Journal of ASTM International
Selected Technical Papers

STP 1533

Surface and Dermal Sampling

JAI Guest Editors:

Michael Brisson
Kevin Ashley

Journal of ASTM International
Selected Technical Papers STP1533
Surface and Dermal Sampling

JAI Guest Editors:
Michael Brisson
Kevin Ashley

ASTM International
100 Barr Harbor Drive
PO Box C700
West Conshohocken, PA 19428-2959

Printed in the U.S.A.

ASTM Stock #: STP1533

Library of Congress Cataloging-in-Publication Data

ISBN: 978-0-8031-7519-8

Journal of ASTM International (JAI) Scope

The JAI is a multi-disciplinary forum to serve the international scientific and engineering community through the timely publication of the results of original research and critical review articles in the physical and life sciences and engineering technologies. These peer-reviewed papers cover diverse topics relevant to the science and research that establish the foundation for standards development within ASTM International.

Photocopy Rights

Peer Review Policy

Each paper published in this volume was evaluated by two peer reviewers and at least one editor. The authors addressed all of the reviewers' comments to the satisfaction of both the technical editor(s) and the ASTM International 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 the peer reviewers. In keeping with long-standing publication practices, ASTM International maintains the anonymity of the peer reviewers. The ASTM International Committee on Publications acknowledges with appreciation their dedication and contribution of time and effort on behalf of ASTM International.

Citation of Papers

When citing papers from this publication, the appropriate citation includes the paper authors, "paper title", J. ASTM Intl., volume and number, Paper doi, ASTM International, West Conshohocken, PA, Paper, year listed in the footnote of the paper. A citation is provided as a footnote on page one of each paper.

Printed in Baltimore, MD
November, 2011

Foreword

THIS COMPILATION OF THE *JOURNAL OF ASTM INTERNATIONAL (JAI)*, STP1533, on Surface and Dermal Sampling contains only the papers published in JAI that were presented at a symposium in San Antonio, TX, on 14-15 October 2010 and sponsored by ASTM Committee D22 on Air Quality and subcommittee D22.04 on Workplace Air Quality.

The Symposium Chairs and JAI Guest Editors are Michael Brisson, Savannah River Nuclear Solutions LLC, Aiken, SC and Kevin Ashley, Centers for Disease Control/National Institute for Occupational Safety and Health (NIOSH), Cincinnati, OH.

Contents

Asbestos

Pharmaceuticals

General Topics

Overview

This compilation represents the work of numerous authors at the ASTM International Symposium on Surface and Dermal Sampling, October 14-15, San Antonio, Texas, USA. This two-day symposium was sponsored by ASTM International Committee D22 on Air Quality and its Subcommittee D22.04 on Workplace Air Quality. The symposium was organized in cooperation with the American Industrial Hygiene Association (AIHA), the Beryllium Health and Safety Committee (BHSC), the U.S. Department of Energy (DOE), the U.S. Department of Housing and Urban Development (HUD), L'Institut de recherché Robert-Sauvé en santé et en sécurité du travail (IRSST), and the National Institute for Occupational Safety and Health (NIOSH) of the U.S. Centers for Disease Control and Prevention (CDC). Over thirty papers were presented at the symposium, and the papers that were submitted and accepted for publication appear in this volume.

The role of surface and dermal sampling to assess contamination levels, or to detect harmful agents, is growing. However, standard techniques for sampling of surfaces, including skin, are relatively few, and their development is hampered by limited data. The lack of harmonization in these techniques creates difficulties in comparing data from different studies. Agreement is needed on protocols for surface and dermal sampling and, to improve data defensibility, methods for sampling of surfaces, including skin, are in need of standardization. The symposium explored recent work that could aid in beginning the standards development process, and addressed challenges that need to be overcome for further standards development.

The symposium solicited presentations on the following topics (and related issues):

- Surface and dermal sampling protocols.
- Samplers and sample collection media.
- Target analytes — chemical, biological and radiation hazards, and dermal sensitizers.
- Application of surface and dermal monitoring techniques to real-world problems.
- Safety, health and risk assessment.
- Quality assurance and method performance.
- Policy issues relating to surface and dermal monitoring.

The targeted audience included a wide range of technical professionals such as industrial hygienists, chemists, biologists, health physicists, safety engineers, epidemiologists, medical personnel, and others having interest in surface or dermal sampling issues, or both.

The papers contained in this publication represent the commitment of ASTM International Committee D22 to providing timely and comprehensive information on advances in monitoring of toxic substances, exposure assessment, and standards development. Sections of the two-day symposium focused on the following themes: 1. Standardization Issues; 2. Dermal; 3. Lead; 4. Beryllium; 5. Asbestos; 6. Pharmaceuticals; and 7. General topics. Papers discussing sampling techniques, analytical measurement technologies, reference materials, standardization, occupational hygiene, decontamination methods, and quality assurance can be found in this compilation.

Standardization Issues

This section includes papers which summarize the currently available consensus standards for surface and dermal sampling and the need for additional standards, particularly in the area of dermal sampling. It also includes papers describing research activities intended to support standards development. Three of the papers that were given dealing with these issues are published in this section.

Dermal

This section includes papers dealing with aspects of addressing contaminants on skin, including sampling, removal, and adherence of contaminated materials to the skin. Two of the papers given in this topical area, both related to lead contamination, are published in this section.

Lead

This section includes papers dealing with sampling, sample preparation, analytical proficiency testing, and lead dust loadings on surfaces other than skin. Three of the papers that were given dealing with these issues are published in this section.

Beryllium

This section includes papers dealing with beryllium surface contamination in various industries and measurement of beryllium on surface wipe samples. Three of the papers given in this topical area are published in this section.

Asbestos

This section includes papers addressing the evaluation of samples collected from surfaces contaminated with asbestos. Two of the papers that were given dealing with these issues are published in this section.

Pharmaceuticals

This section includes papers dealing with occupational exposure to pharmaceutical substances, as well as spills and leakage of antibiotics on surfaces. Three of the papers given in this topical area are published in this section.

General Topics

This section includes papers addressing general topics such as investigations of outdoor environmental surface particulate; microbiological contamination on surfaces; assessments of properties contaminated with methamphetamine; and use of health-based screening levels to evaluate contamination on indoor surfaces. Four of the presented papers are published in this section.

We hope that readers of this publication will find it to be an informative and useful reference on surface and dermal sampling issues.

Michael J. Brisson
Savannah River Nuclear Solutions
Aiken, SC, USA

Kevin Ashley
CDC/NIOSH
Cincinnati, OH, USA

Symposium Co-Chairs and Editors

Acknowledgments

The editors gratefully acknowledge the voluntary contributions of the numerous colleagues who served as peer reviewers of the manuscripts that were submitted for consideration for publication. Their efforts made the symposium and this compilation possible. Special thanks are extended to the following members of the symposium organizing committee, who helped to arrange the presentations and kindly served as session monitors:

Jacques Lesage
IRSST
Montréal, PQ, Canada

Roger D. Lewis
Saint Louis University
St. Louis, MO, USA

James R. Millette
MVA Scientific Consultants
Duluth, GA, USA

Olle Nygren
Umeå University
Umeå, Sweden

Larry Pierce
Fiberquant Analytical Services
Phoenix, AZ, USA

Lisa Rogers
Mycometer, Inc.
Tampa, FL, USA

Kenneth T. White
Consultive Services
Virginia Beach, VA, USA

www.astm.org

ISBN: 978-0-8031-7519-8
Stock #: STP1533

Cover Photo Courtesy of Joseph Fernback