

*Performance of*  
**Protective  
Clothing**

*Fifth Volume*

*James S. Johnson and  
S. Z. Mansdorf, editors*



**STP 1237**



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# *Performance of Protective Clothing: Fifth Volume*

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The quality of the papers in this publication reflects not only the obvious efforts of the authors and the technical editor(s), but also the work of these peer reviewers. The ASTM Committee on Publications acknowledges with appreciation their dedication and contribution to time and effort on behalf of ASTM.

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## Foreword

The Fifth International Symposium on Performance of Protective Clothing: Improvement Through Innovation was held 25–27 Jan. 1994 at the San Francisco Hilton and Towers, San Francisco, California. This meeting was sponsored by ASTM Committee F-23 on Protective Clothing and cosponsored by the Institut de Recherche En Santé et en Sécurité du Travail du Quebec.

This symposium was fifth in a series of symposia held to bring together internationally known experts to discuss new developments as well as emerging issues related to worker protection through the use of protective clothing and equipment.

The symposium Chairmen were James S. Johnson, Fission Energy and Systems Safety Program and Hazards Control Department, Lawrence Livermore National Laboratory and S. Z. Mansdorf, Managing Director-Consulting Services, Liberty International. These key individuals also served as editors of this publication.

### *About the Cover*

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# Overview

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The Fifth International Symposium on Performance of Protective Clothing Improvement Through Innovation has been a major success like the previous four Committee F-23 Symposia. The experience gained from past symposia was used by the cochairmen to organize this symposium with ample time between sessions for personal interactions with speakers, attendees, professional acquaintances, and friends. An afternoon poster session was also organized to provide time for attendee interaction. To make sure all attendees had a chance to savor the fine food San Francisco is known for, the symposium special event was held at the California Culinary Academy. ASTM Committee F-23 would also like to recognize and thank the Intitute de Recherché en Sante et en Sécurité du Travail du Quebec for again being a symposium cosponsor.

It is a normal practice to hold these symposia in conjunction with the standard development meetings of Committee F-23. In addition to these meetings, Committee F-23 hosted the International Standards Organization (ISO) Technical Committee (TC), ISO/TC 94/SC 13 on Protective Clothing the week preceding the symposium. These ISO meetings expanded the opportunities for symposium delegates from around the world to attend, participate, and learn about European protective clothing standards and their development process. It was a pleasure to host these meetings to expand interactions between Committee F-23 and ISO/TC 94/SC 13. The need to harmonize all standards, and specifically protective clothing and equipment standards, is well recognized. It has been a goal of each Committee F-23 symposium to help accomplish this task by providing a technical forum to present new ideas, publish peer-reviewed technical papers, and maintain an on-going structure for future symposia. The next symposium will be held in Orlando, Florida on 18–20 June 1996.

Protective clothing training is recognized by the leadership of Committee F-23 as an on-going need and responsibility. A one-day training program entitled, "Current Developments in Protective Clothing, Testing and Materials," was presented on the Sunday before the symposium began. The keynote presentation provided an occupational medicine overview on protective apparel. Six sessions followed that addressed test methods, protective clothing materials, protective gloves, protective clothing, and equipment for fire fighters and other emergency responders and chemical and biological barrier testing. The training program was well received and future symposia will continue to provide this added feature.

The symposium technical papers were arranged in nine topical areas; physical test methods for protective clothing and components, chemical test method development and applications, protective clothing issues relating to pesticides, biological test methods, protective clothing testing and evaluation, protective clothing program management, protective clothing standards and regulations, thermal test method development and applications, and a protective clothing and equipment poster session. Seventy-eight technical presentations were made addressing a wide range of technical areas summarized by the previous list of subjects. This STP contains 37 papers from the symposium.

In an ideal world, engineering controls would be used to minimize worker exposure and protective clothing and equipment use would be the exception rather than the rule. This unfortunately is not the case and, if anything, we see the increased use of protective clothing and equipment (PC&E). In addition, regulations and more knowledgeable workers are requiring PC&E performance data and improvements in the individual items. The need has also been recognized to test the performance of the entire protective clothing ensemble rather than only

its components. ASTM Committee F-23 has been the focal point for the development of PC&E performance standards since 1977. The future is bright for Committee F-23 with the need to update existing standards, develop new standards, interact with ISO and other international standards organizations to provide harmony between standards and continue organizing this ASTM International Symposium on Protective Clothing and Equipment biannually.

We would like to thank the many members of Committee F-23 who supported this conference, ASTM conference staff, all of the peer reviewers, the ASTM editorial staff, and especially Steve Mawn, our Staff Manager. We both look forward to seeing you at our Sixth International Symposium in Orlando.

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