

1. SCOPE

This schedule specifies characteristics for the SAERTEX-LINER® MULTI Type E and S+ full length UV cured-in-place pipe (CIPP) liner systems as manufactured by SAERTEX multiCom® GmbH. It is applicable to the renovation of gravity drains and sewers.

It is applicable to host pipes having internal diameters as detailed in Table 1.

Table 1 Diameter range of SAERTEX-LINER® liner systems

Liner Type	Circular host pipe diameter (mm)	Non-circular host pipe major diameter (mm)
MULTI E	150 - 600	n/a
Type S+	150 - 1600	375 - 1425

The approval is not applicable to:

- The installation or reconnection of laterals.
- Performance of the liner end seals.

2. PRODUCT DESCRIPTION

2.1 Introduction

Each liner system comprises of a glass fibre reinforced woven sleeve which is factory impregnated with an ultra violet (UV) light curing polyester or vinyl ester thermosetting resin. When installed and

cured this forms a full length cured-in-place structural liner within the host pipe.

2.2 Applicable standards

The following standard is applicable to this product:

- BS EN ISO 11296-4⁽¹⁾

2.3 Approval History

This is the third re-approval of the SAERTEX-LINER® full length UV cured-in-place pipe (CIPP) liner systems.

Previous approvals were:

- PT/299/0610.
- PT/381/0615.
- PT/458/0620.

This approval supersedes previous issues.

3. REQUIREMENTS AND TESTING

3.1 Structural Design

The liners can be designed using any of the recognised international design codes dependent upon the country of installation.

The SAERTEX multiCom® GmbH default design for the liners is DWA-A143-2⁽²⁾ or ASTM F1216⁽³⁾.

3.2 Type Testing

The SAERTEX-LINER® liner systems shall comply with the following test requirements which are based upon BS EN ISO 11296-4.

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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 SAERTEX-LINER® systems from meeting the general fitness for purpose requirement.

Mechanical Characteristics Testing: Mechanical testing characteristics and declared values are listed in Tables 2 to 4.

Table 2 SAERTEX-LINER® MULTI Type E Liner (150mm to 200mm)

Characteristic	Declared Value
Short-term ring stiffness	8,200MPa
Long-term ring stiffness	5,942 MPa
Short-term flexural modulus	8,500 MPa
Short-term flexural stress	273 MPa
Long-term flexural stress	197 MPa
Reduction factor after 10,000 hrs	1.38

Table 3 SAERTEX-LINER® MULTI Type E Liner (201mm to 600mm)

Characteristic	Declared Value
Short-term ring stiffness	15,700 MPa
Long-term ring stiffness	11,894 MPa
Short-term flexural modulus	13,800 MPa

Short-term flexural stress	152 MPa
Long-term flexural stress	115 MPa
Reduction factor after 10,000 hrs	1.32

Table 4 SAERTEX-LINER® MULTI Type S+ liner

Characteristic	Declared Value
Short-term ring stiffness	20,500 MPa
Long-term ring stiffness	16,000 MPa
Short-term flexural modulus	16,800 MPa
Short-term flexural stress	270 MPa
Long-term flexural stress	210 MPa
Reduction factor after 10,000 hrs	1.28

In addition, samples shall show no failure when tested for strain corrosion resistance in accordance with ASTM D3681⁽⁴⁾.

Retained samples are taken each day or from each batch of impregnated lining(s).

Cured QA liners are tested in accordance with BS EN 11296-4 for the tests shown in Table 5 for the annual DIBt approval survey.

Table 5 BS EN ISO 11296-4 Quality Control tests

Parameter	Requirement
Wall structure	Section 8.4.2
Wall thickness	Section 8.4.3 Table 4
Initial specific ring stiffness or short-term flexural modulus	Section 8.5.2 Table 5
Flexural stress at first break	Section 8.5.2 Table 5
Flexural strain at first break	Section 8.5.2 Table 5

3.3 Manufacture

To ensure the quality and performance of the SAERTEX-LINER® MULTI Type E and S+ full length UV cured-in-place pipe (CIPP) liner systems, 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 units/linings;
- Detailed drawing / schedule for manufacture;
- Manufacture / assembly of SAERTEX-LINER® MULTI Type E and S+ full length UV cured-in-place pipe (CIPP) linings;
- Records of manufacture, and;
- Fabrication and quality control of workmanship.

The production of the SAERTEX-LINER® MULTI Type E and S+ full length UV cured-in-place pipe (CIPP) liner systems and related quality control procedures shall comply with requirements to ensure the stated performance of the product is reliably achieved.

3.4 Installation

When installed in accordance with the installation documentation⁽⁵⁾, the SAERTEX-LINER® MULTI Type E and S+ full length UV cured-in-place pipe (CIPP) liner systems shall be reasonably expected to perform as described.

4. APPROVAL

The SAERTEX-LINER® MULTI Type E and S+ full length UV cured-in-place pipe (CIPP) liner systems have been audited and successfully met all the requirements stated within this assessment schedule.

Signed:



Valid until 31st May 2030.

5. REFERENCES

1. BS EN ISO 11296-4:2018+A1:2021 Plastics piping systems for renovation of underground non-pressure drainage and sewerage networks. Part 4: Cured-in-place-pipes.
2. DWA-A143-2 The rehabilitation of drainage systems outside buildings part 2 static.

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3. ASTM F1216-24A Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube.
4. ASTM D3681 Standard Test Method for Chemical Resistance of "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe in a Deflected Condition.
5. Ordering and Installation Manual: Saertex® Liner Gravity Segment, December 2024.