

Konstrukcijas stiprības sertifikāts**ACO Stormbrixx SD (EUR) – no PP izgatavotas infiltrācijas
kastes lietus ūdens uzglabāšanai un novadīšanai zem zemes****Prof. Dr.-Inž. Olaf Selle**Sachverständiger DIBt und
EBA öbuv Sachverständiger
Ingenieurkammer Sachsen**Dr. - Inž. Ricky Selle**Beratender Ingenieur
Ingenieurkammer Sachsen**Selle Consult GmbH**

Shakespearestraße 52

04107 Leipciga

tel. +49 (0) 341-30 82 410
fakss +49 (0) 341-30 82 411info@selle-consult.de
www.selle-consult.deGeschäftsführer:
Prof. Dr.-Inž. Olaf Selle
Dr.-Ing. Ricky SelleAmtsgericht Leipciga
HRB 17916Sparkasse Leipciga
IBAN DE54 860 555 92
1100 7674 59
BIC WELADE8LXXX

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Klients: ACO Severin Ahlmann GmbH & Co KG
Am Ahlmannkai
24782 Büdelsdorfa
Vācija

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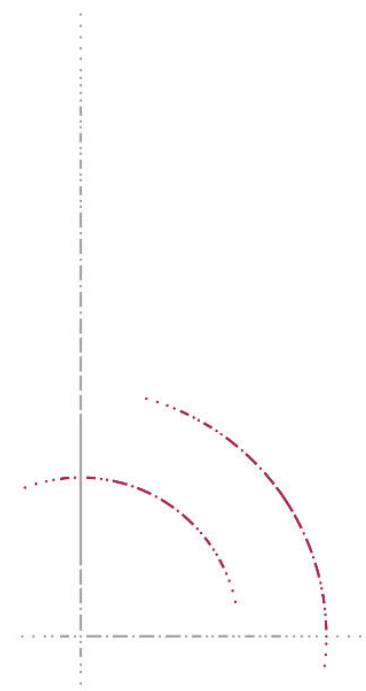
Paraksts



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1 Background

The company ACO Severin Ahlmann GmbH & Co KG is manufacturing a construction product made of polypropylene (PP) labelled “ACO Stormbrixx SD”, which is infiltration and attenuation boxes for non-pressure underground conveyance of stormwater. The material used is called Material EUR 1, which is a virgin PP according to the recipe in the material data sheet (Pielikums D1) und to the material specification (Annex E1) with physical properties.

These boxes are assembled to subsurface systems according to installation manual (Annex B).

The signatory was approached to issue a certification document for this product with regard to its structural integrity.

Hereby, in order to certify the structural integrity of the product for the intended use a comprehensive evaluation is conducted with focusing on various characteristics of the product, such as material properties, quality control system in production and normative references for structural design.

Functional aspects of the product with regard to its infiltration or attenuation performance in accordance with German worksheet Arbeitsblatt DWA-A 138 “Planung, Bau und Betrieb von Anlagen zur Versickerung von Niederschlagswasser”; 2005 are as agreed not covered by this document. Against this background, this certification is for the structural parts of the product, which are the main bodies. It is assumed that integrity of the structural parts is given by appropriate installation according to the aforementioned manual.

2 Subject of certification

ACO Stormbrixx SD infiltration and attenuation systems consist of a structure from injection moulded main bodies which are connected by brickbonding and cross bonding. Main bodies are complemented by side panels in the outer edges of a system.

Main bodies are 1200 mm long, 600 mm wide and 494 mm high (Figure 1). Referring technical drawings are provided in Annex A. Two main bodies on top of each other form a layer 914 mm high.

Depending on the design and installation requirements, a variety of unit configurations and areas can be achieved for infiltration and attenuation systems.

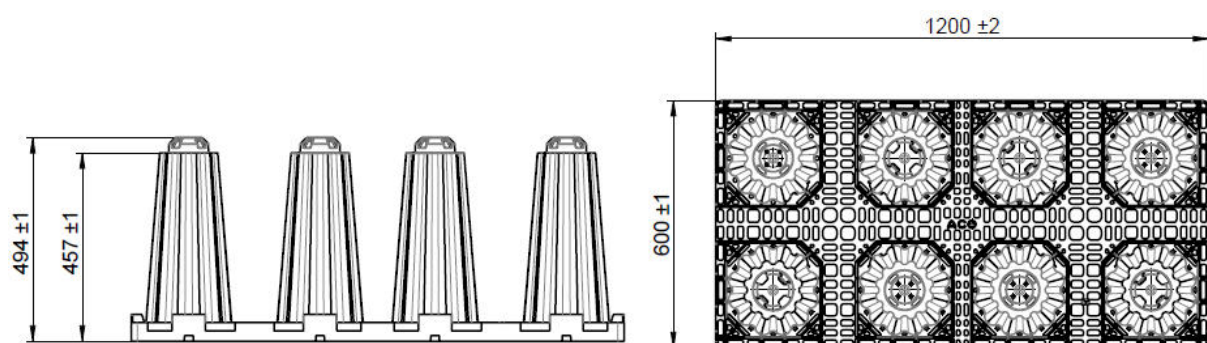


Figure 1 – Main body, ACO Stormbrixx SD

3 Intended use

ACO Stormbrixx SD is designed as an underground system for stormwater infiltration or attenuation in the following application classes.

Class 1: green or pedestrian areas including bicycle paths with barriers which preclude car traffic (single loads 250 kg, area loads 2.5 kPa)

Class 2: car parks which preclude HGVs, with access for emergency vehicles such as fire trucks (wheel load 50 kN, area 0.4 x 0.4 m)

Windows of applications are limited by minimum and maximum cover on the system. Minimum cover is $h = 0.80$ m. The top of the system has to be installed under permanent frost-free conditions. The maximum cover is $h = 2.00$ m as a result of the structural analysis. This window of application is valid under the absence of groundwater table. Design is made for a technical lifetime with a minimum of 50 years. Mechanical long term characteristics refer to his design lifetime.

The system can be installed in one or two layers as described in installation manual (Annex B). Thus, the maximum depth of the system at the base is 2.91 m for a one layer and 3.82 m for a two layer installation.

4 Mechanical characteristics of the product

In order to determine the mechanical characteristics of the product various short and long term tests were conducted at the ACO testing facility in the UK (Annex F) and at the German test houses F+E Ing. GmbH in Fürth (Annex G) and MFPA Leipzig GmbH in Leipzig (Annex H). Test programs are based on the draft of the European standard: „Plastics piping systems for non-pressure underground conveyance and storage of non-potable water - Specification for boxes used for infiltration, attenuation and storage systems made of unplasticized polyvinyl chloride (PVC-U) and polypropylene (PP)“. The signatory is member of the CEN Technical Committee 155 Work Group 26 drafting the standard.

In evaluation of the test results and with regard to the calculations for structural integrity, following requirements are defined concerning the mechanical characteristics of the product, i. e. the long term vertical strength and the short term horizontal strength (Table 1). These requirements will be the matter of quality control both for factory production control (FPC) and third party control.

Table 1 - Mechanical characteristics of the product

Characteristics	Requirements, declared values
Long term strength, vertical	> 80 kPa
Short term strength, horizontal	> 60 kPa

5 Quality control system in production

5.1 Preliminary notes

Main bodies of the construction product ACO Stormbrixx SD are produced in a factory certified to ISO 9001 “Quality management systems – Requirements”; 2015.

In the production a quality control system is installed (Annex K). The quality plan contains the following major steps.

- Inspection of material supplies
- Inspection of production parameters
- FPC on the product
- Third party control on the product

By these means, the compliance of mechanical characteristics of the product with requirements in Table 1 is assured.

5.2 Inspection of material supplies

Compliance of material supplies with declared values in the material specification (Annex E) has to be confirmed for key characteristics for each delivery by a 3.1 certificate (EN 10204 “Metallische Erzeugnisse – Arten von Prüfbescheinigungen”; 2005) of the supplier according to quality plan. Alternatively, for the raw material a goods-in inspection for the aforementioned key characteristics has to be performed according to quality plan.

5.3 Inspection of production parameters

While manufacturing the product in injection moulding, the following parameters have to be controlled and recorded constantly according to quality plan: injection time, temperature and pressure.

5.4 Product identification and traceability

All products are labelled according to quality plan in order to assure identification and traceability. Each injected moulded component includes impression marks, giving the name of product and manufacturer, material, date of production and shift.

5.5 Factory production control (FPC)

After production a FPC is established with checking the following characteristics on the finished product.

- General occurrence, degree of filling
- Dimensions
- Weight
- Strength
- Marking

Intervals are determined in the quality plan.

5.6 Third party control

Additionally to FPC a third party control of the products is established according to quality plan. Third party control includes checks of the requirements according to material specification (Annex E) and according to Table 1 and quality plan (Annex K).

6 Installation



All infiltration or attenuation systems are installed on the site according to installation manual (Annex B).

7 Conclusion

This certification is based on comprehensive evaluation of various characteristics of the product, such as material properties, quality control system in production and structural performance.

Structural integrity can be confirmed by the signatory for the intended use of the construction product ACO Stormbrixx SD with a minimum cover of $h = 0.80$ m and a maximum cover of $h = 2.00$ m in green or pedestrian areas (application class 1) or under car parks which preclude HGVs (application class 2) under the absence of groundwater table. The design lifetime for the product is minimum 50 years.

Application classes for Stormbrixx SD

Application class 1	Application class 2
	
<p>green or pedestrian areas including bicycle paths with barriers which preclude car traffic (single loads 250 kg, area loads 2.5 kPa)</p>	<p>car parks which preclude HGVs, with access for emergency vehicles such as fire trucks (wheel load 50 kN, area 0.4 x 0.4 m)</p>