Australian Standard®

Plastics—Glass filament reinforced plastics (GRP)—Methods of test

Method 15: Determination of resistance to long-term strain corrosion of glass filament reinforced plastics pipes

1 SCOPE. This Standard sets out a method for determining the resistance to strain corrosion by subjecting specimens of GRP pipe to long-term ring deflection in an aggressive environment.

2 PRINCIPLE. Not less than 18 test specimens are subjected to a range of constant vertical deflections, with sections of the pipe exposed to a corrosive test solution. The long-term resistance of pipe to the test solution is obtained by an extrapolation to 50 years of a linear regression line of logarithm deflection versus logarithm time to failure.

3 REFERENCED DOCUMENTS. The documents below are referred to in this Standard.

AS

3572	Plastics—Glass filament reinforced plastics (GRP)—Methods of test	
3572.1	Method 1:	Preparation of glass filament reinforced plastics test specimens
3572.3	Method 3:	Determination of loss on ignition of glass filament reinforced plastics
3572.4	Method 4:	Determination of dimensions of glass filament reinforced plastics pipes
3572.9	Method 9:	Determination of pressure regression characteristics as a function of time for glass filament reinforced plastics pipes

4 DEFINITIONS. For the purpose of this Standard the definitions below apply.

4.1 Strain corrosion—the mechanism of failure of the pipe wall caused by the exposure of the inside surface, while in a deflected condition, to a nominated corrosive environment for a period of time.

4.2 Failure point—the passage of a fluid through the pipe wall or the rupture of the wall, whichever occurs first.

NOTE: The failure mode may be catastrophic, characterized by a sudden fracture parallel to the axis of the pipe, with the filament reinforcement cleanly broken at the edge of the fracture. Visual evidence of surface etching or pitting may or may not be present.

5 APPARATUS.

5.1 Parallel beam apparatus. The apparatus shall be capable of maintaining a constant deflection on the pipe. Elastomeric pads may be used between the parallel beam surfaces and the pipe ring in order to achieve uniform deflection. A typical test apparatus is shown in Figure 1.

For large deflections (28% and greater), where flattening of the pipe may occur against wide bearing surfaces, loading beam types 1 or 2 in Figure 2 shall be used. Only one type of loading beam shall be used in a test series.

The beams shall be rigid and provide a smooth, clean load-bearing surface. The length of the beams shall be equal to, or greater, than the length of the test specimen.

6 TEST SPECIMENS. Test specimens shall be ring sections with a minimum length of one pipe diameter or 300 mm, whichever is the lesser.

7 CONDITIONING. Test specimens shall be conditioned in accordance with AS 3572.1. Except for referee tests, conditioning shall be at ambient conditions.

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