

Australian Standard[®]

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

Method 7: Determination of extension to failure of unreinforced resins

1 SCOPE. This Standard sets out the method for determining the extension to failure of unreinforced resins.

2 REFERENCED DOCUMENTS. The document below is 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

3 APPARATUS. The following apparatus is required:

- (a) A power-driven tensile testing machine equipped with grips capable of being separated at a constant rate of 5 ± 1 mm/min.
- (b) Means by which the extension to failure can be measured during testing.

4 PREPARATION OF TEST SPECIMENS. Test specimens shall be of the shape and dimensions shown in Figure 1. Five test specimens shall be tested.

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

6 PROCEDURE. The procedure shall be as follows:

- (a) Mount the test specimen in the tensile testing machine in axial alignment with the direction of pull.
- (b) Load the test specimen by separating the grips at a constant rate of 5 ± 1 mm/min, until failure occurs. Measure the extension of the test specimen during the test up to the point of fracture.

7 CALCULATION. Calculate the percentage strain at failure using the following equation:

$$\epsilon_u = \frac{L_u - L_o}{L_o} \times 100$$

where

ϵ_u = percentage strain at failure, percent

L_u = gauge length at failure, in millimetres

L_o = original gauge length, in millimetres.

The results obtained from test specimens containing obvious flaws at the plane of fracture, or failing outside the gauge length, shall be discarded and additional samples tested in their place.

8 REPORT. The following information shall be reported:

- (a) Full identification of the resin tested.
- (b) Method of preparation of the test specimen, including the curing procedure (time and temperature).
- (c) An identifying reference to the type of resin used in the test specimen.
- (d) Date of test conditioning.
- (e) Arithmetic mean of the results obtained from the valid tests, reported as percentage strain at failure of the unreinforced resin.
- (f) Individual test results.