

AQUALINER

Gravity Sewer Datasheet

Aqualiner Limited has commercialising a patented process for a novel trenchless pipelining technology for the water and sewerage markets. The process was developed by a consortium consisting of: Severn Trent Water Ltd, Anglian Water Ltd, Yorkshire Water Ltd, NCC Construction Danmark A/S and EPL Composite Solutions Ltd.

The self contained Aqualiner equipment lines the water or sewer pipe with a thin, smooth and extremely strong thermoplastic polymer composite.

The key benefits of Aqualiner over existing CIPP and Fold and Form lining methods are:

- Simple - no complicated storing and mixing of chemicals.
- Long shelf life – with no liquid resins there are no shelf life concerns.
- Potable (no harmful chemicals to leach out of the liner).
- High strength (a structural liner that can withstand short term burst pressures up to 60 bar).
- Thinner liner –a smooth inner surface which can aid water flow.
- Sustainability – liners can be recycled upon exceeding lifespan.
- Low socio-economic costs – low energy consumption and short lining times.

Liner thickness

Aqualiner products are designed in accordance with the procedures of the WRC Sewer Rehabilitation Manual using the formulae of ASTM F 1216, with conservative safety factors used throughout. For typical installations (circular pipes of up to 10% deformation, at 3m deep with typical soil conditions and customary traffic loads), the liner design thickness is shown below. Pressure pipe designs are carried out on a case by case basis using the formulae of ASTM F1216.

Specification	Size (mm)	Typical Design Thickness
S-150/2	150	2.0
S-200/3	200	3.0
S-225/3	225	3.0
S-250/3	250	3.0

WRc Approved Scheme

The Aqualiner system received its WRc Approved certificate in 2009 for wastewater applications. Details of the approval can be found at the WRc Approved website, www.wrcapproved.com, the approval reference for the Aqualiner system is PT/292/1109 – AS. At present the lining of pitch fibre pipes is excluded from the scope of the approval, additional testing for this application will be completed by WRc in 2010

© Aqualiner Ltd, 2009

Aqualiner Ltd, Unit 10, Charnwood Business Park, North Road, Loughborough,
Leicestershire, LE11 1QJ

Tel: +44 (0) 1509 224234, Fax: +44 (0) 1509 261950

URL: www.aqualiner.co.uk Email: info@aqualiner.co.uk

AQUALINER

Material properties

BS EN 13566-4:2002 "Plastics piping systems for renovation of underground non-pressure drainage and sewerage networks – Part 4: Lining with cured-in-place pipes" details the Type Test requirements for cured-in-place pipe systems and is the most appropriate standard for the Aqualiner system. The tests required are summarised below:

- short-term flexural modulus (clause 7.5);
- long-term flexural (creep) modulus (clause 7.5), and;
- long-term failure strain in bending - Strain corrosion test (clause 7.6).

Test	Pass limit	Aqualiner
Short term flexural modulus	1500 MPa	10573 MPa
Long term Flexural modulus	300 MPa	4226 MPa
Long term stain in bending (strain corrosion 10,000 hours)	0.45%	0.62%
Resistance to water jetting	180 bar/ 2600 psi	Pass declared at 280 bar/ 4060 psi

Long term acid corrosion testing

The measured strain of 0.62% after 10,000 hours bending in an acid (0.1N Sulphuric Acid) exceeds the minimum requirements of 0.45% as laid out in BS EN 13566-4.

Long term wet creep testing

The short term flexural modulus of 10573 MPa is well in excess of the minimum flexural modulus requirement of 1500 MPa. After 10,000 hours of testing the long term flexural modulus was estimated by WRc at 4226 MPa, well in excess of the minimum flexural modulus value of 300 MPa specified in BS EN 13566-4 2002.

Jetting Requirements

The Aqualiner lining met the requirement in clause 6.10 of WIS 4-35-01: Issue 1: July 2000 for resistance to jetting pressure of 180 bar (2600 PSI). The maximum jetting pressure at which 5 consecutive runs could be achieved was 280 bar (4060 PSI).

© Aqualiner Ltd, 2009

Aqualiner Ltd, Unit 10, Charnwood Business Park, North Road, Loughborough,
Leicestershire, LE11 1QJ

Tel: +44 (0) 1509 224234, Fax: +44 (0) 1509 261950

URL: www.aqualiner.co.uk Email: info@aqualiner.co.uk