

SYMPOSIUM ON THERMAL CONDUCTIVITY MEASUREMENTS AND APPLICATIONS OF THERMAL INSULATION

INTRODUCTION

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The development of specifications in the field of Thermal Insulating Materials, of use to industry and the public, is the responsibility of ASTM Committee C-16 on Thermal Insulating Materials. The task of carrying out this responsibility requires more than that specific property values or limits be reliably established for products. Antecedently, it requires that an appropriate test method and procedure be selected, subjected to critical trial in different laboratories and, when found satisfactory, standardized as a test method. When this has been done, the specified apparatus for the method is acquired and used by many laboratories, and experience on a wide scale becomes available. Thus, a broad appraisal can be made, workers develop improved criteria and modifications, and revision of the test method is possible.

The present symposium illustrates this process very well. In an earlier symposium,² evidence was given of need for criteria to assure more closely comparable results in thermal conductivity determinations by ASTM Method C

177-45.³ In the present symposium, two important papers present analyses and experimental procedures by which such criteria can be developed. Two others deal with improvements and modifications of the apparatus within the scope of the test method, and its extension to use at lower temperatures. The imminent revision of this test method will take strength and substance from the contributions made by the authors.

The antecedent phase of the committee's work is also exemplified in this symposium by two papers concerned with moisture in relation to thermal insulation. One paper reports on a fundamental study sponsored by Committee C-16 to evaluate a transient heat flow method of measuring the thermal conductivity of moist insulations and gives results on a few materials. Another paper deals with the insulation of underground piping, discussing the effect of the earth cover not only as additional thermal insulation but, more importantly, as governing the conditions affecting the durability of waterproof coverings for the insulation. These two papers thus represent a start in the development of information relative to practical concerns of Committee C-16 in the future.

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² Symposium on Thermal Insulating Materials, Am. Soc. Testing Mats. (1952). (Issued as separate publication, *ASTM STP No. 119*.)

³ Method of Test for Thermal Conductivity of Materials by Means of the Guarded Hot Plate (C 177-45), 1955 Book of ASTM Standards, Part 3, p. 1084.