

Submitted for recognition as an American National Standard

INDUCTION CURE TEST FOR METAL BONDING ADHESIVES

Foreword—This Document has not changed other than to put it into the new SAE Technical Standards Board Format.

1. **Scope**—This SAE Recommended Practice defines a procedure for determining the adhesion strength characteristics of heat-cured metal bonding adhesives subjected to induction heating.

2. References

2.1 **Applicable Publication**—The following publication forms a part of the specification to the extent specified herein. Unless otherwise indicated the latest revision of SAE publications shall apply.

2.1.1 **ASTM PUBLICATION**—Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

ASTM D 1102—Test Method for Ash in Wood

3. **Apparatus Required**—Induction equipment schematic diagram - See Figure 1.

3.1 **Power Supply**—A 20 kW, 10 kHz, frequency generator.

3.2 **Heat Station**—Robotron 20 kW - 10 kHz heat station to match impedance load to coil to power supply.

3.3 **Inductor**—Fabricated as shown in Figure 2.

3.4 **Clamping Fixture**—Fabricated as shown in Figure 3.

3.5 **Temperature Pyrometer**—Temperature measurement instrument with capability of 23 – 300 °C temperature range and ± 3 °C accuracy.

3.6 **Test Coupons**—Test coupons shall be 25 x 100 x 0.8 mm CRLC steel body stock or otherwise specified by the applicable Engineering Material Specification.

3.7 **Tensile Test Machine**—Instron or equivalent with an accuracy of 0.5% of the range used.

Test apparatus as described in ASTM D 1102.

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460 V - 3 phase 60 Hz Power Supply

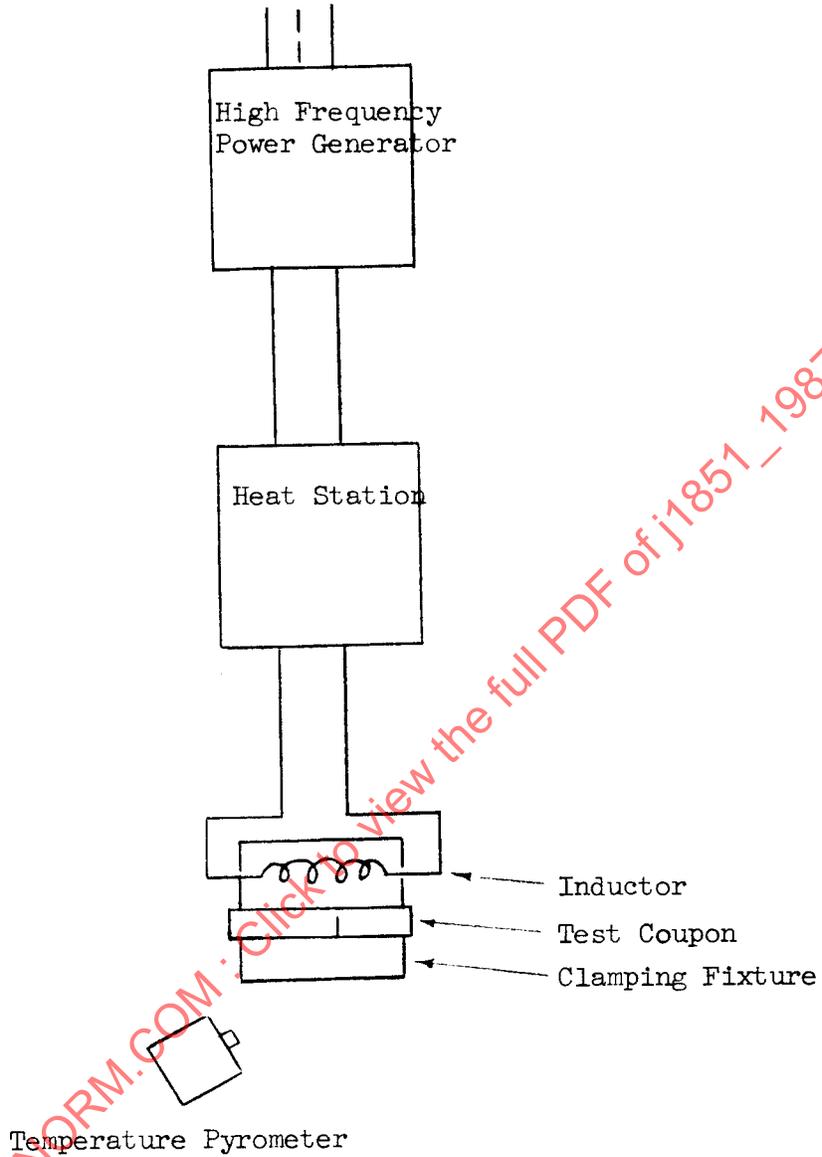
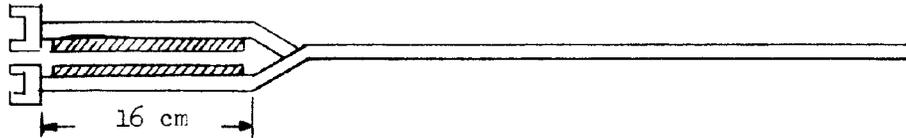


FIGURE 1—EQUIPMENT SCHEMATIC

TOP VIEW



SIDE VIEW

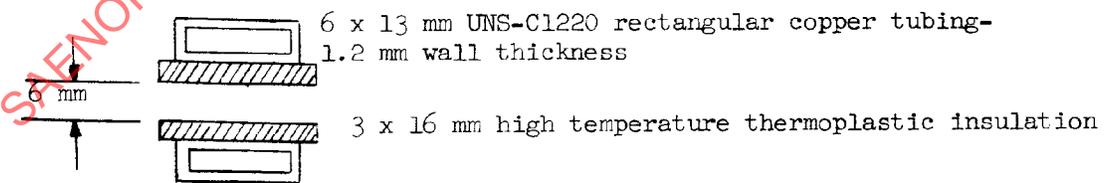
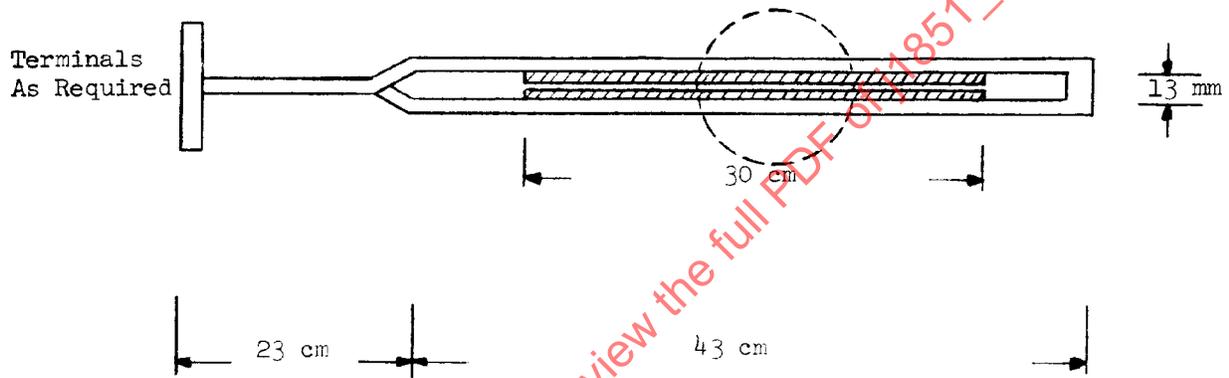
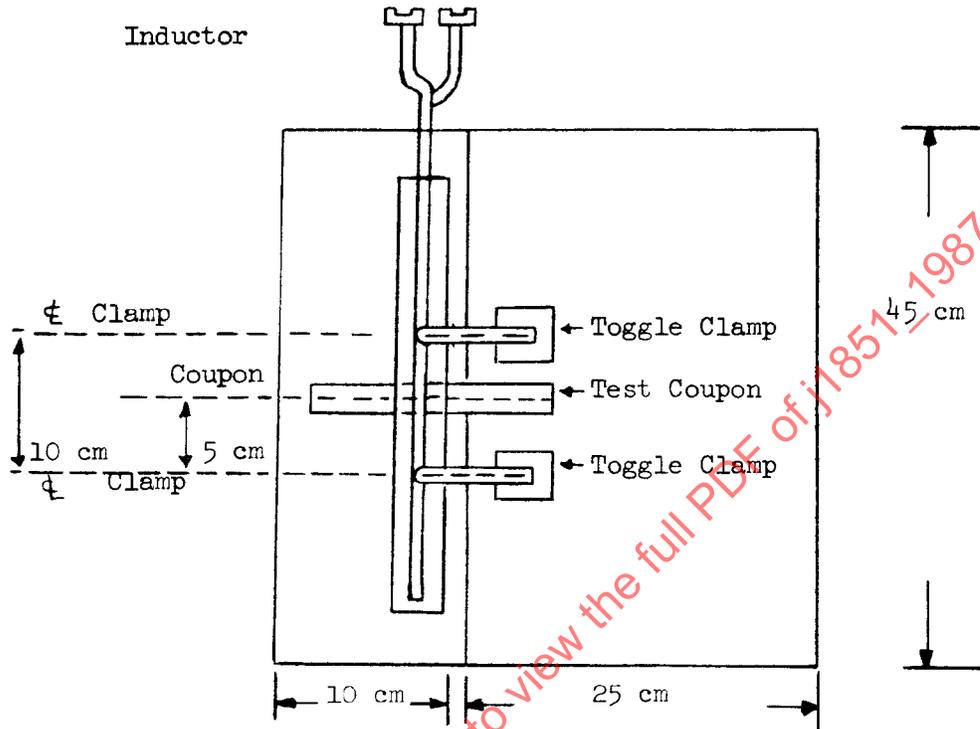


FIGURE 2—INDUCTOR

TOP VIEW



SIDE VIEW

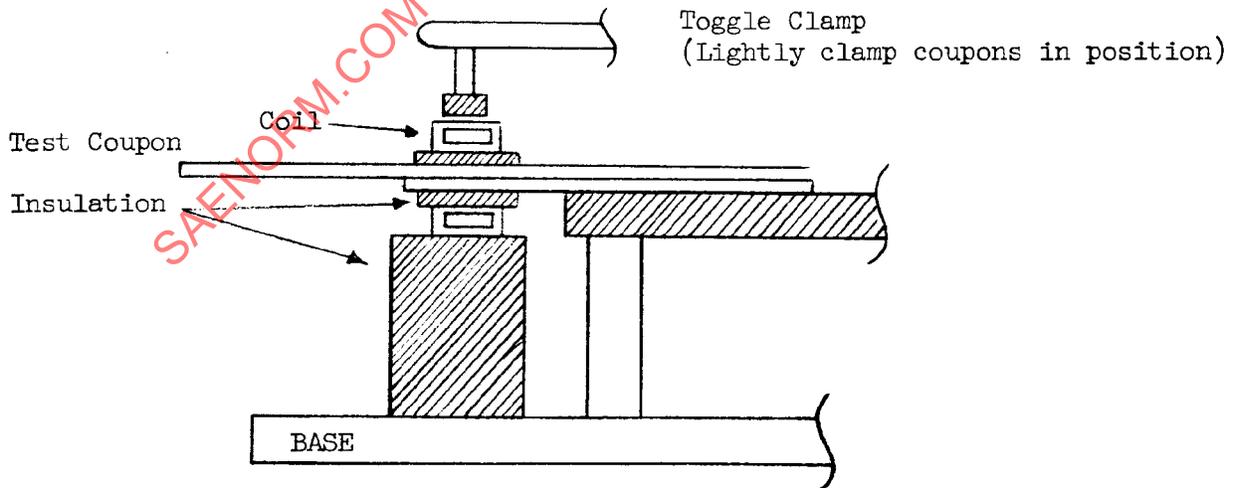


FIGURE 3—CLAMPING FIXTURE

4. Procedure

- 4.1 Condition test materials for 24 h at 23 ± 2 °C and $50 \pm 5\%$ relative humidity before preparing assemblies.
- 4.2 Prepare overlap shear test assemblies as shown in Figure 4. Use CRLC steel substrates unless otherwise specified in the applicable Engineering Material Specification.

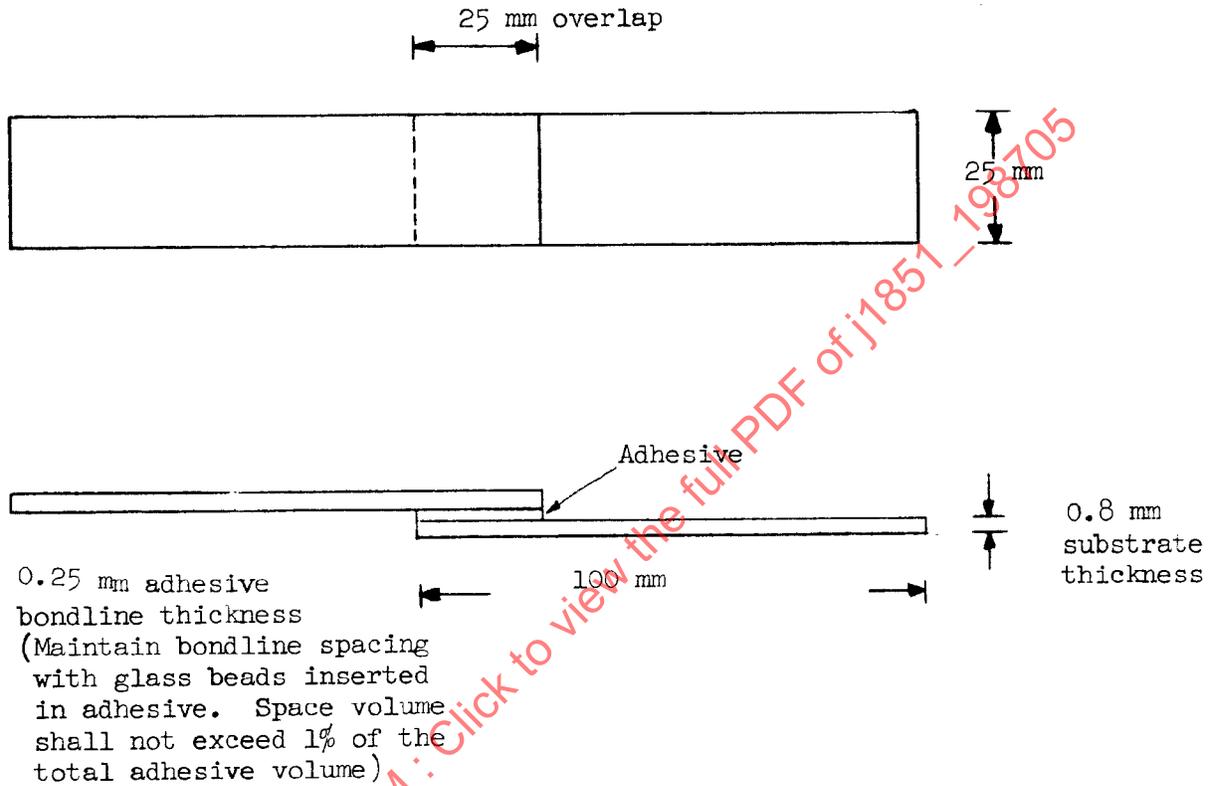


FIGURE 4—TEST COUPON ASSEMBLY

- 4.3 Remove excess adhesive squeeze-out after coupon assembly prior to positioning in induction clamping fixture.
- 4.4 Mount test assembly in clamping fixture, then induction heat at a schedule of 190 ± 10 °C metal surface temperature for 4 s or as specified. Power and temperature curves representing this schedule are shown in Figure 5.
- 4.5 Condition bonded test assemblies to 23 ± 2 °C, then conduct shear pull test at a rate of 13 mm per minute.
- 4.6 Report peak load and type of separation (for example, "adhesive": adhesive to substrate separation; "cohesive": separation within the adhesives).