

Australian Standard®

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

Method 14: Determination of long-term ring deflection of glass filament reinforced plastics (GRP) pipe subject to constant load and environmental exposure

1 SCOPE. This Standard sets out a method for determining the long-term ring deflection of glass filament reinforced plastics pipe subject to constant load and environmental exposure.

2 PRINCIPLE. Cut lengths of pipe are subjected to a range of constant loads in a specified test solution. For each specific load, the deflection of the specimen is monitored until failure occurs. Failure may be by cracking or a rapid increase in the rate of deflection. The failure time/deflection data for each load are used to calculate the long-term (50-year) failure deflection.

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 the dimensions of glass reinforced plastics pipes
- 3572.9 Method 9: Determination of pressure regression characteristics as a function of time for glass filament reinforced plastics pipes
- 3572.10 Method 10: Determination of the initial ring stiffness of glass reinforced plastics pipes

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

4.1 Failure time—the elapsed time when either visible cracking has occurred or the deflection has increased at such a rate that the slope of a plot of log deflection versus log time data is 0.25.

4.2 Failure deflection—the ratio of diameter decrease of the test ring, to the mean diameter of the ring, given as a percentage at the time of failure.

5 APPARATUS. The following apparatus is required.

- (a) *General.* The apparatus shall consist of two parallel bearing plates or beam bars between which the specimen is compressed by an external load. The specimen is submerged in a test tank and the load is applied to the specimen with only negligible friction losses. (See Figure 1).

NOTE: Where deflections exceed 28%, beam bars should be used.

- (b) *Loading plates.* Loading plates, if used, shall be not less than 5 mm thick and should not bend or deform during the test. Their length shall be equal to or greater than the specimen length.
- (c) *Beam bars.* For pipe specimens with a nominal diameter less than 300 mm, beam bars if used, shall be 20 ± 5 mm diameter. For larger diameter pipes the bars shall be 50 ± 5 mm diameter.