



Technical Papers Listing

Complete sets of Technical Papers from past Annual Meetings are available on CD for \$100 each. See the listing below of Technical Papers presented at each meeting and the market-focused committee that secured each paper.

Note: TRFA members can download and print complimentary copies of TRFA technical papers and presentations from the members-only website.

2011 Technical Papers:

- *Baked Melamine Coatings Based on a Renewable Polyhydroxythiol*, Chevron Phillips Chemical Co. (Coatings, Civil Engineering, Flooring)
- *Chemistry and Performance of Epoxy Modifiers – A Review*, Cypress Chemical Consulting (Adhesives & Sealants)
- *Energy Storage for Smart Grid and Other Applications Using Composite Fly Wheels*, Huntsman Advanced Materials (Potting, Encapsulation, Electrical)
- *The Use of Polyphenylene Ethers with Epoxy Resins – A Review*, Sabic Innovative Plastics (Potting, Encapsulation, Electrical)
- *Molecular Weight Distribution of Epoxide-Amine-Adducts and Methods for Determining Them*, Evonik Degussa GmbH (Composites & Tooling)
- *Effect of Cure Temperature on Thermal and Mechanical Properties of PACM Cured Epoxy for Structural Composites*, Air Products & Chemicals (Adhesives & Sealants)
- *Application of Modified Polyetheramines as Epoxy Hardeners*, Huntsman Advanced Materials (Coatings, Civil Engineering, Flooring)
- *Novel Attributes of Nano Graphene Platelets (NGPs) for Enhancing Electrical and Mechanical Properties of Epoxy Composites*, Zyvex Technologies (Potting, Encapsulation, Electrical)
- *Subtle Epoxy Resin Details in Troubleshooting High Performance Epoxy Systems*, Cypress Chemical Consulting (Coatings, Civil Engineering, Flooring)
- *Greener Composites via CO₂-Based Vinyl Ester Resins*, Novomer Inc. (Composites & Tooling)
- *Mechanical Properties of the Adhesive Matrix and Their Influence on Adhesive Performance*, LORD Corporation (Adhesives & Sealants)
- *Advanced Epoxy Resins with Enhanced Toughness for Demanding Applications*, Dow Chemical Company (Coatings, Civil Engineering, Flooring)

2010 Technical Papers:

- *On Site Repair of Wind Blades: Opportunities for Thermoset Resin Formulators*, ITW Plexus (Composites & Tooling)
- *Toughened Epoxy-Anhydride Systems for Thermoset Applications*, Dow Chemical Company (Coatings, Civil Engineering, Flooring)

- *Shed Hydrophobic Cycloaliphatic Epoxy (S-HCEP): A New Semi-Flexible Material for Outdoor Electrical Applications*, Huntsman Advanced Materials (Potting, Encapsulation, Electrical)
- *Phosphazene Flame Retardants as a Green Chemistry to Replace Halogen-type Flame Retardants*, DKSH North America (Adhesives & Sealants)
- *Evaluating the Use of Accelerators in Phenalkamines for Improving the Low Temperature Cure Properties*, Royce International (Potting, Encapsulation, Electrical)
- *The Roles of Polyaryleneethynylene (Kentera™) on Multiwall Carbon Nanotubes in Epoxy Resin Formulations*, Zyvex Performance Materials (Composites & Tooling)
- *New Epoxy Hardeners for 2K Systems*, Dow Chemical Company (Coatings, Civil Engineering, Flooring)
- *Direct Writing of Nanoscale Patterns of Nanoparticles and Polymer-Nanoparticle Composites (and Graphene)*, US Naval Research Lab (Potting, Encapsulation, Electrical)
- *Utilization of Clay-Carbon Nanoparticle Synergy for Enhancing Electrical and Mechanical Properties of Epoxy Composites*, Texas A&M University (Excellence in Thermoset Polymer Research Award Winner)
- *Bio-derived Urethane Additive Chemicals*, Huntsman Corporation (Adhesives & Sealants)
- *PPE Macromonomers-Performance Enhancement of Thermoset Resins*, Sabic Innovative Plastics (Potting, Encapsulation, Electrical)
- *New 100% Solid POS Industrial Tinting System and It's Effects on Solvent Borne Coatings*, Elementis Specialties (Coatings, Civil Engineering, Flooring)
- *Rheology Survey of Surface Treated Fumed Silicas in DGEBA*, Evonik Degussa (Adhesives & Sealants)
- *Development of Innovative Epoxy Prepregs using Bio-Based Curing Agents*, Composite Technical Services LLC (Composites & Tooling)
- *New Amine Hardener for Rapid Curing and Highly Chemical Resistant Coatings*, Huntsman Advanced Materials (Coatings, Civil Engineering, Flooring)

2009 Technical Papers:

- *Advances in Epoxy Technology for Windmill Blade Composite Fabrication*, Dow Chemical Company (Coatings, Civil Engineering, Flooring)
- *Flame Retarded Thermoset Materials based on Phosphorus Chemistry*, Clariant Corporation (Coatings, Civil Engineering, Flooring)
- *Novel Toughened High Performance Vinyl Ester Resins*, Hexion Specialty Chemicals (Composites & Tooling)
- *New Products: XTA-770 and XTA-796 as Alternatives to AEP and ACCELERATOR™ Accelerator for Epoxy Resin Polymerization and Illustrations of Some Structure-Property Relationships*, Huntsman Corporation (Composites & Tooling)
- *Improved Low Temperature Performance of Epoxy Adhesives*, CVC Thermoset Specialties (Coatings, Civil Engineering, Flooring)
- *Next Generation Fire-Retardant Prepreg Formulation for Mass Transportation Applications*, Gurit UK (Composites & Tooling)
- *Storage-stable NDI Prepolymers: Elastomers with Superior Mechanical & Dynamic Load-Bearing Characteristics*, Baulé USA (Potting, Encapsulation, Electrical)
- *Behavior of Solid, Core-Shell-Rubber Nanospheres, Singly Dispersed in Thermoset Composites*, Kaneka Texas Corporation (Composites & Tooling)
- *Aliphatic 2-Component Polyurea and Hybrid-Polyurea-Polyurethane Sealants*, Bayer MaterialScience (Adhesives & Sealants)

- *A Stable Dispersion of a Polymerized Elastomeric Phase in Epoxy Resin for Enhanced Physical Properties*, Innovative Resin Systems (Potting, Encapsulation, Electrical)
- *High-Temperature Epoxies Enhanced by Polyhedral Oligomeric Silsesquioxane (POSS) Molecules*, Hybrid Plastics (Composites & Tooling)
- *Benzoxazine Technology and New Products from Huntsman*, Huntsman Corporation (Potting, Encapsulation, Electrical)
- *Polybutadiene Resins in Re-Entrable Encapsulants*, Sartomer (Adhesives & Sealants)
- *Opportunities for Thermoset Resins in the Wind Energy Market*, Lucintel (Composites & Tooling)

2008 Technical Papers:

- *Tailor-Made Polyhedral Oligomeric Silsesquioxane (POSS) Molecules for Thermoset Resins*, Hybrid Plastics Inc. (Composites & Tooling)
- *Novel Epoxy Toughening for Coatings & Composites Applications*, Dow Epoxy (Coatings, Civil Engineering, Flooring)
- *High Performance-NanoParticles-EcoFriendly: Innovative base epoxy resins enabling a new generation of Composite*, Nanoledge, Inc. (Potting, Encapsulation, Electrical)
- *Nanostrength Block Copolymers for Epoxy Toughening*, Arkema Inc. (Coatings, Civil Engineering, Flooring)
- *Silica Nanoparticles & Rubber Toughening – a Synergy in Adhesives & Composites Applications*, nanoresins AG (Coatings, Civil Engineering, Flooring)
- *Thermoset Solutions for Fuel Cell Seals*, Ballard Power Systems (Potting, Encapsulation, Electrical)
- *Mixed Mineral Thixotropes – A New Class of Additives for Molded Thermoset Systems*, Southern Clay Products (Coatings, Civil Engineering, Flooring)
- *Opportunities for Thermoset Resins I the Composites Industry*, Lucintel (Composites & Tooling)
- *Structural Strengthening of Concrete with FRP Composites*, Sika Corporation (Coatings, Civil Engineering, Flooring)
- *Healable, Shape Memory Polymers for Reflexive Composites*, Cornerstone Research Group (Composites & Tooling)
- *Novel Latent Curing Agents for Thermoset Resin Applications*, Air Products & Chemicals (Coatings, Civil Engineering, Flooring)
- *Nylon Nanocomposites in Flexible Packaging Applications*, Nanocor (Composites & Tooling)
- *Alternatives in Toughening*, CVC Thermoset Specialties (Adhesives & Sealants)
- *Innovative Amine Curing Agents for Epoxy Resins*, Hexion Inc. (Coatings, Civil Engineering, Flooring)

2007 Technical Papers:

- *Advances in Intumescent Coatings*, Broadview Technologies (Coatings, Civil Engineering, Flooring)
- *Wood Composite Overlay*, CPD Construction Products (Coatings, Civil Engineering, Flooring)
- *Low Emission Epoxy Vinyl Ester Resin in Pultrusion*, Ashland Performance Materials (Composites & Tooling)
- *Green Chemistry Does Not Fear Humidity in a Floor* (Cardolite Corporation)
- *Fast Curing Polyurea Sealants; Controllable Reactivity with Commercially Available Secondary Amines*, Bayer Material Science (Adhesives & Sealants)

- *Demonstration of Military Composites with Low Hazardous Air Pollutant Content*, US. Army Research Lab (Composites & Tooling)
- *Joining of Medical Plastics Using Atmospheric Discharge Pretreatments of Adherents Prior to Adhesive Bonding*, Enercon Industries Corp. (Adhesives & Sealants)
- *Regulatory Affairs/VOC Update*, Air Products & Chemicals (VOC Task Force)
- *A New Cycloaliphatic Amine for Coatings and Composites Applications*, Dow Chemical Company (Coatings, Civil Engineering & Flooring)
- *Thermoset Curing Schedule and its Affect on the Final Properties*, Mettler-Toledo (Composites & Tooling)
- *Cycloaliphatic Epoxy Resins*, Huntsman Advanced Materials (Potting, Encapsulation, Electrical)

2006 Technical Papers:

- *Fast Curing Anticorrosion Primers for Steel Protection*, Cardolite Corporation (Adhesives & Sealants)
- *(Meth)Acrylic Structural Bonding in Modern Vehicle Assembly*, Henkel Corporation (Non-Epoxy)
- *Thermal Degradation of Carbon Fiber/Cyanate Ester Resin Composites Filled with Clay Silicate Nanoparticles*, University of Delaware Center for Composite Materials (Composites & Tooling)
- *A Novel Polyfunctional Epoxy Resin with High Heat Resistance and Mechanical Properties*, Aditya Birla Chemicals (Thailand) (Composites & Tooling)
- *Garage Floor Coatings; Identifying Waterborne Epoxies with Optimum Handling and Performance Properties*, Air Products & Chemicals (Adhesives & Sealants)
- *Long Term Durability Testing Machine for CPD Polymer Flooring*, CPD Construction (Coatings, Civil Engineering, Flooring)
- *Novel Epoxy Toughening Technology*, The Dow Chemical Company (Coatings, Civil Engineering, Flooring)
- *Thermoset Epoxy Polymer Concrete for the Fabrication of Chemical Containment Vessels*, Cappar Limited (Coatings, Civil Engineering, Flooring)
- *Thermoset Resins in Production Boatbuilding*, Pro-Set Epoxy (Composites & Tooling)
- *Growing More Ductile Epoxies: An Essential Work of Fracture Study*, Stonhard Division of the StonCor Group, Inc. (Adhesives & Sealants)
- *The True Polyurea Spray Elastomer Story: Chemistry, Advances and Applications*, Primeaux Associates LLC (Coatings, Civil Engineering, Flooring)
- *Azyrals: New Polybenzoxazine Chemistry for Building Composites*, Huntsman Advanced Materials Division (Potting, Encapsulation, Electrical)
- *Formulating High-Performance Waterborne Epoxy Coatings*, Hexion Specialty Chemicals ((Coatings, Civil Engineering, Flooring)
- *Effect of Index on Curing Kinetics and Rheology of Polyurethane Gels*, Huntsman Polyurethanes (Coatings, Civil Engineering, Flooring)

2005 Technical Papers:

- *New Developments in Polyetheramine Curing Agents*, Huntsman Advanced Materials (Coatings, Civil Engineering, Flooring)
- *Epoxy, Urethane, Silicon: Choice of Encapsulate for High Reliability Magnetic Components*, Sandia National Laboratories (Potting, Encapsulation, Electrical)

- *New Concept of Water Based Epoxy Adduct for Water Reducible Epoxy Formulation Dimensionally Stable and Shape Retentive*, Cognis Italy S.p.A. (Coatings, Civil Engineering, Flooring)
- *Halogen Free Epoxy Resin for High Performance Electronic Applications*, Thai Organic Chemicals Co., Ltd. (Potting, Encapsulation, Electrical)
- *Kaneka Core-Shell Toughening Agents for Thermosetting Resins*, Kaneka Texas Corporation (Composites & Tooling; Adhesives & Sealants)
- *Utilizing a Design of Experiments Approach to Nonskid Coating Formulation*, Applied Research Lab, Penn State University. (Coatings, Civil Engineering, Flooring)
- *Di- and Tri-functional Epoxides as Reactive Diluents in Epoxy Systems*, Royce International (Potting, Encapsulation, Electrical)
- *Epoxy systems for Applications Below Zero Degrees Celsius*, Huntsman Advanced Materials (Potting, Encapsulation, Electrical)
- *The Chemistry and Application of Intumescent Agents for Use in Epoxies and Self Crosslinking Styrene-Acrylic Monomers*, Broadview Technology (Coatings, Civil Engineering, Flooring)
- *Nanostrength™ Block Copolymers: Improving Toughness on the Nanometer Scale*, Arkema Inc. (General)
- *Higher Performance Raw Materials for Improved Polyurea Properties*, The Hanson Group LLC (Coatings, Civil Engineering, Flooring)
- *Novel Waterborne Epoxy Curing Agent Technology*, Air Products & Chemicals (Coatings, Civil Engineering, Flooring; Adhesives & Sealants)

2004 Technical Papers:

- *Epoxy Resin Infusion Systems for Large Scale Composites*, Jeffco Products (Composites & Tooling)
- *Selecting the Appropriate Performance Additives*, Material Apps LLC (Adhesives & Sealants)
- *Post-curing Effects on VARTM FRP Composite Material Properties*, Virginia Tech (Composites & Tooling)
- *Bonding of Epoxy Encapsulants to Thermoplastic Substrates*, Huntsman Advanced Materials (Potting, Encapsulation, Electrical)
- *Global Epoxy Market Dynamics*, The Dow Chemical Company (General)
- *Vortex Mixer*, State Mix (Potting, Encapsulation, Electrical)
- *New Water Based Amine Technology for Epoxy Application Over Green Concrete*, Air Products & Chemicals (Coatings, Civil Engineering, Flooring)
- *Productivity on Purpose: A marriage of chemistry and machinery keeps inline skate wheel production in the United States*, ITWC Inc. (Potting, Encapsulation, Electrical)
- *Nonskid Coating Formulation Utilizing a Design of Experiments (DOE) Approach*, Applied Research Lab, Penn State University (Coatings, Civil Engineering, Flooring)
- *Adhesives and Potting Compounds for High Service Temperature in Automotive Electronics Applications*, Emerson & Cuming (Potting, Encapsulation, Electrical)
- *Properties & Effects of Chemically Modified Bis A Epoxy Resin for Cure Acceleration*, CVC Specialty Chemicals (Coatings, Civil Engineering, Flooring)

2003 Technical Papers:

- *Phenalkamines in Concrete Applications*, Cardolite Corporation.
- *Polyurea Overview*, Sherwin Williams/General Polymers.
- *Novel Technology for Water Vapour Permeable Floor Coatings*, Air Products & Chemicals
- *Overmolding Material & Process for Electronic Module Assemblies*, Bayer Corporation.
- *The World of Epoxy Adhesives*, DPNA International Inc.
- *The Fracture Behavior of Filled Epoxies*, Lehigh University.
- *Secondary Amines for Aliphatic Polyurea Polymers*, Huntsman Corporation.
- *Fluorescent UV Weathering Devices (QUV) vs. Xenon Weathering Devices (Q-Sun)*, Q-Panel.
- *Anti-Float Technology for Floor Coatings – A Seamless Solution*, Rebus, Inc.
- *Reactive Resins: Uses in Construction*, Sika Corporation.