

	<b>SURFACE VEHICLE RECOMMENDED PRACTICE</b>	<b>SAE</b> <b>J1355 APR2010</b>
		Issued      1981-03 Revised      2010-04
		Superseding      J1355 MAY1993
(R) Test Method for Measuring Thickness of Resilient Insulating Paddings		

## RATIONALE

This method has been significantly modified from the earlier version, including the apparatus, sample size, conditioning, and procedure. This method provides a way to measure the thickness of a resilient insulating padding correctly as the thickness affects the sound absorption performance and the thickness of the padding needs to be reported for which the absorption data is provided. The thickness of the resilient insulating padding may need to be reported for applications other than absorption data also.

### 1. SCOPE

This SAE Recommended Practice describes a laboratory test procedure for measuring the thickness of various resilient insulating padding materials that are used in the automotive industry. Such padding materials may include synthetic or non-synthetic materials, fibrous or cellular materials, high loft or compressed materials, single layer homogeneous or multilayer products, low and high surface density products. Some of these samples may be deformable and elastic, high loft thermal and acoustical fibrous materials, as well.

The test method described herein has been developed to establish a means of a uniform procedure for measuring the thickness of different types of samples not only for application to all ground vehicles, but also may be applicable to other situations or conditions. The test method is designed to measure the thickness of flat samples and not formed parts.

This test method does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use. This test method provides a different thickness measuring device than what has been mentioned in SAE J1355 Apr87.

### 2. REFERENCES

#### 2.1 Applicable Publications

The following publications form a part of this specification to the extent specified herein. The latest issue of publications shall apply.

##### 2.1.1 SAE Publication

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or 724-776-4970 (outside USA), [www.sae.org](http://www.sae.org).

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### 2.1.2 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, [www.astm.org](http://www.astm.org).

ASTM D 5736 Standard Test Method for Thickness of Highloft Nonwoven Fabrics

## 3. APPARATUS

3.1 It is a parallel plate four-bar linkage thickness measuring device with a counter weight. Appendix A at the end of this standard provides some sources from where this device can be procured.

This device is essentially a table with an upright at the rear (see Figure 1). There are four pivotal arms connected to the upright in such a way that the pivotal arms can carry a flat platen of 305 mm x 305 mm size. The pivotal arms are attached to the uprights and the platen in such a way that when the arms are raised or lowered, the platen is also raised or lowered with its faces staying parallel to the base plate at all times. The specimen (material to be measured) is placed on the table, a predetermined weight (load) is placed on the platen, and then the platen is lowered until it rests lightly on the material. The thickness of the specimen is shown in the thickness measuring indicator.

### 3.2 Thickness Gauge

Thickness measuring indicator with single point-contact loading foot and 0.1 mm or equivalent graduations.

### 3.3 Cutting Dies or Templates

To cut specimens 305 mm x 305 mm in size with a tolerance not to exceed  $\pm 3$  mm.

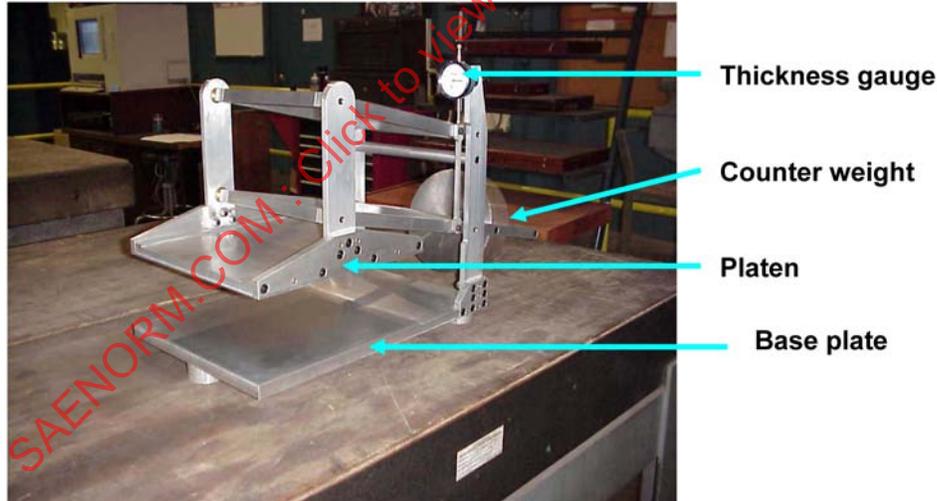


FIGURE 1 - PHOTOGRAPH OF A TYPICAL PARALLEL PLATE FOUR-BAR LINKAGE THICKNESS MEASURING DEVICE

## 4. TEST SPECIMENS

4.1 Two test specimens having the dimensions 305 mm x 305 mm shall be cut from the same lot (roll of articles), and shall also be free of folds, creases, or wrinkles. Avoid getting oil, water, grease, and so forth, on the test specimens when handling.

4.2 The test specimen shall be placed such that the edges of the test specimen line up evenly with the base plate (thickness measuring table) to minimize any contribution of edge effects.

## 5. CONDITIONING

- 5.1 After removal from the packaging, lay the sample on a flat surface for a minimum of 12 hours before cutting specimens and measuring thickness. It is recommended to condition the sample in the same environment where the measurements will be made. If the sample is in a compressed state and circumstances will not permit lengthy sample conditioning, the sample shall be released from compression through natural means (i.e., rising on its own accord after removal from the packaging) and allowed to recover for at least 30 minutes before cutting and testing or as long as possible (but more than 30 minutes), and this should be documented in the reported data. In no case shall additional thickness recovery methods such as shaking or pulling the material be used to increase the thickness to the nominal thickness even if the natural means of recovery is below the nominal thickness.
- 5.2 Tests for material classification and for arbitration purposes shall be made after the test material has been conditioned properly. Tests should be conducted at the standard conditions in the laboratory, and the temperature and the relative humidity should be documented and reported.

## 6. PROCEDURE

- 6.1 Perform the following steps in a controlled atmosphere per paragraph 5.2.
- 6.2 Place the thickness measuring device on a flat surface large enough to accommodate the device and test specimens. Handle the test specimens carefully. Insure that the thickness measuring device is functioning according to the manufacturer's recommendations. The pivot points on the platen should move smoothly and should not bind or stick.
- 6.3 Record in °C the temperature of the testing environment, as well as the relative humidity.
- 6.4 Verify or set the thickness measuring indicator to zero by carefully lowering the platen before measuring the thickness of the specimens.
- 6.5 Raise and balance the platen to a height of 50 mm from the base plate, or to a height greater than that of the thickness of the specimen (if more than 50 mm) by carefully turning the counterweight at the rear until the platen is balanced and at rest at this height.
- 6.6 Place a specimen of the material to be tested on the base plate such that when the platen is lowered its edges line up evenly with the test specimen.
- 6.7 Two different weights are recommended for measuring the thickness. These are 150 g weight  $\pm 1$  g and 300 g weight  $\pm 1$  g.
- 6.8 Place the 150 g weight near the center of the platen and gradually lower the platen until it contacts the surface of the specimen. Release control of the weight and allow the specimen to be compressed for 10 seconds. This is also known as the loading time interval.
- 6.9 Record the thickness from the thickness measuring indicator.
- 6.10 Rotate the specimen to its next side and follow paragraphs 6.6 and 6.9 to measure and record its thickness until all sides have been measured. A total of 4 measurements shall be made for each specimen and arithmetically averaged to obtain the measured thickness for that specimen.
- 6.11 Repeat steps 6.8, 6.9, and 6.10 using the 300 g weight.
- 6.12 If the average thickness of the specimen as measured with a 150 g and 300 g weight varies more than 10% (i.e., 1 mm variation on a 10 mm thick specimen) due to the difference in weight (i.e., the 150 g weight and 300 g weight), the 150 g weight shall be used and reported for the correct measurements. Otherwise, the 300 g weight shall be used and reported for the correct measurements.

6.13 Repeat the measurements on the other test specimen using the appropriate weight. Average the thickness of the two test specimens to obtain the average measured thickness of the test sample.

## 7. REPORT

Report the following information:

7.1 Report that the thickness was determined as directed in this test method.

7.2 Description of the material or product tested.

7.3 Weight applied to platen.

7.4 Condition temperature, relative humidity, and time

7.5 Number of specimens per sample.

7.6 Average thickness.

7.7 Any modification made in accordance with this test method.

## 8. NOTES

### 8.1 Marginal Indicia

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