STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard

METHODS OF TESTING THERMAL INSULATION

AS 2464.6
STEADY–STATE THERMAL TRANSMISSION PROPERTIES BY MEANS OF THE GUARDED HOTPLATE*

CONTENTS

* Based on ANSI/ASTM C1

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METHOD

1 SCOPE. This standard sets out the method for determining the steady-state thermal transmission properties of thermal insulating specimens using a guarded hotplate, within the limits set by Clauses 2.1, 2.2 and 2.3. For purposes of certification, this method is limited to specimens with thermal resistances greater than 0.017 m^2.K/W in all directions (see Note 1).

NOTES:

1. Special techniques may be required for measuring surface temperatures with specimens having thermal resistances less than 0.1 m^2.K/W.
2. The accuracy of measurement on specimens of low-density thermal insulation by this standard may be difficult to verify and may require an extensive analysis of the equipment and/or a performance check using calibration standards having heat transmission characteristics and thickness similar to the test specimens.

This standard is a primary method for measuring the thermal transmission properties of specimens, as only measurements of length, electrical power, and temperature difference are required.

2 APPLICATION.

2.1 Measurement of Thermal Resistance and Thermal Conductance. The specimen(s) shall comply with the following requirements if the thermal resistance and thermal conductance of the specimen(s) are to be determined by this standard:

(a) The portion of the specimen over the test area shall be typical of the whole specimen in every aspect.

(b) The remainder of the specimen shall not, on average, distort the heat flow in that part of the specimen adjacent to the metering area.

(c) The specimen shall be free of low thermal resistance paths that create thermal short-circuits between the test surfaces.

(d) The heat-flux density through the specimens shall be directly proportional to the temperature differences across the specimens.

NOTE: Appendix C describes tests that can help ascertain whether the specimen complies with Clause 2.1. For the purposes of this standard, differences in the measurements of less than 2 percent may be considered insignificant, and the requirements consequently complied with.

2.2 Measurement of Average Thermal Resistivity and Average Thermal Conductivity. The specimen(s) shall comply with *one* of the following requirements in addition to the requirements of Clause 2.1 if the average thermal resistivity and average thermal conductivity of the specimen(s) are to be determined by this method:

(a) The specimen shall be homogeneous.

(b) The specimen shall not be layered and the net direction of heat flow shall not be altered by any inhomogeneities.

NOTE: Appendix C gives one test for checking the condition described in (b) above.

2.3 Applicability of Test Results to a Material. The following requirements, in addition to the requirements of Clauses 2.1 and 2.2, shall apply if the values of thermal resistivity and thermal conductivity measured for the specimen are to be considered valid for the material:

(a) The material shall be homogeneous.

(b) The thickness of the specimen shall be greater than that for which the apparent thermal resistivity of the material does not change by more than 2 percent with further increases in thickness.

NOTE: Appendix C gives one test for checking the condition described in (b) above.

(c) Adequate sampling shall be performed to ensure that the measurements are representative of the whole material.

NOTE: The material standard normally specifies the sampling procedure required for the material.

3 REFERENCED DOCUMENTS. The following documents are referred to in this standard:

AS 2352	Glossary of Terms for Thermal Insulation of Buildings
AS 2464	Methods of Testing Thermal Insulation 2464.5— Steady-state Thermal Transmission Properties by Means of the Heat Flow Meter*
ANSI/ASTM E230-77	Temperature-electromotive Force (EMF) Tables for Thermocouples

* In course of preparation.