

DETERMINATION OF ADHESIVE STRENGTH OF JOINTS

Application

This procedure describes two methods of determining the breaking strength of joints.

Method A: Applicable to butt and scarf joints.

Method B: Applicable to mitred joints.

Apparatus Required

Tensile Testing Machine

Capable of maintaining a constant jaw separation rate of 500 mm/minute. It must have a load range from 98 to 490 N and be equipped with an autographic recorder and suitable jaws.

Inking Pad

As used for rubber stamps and kept fairly moist.

Cartridge Type Paper

The size to be such as to enable one revolution of the formed perimeter to be completed without the control wheel of the planimeter running off the paper.

Fixed Arm Planimeter

Set to ratio 1:1.

Conditioning and Test Conditions

All test values indicated herein are based on material conditioned in a controlled atmosphere of 23 +/- 2 °C and 50 +/- 5 % relative humidity for not less than 24 h prior to testing and tested under the same conditions unless otherwise specified.

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Page 1 of 5

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Procedure

Method A - Butt and Scarf Joints of Straight Profiles

(Three specimens required if not otherwise specified)

1. Cut from the material under test, specimens 120 mm long.
2. Specimens must be clamped in the tensile test machine with the joint midway between the jaws ensuring that the distance between the jaws is 40 mm (see Figure 1). The correct scale is established by preliminary tests.
3. The specimen must be pulled to destruction and the maximum load recorded.
4. The broken portion retaining most of the joint is removed from the machine and cut as close to the joint as practical, to give a clean cut surface at 90° to the length of the profile (see Figure 2).
5. The cut surface is inked with the ink pad and an image of the cross section made on an uncreased sheet of paper in a position near the centre of the sheet (see Figures 3, 4 and 5).
6. The area of the cross section is measured with the aid of a fixed arm planimeter set to a ratio of 1:1 (see Figure 6).

The pointer of the planimeter is made to trace the perimeter of the inked image in a clockwise direction not less than three times, care being taken to start and finish the trace at the same point on the perimeter.

The mean cross sectional area in mm² is obtained by dividing the reading obtained from the planimeter scale by the number of completed traces.

Note: See alternative method of measuring.

Evaluation

The load carried by the joint is calculated by dividing the maximum load recorded by the tensile tester (see para 3), by the cross sectional area of the specimen (see para 6). All specimens must meet the minimum requirements of the specification.

Method B - Mitred Joints

(Three specimens required if not otherwise specified)

1. The specimens are cut from the material under test so that the joint has two 60 mm lengths of section on either side (see Figure 1).
2. A specimen is clamped in the tensile test machine with the joint midway between the jaws ensuring that the distance between the jaws is 40 mm. Each leg is clamped in the jaws so that they are in line with each other. The correct scale shall be established by preliminary tests (see Figure 2).