Volume I

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The papers in the "Proceedings" section are based upon the material the authors would have presented at the 2020 conference Architectural Plastics & Polymer Composites in the 21st Century: Design & Preservation of Contemporary & Historic Architecture that was cancelled due to the Covid-19 pandemic. Posters and the first section of supplemental material (Appendix A) follow the papers in this volume. The additional supplemental articles and items (Appendix B) and the CD – Understanding Polymeric Materials are contained in Volume II.

PROCEEDINGS

Plastics: A Brief Perspective on the Materials & Their Development
Committee on Plastics Education, Society of the Plastics Industry, Inc.

Conserving Plastics in Architecture: Challenges in Identification, Conservation, and Replication
Odile Madden, PhD, Margerita Pedroni, Chandler McCoy, AIA, and Janine Koeppen

The Monsanto House of the Future: A Creative Collaboration in Structural Plastics That Was Ahead of Its Time
Roger N. Goldstein, FAIA, and Glenn R. Bell, PE, SE, FSEI

Polymer Materials in Architectural Applications: Building on Traditional Knowledge and Innovative Technologies in Materials Selection for Long-Term Success
Michael Dimitriou, PhD, Jericho Moll, PhD, and Maureen Reitman, ScD, PE

Carbon>Building: Toward a Carbon Ontology
Prof. Mark Goulthorpe

Emerging Roles for Polymers in Glazing, Windows, and the Building Façade
Stephen Selkowitz

Fire and Composites: The Path Forward
Alexander B. Morgan, PhD

Traditional Polymer Materials in Innovative Architectural Applications: Understanding How Advances in Design Affects the Materials Selection Process
Christopher White, Ph.D, Michael Dimitriou, PhD, Jericho Moll, PhD, and Maureen Reitman, ScD, PE

Conservation and Restoration of the Great Pagoda at Kew: The Re-creation & Reinstatement of the Iconic Structure’s Lost Dragons through Research, Craftsmanship, and Innovation
Craig Hatto, FRSA

Appropriateness of Synthetic Materials in Historic Districts
Charles Sullivan

Restoration of an Original Buckminster Fuller Dome: Restoring a Forgotten Piece of Architectural History
Eric Goetz

Preserving Plastics: An Evolving Material, a Maturing Profession
Odile Madden, PhD, and Dr Thomas J. S.Learner

The Eden Project: The Genesis of Eden
Andrew Whalley, RIBA, FAIA, FRSA

The Use of Plastics and Polymer Composites for Structural and Other Building Components
Edmund P. Meade, PE, FAPT

The Museum of the Future: Engineering an Iconic Façade
Benjamin J. Leslie, CPEng., IntPE, APEC Engineer

Weathering of GRP: Field Assessments and Surveys
John A. Fidler, RIBA, IHBC, Intl. Assoc. AIA, FRICS, FSA, FRSA, FIIC, FAPT

Herman Miller Furniture Factory to Bath Spa School of Art and Design
Andrew Whalley, RIBA, FAIA, FRSA

Advances in Plastics and Polymer Composites Fabrication
Justin Jin

Glass-Reinforced Plastic: Architectural Uses for an Industrial Material
Andy Groarke, Lukas Barry, and Ana Maria Ferreira

National Aquatics Center: The Water Cube
ETFE Building Physics
Haico Schepers

Germany’s First 3L Renovated Homes: Revitalization of the Brunck District in Ludwigshafen, Germany
Justin DeMarco, CSI, CDT

Conservation of GRP Buildings, Towards a Future Heritage Strategy
Robert Loader, RIBA, ARB

Architectural Use of Advanced FRP Systems: Creating Unique Roof and Dome Structures
Dr. Mark Hobbs, CEng, MRINA

Building Without Tradition – A Musing on Plastics, Newness and Authenticity
David N. Fixler, FAIA, FAPT, LEED
APPENDIX A – Posters & Supplemental Material #1

Some Plastics Timeline Highlights from the 1930s to the mid-1960s
NIST - BEES Online 2.1 – Building for Environmental and Economic Sustainability
Commonly Used Abbreviations for a Range of Plastics
Terminology – Brand/Trade Names of Some Commonly Used Plastics
Some Additional References – Books, Articles, Professional Societies
The POPART Project
Material Properties – A 3-D Slice through Material Property Space
Properties of Various Materials Used in Construction – Comparison Chart
Bridge Construction: Plastics Used in the Building of Vehicular & Pedestrian Bridges (Information on innovations in 3D equipment and printing of bridges is included.)
Halley VI Antarctic Research Station: GRP Cladding for an Extreme Environment
  Hugh Broughton
PES Tensile Mesh with Protective PVC Coating for Ventilated Façade Screens, Sun Shades, and Other Applications (Details are provided on the material, plus case histories, e.g., the printed mesh façade screen of Rice University’s new garage building.)
Polymeric Materials in the Restoration of Lost Architectural Details
  David W. Torrey, AIA
Cast Steel Connections for Lightweight Structures
  Castconnex
The Use of PVC in a Variety of Architectural Structures (Case histories involving educational, religious, industrial, airport, social club and athletic facilities as well as a pavilion and an art work installation are detailed.)
ETFE - Use as a building membrane/cladding material with information on applications including the monumental entertainment center in Kazakhstan and stadiums in New Zealand, Singapore, and the United States
Preserving Plastics in the Collection of the Harvard Art Museums
  Georgina Raynor, Susan E. Costello, Angela Chang, and Elizabeth La Duc
The ArtLab: A Flexible Polycarbonate Building
Futuro: Rescue, Relocation, and Restoration Challenges
  Milford Wayne Donaldson, FAIA

NOTE: Any paper, article, or other literature contained in Volume I or in Volume II that is not attributed to an author/authors, or to a company/organization, has been produced by Susan E. Schur for this publication.
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APPENDIX B

Supplemental Material #2

Recyclability & Properties Chart for Plastics
Fossil Fuels, The Building Industry & Human Health: Evaluating Toxicity in Architectural Plastics
   Franca Trubiano, Chloe Onbargi, Antonio Rinaldi, and Zachary Whitlock
Formaldehyde: Housing Applications
   American Chemistry Council
Paint and Coating Guide
   Mark Edwards
Acrylic Emulsion Technology: From Plastics to Paints It Changed Our World
   American Chemical Society
Plastic Identification Tool
Strategy for the Preservation of Plastic Artefacts in Museum Collections: Final Report -Executive Summary
Surface Cleaning/Graffiti Removal from Art Work and Architecture
Nanomaterials and the Nanorestart Project: A Challenging Three Year Project
Fire Test and Fire Safe Material Development
   University of Dayton Research Institute
Counting Carbon: Low Global Warming Potential Blowing Agents for Closed Cell Spray Foam
   Spray Polyurethane Foam Alliance
Spray Polyurethane Foam Roofing Takes Center Stage in an Historic Theater’s Second Act
   Spray Foam Coalition
Carbon Fibers
Polycarbonate in Construction
   Kenneth Schwartz
Styrene – Fact Sheet
   Styrene Information and Research Center
FRP in Architectural Applications
Yitzhak Rabin Center: Innovation in Composite Use
The Bakelizer: A National Historic Chemical Landmark
Monsanto House of the Future – Recap
   Roger N. Goldstein, FAIA, LEED AP and Glenn R. Bell, PE, SE, FSEI
Building with the Power of Plastics
   American Chemistry Council
Plastic Pipe
BIPV Technologies & Market Overview
   Build Up
More Sustainable Construction with Plastic Materials
   Modern Building Alliance
Embodied Carbon in Buildings – Facts & Figures
   Carbon Leadership Forum
Embodied Carbon in Construction Calculator (EC3) Tool
   Carbon Leadership Forum
Neopor® – Innovation in Insulation
   BASF
Technology & Conservation – Listing of Available Back Issues and Materials from Past Conferences
The Use of Substitute Materials on Historic Building Exteriors (Preservation Brief 16)
   Sharon C. Park, AIA
Safe Plastics & Fabrics for Exhibit & Storage
   National Park Service, Janet Pasiuk

CD: Understanding Polymeric Materials
The CD contains the full content of 43 historic and contemporary publications.

Any paper, article, or other literature contained in Volume I or in Volume II that is not attributed to an author/authors, or to a company or organization, has been produced by Susan E. Schur for this publication.