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European Assessment Document for

Plastic chambers for underground network access applications installed below manhole tops

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This European Assessment Document (EAD) has been developed taking into account up-to-date technical and scientific knowledge at the time of issue and is published in accordance with the relevant provisions of Regulation (EU) No 305/2011 as a basis for the preparation and issuing of European Technical Assessments (ETA).

Contents

1 SCOPE OF THE EAD

1.1 Description of the construction product

The plastic chamber for underground network access applications, installed below manhole tops, is a complete system for access and distribution (hereinafter referred to as: “plastic access chamber”) in applications like, but not limited to: power and energy, telecommunication, transportation (rail, highways, etc.), water and general construction (no wastewater or sewage application).

A manhole top that meets the load classifications required by EN 1433[1] and by EN 124 is needed to close the plastic access chamber but is not subject to this EAD.

The following table shows the load classes.

Table 1.1.1 Load classes according to EN 1433 and EN 124-1

Load Class	Load bearing capacity in kN
A 15	15
B 125	125
C 250	250
D 400	400
E 600	600
F 900	900

In the built-in state, the plastic access chambers require openings for the introduction of the application.

The plastic access chambers can be monolithic (e.g., made of one piece) or modular (e.g., made of stacked individual frames). They may have different geometries (e.g., rectangular, circular, triangular, etc.) and dimensions suitable for the spaces will be installed. Typical clear widths of plastic access chambers range from, but are not limited to, 0.4 – 2.5 m with heights of up to, but not limited to, 1.2 m.

See Figure 1.1.1 for an example of a modular rectangular plastic access chamber made of stacked frames.

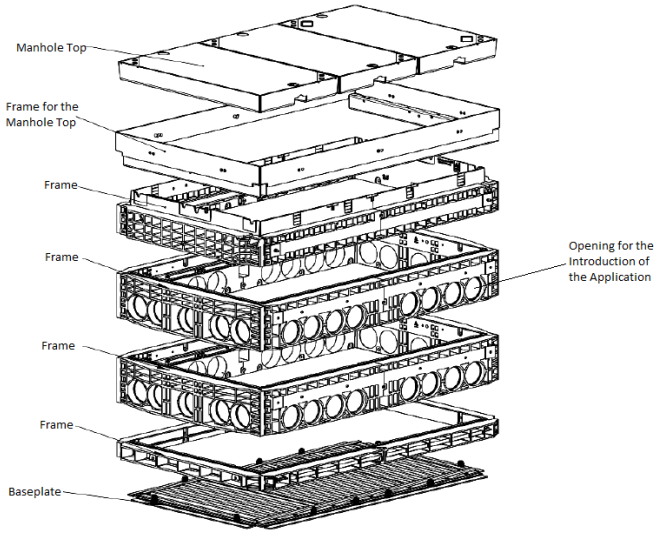


Figure 1.1.1: Example of a modular rectangular plastic access chamber made of stacked frames

The dimensions of the overall system shall be stated in the ETA.

1 All undated references to standards or to EADs in this EAD are to be understood as references to the dated versions listed in chapter 4.

For a modular design, state the dimensions, associated dimensional tolerances and any differing geometries of the individual plastic chamber systems elements in the form of technical drawings.

The product is not covered by a harmonized European standard (hEN) as the harmonized European standard EN 1917 is only for manholes and inspection chambers out of unreinforced concrete, steel fibre concrete and/or reinforced concrete.

Concerning product packaging, transport, storage, maintenance, replacement and repair it is the responsibility of the manufacturer to undertake the appropriate measures and to advise his clients on the transport, storage, maintenance, replacement and repair of the product as he considers necessary.

It is assumed that the product will be installed according to the manufacturer's instructions or (in absence of such instructions) according to the usual practice of the building professionals.

Relevant manufacturer's stipulations having influence on the performance of the product covered by this European Assessment Document shall be considered for the determination of the performance and detailed in the ETA.

1.2 Information on the intended use(s) of the construction product

1.2.1 Intended use(s)

Plastic access chambers are intended for use in conjunction with jointing, feeding through and branching cables, pipes or ducts and the housing of active and passive technical components. They can be used in all accessible (by foot and vehicle) areas such as parking areas, pedestrian zones, sidewalks and hard shoulders, along roads and rail tracks as well as in road surfaces and lanes.

1.2.2 Working life/Durability

The assessment methods included or referred to in this EAD have been written based on the manufacturer's request to take into account a working life of the plastic access chambers for the intended use of 25 years in the works provided that the plastic access chamber is subject to appropriate installation (see 1.1). These provisions are based upon the current state of the art and the available knowledge and experience.

When assessing the product, the intended use as foreseen by the manufacturer shall be taken into account. The real working life may be, in normal use conditions, considerably longer without major degradation affecting the basic requirements for works[2].

The indications given as to the working life of the construction product cannot be interpreted as a guarantee neither given by the product manufacturer or his representative nor by EOTA when drafting this EAD nor by the Technical Assessment Body issuing an ETA based on this EAD but are regarded only as a means for expressing the expected economically reasonable working life of the product.

2 The real working life of a product incorporated in a specific works depends on the environmental conditions to which that works is subject, as well as on the particular conditions of the design, execution, use and maintenance of that works. Therefore, it cannot be excluded that in certain cases the real working life of the product may also be shorter than referred to above.

2 ESSENTIAL CHARACTERISTICS AND RELEVANT ASSESSMENT METHODS AND CRITERIA

2.1 Essential characteristics of the product

Table 2.1.1 shows how the performance of plastic access chambers is assessed in relation to the essential characteristics.

Table 2.1.1 **Essential characteristics of the product and methods and criteria for assessing the performance of the product in relation to those essential characteristics**

No	Essential characteristic	Assessment method	Type of expression of product performance
Basic Works Requirement 1: Mechanical resistance and stability			
1	Mechanical resistance	2.2.1	level
2	Mechanical resistance after thermal stress	2.2.2	description in relation of No. 1 (level)
3	Load-bearing capacity	2.2.3	class (according to Table 1.1.1)
4	Shear stress testing	2.2.4	level
5	Load-bearing capacity when installed	2.2.5	Load case II: class (according to Table 1.1.1) + Load case III: level
6	Dynamic stress when installed	2.2.6	level
Basic Works Requirement 2: Safety in case of fire			
7	Reaction to fire	2.2.7	class (according to EN 13501-1)
Basic Works Requirement 3: Hygiene, health and the environment			
8	Release of particles during operation	2.2.8	level
Basic Works Requirement 4: Safety and accessibility in use			
9	Chemical resistance	2.2.9	description in relation of No. 1 (level)
10	UV resistance	2.2.10	description in relation of No. 1 (level)

2.2 Methods and criteria for assessing the performance of the product in relation to essential characteristics of the product

This chapter is intended to provide instructions for TABs. Therefore, the use of wordings such as “shall be stated in the ETA” or “it has to be given in the ETA” shall be understood only as such instructions for TABs on how results of assessments shall be presented in the ETA. Such wordings do not impose any obligations for the manufacturer and the TAB shall not carry out the assessment of the performance in relation to a given essential characteristic when the manufacturer does not wish to declare this performance in the Declaration of Performance.

Testing will be limited only to the essential characteristics which the manufacturer intends to declare. If for any components covered by harmonised standards or European Technical Assessments the manufacturer of the component has included the performance regarding the relevant characteristic in the Declaration of Performance, retesting of that component for issuing the ETA under the current EAD is not required.

2.2.1 Mechanical resistance

The following mechanical resistance characteristics shall be determined:

1. Charpy impact properties according to EN ISO 179-1,
2. Flexural properties according to EN ISO 178,
3. Tensile properties according to EN ISO 527-1 to 5.

The samples shall be conditioned for > 16 h at (23±2) °C and at relative humidity of (50±10) % prior to testing.

For the samples, permissible absorption of moisture is from 0 to 2%.

The test shall be performed at (23±2) °C and at relative humidity of (50±10) %.

Impact strength [kJ/m²], flexural strength [MPa], elongation at bending strength [%] and tensile strength [MPa] and the corresponding specimen geometry shall be stated in the ETA.

In each case, test at least 5 samples.

2.2.2 Mechanical resistance after thermal stress

The following mechanical resistance characteristics shall be determined:

1. Charpy impact properties according to EN ISO 179-1,
2. Flexural properties according to EN ISO 178,
3. Tensile properties according to EN ISO 527-1 to 5.

Store the samples for 30 cycles of 12 hours in a thermal chamber at -20 °C or + 70 °C, in accordance with EN 60068-2-14.

Use the test “Nb” Temperature change with a specific rate of change.

Use a rate of change of (1 ± 0.2) K/min.

The samples shall then be conditioned for > 16 h at (23±2) °C and at relative humidity of (50±10) %.

The moisture absorption of the samples shall be stated in the ETA.

The destructive load test shall be performed at (23±2) °C and at relative humidity of (50±10) %.

In each case, test at least 5 samples.

The decrease in strength [%] as well as the deviations of deformations [%] shall be stated in the ETA with the results from section 2.2.1 as a base.

2.2.3 Load-bearing capacity

The assessment for “Load-bearing capacity” shall be performed according to annex A1.

2.2.4 Shear stress testing

The assessment for “Shear stress testing” shall be performed according to annex A2.

2.2.5 Load-bearing capacity when installed

The assessment for “Load-bearing capacity when installed” shall be performed according to annex A3.

2.2.6 Dynamic stress when installed

The assessment for “Dynamic stress when installed” shall be performed according to annex A4.

2.2.7 Reaction to fire

The plastic access chambers shall be tested using the method EN ISO 11925-2–relevant for the corresponding fire–class according to EN 13501-1. The product shall be classified according to the Commission Delegated Regulation (EU) No 2016/364 in connection with EN 13501-1.

The necessary tests according to EN ISO 11925-2 shall be performed with edge exposure as well as with surface exposure on specimens as follow:

a) flat boards made from the material of the plastic access chambers or cut sections of the plastic access chambers with corrugation in lengthwise direction, mounted in a free-hanging test position without any substrate behind,
b) flat boards made from the material of the plastic access chambers or cut sections of the plastic access chambers with corrugation in lengthwise direction, mounted on a standard calcium-silicate board according to EN 13238, if tests fail with a specimen configuration according to "a)".

The following parameters shall be considered when preparing the test specimens and executing the tests:

- variations of a product family (as defined by a combination of certain raw materials and certain type of production process),
- highest and lowest thickness, if relevant,
- highest and lowest density, if relevant.

The results of tests considering the aforementioned parameters in full are valid for:

- all variations of the defined product family,
- the tested thickness or the whole range between those thickness values tested,
- the tested density or the whole range between those density values tested.

2.2.8 Release of particles during operation

In the built-in state, corresponding to the application, openings for the introduction of the application (e.g., cables, pipes, etc.) may be required to be made into the walls of the plastic access chamber. The dust pollution generated during this mechanical processing (inhalation exposure) shall be tested in a critical plastic access chamber.

The test shall be performed on a plastic access chamber with the dimensions 0.5 m x 1.0 m x 1.0 m.

The mechanical installation of the openings shall be completed within 10 minutes, whereby 4 holes (each with a diameter of 110 mm) shall be positioned opposite each other at a central height (maximum cutting area). The measurement is performed during a period of 15 minutes.

Aerosols, inhalable dust (E dust), and respirable dust (A dust) shall be measured and indicated according to EN 481.

The values shall be stated in the ETA based on the technique used to install the openings.

The technique used to install the openings shall be specified in the ETA.

Measurement is not necessary if minor or negligible exposures are expected for procedural and/or material-related reasons. The stated value is “0”.

2.2.9 Chemical resistance

The following mechanical resistance characteristics shall be determined:

1. Charpy impact properties according to EN ISO 179-1,
2. Flexural properties according to EN ISO 178,
3. Tensile properties according to EN ISO 527-1 to 5.

The material shall be stable following storage in liquid chemicals.

The storage is done in accordance with EN ISO 175.

At least the following liquid chemicals shall be tested:

- Store for 24 h in mineral oil, No.2 (ISO 1817),
- Store for 24 h in petroleum (Kerdane),
- Store for 24 h in isooctane (2,2,4-Trimethylpentane),
- Store for 7 d in milk of lime (saturated),
- Store for 7 d in 0.1% sodium hydroxide.

Store the samples at (23±2) °C.

The destructive load test shall be performed at (23±2) °C and at relative humidity of (50±10) %.

In each case, test at least 5 samples.

The decrease in strength [%] as well as the deviations of deformations [%] shall be stated in the ETA with the results from section 2.2.1 as a base.

2.2.10 UV resistance

The following mechanical resistance characteristics shall be determined:

1. Charpy impact properties according to EN ISO 179-1,
2. Flexural properties according to EN ISO 178,
3. Tensile properties according to EN ISO 527-1 to 5.

The material shall be stable following storage under xenon light.

Stress in accordance with EN ISO 4892-2, Clause 7.

Use method A with the irradiation strength “narrowband” (table B.1).

The test duration is set to 800 hours.

Subsequently, condition the samples for > 16 h at (23±2) °C and at relative humidity of (50±10) % prior to destructive testing.

The moisture absorption of the samples shall be stated in the ETA.

The destructive load test shall be performed at (23±2) °C and at relative humidity of (50±10) %

In each case, test at least 5 samples.

The decrease in strength [%] as well as the deviations of deformations [%] shall be stated in the ETA with the results from section 2.2.1 as a base.

3 ASSESSMENT AND VERIFICATION OF CONSTANCY OF PERFORMANCE

3.1 System(s) of assessment and verification of constancy of performance to be applied

For the products covered by this EAD the applicable European legal act is: Decision 2015/1959/EC(EU).

The system is: 4 for all essential characteristics except for reaction to fire.

For reaction to fire the applicable AVCP systems are 1, 3 or 4 depending on the conditions defined in the said Decision.

3.2 Tasks of the manufacturer

The cornerstones of the actions to be undertaken by the manufacturer of the product in the procedure of assessment and verification of constancy of performance are laid down in Table 3.2.1.

The manufacturer (regarding the components he buys from the market with DoP) shall take into account the Declaration of Performance issued by the manufacturer of that component. No retesting is necessary.

Table 3.2.1 Control plan for the manufacturer; cornerstones

No	Subject/type of control	Test or control method	Criteria, if any	Minimum number of samples	Minimum frequency of control
Factory production control (FPC) [including testing of samples taken at the factory in accordance with a prescribed test plan]*					
1	Mechanical properties of the plastic access chamber systems and/or the plastic access chamber elements	See Annex B1 or equivalent test	Laid down in the control plan	1	Laid down in the control plan
2	Dimensions of the plastic access chamber systems or plastic access chamber elements	Measurement using universal devices	Laid down in the control plan	1	Laid down in the control plan
3	Weights of the plastic access chamber systems or plastic access chamber elements	Measurement using universal devices	Laid down in the control plan	1	Laid down in the control plan
4	Visual inspection of the plastic access chamber systems or plastic access chamber elements for cracks, deformations and other damages	Visual examination	Laid down in the control plan	1	Laid down in the control plan
5	Reaction to fire	EN ISO 11925-2	According to Control plan	According to test method	Once per two years

3.3 Tasks of the notified body

The cornerstones of the actions to be undertaken by the notified body of the product in the procedure of assessment and verification of constancy of performance are laid down in Table 3.3.1.

Table 3.3.1 Control plan for the notified body; cornerstones

No	Subject/type of control	Test or control method	Criteria, if any	Minimum number of samples	Minimum frequency of control
Initial inspection of the manufacturing plant and of factory production control *(for systems 1 only)*					
1	Notified Body will ascertain that the factory production control with staff, equipment and an appropriate quality assurance system and necessary stipulations are suitable to ensure a continuous and orderly manufacturing of the product. With regard to reaction to fire the notified body shall especially take account of a clearly identifiable stage in the production process results in an improvement of the reaction to fire classification.	Verification of the complete FPC as described in the control plan agreed between the TAB and the manufacturer	According to Control plan	According to Control plan	When starting the production or a new line, or after modification of the production process
Continuous surveillance, assessment and evaluation of factory production control *(for systems 1 only)*					
2	The Notified Body will ascertain that the system of factory production control and the specified manufacturing process are maintained taking account of the control plan. With regard to reaction to fire the notified body shall especially take account of a clearly identifiable stage in the production process results in an improvement of the reaction to fire classification.	Verification of the controls carried out by the manufacturer as described in the control plan agreed between the TAB and the manufacturer with reference to the raw materials, to the process and to the product as indicated in Table 3.1	According to Control plan	According to Control plan	once per year

4 REFERENCE DOCUMENTS

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 ISO 175:2010	Plastics. Methods of test for the determination of the effects of immersion in liquid chemicals
EN ISO 179-1:2010	Plastics. Determination of Charpy impact properties, Non-instrumented impact test
EN ISO 178:2019	Plastics. Determination of flexural properties
EN ISO 527-1:2019	Plastics. Determination of tensile properties. General principles
EN ISO 527-2:2012	Plastics. Determination of tensile properties. Test conditions for moulding and extrusion plastics
EN ISO 527-3:2018	Plastics. Determination of tensile properties. Test conditions for films and sheets
EN ISO 527-4:2021	Plastics. Determination of tensile properties. Test conditions for isotropic and orthotropic fibre-reinforced plastic composites
EN ISO 527-5:2021	Plastics. Determination of tensile properties. Test conditions for unidirectional fibre-reinforced plastic composites
EN 1433:2002 +AC:2004 + A1:2005	Drainage channels for vehicular and pedestrian areas. Classification, design and testing requirements, marking and evaluation of conformity
ISO 1817:2020	Rubber, Vulcanized or thermoplastic. Determination of the effect of liquids
EN 1917:2002 + AC:2008	Concrete manholes and inspection chambers, unreinforced, steel fibre and reinforced
EN 1991-2:2003 + AC:2010	Eurocode 1: Actions on structures. Part 2: Traffic loads on bridges
EN ISO 4892-2:2013 + A1:2021	Plastics. Methods of exposure to laboratory light sources. Xenon-arc lamps
EN 13501-1:2018	Fire classification of construction products and building elements. Classification using test data from reaction to fire tests
EN 481:1993	Workplace atmospheres. Size fraction definitions for measurement of airborne particles
EN ISO 11925-2:2020	Reaction to fire tests. Ignitability of products subjected to direct impingement of flame. Part 2: Single-flame source test
EN 13238:2010	Reaction to fire tests for building products. Conditioning procedures and general rules for selection of substrates

ANNEX A: ASSESSMENT METHODS FOR SYSTEM TESTS

A1 Load-bearing capacity

Load-bearing capacity of the plastic access chamber as a unit shall be tested in accordance with EN 1433, Clause 9.1.4.1.

The manhole top is not part of the construction product; however, it is required to determine the load-bearing capacity of the plastic access chamber. The test set-up therefore includes the manhole top.

Perform the test on the free standing modular or single-piece overall system, including the manhole top in accordance with EN 1433, Clause 9.1.4.1. The plastic access chambers shall always be tested as a unit (base or plastic access chamber body with manhole top) in accordance with the specifications.

The rating may not be applied to other manhole tops in the same load class without prior testing.

Each type requires a different manhole top and a separate test of load-bearing capacity (proof of stability of the overall system manhole top + plastic access chamber).

Apply force to the test piece, free standing on a flat surface as a complete unit in its intended installation position. Ensure secure fit of the test plastic access chamber on a horizontal work surface. The test procedure and the test parameters are specified in EN 1433, Clause 9.1.4.1.

Perform the test with the maximum number of open holes / unfavourable hole arrangement that is permitted for the entire system, without additional elements (pipe, cable, etc.) installed. Provide openings in accordance with the installation instructions of the manufacturer.

Fit at least two tube insertion layers on top of each other.

Stiffening elements may only be considered if they are used over the entire lifetime.

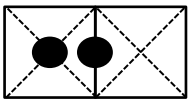
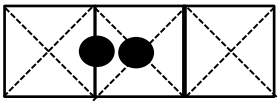
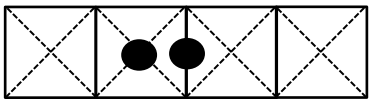
Perform a complete test on a test piece.

The test facility shall comply with the requirements of EN 1433, Clause 9.1.2.1.

The test sequence is as follows:

Apply force, which is specified for the load rating, at a speed of 5 kN per second. Keep the test piece under full load for 30 sec. The test positions to be tested for one or more manhole tops are shown in Table A1.1 (test position 01: central). For multi-part manhole tops, always check the specified central test position of the system first. Subsequently, test the predetermined test position 02 on the same test piece.

Table A1.1 Test positions of various manhole top variants

One-piece manhole tops:	Test position 01	
Two-piece manhole top:	Test position 01 Test position 02	
Three-piece manhole top:	Test position 01 Test position 02	
Four-piece manhole top:	Test position 01 Test position 02	
Triangle manhole top	See test position in EN 124-1, Annex, Clause A.4.2	
Round manhole top	See test position in EN 124-1, Annex, Clause A.4.1	

Following the test or tests under full load, the entire system shall not show any indication of a failure that might influence the load bearing capacity of the system.

Examples for indicators that might influence the load bearing capacity are visible cracks or chips during and/or after the test (no optical magnification, e.g., microscopy).

The load rating of the manhole top shall correspond to the load rating of the plastic access chamber at a minimum.

The load class according to Table 1.1.1 shall be stated.

A 2 Shear stress testing

Test the side of the test piece. The smallest clearance is usually the standard.

Ensure secure fit of the test piece on a horizontal work surface. Any unevenness between the ground and the wall shall be compensated for using humid sand 0/5 with 7% water content and with good cohesive force/good cohesion, or a similar material.

The direct bond between the manhole top and the plastic access chamber body shall be form-fit or bonded to secure against non-positive or material-locking relative motion from the time of assembly. This is to ensure the guaranteed clearance during or after professional floor installation.

The test setup is shown in Figure A2.1. The manhole top is not part of the construction product; however, it is required to determine the load-bearing capacity of the plastic access chamber. The test set-up therefore includes the manhole top.

The increase of force application is 10kN/min; the force is increased to failure of the bond.

The shift may only take place along the stress axis. The mounting of the manhole top shall suit the application. Additional form-fit or bonded connections are prohibited.

Perform a complete test on a test piece.

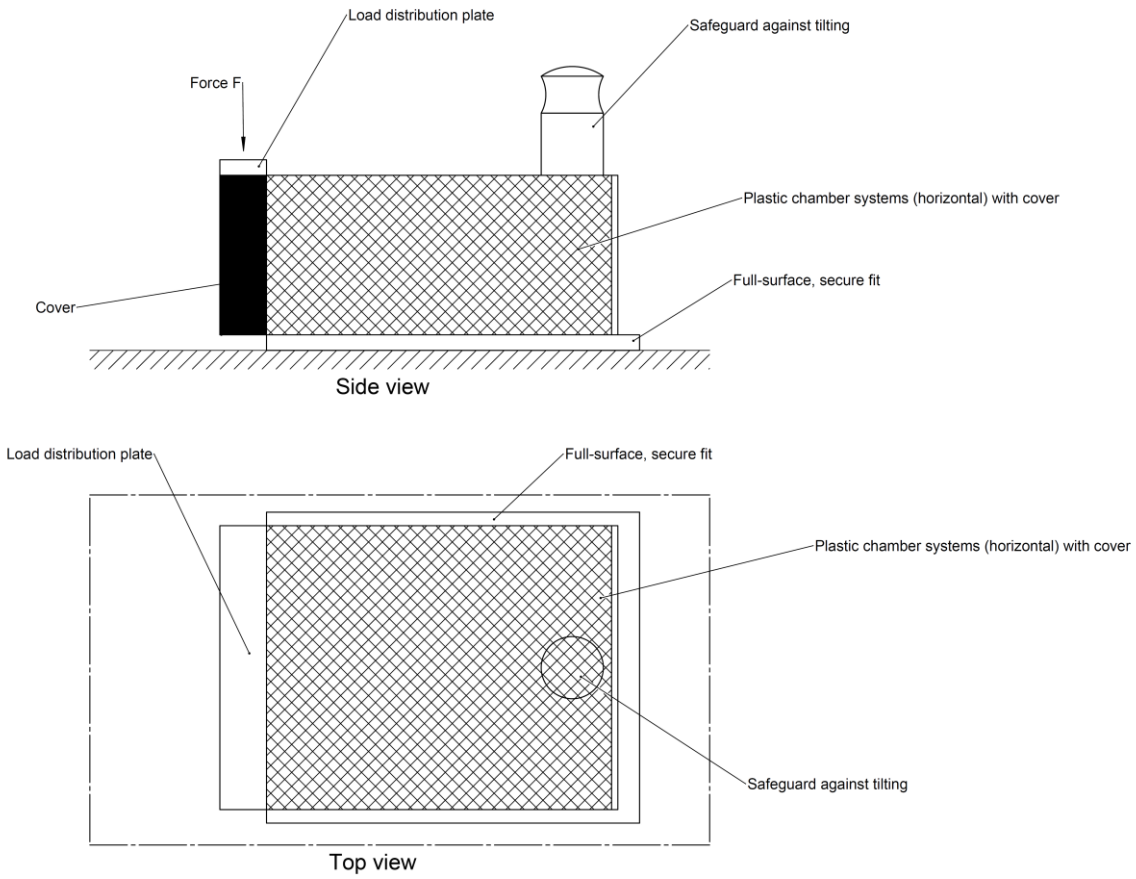


Figure A2.1: Test setup for shear stress testing

The test facility shall comply with the requirements of EN 1433, Clause 9.1.2.1.

The maximum load which results in breakage or destruction of the bond between the manhole top and the plastic access chamber body shall be stated in the ETA.

A3 Load-bearing capacity when installed

Perform the test on the integrated overall system, modular or one-piece, including the manhole top in accordance with EN 1433, Clause 9.1.4.1. The plastic access chambers shall always be tested as a unit (base or plastic access chamber body with manhole top) in accordance with the manufacturer's specifications.

The manhole top is not part of the construction product; however, it is required to determine the load-bearing capacity of the plastic access chamber. The test set-up therefore includes the manhole top.

Perform a complete test on a test piece.

The test shall be performed in a pre-made excavation as follows:

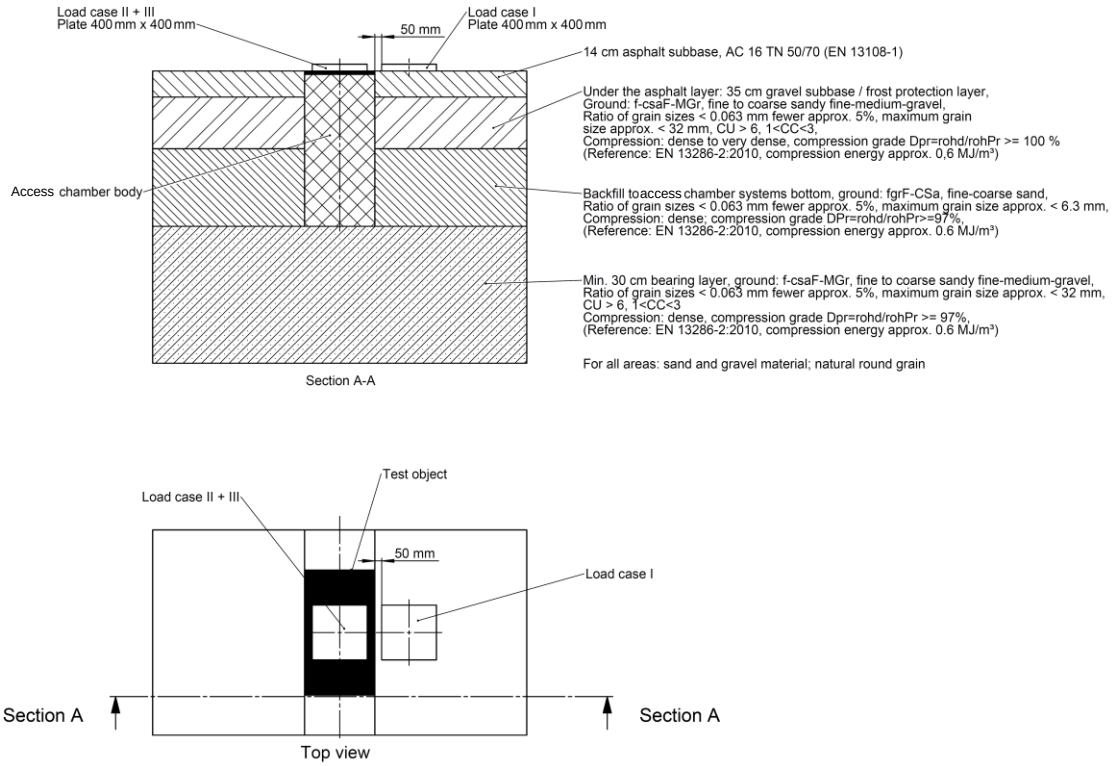


Figure A3.1: Test set-up – side view (above) and top view (below)

The test procedure and the test parameters are specified in EN 1433, Clause 9.1.4.1 Deviating from EN 1433, use a plunger size of 0.4 x 0.4 m² as specified in EN 1991-2, Clause 4.3.

Perform the test with the maximum number of open holes / unfavourable hole arrangement that is permitted for the entire system, without additional elements (pipe, cable, etc.). Provide openings in accordance with the installation instructions of the manufacturer.

Fit at least two tube insertion layers on top of each other.

The test facility shall comply with the requirements of EN 1433, Clause 9.1.2.1.

Stiffening elements may only be considered if they are used over the entire lifetime.

The test involves 3 load cases, performed in sequence, for one test piece. Perform the entire test once.

In load case I, always test on the less favourable side, which is usually the longer side.

Load case II and III are tested after load case I.

The Load class according to Table 1.1.1 for load case II and the failure force [kN] determined in load case III shall be stated in the ETA.

Following load case I and II, the entire system shall not show any indication of a failure that might influence the load bearing capacity of the system.

Examples for indicators that might influence the load bearing capacity are visible cracks or chips during and/or after the test (no optical magnification, e.g., microscopy).

Load case I

Test the following sequence:

- Test position see diagram A3.1,
- Test load: 300 kN in compliance with the Eurocode 1 (EN 1991-2, Clause 4.3),
- Holding time: 10 h.

After the load test, the reduction of the clearance (over the entire height of the system) shall not exceed 5% of the clearance of the tested manhole side. Starting value is the measured clearance before installation. Check measurement accuracy with 1 mm. Specify at least 3 measurement points (centre of the top, middle and bottom third) of the manhole for the deflection. For individual components, each component shall be tested in the geometrical centre.

Load case II

Full load test in accordance with EN 1433, Clause 9.1.4.1 in the centre of the system.

Load case III

The position of the plunger is specified in load case II.

Test the plastic access chamber to failure.

A 4 Dynamic stress when installed

Perform the test on the integrated overall system, modular or one-piece, including the manhole top in accordance with EN 1433, Clause 9.1.4.1. The plastic access chamber shall always be tested as a unit (base or plastic access chamber body with manhole top) in accordance with the manufacturer's specifications.

The manhole top is not part of the construction product; however, it is required to determine the load-bearing capacity of the plastic access chamber. The test set-up therefore includes the manhole top.

The test shall be set up in accordance with Section A3.

The test involves 3 load cases, performed in sequence, for one test piece. Perform the entire test once.

In load case I, always test on the less favourable side, which is usually the longer side.

Load case II and III are tested after load case I.

Stiffening elements may only be considered if they are used over the entire lifetime.

The test facility shall comply with the requirements of EN 1433, Clause 9.1.2.1.

Perform the test with the maximum number of open holes / unfavourable hole arrangement that is permitted for the entire system, without additional elements (pipe, cable, etc.) installed. Provide openings in accordance with the installation instructions of the manufacturer.

Fit at least two tube insertion layers on top of each other.

Perform a complete test on a test piece.

The maximum displacement of the manhole top with respect to the street level [mm] determined in load case II and the failure force [kN] determined in load case III shall be stated in the ETA.

Following load case I and II, the entire system shall not show any indication of a failure that might influence the load bearing capacity of the system.

Examples for indicators that might influence the load bearing capacity are visible cracks or chips during and/or after the test (no optical magnification, e.g., microscopy).

Load case I

The test shall be performed using the following test parameters:

- 1Hz,
- Upper load level: 83kN / lower load level: 10kN,
- Sine wave oscillation,
- Number of cycles: 500 000.

After the load test, the reduction of the clearance (over the entire height of the system) shall not exceed 5% of the clearance of the tested manhole side. Starting value is the measured clearance before installation. Check measurement accuracy with 1mm. Specify at least 3 measurement points (centre of the top, middle and bottom third) of the manhole for the deflection. For individual components, each component shall be tested in the geometrical centre.

Load case II

Tested similar to load case I; the load plunger is located in the centre of the system.

Load case III

Carry out in accordance with load case III, A.3.

ANNEX B: TEST OR CONTROL METHODS FOR FACTORY PRODUCTION CONTROL

B1 Three-point bending test

Perform the test in reference to EN ISO 178 on plastic access chamber elements.

Condition the samples at (20±2) °C prior to destructive testing.

The test facility shall comply with the requirements of EN ISO 178 and the following amendments:

- The test facility shall comply to Figure B1.1
  l_w = open width of the sample,
- The force shall be applied with an indenter according to Figure B1.2.

The sample shall be installed into the test facility in reference to Figure B1.3.

Measure the maximum force [kN] and deflection [mm] of each sample.

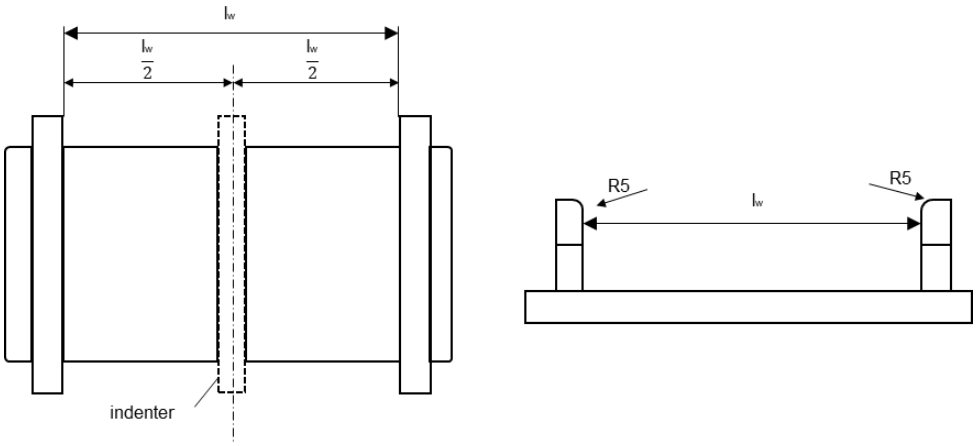


Figure B1.1: Top view (left) and side view (right) of the test facility

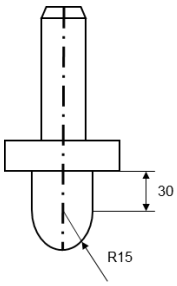


Figure B1.2: Indenter

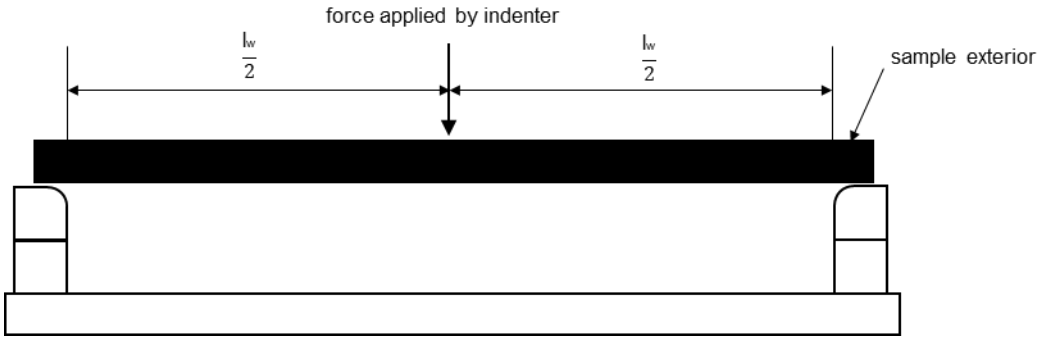


Figure B1.3: Schematic installation of a sample