

Polymers, Laminations and Coatings Division meets in San Diego

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Approximately 550 registrants enjoyed a very successful Polymers, Laminations and Coatings Division Conference on September 3-6 at the San Diego Marriott Hotel and Marina in California.

Thomas Bezigian, PLC Technologies, who was the technical program chairman, put together a program of 24 sessions with the assistance of 21 session developers. The sessions covered a wide range of topics of current interest ranging from "New Microwaveable Packaging Technology" to "Hot Topics in Printing." Registrants scurried from one concurrent session to another during the four days of meetings as they tried to acquire as much information as possible from the more than 120 speakers and panel discussion members. The two-volume set of conference proceedings given to each attendee also gave them a chance to gather information from sessions they did not hear firsthand.

Pressure-sensitive adhesives

With the recent formation of the Pressure Sensitive Adhesives Committee and the planned emphasis by the Division on this area of technology, a number of papers on these adhesives were presented during the course of the 1991 conference. Arthur Rogove, Release Technologies, Inc., gave a comprehensive review of release surfaces used with the pressure sensitive adhesives.

Adhesives formulation was the topic of two papers which discussed UV stabilizers and styrenic block copolymers. Larry Gwin and Christopher Zoky, Franklin International, presented "Removable Pressure Sensitive Adhesives For Food Packaging Applications," and Peter Merkel and Susan Lydzinski offered "Advances In High Performance Waterborne PSAs."

In a related area, hot-melt adhesives were the subject of six papers. Andres Sustic and Brian Pellon, Rexene Products Co., demonstrated the versatility of amorphous poly-alphaolefins in selected hot-melt adhesive formulations. Bruce Foster and Alicia Barrett, Texas Eastman Co., showed a method to confirm reported hot tack differences between adhesives.

"Formulation of HMA Based on Butene-1 Polymers" by C.C. Hwo *et al.*, Shell Development Company, gave the

TAPPI Vice President **Ronald B. Estridge**, of James River Corp., addressed the audience and presented awards during the 1991 TAPPI Polymers, Laminations and Coating Conference luncheon and awards ceremony.



results of an extensive experimental design wherein this raw material was incorporated to give performance properties such as peel strength, shear adhesion, and performance on certain substrates. Likewise George W. Prejean, Du Pont Co., in his designed experiments, showed how a grafting technique for ethylene copolymers could produce an adhesive which allowed tailoring viscosity, open time, high and low temperature performances, and tensile strength.

Ronald Schultz, RBS Technologies, Inc., chaired a session entitled "Coating and Sealant Technology in Health Care Packaging" in which the technical challenges of sterilization methods, packaging materials, and end-user demands on package sealant technology were addressed by seven papers. Jim Komerska, Komerska Enterprises, Inc., reviewed the compatibility of packaging materials as well as package design with ethylene oxide, wet and dry heat, electron beam, and gamma radiation forms of sterilization. George Scanlan, Du Pont Co., and Joseph Bason, Fletcher Paper Co., submitted presentations on spunbonded polyolefin and kraft papers, respectively, in health care packaging applications. The popularity of hot-

melt adhesives for a wide variety of medical device packaging uses was evident with the presentation by Donald Reinke, Oliver Products Co.

Environmental considerations

Considering the current importance in the converting industry of environmental considerations it is not surprising that five papers and one entire session used the word "environment" or some derivative in their titles, and many others touched on environmental concerns and pressures. "Practical Environmental Solutions to Solvent Coating Processes" by Donald Broadhead, Black Clawson Co., and "Presenting the Facts About Rigid Vinyl and the Environment" by Richard Ryder, Klockner-Pentaplast of America, are but two examples.

In "Environmentally Conscious Hot Melt Adhesives" Thomas Kauffman, National Starch & Chemical Co., showed how the use of a class of graft copolymers of various vinyl monomers can alleviate the formation of stickies in the repulping of paper stocks. Such copolymers can be used in multiwall bag hot melts, bookbinding hot melts, and roll wrap hot melts.

Ronald Wence, Dow Chemical USA, was the substitute chairman for a session on solid waste/environmental issues. This was a panel discussion in which David Hartley, California Department of Health Services, spoke on the "movement to waste minimization." He suggested the following steps companies can take to prepare for anticipated source reduction legislation, reduce their waste by 30%, and save money:

- Establish a *management commitment* to pollution prevention including a written corporate policy, pollution prevention teams, and training for employees.
- Make a *pollution prevention assessment* of practices that generate waste, types, and quantities of waste emissions; establish priorities; and investigate options to control emissions.
- Adopt *inventory control* methods such as Just-In-Time purchasing and first in-first out; assign responsibility/accountability to one person; schedule runs to minimize press cleaning; use vendors who will accept unused materials for recycling.
- Perform *cost accounting* on waste by assigning waste-generating costs to specific machines or departments and discussing waste-generating costs with clients as a means to develop options which produce less waste.
- Practice *good housekeeping* to prevent leaks and spills and wasted materials; segregate waste materials for better recyclability; mix unused materials in low-grade or low-quality runs.

The panel representative from Du Pont, Scott Fritschel, was one of three who presented position papers on high-barrier multilayer packaging as a solid-waste problem. A

Nick Schott, of the University of Lowell in Massachusetts, accepted the \$1000 Ralph A. Klucken Scholarship Award for Carlos E. Hinton, who is studying plastics engineering at the university.



Special recognition was given during the 1991 TAPPI Polymers, Laminations and Coatings Conference to (L-R) Conference Chairman **David J. Bentley Jr.**, **Patricia C. Barton**, and **Ray Edwards**. Bentley was presented with the Division's Leadership and Service Award and the \$1000 Andreas G. Ahlbrandt Prize. Barton, who has served as TAPPI meeting administrator, was awarded a Special Certificate of Appreciation, and Edwards received the Division's Technical Award, the \$1000 Sam Zweig Prize, and the Best Session Award and a Best Paper Award for the 1990 conference.



significant point to him is that only about 1% by volume of the municipal solid-waste stream is multilayer plastics. The perception by the public, however, is that this is considerably larger.

The concluding portion of the session addressed questions from the audience ranging from the relatively simple "What do you do with ash after incineration?" to the more complex "How does one promote a product nationwide when recycling regulations may differ by locale?" In the first case, ash is simply sent to a landfill, although it is

often segregated there to eliminate the potential of heavy metal leachate. The panelists agreed there was no real answer to the second question and alluded to the fact that the courts may have to decide the issue at some point. Environmental issues affecting PVDC materials such as their use as foil replacements and their acid generation during burning also were topics of the question-and-answer portion of this session.

Session Developer Ronald Lombardi, ICI Resins US, assembled six speakers who addressed methods to comply with air quality regulatory requirements. James Full, Morton International, discussed the dry bond laminating process using high solids, 100% solids, waterborne, and high energy cure adhesives with the constraints and economics peculiar to each, but noted that the marketplace will continue to require solvent-based high performance adhesives in the near and medium term. Karen Neal, ICI Resins US, cited the Clean Air Act Amendments of 1990 in her review of regulations governing emission of volatile organic compounds (VOCs) especially as these are enforced by the Southern California Air Quality Management District. Under the title "Solventless Lamination: The Modern Answer to Lamination," Wallace Nard, Ameriflex Group, Inc., noted that of 200 or so solventless laminators in use worldwide, only 10% are used in the United States. Through a description of the process and various installations, he sought to present this approach to converters as a viable alternative to their present coating operating techniques.

Extrusion sessions

Three sessions were devoted to film extrusion, and five sessions concerned extrusion coating. As session developer, Rick Knittel of Sano, Inc. continued the popular series begun a few years ago in which selected papers from the 1991 SPE ANTEC meeting were offered to present the latest state-of-the-art information on various topics in film extrusion technology. These consisted of "Film Properties and Applications for LLDPE and High Pressure LDPE Blends" by Frank Velisek, Mobil Chemical Co.; "Economical Breathable Films for Medical and Consumer Soft Goods" by C. T. Lue and R. C. Portnoy, Exxon Chemical Co.; "The Effect of Fabrication on Cling and Stretch Properties of LLDPE Film" by George Panagopoulos Jr. *et al.*, Dow Chemical USA; "LLDPE Resins for High Output Blown Film Extrusion" by David Cooke and Mike Koyich, Novacor Chemicals; and "Effect of Photo-degradable Additives in HMW-HDPE" by A. K. Bose, Union Camp Corp.

In the area of extrusion coating Dragan Djordjevic, Er-We-Pa Maschinenfabrik GmbH, gave a comprehensive, technical presentation on "Screw Design Evaluation." Frank Orsini, Egan Machinery Division, in "Equipment and Procedural Considerations for Running Acid Copolymers in Extrusion Coating" suggested safe operating procedures for converters to follow in handling these

corrosive materials.

Edwina Mitchell and Bernard Bossaert, Donald Charboneau and Joseph Domine, and Dirk Van der Sanden and Richard W. Halle, all from Exxon Chemical Co., discussed specific extrusion coating resins including polypropylene, acid terpolymers, and linear ethylene polymers. Other polymer systems were cited in studies by Laura Mergenhagen of Dow Chemical USA and John W. Spink *et al.*, Chevron USA. Nick Schott, University of Lowell, *et al.* presented three papers which formed a comprehensive overview dwelling in depth on the polymer chemistry, rheology, and processing of extrusion coating. Similarly Djordjevic presented a second paper in which he examined the care and handling of polyester resin in extrusion coating.

Microwave packaging

The U.S. Food and Drug Administration's (FDA) current concerns regarding regulation of packaging materials used in microwave applications were the impetus behind the development of a session by B. R. Vijayendran, PPG Industries, Inc. called "Regulatory Developments and Testing Procedures for Microwave Packaging." Michael Adams and Edward Machuga of the FDA discussed their organization's evaluation of microwave packaging materials. Charles Breder, Keller and Heckman, summarized the history of the Susceptor Microwave Packaging Committee of The Society of the Plastics Industry and the information it presented to the FDA. William Rose of The National Food Processors Association, Patricia Sackett *et al.* of The Pillsbury Co., and Jonathan DeVries of General Mills, Inc., contributed three papers in which they examined the extractives which can occur when various packages are subject to microwave heating. Nancy Smith's session on "New Microwavable Packaging Technology" gave information on package design considerations, the use of aqueous laminating adhesives, and attempts to solve uneven heating problems.

In the high-barrier packaging area, Robert Demorest of Modern Controls, Inc., discussed "Recent Developments in Testing the Permeability of Good Barriers." Virginia Cushing *et al.* of Micra Corp. discussed the use of ethylene vinyl alcohol dispersions to displace the previously used polyvinylidene chloride in applications requiring high-barrier properties. These dispersions also offer good enough barrier characteristics to consider in lieu of a foil substrate or a metalized substrate.

Polymers as flavor barriers and transmitters were discussed in papers by Rodney C. Mason *et al.* at Central Michigan University, who looked at diffusion of flavors; William Glick *et al.* of Du Pont Co., who looked at taste imparted from ethylene acid copolymers; and J. S. Paik *et al.*, University of Delaware, who compared flavor sorption by various polymeric heat sealants. Paik concluded that the major cause of flavor component loss in a pouch is sorption by the sealant layer.

Printing

The two sessions in the 1991 Polymers, Laminations and Coatings Division Conference devoted to printing included a presentation by Kenneth Barton, Eastman Chemical Co., on the use of sulfo polyesters as a water dispersible resin for compounding inks and one by Robert O'Boyle, Sun Chemical, on the formulating techniques for preparing inks with low VOC emissions. In addition, Thomas Gilbertson, Enercon Industries Corp., discussed the co-operative efforts which are needed among resin supplier, ink supplier, and surface treatment equipment supplier to achieve successful printing with water borne inks. J. Robin Rappolt, Bobst Group, Inc., provided a description of a concept which can be used by gravure printers to keep costs of job changes low and therefore make short runs more economical.

Adhesives of all sorts were an important part of this year's conference. Accordingly, flexible packaging laminating adhesives were the topic of a number of papers. Louis Graziano *et al.*, Rohm and Haas Co., discussed "New Advances in One Part Aqueous Adhesives For Snack Food Lamination." David Zimmer *et al.*, Lord Corp., in their presentation, "Pigmented Adhesives For Flexible Packaging Laminating," offered manufacturers of opaque constructions a technique to prepare many different colors without the attendant inventory of costly, pigmented films. B. Ramalingam *et al.*, Century Adhesives Corp., provided an insight into the use of statistical methods and experimental design to develop adhesives for the flexible packaging industry. Patrick W. Hardy, et al, Ciba-Geigy, offered insights on film and foil lamination using ultraviolet curable adhesives.

One of the final sessions on Friday morning was a panel discussion entitled "Current Topics in Midwest Converting," which was chaired by Roger Isbister, Morton International. There were three converters and two suppliers on the panel who began by presenting a brief position paper in their particular area of expertise. Tom Mueller, Cellu Craft, Inc., noted that the challenges which face all converters are categorized into material, environmental, customer, or supplier issues. In the environmental area, he stated that Cellu Craft consolidated two plants in the Chicago area into one rather than cope with the prohibitive cost of compliance with the regulations mandated by the EPA in Region V.

Stating that "we have a challenge that we have created," James Guse, James River Corp., explained the requirement to meet customer needs determines the end-user properties that converters must tailor their products to satisfy. For example, the customer's desire for convenience may lead to the end user seeking easy open packaging, to which the converter responds with a customized sealant. Guse felt coextrusion offered the best current technique to respond to many requirements. Richard Bashford, Werthan Industries, gave an overview of metallized paper, a newer substrate which is finding use for labels, overwraps, halograms, electrosensitive and deco-

rative products. Jeffrey Deitch, Morton International, commented on dry bond laminating adhesives including aqueous technology, 100% solids systems, and recent developments in the older solvent systems.

Tom Stelling, Curwood, Inc., addressed recycling at the converter level. His organization internally recycles 15 million pounds of scrap per year and sends 28 million pounds per year to landfill. On a long-term basis, they are investigating incineration as an alternative to the landfill. Shorter term, they are finding specific markets for unmixed segments of their waste stream and, in some cases, even more complex scrap such as nylon/polyethylene blends to make plastic cores for in-plant use. These and other procedures have kept 6 million pounds of scrap out of the landfill while also generating income for Curwood.

To a question from the audience, the panel said a decline in the number of converters can be expected, in part as the result of the cost of complying with environmental regulations. In response to another question, the converters indicated that they have an awareness of environmental action programs but do not have a formal "green program." Metal poisoning, size of coextrusion equipment, the fuel potential of discarded plastics, and disposal of scrap containing aluminum foil also were topics discussed.

Awards luncheon

David J. Bentley Jr., Morton International, opened the Awards Luncheon on September 4. In his introductory comments, David A. Markgraf of Enercon Industries Corp. and Chairman of the Polymers, Laminations and Coatings Division, noted the hard work of the session developers and thanked them for all of their effort.

For his remarks to the audience TAPPI Vice President Ron Estridge, James River Corp., asserted that "TAPPI is alive, vital, and still growing very fast." Noting the contributions of many in the audience, he further stated, "The success and vitality of TAPPI is due to its members. Volunteer efforts make successful conferences like this."

After a brief explanation of TAPPI's involvement in and commitment to efforts in all areas of education as well as TAPPI's education mission in the 1990s, Estridge presented Certificates of Appreciation to David A. Markgraf, retiring division chairman; Russell H. Cramm, retiring chairman of the Extrusion Coating Committee; Thomas J. Butler, retiring chairman of the Film Extrusion Committee; Thomas M. Rebne, retiring chairman of the Health Care Packaging Committee; Gary W. Alexander, retiring chairman of the Microwaveable Packaging Committee; and Ronald B. Schultz, retiring chairman of the Midwestern Packaging and Converting Committee.

TAPPI's Patricia C. Barton received a Special Certificate of Appreciation, presented by Bentley, for the many years she has helped the Division produce successful conferences.

Bentley was the recipient of the 1991 TAPPI Polymers, Laminations and Coatings Division Leadership and Service Award as well as the accompanying Andreas G.

Ahlbrandt Prize. Ray Edwards, Texas Eastman Co., received the 1991 TAPPI Polymers, Laminations and Coatings Division Technical Award and accompanying Sam Zweig Prize.

Edwards received the Best Session Award for the 1990 conference. The session was sponsored by the Extrusion Coating Committee and was entitled "Polymer Surface Studies."

The following individuals who are shown with the title of their paper received Best Paper Awards for their participation in the 1990 conference: Gary Hyatt, Procter & Gamble, "Solid Waste—A Manufacturer's Perspective"; Alicia D. Cramer, Heinz Venture Group, Ltd., "Partnerships: The Foundation For Quality Products"; Joel Schwartz, Air Products & Chemicals Inc., "The Importance Of Low Dynamic Surface Tensions In Water-Borne Coatings"; William T. Penn, P. H. Glatfelter Co., "Total Quality Management Is An Evolution"; Ray Edwards, Texas Eastman Co., "Polyethylene For Low Temperature Extrusion"; Mark D. Paster, Peter Tkaczuk, and William C. Dale, Monsanto Chemical Co., "A Perspective Of The Acrylic PSA Automotive Market, Current and Future Challenges"; Karl E. Benson, Charles R. Frihart, and Kirstan J. Giberson, "Relationship Of Dynamic Mechanical And Thermal Properties To Tack For Hot Melt Polyamide Films"; Kathy L. LaCava, George E. Ealer, Harvey L. Batleman, and Dana C. Filotte, Union Carbide Corp., "Another Class of Polyolefins For Film Extrusion"; Nelson S. Slavik, Compliance Resources, Inc., "Infectious Waste Management: Strategies For The Health Care Facility"; and Francis M. Mirabella Jr., and Stanley P. Westphal, Quantum Chemical Corp., "Infrared Microspectroscopy: Analysis of Multilayer Films, Contaminants, and Inclusions."

1992 conference

During the conference, the Division's Extrusion Coating, Film Extrusion, Flexible Packaging, Health Care Packaging, High Barrier Packaging, Hot Melt, Microwaveable Packaging, and Midwestern Packaging and Converting committees each held a business meeting, as did the two ad hoc committees on printing and pressure-sensitive adhesives.

Plans are already in progress for the 1992 Conference of the Polymers, Laminations and Coatings Division. The date is September 8-11 at the Hilton at Walt Disney World Village, Lake Buena Vista, FL. Anyone interested in presenting a paper at this meeting should contact Technical Program Chairman Thomas Bezigian, PLC Technologies, P.O. Box 610, Kalamazoo, MI, 49081. His telephone number is (616) 323-3030. Additional information is also available from TAPPI at 800-332-8686. □