the manhole top or gully top and (a) reference reading(s) shall be taken. The load F_D shall be applied at a rate of 1 kN/s to 5 kN/s up to 1/3 F_T and maintained for 30 s. The deflection measurement device(s) shall be read again within the next 10 s. The load shall then be released.

A.4.2 Procedure for testing multiple and triangular covers/gratings

In the case of multiple manhole tops or gully tops, each individual unit and each intermediate structural element shall be tested in accordance with the procedure in A.4.1. The location of the test blocks and the deflection measurement device(s) shall be in accordance with EN 124-1:2015, Figure A.1 and Figure A.2. In the case of double triangular covers or gratings, the test block shall be positioned in the geometric centre, as shown in EN 124-1:2015, Figure A.3.

A.5 Observations and reporting

Record shall be made of all deflection gauge readings, and the differences between the “reference readings” and the equivalent “readings under load” shall be determined. A comparison shall be made between these differences and the requirements of this standard, and a report prepared accordingly.

Annex ZA
(informative)

Clauses of this European Standard addressing the provisions of the EU Construction Products Regulation

ZA.1 Scope and relevant characteristics

This European Standard has been prepared under Mandate M/118 “Wastewater engineering products”, as amended, given to CEN by the European Commission and the European Free Trade Association.

If this European Standard is cited in the Official Journal of the European Union (OJEU), the clauses of this standard, shown in this annex, are considered to meet the provisions of the relevant mandate, under the Regulation (EU) No. 305/2011.

This annex deals with the CE marking of gully tops and manhole tops made of composite materials intended for the uses indicated in Table ZA.1 and shows the relevant clauses applicable.

This annex has the same scope as in Clause 1 of this standard related to the aspects covered by the mandate and is defined by Table ZA.1.

Table ZA.1 — Relevant clauses for manhole tops and gully tops made of composite materials

Construction products: Gully tops and manhole tops made of composite materials **Intended uses:** For covering of gullies, manholes and inspection chambers in areas subjected to pedestrian and/or vehicular traffic			
Essential characteristics	**Clauses in this or other European Standards related to essential characteristics**	**Regulatory classes**	**Notes**
Reaction to fire	EN 124–5:2015, 5.2.7	B to E	the lowest class of the relevant constituent materials declared (acc.to EN 13501–1) based on the results of the relevant test method(s)
Load bearing capacity, as			
— Frame bearing area	EN 124–1:2015, 6.15	–	calculation of frame bearing pressure (in N/mm^2) according to the requirement clause and expressed as $P_b \leq 7{,}5\ N/mm^2$
— load bearing capacity	EN 124–1:2015, 7.2	–	tested acc. to EN 124–1:2015, 8.3, against the declared load-bearing class and expressed as test load for the declared class
— permanent set	EN 124–1:2015, 7.3	–	tested acc. to EN 124–1:2015, 8.2, and maximum permissible value declared for the load-bearing class and the clear opening as given for the product type
Securing of covers/gratings by either			
— locking device or	EN 124–1:2015, 6.6 a)	–	tested for classes C 250 to D 400 according to EN 124–1:2015, Annex E, and declared as h at F_v; for classes A 15 and B 125 “securing feature” is to be declared after visible inspection

— other method	EN 124–1:2015, 6.6 c)	–	tested according to EN 124–1:2015, Annex E, and declared as *h* at F_V; for classes A 15 and B 125 "other method" is to be declared after visible inspection
Child safety, as:			
— locking accessory or securing feature or weight	EN 124–1:2015, 8.5	–	visible inspection and declared as "securing feature" or "locking accessory" or "weight in kg"
Skid resistance of:			
a) Covers	EN 124–1:2015, 7.4.2 b)	–	visible inspection of concrete surface or raised pattern measured according to the requirement clause and expressed as "raised pattern"
	EN 124–1:2015, 7.4.2 c)	–	skid resistance value measured acc. to EN 124–1:2015, Annex C, and USRV declared
b) Gratings:	EN 124–1:2015, 7.4.3	–	measured and declared as "raised pattern" for the specified raised pattern or "slots" for the measured slot dimensions
c) Frames with max. horizontal visible width of: — ≤ 40 mm or — > 40 mm	EN 124–1:2015, 7.4.4	–	EN 124–1:2015, 7.4.4, measured acc. to the requirement clause and expressed as: — "NPD" for ≤ 40 mm or — method or value for > 40 mm
Durability of load bearing capacity against			
— fatigue	EN 124–5:2015, 5.2.8.2	–	tested acc. to the requirement clause and expressed as "Pass" or "Fail"
— water absorption	EN 124–5:2015, 4.3.3	–	measured acc. to the requirement clause and expressed as "less than 0,3 %".
— vehicle fuels	EN 124–5:2015, 4.3.4	–	measured acc. to the requirement clause and expressed as "less than 0,5 %".
Durability of securing against			
— fatigue	EN 124–5:2015, 5.2.8.2	–	tested acc. to the requirement clause and expressed as "Pass" or "Fail"
Durability of skid resistance against			
— loss of grip	EN 124–5:2015, 5.2.8.4	–	expressed as "Pass" for the "raised pattern" or the declared value of USRV, if applicable
Durability of effectiveness of child safety against			
— fatigue	EN 124–5:2015, 5.2.8.5	–	tested acc. to the requirement clause and expressed as "Pass" or "Fail"
Dangerous substance	EN 124–5:2015, 5.2.9	–	EN 124–5:2015, 5.2.9

The declaration of the product performance related to certain essential characteristics is not required in those Member States (MS) where there are no regulatory requirements on these essential characteristics for the intended use of the product.

In this case, manufacturers placing their products on the market of these MS are not obliged to determine nor declare the performance of their products with regard to these essential characteristics and the option "No performance determined" (NPD) in the information accompanying the CE marking and in the declaration of performance (see ZA.3) may be used for those essential characteristics.

ZA.2 Procedures for AVCP of gully tops and manhole tops made of composite materials

ZA.2.1 Systems of AVCP

The AVCP systems of gully tops and manhole tops indicated in Table ZA.1 established by EC Decision 97/464/EC of 1997-06-27 (*see OJEU L 198 of 1997-07-25*), as amended by 2004/663/EC of 2004-09-20 (*see OJEU L 302 of 2004-09-29*), is shown in Table ZA.2 for the indicated intended use(s) and relevant level(s) or class(es) of performance.

Table ZA.2 — Systems of AVCP

Product	Intended use	Level(s) or class(es) of performance	AVCP systems
Manhole tops and gully tops	For use in vehicular and pedestrian areas	-	1
	For all use(s) when subject to regulations on reaction to fire	A1*, A2*, B*, C* ——— A1**, A2**, B**, C**, D, E ——— (A1 to E)***, F	1 ——— 3 ——— 4
System 1: See Regulation (EU) No. 305/2011 (CPR) Annex V, 1.2 System 3: See Regulation (EU) No. 305/2011 (CPR) Annex V, 1.4 System 4: See Regulation (EU) No. 305/2011 (CPR) Annex V, 1.5			
* Products/materials for which a clearly identifiable stage in the production process results in an improvement of the reaction to fire classification (e.g. an addition of fire retardants or a limiting of organic material). ** Products/materials not covered by footnote (*). *** Products/materials that do not require to be tested for reaction to fire (e.g. products/materials of Class A1 according to the Decision 96/603/EC, as amended).			

The AVCP of the gully tops and manhole tops made of composite materials in Table ZA.1 shall be according to the AVCP procedures indicated in Table ZA.3 resulting from application of the clauses of this or other European Standard indicated therein. The content of tasks of the notified body shall be limited to those essential characteristics as provided for, if any, in Annex III of the relevant mandate and to those that the manufacturer intends to declare.

Table ZA.3 — Assignment of AVCP tasks for gully tops and manhole tops made of composites under system 1, system 3 and system 4

Tasks		Content of the task	AVCP clauses to apply
Tasks for the manufacturer	Factory production control (FPC)	— Parameters related to essential characteristics of Table ZA.1 relevant for the intended use for which performance is declared (except for reaction to fire). — Reaction to fire only relevant for use(s) when subject to regulations on reaction to fire (for classes B*, C*, D, E or F), if applicable.	7.3.1, 7.3.2, 7.3.3, 7.3.5, 7.3.6
	Further testing of samples taken at the factory according to the prescribed test plan	— Essential characteristics of Table ZA.1 relevant for the intended use for which performance is declared (except for reaction to fire). — Reaction to fire only relevant for use(s) when subject to regulations on reaction to fire (for classes B*, C*), if applicable.	7.3.4
Tasks for the notified certification body	Determination of the product-type on the basis of type testing (based on sampling carried out by the manufacturer), type calculation, tabulated values or descriptive documentation of the product	— Parameters related to essential characteristics of Table ZA.1 relevant for the intended use for which performance is declared (except for reaction to fire). — Reaction to fire only relevant for use(s) when subject to regulations on reaction to fire (for classes B*, C*, D, E), if applicable.	7.2
	Initial inspection of manufacturing plant and of FPC	— Parameters related to essential characteristics of Table ZA.1, relevant for the intended use which is declared. Documentation of the FPC (except for reaction to fire). — Reaction to fire only relevant for use(s) when subject to regulations on reaction to fire (for classes B*, C*), if applicable.	7.3.4
	Continuous surveillance, assessment and evaluation of FPC	— Parameters related to essential characteristics of Table ZA.1, relevant for the intended use which is declared. Documentation of FPC (except for reaction to fire). — Reaction to fire only relevant for use(s) when subject to regulations on reaction to fire (for classes B*, C*).	7.3.5
* Products/materials for which a clearly identifiable stage in the production process results in an improvement of the reaction to fire classification (e.g. an addition of fire retardants or a limiting of organic material).			

ZA.2.2 Declaration of performance (DoP)

ZA.2.2.1 General

The manufacturer draws up the DoP and affixes the CE marking on the basis of the different AVCP systems set out in Annex V of the Regulation (EU) No. 305/2011:

— the factory production control and further testing of samples taken at the factory according to the prescribed test plan, carried out by the manufacturer; and

— the certificate of constancy of performance issued by the notified product certification body on the basis of determination of the product type on the basis of type testing (including sampling), type calculation, tabulated values or descriptive documentation of the product; initial inspection of the manufacturing plant and of factory production control and continuous surveillance, assessment and evaluation of factory production control.

ZA.2.2.2 Content

The model of the DoP is provided in Annex III of the Regulation (EU) No. 305/2011. According to this Regulation, the DoP shall contain, in particular, the following information:

— the reference of the product-type for which the declaration of performance has been drawn up;

— the AVCP system or systems of the construction product, as set out in Annex V of the CPR;

— the reference number and date of issue of the harmonized standard which has been used for the assessment of each essential characteristic;

— where applicable, the reference number of the Specific Technical Documentation used and the requirements with which the manufacturer claims the product complies.

The DoP shall in addition contain:

a) the intended use or uses for the construction product, in accordance with the applicable harmonized technical specification;

b) the list of essential characteristics, as determined in the harmonized technical specification for the declared intended use or uses;

c) the performance of at least one of the essential characteristics of the construction product, relevant for the declared intended use or uses;

d) where applicable, the performance of the construction product, by levels or classes, or in a description, if necessary based on a calculation in relation to its essential characteristics determined in accordance with the Commission determination regarding those essential characteristics for which the manufacturer shall declare the performance of the product when it is placed on the market or the Commission determination regarding threshold levels for the performance in relation to the essential characteristics to be declared;

e) the performance of those essential characteristics of the construction product which are related to the intended use or uses, taking into consideration the provisions in relation to the intended use or uses where the manufacturer intends the product to be made available on the market;

f) for the listed essential characteristics for which no performance is declared, the letters “NPD” (No Performance Determined).

Regarding the supply of the DoP, Article 7 of the Regulation (EU) No. 305/2011 applies.

The information referred to in Article 31 or, as the case may be, in Article 33 of Regulation (EC) No. 1907/2006, (REACH) shall be provided together with the DoP.

ZA.2.2.3 Example of DoP

The following gives an example of a filled-in DoP for a manhole top, made of composite:

DECLARATION OF PERFORMANCE
No. 00001 – CPR – 2015/05/12

1. Unique identification code of the product-type:

Manhole top C 250 – C1 – 5/5 – 600 – F – RP

2. Intended use or uses:

For covering of manholes in areas subject to pedestrian and/or vehicular traffic

3. Manufacturer:

AnyCo SA, PO Box 21
B-1050 Brussels, Belgium
Tel.:+32987654321
Fax: +32123456789
e-mail: anyco.sa@provider.be

4. Authorized representative:

Anyone Ltd
Flower Str. 24
West Hamfordshire
UK-589645 United Kingdom
Tel. +44987654321
Fax: +44123456789
e-mail: anyone.ltd@provider.uk

5. System of AVCP:

System 1 for the intended use under item 2

6. Harmonized standard: **EN 124-5**

Notified product certification body (name) No. 5678, performed the determination of the product-type on the basis of type testing, the initial inspection of the manufacturing plant and of factory production control and the continuous surveillance, assessment and evaluation of factory production control under system 1 and issued the certificate of constancy of performance of the product.

7. Declared performance

Essential characteristics	**Performance**	**Harmonized technical specification**
Reaction to fire	E	EN 124-5: 2015
Load-bearing capacity, as:		
— frame bearing area	$P_b \leq 7{,}5$ N/mm^2	
— load-bearing capacity	250 kN	
— permanent set	≤ 2 mm	
Securing of covers,		
— by securing feature	0 mm at 1 100 N	
Child safety	Locking accessory	

Skid resistance	Raised pattern	
Durability of load bearing capacity, against:		
— fatigue	Pass	
Durability of securing, against:		
— fatigue	Pass	
Durability of skid resistance, against:		
— loss of grip	Pass	
Durability of effectiveness of child safety	Pass	
Dangerous substances	NPD	

8. Appropriate Technical Documentation and/or Specific Technical Documentation, if appropriate (see Articles 36 to 38 of Regulation (EU) No. 305/2011)

- not appropriate -

The performance of the product identified above is in conformity with the set of declared performance/s. This declaration of performance is issued in accordance with regulation (EU) No. 305/2011 under the sole responsibility of the manufacturer identified above.

Signed for and on behalf of the manufacturer by:

(name) ……

At (place) ……..…… on (date of issue) ……

(signature) ……

ZA.3 CE marking and labelling

The CE marking symbol shall be in accordance with the general principles set out in Article 30 of Regulation (EC) No. 765/2008 and shall be affixed visibly, legibly and indelibly to the manhole top or gully top.

The CE marking and the accompanying information shall be placed on a label attached to it, or on the packaging or on the accompanying documents.

The CE marking shall be followed by:

a) the last two digits of the year in which it was first affixed;

b) the name and the registered address of the manufacturer, or the identifying mark allowing identification of the name and address of the manufacturer easily and without any ambiguity;

c) the unique identification code of the product-type;

d) the reference number of the declaration of performance (see example of DoP);

e) the level or class of the performance declared;

f) the dated reference to the harmonized technical specification applied;

g) the identification number of the notified body;

h) the intended use as laid down in the harmonized technical specification applied.

The CE marking shall be affixed before the construction product is placed on the market. It may be followed by a pictogram or any other mark notably indicating a special risk or use.

Figure ZA.1, gives an example of such complete CE marking given in the commercial documents, accompanying the gully top or manhole top.

CE 01234	*CE" marking consisting of the "CE"- symbol* *Identification number of the notified certification body*
AnyCo Ltd **15** **No. 00001 – CPR – 2013/05/14**	*Name and the registered address or identifying mark of the manufacturer* *Last two digits of the year in which the marking was first affixed* *Reference number of the DoP*
EN 124-5:2015 **Manhole top C 250 - C1 - 5/5 – 600 – F – RP** for use in areas for pedestrian and/or vehicular traffic	*Number of the European Standard, and the year of its publication* *Unique identification code of the product type* *Intended use of the product as laid down in the European Standard applied*
Reaction to fire	E
Load-bearing capacity, as:	
— frame bearing area	$P_b \leq 7{,}5$ N/mm^2
— load-bearing capacity	250 kN
— permanent set	≤ 2 mm
Securing of cover	
— securing feature	0 mm at 1 100 N
Child safety	Locking accessory
Skid resistance	Raised pattern
Durability of load bearing capacity against	
— fatigue	Pass
Durability of securing, against	
— fatigue	Pass
Durability of skid resistance against	
— loss of grip	Pass
Durability of effectiveness of child safety characteristics	Pass
Dangerous substances	NPD

Levels or classes of the performance declared

Figure ZA.1 — Example for CE marking given in the commercial documents, accompanying a manhole top, class C 250, cover and frame made of composite C1 and secured by a securing feature

Bibliography

[1] EN 1253 (all parts), *Gullies for buildings*

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

[3] EN ISO 6603-1:2000, *Plastics - Determination of puncture impact behaviour of rigid plastics — Part 1: Non-instrumented impact testing (ISO 6603-1:2000)*

[4] EN ISO 9001, *Quality management systems — Requirements (ISO 9001)*

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