



Determination of the Press-Through Force of Trim 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. The object of this test is to determine the press-through force of trim materials (e.g., compressed fibrous materials) when subjected to specific compressive stress.

1.2 Applicability. Trim materials (e.g., compressed fibrous materials) subjected to specific compressive stress.

1.3 Remarks. The press-through force is the maximum compressive force measured during the test, before the material is pressed through.

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.

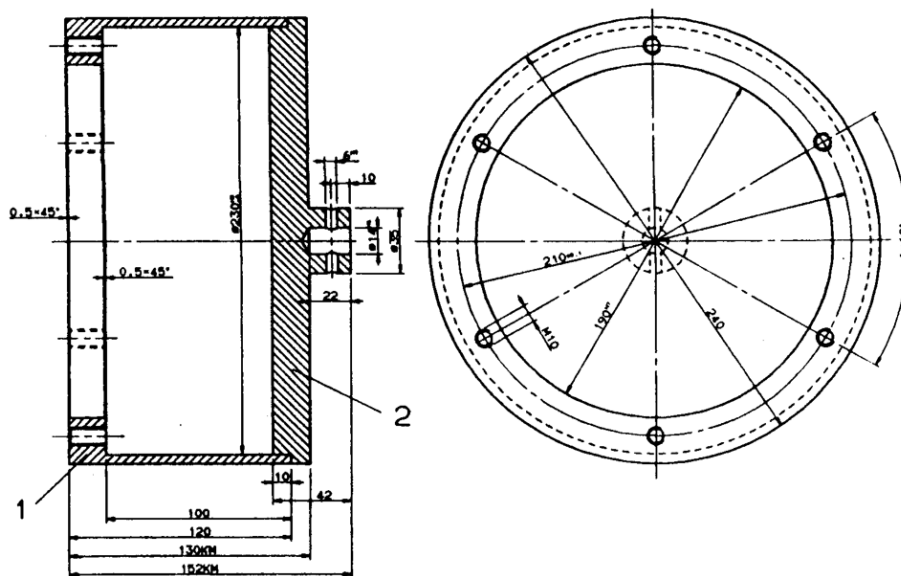
3.2.1 Suitable punching apparatus, saw, cutter or similar for preparation of test piece.

3.2.2 Universal tensile test machine in accordance with GMW3010 capable of maintaining a traverse speed of 10 mm/minute $\pm$ 1 mm/minute and shall be equipped with a suitable force extension recorder.

3.2.3 Press-Through Test Apparatus.

3.2.3.1 Clamping Device. The press-through test apparatus consisting of a cylindrical housing with clamping circle of 240 mm in diameter. The test piece shall be fixed on the housing with the clamping circle with help of 6 fasteners. See Figure 1 for a depiction of a suitable apparatus.

Figure 1: Press-Through Test Apparatus



1 Cylinder 2 Bottom Plate

3.2.3.2 Pressure Stamp with a flat disk head 8 mm in diameter and suitable end to mount into the universal tensile test machine.

Note: Clamping Ring (not shown) shall have the same diameter and hole pattern as the cylinder, with a height of 15 mm.

The Clamping Ring holes shall be of a diameter so that the mounting fasteners pass through with minimal clearance. The holes in the Cylinder shall be tapped to accept the appropriate sized fasteners such as M10 bolts shown in Figure 1.

The Bottom Plate in Figure 1 details a mounting feature such that the apparatus may be fixtured to the universal tensile test machine. Any suitable mounting scheme may be used.

Press Through Apparatus shall be made from any suitable grade of tool steel.

All dimensions are nominal unless tolerances are noted. The apparatus must fit tightly together.

A suitable device has been fabricated by Opel TL&TF Organic Materials.

3.2.4 Mechanical Convection Oven capable of maintaining the required temperature from the material specification to a tolerance of $\pm 3^\circ\text{C}$.

3.3 Test Vehicle/Test Piece. A test piece with a nominal diameter of 250 mm shall be cut out from the trim material. The thickness shall be equal the thickness of the part, however, it should be constant over the area of test piece. Drill or punch appropriate holes to mount the test sample into the Press Through Apparatus such that the holes are clean and are not a fracture site initiation point.

The area from which the test piece is taken from, should be in the center of the part, or shall be marked on the respective part drawing.

Test at least three (3) pieces for initial sample approval and arbitration purposes. Test at least one piece for routine quality control purposes. Samples shall be prepared under the conditions set forth in GMW3221 Code D.

3.4 Test Time.

Calendar time: 2 d

Test time: 2 h

Coordination time: 1 h

3.5 Test Required Information. Not applicable.