

## Overview

ASTM Committee C-16 on Thermal Insulation enters its second half-century with the 1991 Symposium on Insulation Materials: Testing and Applications. STP 1116 contains the proceedings of the Symposium that brought together the latest information on thermal insulations, test methods applicable to thermal insulations, and applications. In keeping with its scope, ASTM Committee C-16 has held many programs to present the latest information on insulation materials and their test methods. A tangible result of these programs has been the publication of over a dozen ASTM Special Technical Publications covering the technology of thermal insulation.

This STP reflects the interest in this decade of conserving energy and protecting the environment. The Symposium and the resulting STP clearly demonstrate the Committee's objective of providing timely information on the testing, characterization, use, and development of thermal insulations. In the 1970s and 1980s, interest and activity in thermal insulation was spurred by the growing recognition of the need for energy conservation. The value of thermal insulation in combating the impact of rising energy costs and in sustaining economic growth was widely recognized. While these economic factors are still important, society's attention today is shifting toward the effects which the production and consumption of energy have on our environment. The role of thermal insulation in mitigating these effects until new, more environmentally sound energy technologies are developed becomes even more important.

International agreements to phase-out the use of CFCs has impacted the field of thermal insulations. This impact is demonstrated by a significant fraction of the Symposium and the STP devoted to the long-term performance for cellular plastics and foamboard insulations. Fundamental questions about aging, stability, testing, and overall acceptability of a new generation of insulating foams are addressed. Increasing interest in high-R innovative insulations is demonstrated in this STP by reports of research on evacuated panel insulations, non-CFC high performance insulations; aerogels, and thin-wall ceramic spheres.

As the need for energy conservation increases, so does the need for environmentally sound insulation materials, the need for better understanding of the factors which affect insulation performance, and the need for better test methodology.

Research in the area of thermal insulations and the testing of products has matured. Heat transfer mechanisms are being given more attention than in the past, and the effects of moisture and positioning of insulation in the building envelope are being studied. A wide range of factors that affect performance were presented and discussed at the 1991 Symposium and presented in this STP. An understanding of mechanisms and performance factors is crucial to the design and use of thermal insulations to obtain optimum

results. Control of thermal radiation and a quantitative evaluation of convective effects in relatively low-density insulations are examples of the detailed research that was presented.

The manufacture, testing, and use of insulations in the building industry has high priority with C 16 and received significant attention at the Symposium. Economic evaluations and regulation activities are becoming more sophisticated. Inspections of materials in actual use configurations continues to be an important issue.

The 1991 Symposium was international in scope with participation from seven nations including the United States. The papers presented represented input from the industrial sector, the National Laboratories in the United States, Canada, and Australia, and Universities in the United States, the Netherlands, and Portugal. The STP will be useful to a wide range of professionals dealing with thermal insulations by presenting research on currently used materials and thermal insulations under development.

The significance of the STP is directly related to the efforts of the contributing authors, the technical reviewers, and session chairpersons. Session chairpersons and reviewers are identified on the following page and appreciation is expressed here. The editors also wish to acknowledge the contributions of the Steering Committee: R. L. Baumgardner, W. M. Edmunds, and D. L. McElroy.

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