



Determining the Cohesive Strength of Felts and Similar Materials

1 Introduction

Note: Nothing in this standard supercedes applicable laws and regulations.

Note: In the event of conflict between the English and domestic language, the English language shall take precedence.

1.1 Purpose. This standard shall be used to determine the cohesive strength of felts and similar materials comprised of animal, vegetable, or synthetic fibers, either singly or in combination, the fibers being physically interlocked by the inherent felting properties of the based materials or assisted by synthetic bonding.

1.2 Applicability. Any fibrous material.

2 References

Note: Only the latest approved standards are applicable unless otherwise specified.

2.1 External Standards/Specifications.

None

2.2 GM Standards/Specifications.

GMW3010

GMW3221

3 Resources

3.1 Facilities.

3.1.1 Calibration. The test facilities and equipment shall be in good working order and shall have a valid calibration label.

3.1.2 Alternatives. Alternative test facilities and equipment may also be used. However, all measuring variables as specified in this standard shall be determined correctly with respect to their physical definition.

3.2 Equipment.

3.2.1 Apparatus for conditioning to the appropriate requirements as described in GMW3221, Code B unless otherwise specified in the relevant material specification.

3.2.2 Cutting dies or shears for preparation of the test pieces.

3.2.3 Mechanical convection oven capable of maintaining the required temperature from the material specification to a tolerance of ± 3 °C.

3.2.4 Test fixture (see Figure 1).

3.2.5 Synthetic adhesive (neoprene base).

3.2.6 Tensile test machine in accordance with GMW3010, capable of traversing at a speed of $25 \text{ mm} \pm 2 \text{ mm/minute}$ and equipped with a force-extension recorder.

3.3 Test Vehicle/Test Piece. From the available material square test pieces of $100 \text{ mm} \pm 25 \text{ mm}$, sides shall be taken from various areas of the material but not closer than 100 mm to an edge. For initial sample approval, arbitration purposes and for routine quality control, at least three test pieces shall be tested.

3.4 Test Time. 7 days with environmental exposure.

3.5 Test Required Information. Not applicable.

3.6 Personnel/Skills. Author: Personnel trained in accordance with the laboratory accreditation and Standard Operating Procedure requirements.

4 Procedure

4.1 Preparation. For initial sample approval and arbitration purposes, conditioning shall be carried out according to GMW3221, Code B. Routine quality control tests shall be carried out on test pieces in the as-received condition (i.e., no special pre-conditioning).

4.2 Conditions.

4.2.1 Environmental Conditions. See Table 1 for aging temperatures.

Table 1: Aging Temperatures

Coding	Temperature in °C
A	+70 ± 3
B	+80 ± 3
C	+90 ± 3
D	+100 ± 3
E	+120 ± 3
F	As specially defined

4.2.1.1 Ageing Time. The aging time for all temperatures shall be 120 h ± 2 h, followed by 2 h cooling to +23 °C ± 5 °C.

4.2.2 Test Conditions. Deviations from the requirements of this standard shall have been agreed upon. Such requirements shall be specified on component drawings, test certificates, reports, etc.

4.3 Instructions.

4.3.1 Duplicate tests shall be performed, one immediately after conditioning or in the as-received condition; the other after aging of the test piece at the temperature specified in the appropriate material specification. For routine quality control, the test after ageing may be omitted.

4.3.2 Preparation of Test. The test piece shall be adhered, using the adhesive, between the plates of the test fixture as shown in Figure 1, and allowed to stand for 2 h at a temperature of +23 °C ± 5 °C.

4.3.3 The test piece/fixture assembly shall be pulled in the tensile testing machine in the direction of the arrows indicated in Figure 1, and the force required to cause rupture of the test piece recorded autographically. The jaw separation rate shall be 25 mm ± 2 mm/minute.