

Australian/New Zealand Standard®

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

Method 21: Method for the determination of the shear strength of a sandwich panel

1 SCOPE This Standard describes the test procedure to determine the shear strength of a sandwich panel.

2 PRINCIPLE Five square test specimens are conditioned and held only by the external skins in a set of grips and a strain applied at a constant rate such that the axis of loading lies on the centre-line of the core of the test specimen. The maximum force to cause failure is noted and the mean shear strength calculated.

3 APPARATUS The apparatus shall be as shown in Figure 1. Each grip shall bear only on the edge of the skin and shall be at least 0.5 mm from the core/skin interface. The clamp plates shall be coated with a lubricant and tightened sufficiently to allow the grips to move without separation from the specimen.

4 PREPARATION OF TEST PIECES Test pieces shall be of the form and dimensions shown in Figure 2.

The core shall be of such a thickness that the centre-line of the core lies on the line of axis of the loading. The skins shall consist of a minimum construction of 1.35 kg/m chopped strand mat (CSM) each.

Five test pieces shall be used.

If the core has directional properties, 10 test pieces, five parallel with each directional axis, shall be tested.

5 PROCEDURE The procedure shall be as follows:

- (a) Condition the test specimens at $20 \pm 5^\circ\text{C}$ for not less than 3 h immediately prior to testing and carry out the test at $20 \pm 5^\circ\text{C}$.
- (b) Record the dimensions of each test piece, place in the grips and apply stress until failure occurs.
- (c) Separate the grips at a constant rate between 1.0 mm/min and 1.5 mm/min.

6 CALCULATIONS The shear strength (s), in N/mm, shall be determined from the following equation:

$$s = \frac{W}{ab}$$

where

W = the maximum load, in newtons

a = the width of specimen, in millimetres

b = the length of specimen, in millimetres

The shear strength of the panel under test shall be reported as the arithmetic mean of the shear strengths of the individual test pieces.

7 REPORT The following information shall be reported:

- (a) Full details of the sandwich panel tested.
- (b) The shear strength of the core.
- (c) Individual test results.
- (d) A brief description of the failure mode.
- (e) Reference to this test, i.e. AS/NZS 3572.21.

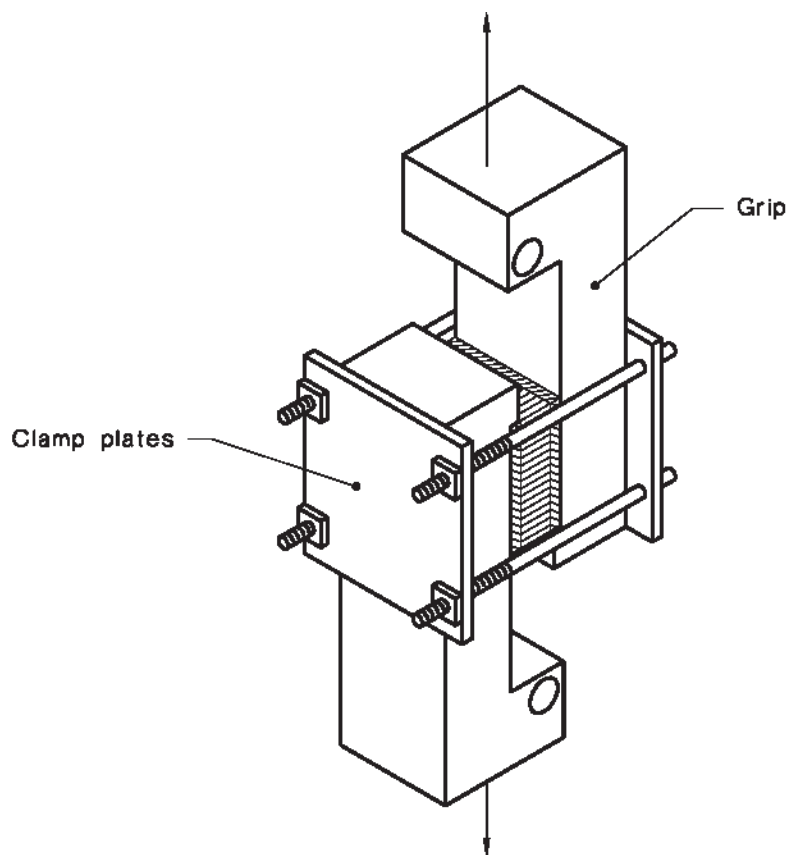


FIGURE 1 ASSEMBLY OF TEST SPECIMEN AND GRIPS