Roofing Research and Standards Development

Second Volume

Wallace/Rossiter editors



STP 1088

Roofing Research and Standards Development: 2nd Volume

Thomas J. Wallace and Walter J. Rossiter, Jr., editors



Library of Congress Catalogue Card Number: 87–31938 ASTM Publication Code Number (PCN): 04-010880-57

ISBN: 0-8031-1393-5 ISSN: 1050-8104

Copyright © 1990 by the American Society for Testing and Materials. All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopy, recording, or otherwise, without the prior written permission of the publisher.

NOTE

The Society is not responsible, as a body, for the statements and opinions advanced in this publication.

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, Roofing Research and Standards Development: 2nd Volume, were presented at a symposium held in San Francisco, California, 17 June 1990. The symposium was sponsored by ASTM Committee D08 on Roofing, Waterproofing, and Bituminous Materials. Thomas J. Wallace, U.S. Navy, and Walter J. Rossiter, Jr., National Institute of Standards and Technology, served as symposium cochairmen and are editors of this publication.

Contents

Overview	1
ELASTOMERIC AND THERMOPLASTIC ROOFING SYSTEMS	
Characterization of Lap Seam Strength for In-Place and Laboratory Prepared EPDM Roof Membranes—CHRISTOPHER P. HODGES	5
Effects of Adhesive Thickness, Open Time, and Surface Cleanness on the Peel Strength of Adhesive-Bonded Seams of EPDM Rubber Membrane— HIROSHI WATANABE AND WALTER J. ROSSITER, Jr.	21
The Application of Thermal Analysis Techniques to the Characterization of EPDM Roofing Membrane Materials—GLEN D. GADDY,	
WALTER J. ROSSITER, JR., AND RONALD K. EBY	37
Evaluating Polymeric Roofing Membranes for Linear Dimensional Stability— LYLE D. HOGAN	53
Polyvinyl Chloride (PVC) Roofing: Preliminary Field Test Results— STUART FOLTZ AND DAVID M. BAILEY	63
Performance Study of Single Ply Roof Membranes in the Northeast United States—RICHARD H. PETERSON	82
Photovoltaic Single-Ply Roofing Membranes—HESHMAT O. LAALY	99
ANALYTICAL INVESTIGATIONS OF ROOFING SYSTEMS	
A Preliminary Investigation of the Biaxial Load-Strain Testing of Selected Roofing Sheet Materials—JAMES R. WELLS AND JEFFREY A. TILTON	117
Finite Element Analysis of Roofing Systems—MARK EASTER	138
Dynamics of Roofing Membranes in Wind—MEHDIS. ZARGHAMEE	152
Wind Test Methodology for Loose-Laid Roof Elements and Components— JORGE E. PARDO	163

vi CONTENTS

BITUMINOUS ROOFING SYSTEMS

Porosity of Glass Fiber Felts Used in Built-Up Roofing—CARL G. CASH	181
Statistics from Built-Up Roofing Sample Analyses—CARL G. CASH AND JUSTIN HENSHELL	190
Strain Energy and Elongation Behavior of Field Samples Taken from Polyester Reinforced Built-Up Roofs—RENE M. DUPUIS	210
Indexes	
Author Index	225
Subject Index	227