



Product Certificate

This is to certify that the following product has met the requirements detailed below

BLUELIGHT® PAA-F Liner™ LED Cured-in-Place Pipe Lining

For the assessment of the BLUELIGHT® PAA-F Liner™ LED Cured-in-pipe lining system, applicable to the renovation of the rehabilitation of gravity sewers and drains supplied by:

Bluelight GmbH

Motorstr. 25
74099 Stuttgart
Germany

This service meets the requirements set out in WRc Assessment Schedule PT/437/0519-AS.

Assessor

Director

Issue Date

Start Date: 3rd May 2019

Expiry Date

Exp Date: 3rd May 2024

Certificate Number

PT/437/0519

The logo for WRc approved, featuring the letters 'WRc' in a large, bold, white font, with a small teal leaf icon to the right. Below 'WRc' is the word 'approved' in a smaller, white, lowercase font, with a teal checkmark integrated into the letter 'v'. A small 'TM' trademark symbol is located to the right of 'approved'. The entire logo is set against a dark teal background that curves from the bottom right of the page.

**Assessment Schedule for the
BLUeLiGHT® PAA-F Liner™ LED Cured-in-
Place Pipe lining systems as
manufactured by BLUeLiGHT® GmbH
(Parent Group)**



independent certification of your products & services

1. SCOPE

This schedule specifies the requirements for the BLUeLiGHT® PAA-F Liner™ LED Cured-in-Place Pipe lining system as manufactured by the BLUeLiGHT® GmbH (Parent Group).

This approval is not applicable to:

- Leak tightness of end seals;
- reconnection of laterals

2. PRODUCT DESCRIPTION

2.1 Introduction

The lining system is for the rehabilitation of gravity drains and sewers in diameters of between 100mm to 250mm.

PAA-F- LINER™ LED Liner for diameters of 100 mm to 250mm, where the system can accommodate a dimensional diameter change of up to 33% and a maximum bend of 90° with folding.

The PAA-F- LINER™ LED consists of a polyester sleeve with internal membrane (installed) and a styrene free vinylester resin.

The PAA-F- LINER™ LED can be installed with or without a PE-Preliner or a fabric reinforced PVC-Preliner in accordance with the BLUeLiGHT® installation manual(4).

The PAA-F- LINER™ LED can be supplied as either as a factory impregnated lining ready for site or as components where the sleeve and resin are combined on site in accordance with the BLUeLiGHT® installation manual(4).

The BLUeLiGHT® PAA-F LINER™ LED Liner is installed by inversion and curing is only by BLUeLiGHT® LED equipment.

2.2 Relevant standards

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

- BS EN ISO 11296-4:2018⁽¹⁾
Plastics piping systems for renovation of underground non-pressure drainage and sewerage networks

2.3 Approval History

This is the first approval of the BLUeLiGHT® PAA-F LINER™ LED Cured-in-Place Pipe lining systems.

3. REQUIREMENTS AND TESTING

3.1 General

The BLUeLiGHT® PAA-F LINER™ LED systems shall comply with the requirements of BS EN ISO 11296-4:2018.

3.2 Type Testing

Mechanical characteristics.

The BLUeLiGHT® PAA-F LINER™ LED shall comply with the test requirements based upon BS EN ISO 11296-4:2018 listed in Appendix A

Mechanical resistance.

The mechanical resistance shall be demonstrated by calculation in accordance with DWA-A143.2⁽²⁾ or ASTM F1216-09⁽³⁾

PT/437/0519 - AS (May 2019)

**Assessment Schedule for the
BLUeLiGHT® PAA-F Liner™ LED Cured-in-
Place Pipe lining systems as
manufactured by BLUeLiGHT® GmbH
(Parent Group)**



independent certification of your products & services

3.3 Manufacture

To ensure the quality and performance of the BLUeLiGHT® PAA-F LINER™ LED CIPP lining system, the manufacturing process shall include appropriate systems for:

- Verification component materials received are to specification.
- Handling and storage of all component materials.
- Records of manufacture
- Inspection and maintenance of manufacturing equipment

The production of the BLUeLiGHT® PAA-F LINER™ LED lining system 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⁽⁴⁾, the installation shall be practicable and suitable for conditions that could reasonably be expected on site.

4. APPROVAL

The BLUeLiGHT® PAA-F LINER™ LED (Standard) lining system has been audited and successfully met all the requirements stated within this assessment schedule.

Signed: 

Valid until May 2024

5. REFERENCES

1. BS EN ISO 11296 Part 4 Plastic piping systems for renovation of underground non-pressure drainage and sewerage networks. Part 4 Cured-in-place-pipes, 2018
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- 09 Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing Installation Guide.
4. BLUeLiGHT® Installation manual, VH-PAA-F Procedure Manual PAA-F-Liner™ / LED (current version: Revision 1.6, valid from 04-2018)

Appendix A

Table 1 – Short-term mechanical characteristics of pipes (BS EN ISO 11296-4:2018; Table 5)

Parameter	Requirement
Initial specific ring stiffness, S_0	Minimum: ≥ 0.25 kPa Declared: 1.23 kPa
Short-term flexural modulus, E_0	Declared: 2400 MPa
Flexural stress at first break, σ_{fb}	Declared: 26 MPa
Flexural strain at first break, ε_{fb}	Minimum: $\geq 0.75\%$ Declared: 0.89 %

Table 2 – Long-term mechanical characteristics of pipes (BS EN ISO 11296-4:2018; Table 6)

Parameter	Requirement
Long-term flexural modulus under dry or wet conditions, $E_{x,wet\ or\ dry}$	Minimum: 300 MPa Declared: 714 MPa