

PT/486/0621 - AS (Updated August 2021)
Assessment Schedule for the MFGIL SGRP
sewer lining system as manufactured by
Megha Fibre Glass Industries Limited



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1. SCOPE

This schedule specifies requirements for the MFGIL SGRP sewer lining system as manufactured by Megha Fibre Glass Industries Limited for the renovation of gravity sewers with discrete pipe liners between manholes. It is applicable for circular and non-circular Type II structural design in accordance with the WRC Sewerage Rehabilitation Manual⁽¹⁾.

Lengths of circular glass reinforced plastic (GRP) liner are manufactured via a continuous filament winding process with diameters between 300mm and 3,000mm. Lengths of non-circular GRP liner are manufactured to customised sizes between 300mm and 6,000mm by the contact moulding or filament winding processes.

This approval is not applicable to:

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

2. PRODUCT DESCRIPTION

2.1 Introduction

A pre-lining inspection survey is undertaken to ensure the host structure has been adequately prepared.

Individual discrete GRP liner sections are conveyed and located via trolleys from the access point to the furthest end of the sewer. They are restrained with wooden chocks, jointed to form a lining and the circumferential joints are sealed with a flexible sealing compound.

Further liner sections are added and at appropriate locations head-walls are constructed from mass-concrete to seal the annulus between the lining and host

structure. Bleed-tubes are inserted into the isolated annulus and a suitable grouting system is used to fill the annulus following the grouting plan lift requirements. The bleed-tubes minimise grout pressure, remove standing water and ensure that full annular void filling is achieved.

After grouting, the bleed-tubes are capped and the lining is inspected to ensure that full joint sealing has been achieved and no grout infiltration has occurred into the lined section.

All of the laterals are reinstated and a full CCTV inspection of the lining is undertaken.

2.2 Relevant Standards

The following relevant standards were identified for GRP sewer liners:

- IGN 4-34-02 Specification for Glassfibre Reinforced Plastics (GRP) Sewer Linings, Issue 1, April 1986⁽²⁾
- ASTM D3262 – 20 Standard Specification for “Fiberglass” (Glass-Fiber-Reinforced Thermo-setting Resin) Sewer Pipe⁽³⁾
- IS 14402:1996 GLASS FIBRE REINFORCED PLASTICS (GRP) PIPES, JOINTS AND FITTINGS FOR USE FOR SEWERAGE, INDUSTRIAL WASTE AND WATER (OTHER THAN POTABLE) — SPECIFICATION⁽⁴⁾

2.3 Approval History

This is the first approval of the MFGIL SGRP sewer lining system.

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3. REQUIREMENTS AND TYPE TESTING

3.1 Requirements

The MFGIL SGRP sewer lining system shall comply with the following requirements:

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

3.2 Structural Design

The MFGIL SGRP sewer lining system is designed in accordance with the WRC Sewerage Rehabilitation Manual Type II design method for structural liners.

3.3 Type Testing

The MFGIL SGRP sewer lining system shall comply with the following performance characteristics.

Characteristic	Test method	Declared value
Short-term flexural modulus	EN ISO 178 ⁽⁵⁾	10,000 to 25,000 MPa
Long-term flexural modulus	EN ISO 178	6,200 to 15,500 MPa
Short-term flexural strength	ASTM D790 ⁽⁶⁾	150 MPa (minimum)
Long-term flexural strength	ASTM D790	93 MPa (minimum)
Short-term tensile strength	IS 14402	44.3 MPa
Long-term tensile strength	IS 14402	27.5 MPa

Creep factor	ISO 10468 ⁽⁷⁾	0.62
Poisson's ratio	ASTM D638 ⁽⁸⁾	0.38
Temperature of (resin) deflection under load	ASTM D648 ⁽⁹⁾	91°C
Long-term strain corrosion	ASTM D3262	Pass
Joint tightness	ASTM D4161 ⁽¹⁰⁾	Pass

3.4 Manufacture

To ensure the quality and performance of the MFGIL SGRP sewer lining system, 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 liner sections;
- Detailed drawings for liner sections;
- Fabrication of liner sections and quality of workmanship.

The production of the MFGIL SGRP sewer lining 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⁽¹¹⁾, the installation shall be practicable and suitable for conditions that could reasonably be expected on site.

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4. APPROVAL

Megha Fibre Glass Industries Limited has been audited and has successfully met all the requirements stated within this assessment schedule.

Signed:

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

Valid until 22 June 2026

— Determination of the ring creep properties under wet or dry conditions.

8. ASTM D638 – 14 Standard Test Method for Tensile Properties of Plastics.
9. ASTM D648 - 18 Standard Test Method for Deflection Temperature of Plastics Under Flexural Load in the Edgewise Position.
10. ASTM D4161 - 14(2019) Standard Specification for “Fiberglass” (Glass Fiber Reinforced Thermosetting-Resin) Pipe Joints Using Flexible Elastomeric Seals.
11. MFGIL Installation Manual – GRP Liner Pipes, 68754.

5. REFERENCES

1. WRc Sewerage Rehabilitation Manual, 4th Edition, 2001.
2. IGN 4-34-02 Specification for Glassfibre Reinforced Plastics (GRP) Sewer Linings, Issue 1, April 1986.
3. ASTM D3262 – 20 Standard Specification for “Fiberglass” (Glass-Fiber-Reinforced Thermo-setting Resin) Sewer Pipe.
4. IS 14402:1996 GLASS FIBRE REINFORCED PLASTICS (GRP) PIPES, JOINTS AND FITTINGS FOR USE FOR SEWERAGE, INDUSTRIAL WASTE AND WATER (OTHER THAN POTABLE) — SPECIFICATION.
5. EN ISO 178:2019 Plastics. Determination of flexural properties.
6. ASTM D790 - 17 Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
7. ISO 10468:2018 Glass-reinforced thermosetting plastics (GRP) pipes