

BOND STRENGTH OF TRIM ASSEMBLIES**Application**

This procedure is used to evaluate the bond strength of trim assemblies manufactured by a heat bonding process.

Apparatus Required**Tensile Machine**

The tensile testing machine shall have a full scale range of 0 - 50 N with an accuracy of $\pm 1\%$ in load indication.

Humidity Cabinet

Maintained at $98 \pm 2\%$ relative humidity and $38 \pm 2^\circ\text{C}$.

Cold Box

$-35 \pm 1^\circ\text{C}$.

Oven

A mechanical convection oven capable of maintaining $85 \pm 2^\circ\text{C}$ and $105 \pm 2^\circ\text{C}$. Conforming to ISO 188/ASTM E 145 Type IIA normal oven, 150 $\pm$ 50 air changes per hour.

Conditioning and Test Conditions

All test values indicated herein are based on material conditioned in a controlled atmosphere of $23 \pm 2^\circ\text{C}$ and $50 \pm 5\%$ relative humidity for not less than 24 h prior to testing and tested under the same conditions unless otherwise specified.

Procedure

Samples of the materials used in the assembly are bonded under specified conditions. The bond strength of the materials is determined in a tensile test machine before and after an accelerated aging cycle of heat, cold and humidity. A properly bonded assembly will exhibit no greater loss in bond strength after aging than that permitted by the Engineering specification.

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Bonding of Samples

Prepare bonded test assemblies that meet the Engineering Material Specification. The assembly shall consist of the approved trim cover, molding, bonding, padding, adhesive, subfoundation and/or foundation board materials as used in production assemblies in which the material being evaluated will be employed.

Dielectric Bonding Conditions (when used)

For each test, bond the assembly, using a 2.4 mm wide aluminum or brass die bar, using a pressure range of 862 - 2068 kPa at 3000 R.F. volts (peak) minimum at 13.5 megacycles or 2400 R.F. volts (peak) minimum at 24 megacycles for no more than 12 s and hold under pressure for no more than 10 s.

Sample Size

Samples shall be cut so that a strip 200 mm long (min) and 25 mm wide can be tested.

Original Bond Strength

1. Hand separate the bonded components to allow insertion of the ends in the jaws of the tensile machine, allowing an initial jaw separation of 25 mm or more (if required).
2. Peel the strip back upon itself, as shown in Figure 1 using a jaw movement speed of 300 mm/minute.
3. Determine the bond strength in N per ISO 6133 and note the nature of separation.

Cycled Bond Strength

1. Prepare test specimen as described under Bonding of Samples.
2. Age the samples tested for bond strength above by subjecting them to the following cycle:
 - (a) 4 h in the humidity cabinet at 98 +/- 2 % relative humidity and 38 +/- 2 °C.
 - (b) 4 h or overnight (16 h max) in the cold box at -35 +/- 1 °C.
 - (c) 4 h in an oven at 85 +/- 2 °C.
3. After cycling, condition the samples for 1 h at 23 +/- 2 °C and 50 +/- 5 % relative humidity.
4. Determine bond strength (see Original Bond Strength).

Wet Bond Strength

1. Prepare test specimen as described under Bonding of Samples.
2. Immerse the test specimen in tap water at 23 +/- 2 °C for 24 h.