

ADVANCES IN

Adhesives, Adhesion Science, and Testing

STP 1463

Editor:
Dennis Damico



STP 1463

Advances in Adhesives, Adhesion Science, and Testing

Dennis Damico, editor

ASTM Stock Number: STP1463



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

Printed in the U.S.A.

Library of Congress Cataloging-in-Publication Data

Symposium on Advances in Adhesives, Adhesion Science, and Testing (2004 : Washington, D.C.)

Advances in adhesives, adhesion science, and testing / Dennis Damico, editor.

p. cm. — (STP ; 1463)

ISBN: 0-8031-3489-4 (alk. paper)

1. Adhesives—Congresses. 2. Adhesion—Research—Congresses. 3. Adhesion—Testing—Congresses. I. Damico, Dennis J., 1947– II. Title. III. Series: ASTM special technical publication ; 1463.

TP967.S956 2004

620.1'99—dc22

2005022769

Copyright © 2005 ASTM International, West Conshohocken, PA. All rights reserved. This material may not be reproduced or copied, in whole or in part, in any printed, mechanical, electronic, film, or other distribution and storage media, without the written consent of the publisher.

Photocopy Rights

Authorization to photocopy items for internal, personal, or educational classroom use, or the internal, personal, or educational classroom use of specific clients, is granted by ASTM International (ASTM) provided that the appropriate fee is paid to the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923; Tel: 978-750-8400; online: <http://www.copyright.com/>.

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.

To make technical information available as quickly as possible, the peer-reviewed papers in this publication were prepared "camera-ready" as submitted by the authors.

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.

Foreword

The Symposium on Advances in Adhesives, Adhesion Science, and Testing was held in Washington, DC on October 4, 2004. The Symposium was sponsored by ASTM Committee D14 on Adhesives. The chairman was Dennis Damico. He also served as editor for this publication.

Contents

Overviewviii

Adhesive Bonding and Performance Testing of Bonded Wood Products—C R. FRIHART1

A New Low Cost Method for Measuring the Viscoelastic Behavior of Adhesives—D. J. MOONAY, R. G. MCGREGOR, AND R. A. MASTRIA, JR.13

Method for Quantifying Percentage Wood Failure in Block-Shear Specimens by a Laser Scanning Profilometer—C. T. SCOTT, R. HERNANDEZ, C. FRIHART, R. GLEISNER, AND T. TICE25

SED Method of Measuring Yield Strength of Adhesives and Other Materials—A. LENWARI, P. ALBRECHT, AND M. ALBRECHT35

Characterizing Dynamic Fracture Behavior of Adhesive Joints Under Quasi-Static and Impact loading—J. C. SIMÓN, E. JOHNSON, AND D. A. DILLARD53

Interfacial Diffusion of Fluids in Pressure Sensitive Adhesives—E. P. O'BRIEN, T. C. WARD ...72

Advanced Methods of Coating Adhesion Testing—N. V. GITIS, J. XIAO, AND M. VINOGRADOV80

Fracture Mechanics Applied to Adhesive Joints—G. E. WHEELER, B. S. MADSEN, AND K. L. DEVRIES85

The Study of Bond Strength and Bond Durability of Reactive Powder Concrete—M-G LEE, C-T CHIU, AND Y-C WANG104

Evaluation of Different Techniques for Adhesive Properties of Asphalt-Filler Systems at Interfacial Region—S-C HUANG, T. F. TURNER, A. T. PAULI, F. P. MIKNIS, J. F. BRANTHAVER, AND R. E. ROBERTSON114

New Technique for Measuring Extended Viscosity Ranges—Gel Times, Pot Life, or Cure Monitoring—with Programmable Rotational Viscometers or Rheometers—D. F. MOONNAY129

Overview

This symposium focused on new adhesives particularly from the perspective of newer test methods emerging to better determine adhesive reliability. Areas of particular interest included:

- Test methods and specifications that improve the ability to determine long-term bond durability,
- Bonding and debonding of wood products
- Test methods that generate more meaningful material information on adhesive reliability
- Method of measuring viscoelastic behavior of adhesives
- Accurate method of measuring yield strength of adhesives and other materials,
- Characterizing fracture properties of adhesive joints under impact loading conditions,
- Fracture mechanics applied to adhesives joints,
- Coating adhesion testing,
- Diffusion of fluids in pressure sensitive adhesives.

Information presented is of value to design engineers and those with interest in advanced test methods for adhesive validation.

The symposium also had a global focus more than ever before in bringing speakers from the U.S., Taiwan, and Republic of China.

Dennis Damico
Lord Corporation
Erie, Pennsylvania
Symposium Chairman and Editor

www.astm.org

ISBN: 0-8031-3489-4
Stock #: STP1463