

PT/460/0920 - AS (September 2020) Assessment Schedule for the iMPREG® GL01, GL13 and GL16 full-length UV-cured liner systems for gravity drains and sewers as supplied by iMPREG® GmbH



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1. SCOPE

This schedule specifies requirements for the iMPREG® GL01, GL13 and GL16 full length UV cured-in-place pipe (CIPP) liner systems as manufactured by iMPREG GmbH. It is applicable to the renovation gravity drains and sewers.

It is applicable to host pipes having internal diameters as follows:

Table 1 Diameter range of iMPREG® liners by system

Liner Type	Circular host pipe diameter (mm)	Non-circular host pipe major diameter (mm)
GL01	150-1200	200-300 to 1000-1500
GL13	400-1600	200-300 to 1000-1500
GL16	150-1600	200-300 to 1000-1500

The approval is not applicable to:

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

2. PRODUCT DESCRIPTION

2.1 Introduction

The 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 Relevant standards

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

- BS EN ISO 11296-4:2018⁽¹⁾

2.3 Approval History

This is the second re-approval of the iMPREG® GL range of liners which have been awarded the following WRC Approved™ certification:

- PT/307/0910.
- PT/367/0915.

This approval supersedes previous issues.

3. REQUIREMENTS AND TESTING

3.1 Requirements

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 iMPREG® GL liners from meeting the general fitness for purpose requirement.

3.2 Type Testing

The iMPREG® GL liner systems shall comply with the following test requirements which are based upon BS EN ISO 11296-4:2018.

Mechanical Characteristics Testing: Mechanical testing requirements of BS EN ISO 11296-4 are listed in Tables 2 to 4.

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Table 2 iMPREG® GL01 liner mechanical characteristics

Characteristics	Declared Value
Short-term ring stiffness	11,000 MPa
Long-term ring stiffness	7,970 MPa
Short-term flexural modulus	9,500 MPa
Short-term stress at first break	180 MPa
Long-term stress at first break	130 MPa
Long-term strain corrosion	0.451% extrapolated at 50 years
Reduction factor after 10,000 hrs	1.38

Table 4 iMPREG® GL16 liner mechanical characteristics

Characteristics	Declared Value
Short-term ring stiffness	15,600 MPa
Long-term ring stiffness	13,000 MPa
Short-term flexural modulus	14,000 MPa
Short-term stress at first break	245 MPa
Long-term stress at first break	204 MPa
Long term strain corrosion	0.451% extrapolated at 50 years
Reduction factor after 10,000 hrs	1.20

Table 3 iMPREG® GL13 liner mechanical characteristics

Characteristics	Declared Value
Short-term ring stiffness	17,900 MPa
Long-term ring stiffness	14,900 MPa
Short-term flexural modulus	14,000 MPa
Short-term stress at first break	220 MPa
Long-term stress at first break	180 MPa
Long term strain corrosion	0.451% extrapolated at 50 years
Reduction factor after 10,000 hrs	1.20

3.3 Structural Design

The liners can be designed using any of the recognised international design codes dependent upon the country of installation. The iMPREG® GmbH default design for the liners is DWA-A143-2⁽²⁾ or ASTM F1216-16⁽³⁾.

3.4 Manufacture

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

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

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The production of iMPREG® GL linings and related Quality Control procedures shall comply with requirements to ensure the stated performance of the product is reliably achieved.

3.5 Quality Control Test

Lining samples are taken each day or from each batch of impregnated lining(s) and cured. The cured sample is tested in accordance with BS EN 11296-4:2018 for the tests shown in Table 5.

Table 5 Quality Control tests

Parameter	Requirement
Wall structure	Section 8.4.3 Table 4
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

3.6 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

iMPREG® GmbH has been audited and has successfully met all the requirements stated within this assessment schedule for the GL01, GL13 and GL16 liner systems.

Signed:

A handwritten signature in black ink, appearing to read 'K.A. Adams', written over a white rectangular background.

Valid until 9th September 2025

5. REFERENCES

1. BS EN ISO 11296:2018 Part 4 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.
3. ASTM F1216-16 Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin Impregnated Tube.
4. Installation manual for UV for iMPREG UV curing (tl/tg gl vh001).