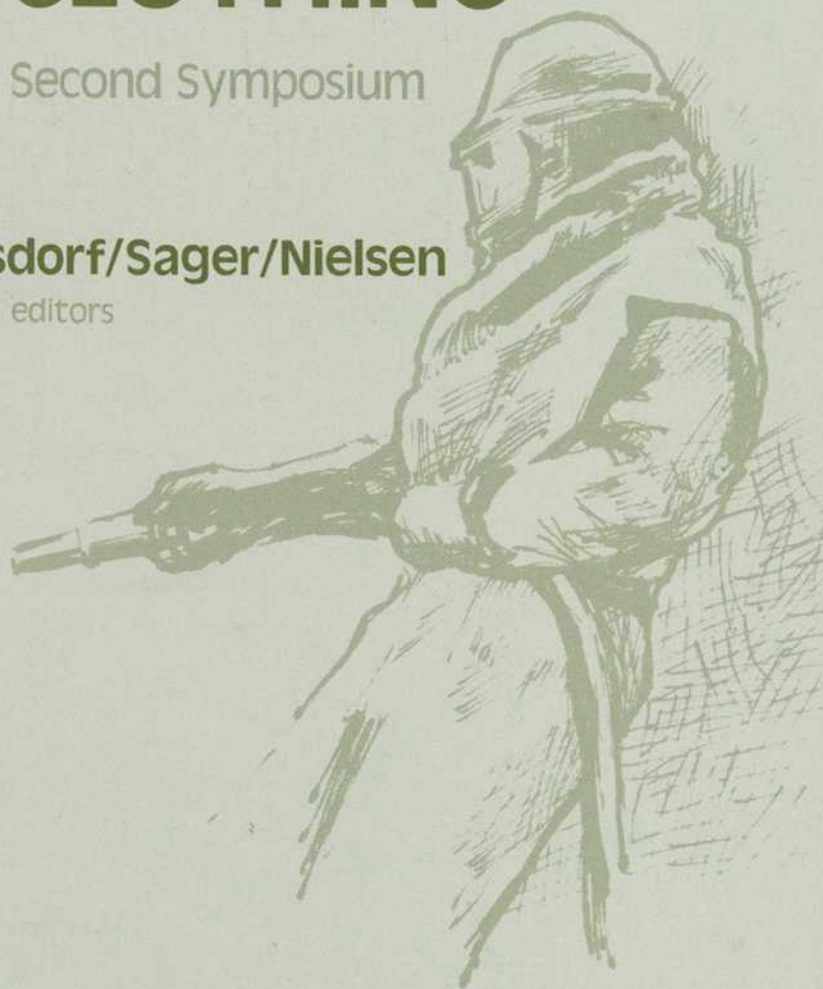


# Performance of PROTECTIVE CLOTHING

Second Symposium

Mansdorf/Sager/Nielsen

editors



STP 989

**STP 989**

***Performance of Protective  
Clothing:  
Second Symposium***

*S. Z. Mansdorf, Richard Sager, and Alan P. Nielsen, editors*



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**Peer Review Policy**

Each paper published in this volume was evaluated by three peer reviewers. The authors addressed all of the reviewers' comments to the satisfaction of both the technical editor(s) and the ASTM Committee on Publications.

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 of time and effort on behalf of ASTM.

# Foreword

The papers in this publication, *Performance of Protective Clothing—Second Symposium*, have been selected from those presented at the Second International Symposium on the Performance of Protective Clothing, which was held in Tampa, Florida, during 19–21 January, 1987. This meeting was sponsored by the ASTM Committee F-23 on Protective Clothing and cosponsored by the American Industrial Hygiene Association Committee on Protective Devices and the Royal Institute of Technology of Stockholm, Sweden. This symposium was the second in a series of symposia held to bring together internationally known experts to discuss the emerging issues related to worker protection through the use of protective clothing.

The symposium chairmen were S. Z. Mansdorf, S. Z. Mansdorf & Associates, Inc., and Richard Sager, Sager Corporation. Additional support was provided by Alan Nielsen of the U.S. Environmental Protection Agency who was largely responsible for the overwhelming success of the pesticides sessions. These key individuals also served as editors of this publication.

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# Overview

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The performance of protective clothing has become a significant concern of the health and safety community over the last ten years. This has been due in large part to the development of standard test methods by the F-23 Committee of ASTM and others which demonstrated significant limitations to previously considered "safe" uses of this equipment. Secondly, increased use of personal protective equipment as an apparent cost effective alternative to engineering controls and for those operations where engineering controls are not feasible has been evidenced.

## **The F-23 Committee**

The F-23 Committee was originally organized in 1977 as the Chemical Protective Clothing Committee under the ASTM organizational umbrella. This committee was formed as a direct result of the recognized need by manufacturers and users for uniform standards for chemical protective clothing.

The first official F-23 standard test method [Resistance of Protective Clothing Materials to Permeation by Hazardous Liquid Chemicals (F 739-81)] was published in 1981. Following the publication of this test method and others, a considerable amount of data were generated that indicated most chemical protective clothing was not an absolute safeguard as was once commonly believed.

The F-23 Committee has grown to become the major recognized force in the protective clothing arena with over 160 active members representing protective clothing users, manufacturers, government, and academia.

## **Symposia**

To help satisfy the growing interest of the general health and safety community in the activities of F-23 and the use of protective clothing, a symposium was sponsored in Raleigh, North Carolina in 1984. The Symposium was an overwhelming success in terms of partici-

pation and the transfer of technical knowledge through an ASTM Special Technical Publication (STP 900), *Performance of Protective Clothing*, containing 48 peer-reviewed technical papers.

The Second International Symposium on Protective Clothing was held three years later in Tampa, Florida. It was the most comprehensive and well attended symposium ever held on the subject of protective clothing. Over 150 papers encompassing a number of broad areas related to protective clothing were presented by an internationally recognized roster of experts. The international scope of the subject was evidenced by the fact that two of the four plenary speakers were from outside of the United States.

This publication, as the second volume to the original STP 900 contains 84 papers selected from the original presentations. These cover issues and areas of concern related to protective clothing selection, use, and testing. All of the manuscripts have undergone extensive peer review in accordance with ASTM requirements.

### **Organization**

This STP is divided into six general topic areas. These sections contain a diverse range of papers on protective clothing which are characteristic of this type of symposium and the breadth of the subject. They represent the current issues of interest in this emerging field and thus will be of value to readers desiring both an overview and specific information on the latest research in protective clothing.

The major topic areas of the book are the voluntary standards process, human factors, protection from physical stressors, protection from industrial chemical stressors, protection from pesticides, and new materials and technologies.

The first topic area covering voluntary standards includes a history of the function and purpose of the ASTM Committee F-23 on Protective Clothing and a paper on the need for international cooperation for the development of standard test methods. The second topic area is human factors which contains four papers addressing the proper fit and testing of protective clothing. The third topic area, containing nine papers on protection from physical stressors, has a major emphasis on thermal performance and testing but also contains a paper on cut resistance of protective leggings. The fourth topic area on protection from industrial chemical stressors is one of the larger sections of the book with 38 papers. It is subdivided into sections containing papers on dermal toxicology, permeation theory and testing of protective clothing (including an expert roundtable discussion), new laboratory test methods, field test methods and the application of their data, field experiences, decontamination issues, selection and use of chemical protective clothing, emergency response and military applications, and the performance of full ensembles. The fifth topic area covering protection from pesticides contains 28 papers. It is divided into three major sections. These are field performance, laboratory test methods for materials resistance and decontamination, and user attitudes and work practices. The final topic areas of the book contains three papers on new materials and technologies.

### **Significance**

This publication in combination with STP 900 contains the most comprehensive body of knowledge on the subject of protective clothing currently available. It spans the range of thermal protection to human factors and as such should be a valuable resource for those interested or responsible for the selection, use, or testing of protective clothing.

It is the hope of the editors that this book will encourage protective clothing research and subsequently lead to advancements in its selection, safe use and testing. As stated best by

John Moran of NIOSH at the plenary session, “. . . Protective clothing is clearly the last line of defense . . .”

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