PT/546/0724 (July 2024)

Assessment Schedule for the Brandenburger BB$^{2.5}$ UV cure CIPP liner system as manufactured by Brandenburger GmbH & Co. KG

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1. SCOPE

This schedule specifies characteristics for the Brandenburger BB$^{2.5}$ UV cure cured-in-place pipe (CIPP) liner system as manufactured by Brandenburger GmbH & Co. Kg. It is applicable to the renovation of gravity drains and sewers.

The Brandenburger BB$^{2.5}$ UV cure CIPP liner system has a range of internal diameters from 150mm to 1600mm and egg-shaped pipes between 250mm x 375mm (DN250 equivalent) and 1200mm x 1800mm (DN1600mm equivalent) with a maximum wall thickness of 24.5mm.

Resins within the scope of this approval include Vinyl Ester resin Palatal® A 429 I-02 X and Unsaturated Polyester resins Synolite 2103-Q-1, Synthopan UON 6213 and Estromal 11.ONB-4 UV.

This approval is not applicable to:

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

2. PRODUCT DESCRIPTION

2.1 Introduction

The system comprises of a glass fibre reinforcement woven sleeve which is factory impregnated with an ultra violet (UV) light curing polyester or vinyl ester thermosetting resin. When installed and cured this resin forms a full length cured-in-place structural liner within the host pipe.

2.2 Applicable standards

The following relevant standard was identified for cured-in-place pipe liners:

- BS EN ISO 11296-4:2018+A1-2021(1)

2.3 Approval History

This is the second re-approval of the Brandenburger BB$^{2.5}$ UV cure CIPP liner system.

- PT/351/0614.
- PT/440/0719.

3. REQUIREMENTS AND TESTING

3.1 Structural Design

The liner can be designed using any of the recognised international design codes dependent upon the country of installation. The Brandenburger default designs for the Brandenburger BB$^{2.5}$ UV cure CIPP liner system is DWA-A143-2(2) or ASTM1216-24(3).

3.2 Type Testing

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 Brandenburger BB$^{2.5}$ UV cure CIPP liner system from meeting the general fitness for purpose requirement.

Mechanical Characteristics Testing: Mechanical testing requirements for the Brandenburger BB$^{2.5}$ UV cure CIPP liner system are listed in Table 1.

Contact: WRc Ltd., Frankland Rd, Blagrove, Swindon SN5 8YF
Tel: 01793 865000 Web: www.wrcapproved.com, E-Mail: wrcapproved@wrcgroup.com

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Table 1 Brandenburger BB$^{2.5}$ UV cure CIPP liner mechanical characteristics

Parameter	Declared
Short-term flexural modulus DN150-875mm DN 875-1600mm	Short-term flexural modulus 11,800 MPa 13,600 MPa
Long-term flexural modulus DN150-875mm DN 875-1600mm	Long-term flexural modulus 9,290 MPa 10,708 MPa
Initial specific ring stiffness DN150-875mm DN 875-1600mm	Initial specific ring stiffness 14,200 MPa 16,875 MPa
Long-term ring stiffness DN150-875mm DN 875-1600mm	Long-term ring stiffness 11,180 MPa 13,288 MPa
Short-term stress at first break	200 MPa
Long-term stress at first break	157 MPa
Long term strain corrosion test (10,000h)	Minimum: 0.45% Declared: 1.01%

3.3 Quality Control Testing

Every six months lining production is audited by an external institute, as required by DIBt Certification. This includes measurement of cured test liner mechanical characteristics and an audit of a construction site.

3.4 Manufacture

To ensure the quality and performance of the Brandenburger BB$^{2.5}$ UV cure CIPP liner system, the manufacturing process shall include appropriate systems for the:

- Specification of component materials.
- Verification of component materials received are to specification.
- Handling and storage of all component materials and finished units.
- Detailed drawing / schedule for manufacture.
- Manufacture / assembly of Brandenburger BB$^{2.5}$ UV cure CIPP liner system, and;
- Fabrication and quality control of workmanship.

The production of the Brandenburger BB$^{2.5}$ UV cure CIPP liner system and related quality control procedures shall comply with requirements to ensure the stated performance of the product is reliably achieved.

3.5 Installation

When installed in accordance with the installation documentation[(4)], the Brandenburger BB$^{2.5}$ UV cure CIPP liner system shall be reasonably expected to perform as described.

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4. APPROVAL

The Brandenburger BB$^{2.5}$ UV cure CIPP liner system has been audited and successfully met all the requirements stated within this assessment schedule.

Signed:

Valid until: 30 June 2029

5. REFERENCES

1. BS EN ISO 11296 Part 4:2018+A1-2021 Plastic piping systems for renovation of underground non-pressure drainage and sewerage networks. Part 4 Cured-in-place-pipes.
2. DWA-A 143.2- Rehabilitation of drainage systems outside buildings - Part 2: Static calculation for the rehabilitation of wastewater pipes and pipes with lining and assembly methods (July 2015).
3. ASTM F1216-24 Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube.
4. Installation manual Brandenburger CIPP Lining BB2.5 Liner, Version: 2.0, 09/02/2023.

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