

1. SCOPE

This schedule specifies the requirements for the A0500G and A1800H Alphaliner full length UV cure liner systems as manufactured by RelineEurope GmbH for the rehabilitation of gravity sewers and drains. This schedule includes two resins: Alphaliner (UP resin) and AlphalinerVE (Vinylester resin).

The approval is not applicable to:

- Leaktightness of end seals.
- Reconnection of laterals.

2. PRODUCT DESCRIPTION

2.1 Introduction

The systems comprise of a glass fibre reinforced woven sleeve which is factory impregnated with an ultraviolet (UV) light curing resin. There are two variations: A0500G and A1800H which have different percentages and orientation of glass within the sleeve matting.

The resin options include Alphaliner (UP resin) and AlphalinerVE (Vinylester resin). When installed and cured in-situ, the product forms a structural liner within the host pipe.

The A0500G and A1800H Alphaliner and AlphalinerVE systems are used for the full-length rehabilitation of gravity sewers and drains. Liners are for circular pipes with internal diameters between 150mm and 2,000mm and egg-shaped pipes between 200mm x 300mm (DN250mm equivalent) and 1,400mm x 2,100mm (DN1,750mm equivalent).

2.2 Applicable standards

The following relevant standard was identified as applicable to this product:

- BS EN ISO 11296-4:2018+A1:2021⁽¹⁾

2.3 Approval History

The Alphaliner liner system was originally awarded WRc Approved™ certification in July 2012.

- PT/332/0712.
- PT/417/0717.

The 2022 certification includes the AlphalinerVE (Vinylester resin).

3. REQUIREMENTS AND TESTING

3.1 Product Design

Alphaliner liners can be designed using any of the recognised international design codes dependent upon the country of installation. RelineEurope's default structural design for liners is in accordance with DWA-A 143 Part 2 (July 2015)⁽²⁾ or as a WRc Sewerage Rehabilitation Manual⁽³⁾ Type II liner.

3.2 Type Testing

Performance testing is listed below which is based upon BS EN 11296-Part 4: 2018+A1:2021.

Appearance: The internal surface of the liner shall be smooth, clean and free from scoring, cavities, wrinkling and other surface defects that would prevent the Alphaliner system from meeting the general fitness for purpose requirement.

Mechanical Characteristics Testing: Mechanical testing requirements of BS EN ISO 11296 Part 4: 2018+A1:2021 are listed below in Tables 1 and 2 for the Alphaliner systems.

Table 1 A0500G UP and VE resin system mechanical characteristics (5% fractile)

Characteristic	Declared Value
Short-term flexural modulus	8,500 MPa
Long-term flexural modulus	5,312 MPa
Short-term stress at first break	180 MPa
Long-term flexural stress	110 MPa

Table 2 A1800H UP and VE resin system mechanical characteristics (5% fractile)

Characteristic	Declared Value
Short-term flexural modulus	19,064 MPa
Long-term flexural modulus	14,552 MPa
Short-term stress at first break	320 MPa
Long-term flexural stress	244 MPa

Resistance to chemical attack in a deflected condition testing has a declared value of 0.68% with a required minimum extrapolated 50-year value of $\geq 0.45\%$.

Quality control tests

Samples are taken each day or from each batch of impregnated linings and cured. The cured sample is tested in accordance with BS EN ISO 11296-4 as detailed in Table 3.

Table 3 Quality control tests

Parameter	Requirement
Wall structure	Clause 8.4.2
Wall thickness	Clause 8.4.3
Initial specific ring stiffness or short-term flexural modulus	Clause 8.5.2 Table 5
Flexural stress at first break	Clause 8.5.2 Table 5
Flexural strain at first break	Clause 8.5.2 Table 5

3.3 Manufacture

To ensure the quality and performance of the Alphaliner linings, the manufacturing process shall include appropriate systems for the:

- Specification of component materials.
- Verification component materials received are to specification.
- Handling and storage of all component materials and finished linings.
- Detailed drawing / schedule for manufacture.
- Lining manufacture / records of lining manufacture.
- Fabrication and quality control of workmanship.
- Inspection and maintenance of manufacturing equipment.

The production of the Alphaliner linings and related quality control procedures shall comply with requirements to ensure the reliably achieved.

PT/506/0722 (Updated April 2024)

**Assessment Schedule for the Alphaliner
full length UV cured CIPP liner systems
as manufactured by RelineEurope GmbH**



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3.4 Installation

When installed in accordance with the installation documentation^(4,5,6), the Alphaliner liner systems shall be reasonably expected to perform as described.

4. APPROVAL

The A0500G and A1800H Alphaliner CIPP liner systems with UP and vinylester resins have been audited and successfully met all the requirements stated within this assessment schedule.

Signed:

A handwritten signature in black ink that reads 'A Russell'.

Valid until: 14th July 2027

4. Alphaliner Installation Instructions, 05/10/2021.
5. Procedure Manual Alphaliner, 500G 1800H, status: 2022/02/22.
6. Installation Recommendation for Alphaliner in Gravity Pipes A500G, A1800H, 160106.

5. REFERENCES

1. BS EN ISO 11296-4:2018+A1:2021 Plastics piping systems for renovation of underground non-pressure drainage and sewerage networks. Lining with cured-in-place pipes.
2. DWA-A 143-2 Rehabilitation of drainage systems outside of buildings, part 2: static design for rehabilitation of sewer and culverts with CIPP and assembly method; July 2015.
3. WRc Sewerage Rehabilitation Manual, Sewerage Risk Management, ©2008 - 2024 Water Research Centre Limited.