

December 1995

JCT

JOURNAL OF COATINGS TECHNOLOGY



1995 FSCT
Annual Meeting
& Paint
Industries' Show
Wrap-Up Issue

Creativity +
Adaptability =
Gateway to
Success



The new DuPont equation for unmatched TiO_2 performance

DISPERSION
+ DURABILITY
+ HIGH GLOSS

Ti-Pure® R-706

New R-706 is the ultimate in TiO_2 performance. It combines the easiest wet-in, excellent durability and high gloss in a pigment that's unbeatable. DuPont takes TiO_2 technology to a new, higher level with Ti-Pure® R-706. This versatile pigment is effective in solvent and waterborne systems for architectural, industrial, powder and automotive applications. And you'll be able to consolidate grades for reduced inventory. To make R-706 part of *your* equation, call 1-800-441-9485, today.

Circle No. 273 on the Reader Service Card

DU PONT

Ti-Pure®

TiO_2

TOP TEN REASONS

To Experience the Ultimate
Adventure in Coatings Education—
SciQuest, Volume I

Take the Journey . . .

Let SciQuest guide you through the world of coatings. The first in a series of CD-ROM educational tools for coatings, this program combines state-of-the-art multimedia with industry expertise to give the most comprehensive overview of coatings technology and manufacturing.

Developed for the Federation of Societies for Coatings Technology by Consolidated Research Inc. and ITE Consultants, this is self-instruction at its best. You choose the time, the location, the subject, and the depth of the topic to be explored.

From seasoned research staff to sales and marketing professionals—from suppliers to manufacturers—*anyone* with the need to learn more about the coatings industry can benefit.

The World of Coatings As You Never Experienced It . . .

SciQuest takes you on a visual tour of production lines and manufacturing plants—to see how electrodeposition takes place—to see how powder coatings are applied electrostatically—to a raw material supplier plant that is processing TiO₂. High resolution graphics, audio and video clips give you first-hand experience.

Choose from topics such as solvent systems, coating additives, types of coatings, application techniques, coating failures, rheology/mechanical properties, formulation, substrates, market size and sectors and organic chemistry review.

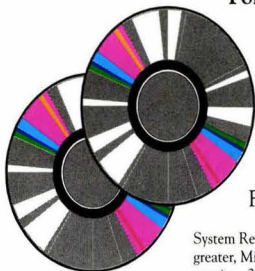
With just a touch of a keystroke, the world of coatings can be yours to explore and master!

FSCT Member: \$750
List Price: \$800

For more information, contact:

Federation of Societies
for Coatings Technology
492 Norristown Rd.,
Blue Bell, PA 19422-2350.
Phone: (610) 940-0777 or
FAX: (610) 940-0292

System Requirements: IBM PC or compatible, 386 or greater, Microsoft Windows with 8 MB of RAM, VGA monitor, 256 Color recommended, CD-ROM drive.



1. Comprehensive Instruction on a Wide Range of Subjects
2. Features High Resolution Graphics and Video to Demonstrate Concepts and Techniques
3. Allows You to Explore at Your Own Pace and Convenience
4. Provides Full Encyclopedic Text Searching in Seconds
5. Features On-Line Note Taking: Add Your Own Notes to Any Text for Future Reference
6. Highlights Critical Concepts with Full Text Printing Capabilities
7. Offers Bookmarking—SciQuest Keeps Your Place When You're Ready for a Break
8. Provides Instruction on a Variety of Experience Levels
9. Serves as an On-Going Reference Source as Additional Volumes Are Released
10. SciQuest Is Offered by the FSCT—**THE** Educational Source for the Coatings Industry

NUOCIDE® FUNGICIDE

THE FUNGICIDAL EFFICACY OF NUOCIDE HAS OUR CUSTOMERS SMILING.

MILDEWS AND DON'TS.

*When you buy **NuoCide** (Chlorothalonil-based products) for your latex paints, you get the most effective paint and coatings fungicides available — and the advice you need.*

Hüls' biocide technical staff will handle your toughest questions: "What's the best fungicide?" "What's the most effective in-can preservative?" "Which ones work together in my system?" The answers from our experienced microbiologists, chemists and technicians come in words as well as action, including biocide efficacy tests (more than 20), annual test fence evaluations, and extensive biodeterioration prevention measures.

Invest a penny in our thoughts, and save up to

thousands in potential costs from mildew damage.

For more information contact:

HÜLS AMERICA INC., Colorants and Biocides Division, 220 Davidson Ave., Somerset, NJ 08873, (908) 560-6800.

In Canada: (905) 451-3810.

hüls

WITHOUT NUOCIDE, MILDEW COULD BE SHOWING ITS UGLY FACE.*

*Photos of actual painted drawdown strips from paints with (above) and without (below) NuoCide 404-D. NuoCide® is a registered U.S. Trademark of Hüls America Inc.

Technical Articles

- 55** Durability and Gloss—J.H. Braun and D.P. Cobranchi
This paper addresses an interesting and provocative subject—gloss retention upon drying/curing. It is a subject which has not been addressed much in literature and should be valuable and interesting to readers.
- 63** The Reactions of Amines with Melamine Formaldehyde Crosslinkers in Thermoset Coatings—P.E. Ferrell et al.
Amines are typically used in water-based coatings to disperse carboxyl functional resins. This manuscript demonstrates that primary amines do participate in melamine formaldehyde curing reactions which drastically affect film properties.
- 71** Cationic Photopolymerization of Epoxy Modified Silicones for Application to Silicone Release Papers: A New Photoinitiator—C. Priou et al.
This paper outlines silicone curing reactions and reviews photoinitiators for cationic polymerization. The authors delineate the problems associated with common onium salts initiators (performance deficiency and toxicity) and show the advantages of onium borate salts for the epoxy and epoxy silicones.

Federation News

- 13** 1995 FSCT Annual Meeting and Paint Industries' Show Wrap-Up
- 35** Fall 1995 FSCT Board of Directors Report



Departments

Technical Abstracts	4	Future Society Meetings	94
Comment	7	People in the News	95
Industry News	9	Obituaries	95
Meetings Update	11	New FSCT Members	97
Regulatory Update	33	New Products	98
JCT 1995 Annual Index	79	Calendar of Events	101
Society Reports	89	Humbug from Hillman	104

Translations provided by: French—Montreal Society Member Mario Côte, of Eastman Chemical Canada Inc.—Montreal; and Spanish—Jesús Camacho, of Instituto Mexicano de Tecnicos en Pinturas y Tintas.

Durability and Gloss—J.H. Braun

Jct, Vol. 67, No. 851, 55 (Dec. 1995)

The durability of high gloss industrial and automotive coatings, their service-life, is usually predicted from gloss retention data. Because of time pressures, business decisions are often based on data of an early phase of exposure.

We present evidence and conclusions that show that initial gloss retention results of coatings pigmented with TiO_2 involve phenomena of film formation rather than weathering. We show that film formation of automotive finishes continues after cars leave the baking ovens, albeit on a time scale of months rather than the minutes for which the paint film is baked. Later in the service-life of a paint film, weathering sets in. Oxidation of the polymeric binder takes place involving the combined actions of UV light, water, and oxygen. As a result, the film surface erodes and its gloss degrades far beyond effects of film formation.

According to our hypothesis, high gloss rather than good durability of the TiO_2 pigment in the coating makes for good initial gloss retention. Eventually, of course, the durability of the TiO_2 pigment, that is, the inhibition of its surface catalytic activity, becomes important for film performance.

Durabilidad y Brillo—J.H. Braun

La durabilidad de un alto brillo de los recubrimientos automotriz e industriales, su vida en servicio es generalmente predecible a partir de los datos de retención del brillo. Debido a las presiones del tiempo, las decisiones en los negocios son frecuentemente basadas en datos de una fase de primaria exposición.

Evidencias y conclusiones que muestran la retención del brillo inicial, resultando del recubrimiento pigmentado con TiO_2 , se involucra la formación de capa más allá del interperismo climatológico. Mostramos que la formación de capa de acabados automotrices, se continúa después de salir de las cabinas de horneado de que en escala de tiempos en meses más allá de minutos, para los cuales la capa de pintura es horneada. Más tarde con el tiempo de servicio de una capa de pintura, se asienta climatológicamente a la interperie. La oxidación de los enlaces poliméricos toman lugar, involucrando las acciones de la luz U.V., agua y oxígeno. Como un resultado la superficie del recubrimiento erosión y brillo se degradan pasando un tiempo a efectos de la formación del recubrimiento inicial.

De acuerdo a nuestra hipótesis, es más allá de la buena durabilidad del pigmento TiO_2 en el recubrimiento procede a la retención de un buen brillo inicial.

Eventualmente, por supuesto, la durabilidad de el pigmento de TiO_2 que es la inhibición en la actividad catalítica de la superficie llega a ser importante en el rendimiento de la capa.

The Reactions of Amines with Melamine Formaldehyde Cross-linkers in Thermoset Coatings—P.E. Ferrell et al.

Jct, Vol. 67, No. 851, 63 (Dec. 1995)

Amines have had a long history of use in melamine formaldehyde (MF) coatings. The primary uses are blocking agents for the acid catalyst and neutralization of acid groups as well as pH adjustments for waterborne systems. In the latter case, the level of amine in the coating will become quite significant.

Work has been done to characterize reactions between the MF resin and the amine used in the coating. It has been shown that these reactions are dependent both on amine type and MF resin composition. The effects of these reactions on the cured film properties will be discussed.

Las Reacciones de Aminas con Entrecruzadores de Formaldehído de Melamina en Recubrimientos Termofijos—P.E. Ferrell et al.

Las aminas han tenido una larga historia de uso en recubrimientos (MF) de formaldehído de melamina. Los usos primarios son agentes bloqueadores para la catálisis ácida y la neutralización de grupos ácidos también como ajustes de PH para sistemas base agua. En el caso más reciente, el nivel de amina en el recubrimiento llegará a ser significativo.

El trabajo ha sido hecho para caracterizar reacciones entre la resina MF y la amina usada en el recubrimiento. Esto a demostrado que ambas reacciones son dependientes del tipo de amina y la composición de la resina MF. Serán discutidos los efectos de estas reacciones sobre las propiedades de la película curada.

Cationic Photopolymerization of Epoxy Modified Silicones for Application to Silicone Release Papers: A New Photoinitiator—C. Priou et al.

Jct, Vol. 67, No. 851, 71 (Dec. 1995)

The synthesis and the characteristics of new cationic photoinitiators are described. These compounds are endowed with high reactivity in such nonpolar media as silicone resins. They offer advantages over thermal cure systems that are working at lower temperature, and make faster curing available for all types of plastic substrates. An example of application in release paper coating is given.

Fotopolimerización Catiónica de Siliconas Modificadas Epóxicas por Aplicación a Papeles de Descarga de Silicona. Un Nuevo Fotoiniciador—C. Priou et al.

Son descritas las síntesis y las características de nuevos fotoiniciadores catiónicos. Estos compuestos están dotados con alta reactividad en cada media no polar como resinas de silicona: ofrecen ventajas sobre sistemas de cura termal que están siendo trabajados a más baja temperatura y hacen más rápido el curado disponible para todos los tipos de substratos plásticos. Es proporcionado un ejemplo de aplicación en el recubrimiento de papel descargado.



If it has anything to do with MDI, we're right in the middle of it.

When it comes to MDI chemistry, materials and technical support, ICI may be your most important supplier. Our experience and wide range of MDI specialty variants can help you at virtually every stage of product development, from formulating to manufacturing.

As one of the world leaders in MDI technology, ICI can assist you as you develop your next-generation coatings, adhesives, sealants and encapsulants. Or help bring improved quality and performance to your existing products. ICI takes an innovative, hands-on approach to solving your problems. And our expertise in custom designing MDI components ensures the precise properties you desire.



COATINGS &
ADHESIVES

So, if it involves MDI, call ICI. Contact our CASE Specialists today and learn how we can meet your MDI needs.

PHONE: 1-800-553-8624 FAX: 810-826-7733

ICI Polyurethanes
6555 Fifteen Mile Road
Sterling Heights, MI 48312

*No one
knows MDI
like ICI.*



Polyurethanes

ICI Polyurethanes is a business unit of ICI Americas, Inc.

Circle No. 265 on the Reader Service Card

The JOURNAL OF COATINGS TECHNOLOGY is published monthly by the Federation of Societies for Coatings Technology at 492 Norristown Rd., Blue Bell, PA 19422-2350. Phone: (610) 940-0777; FAX: (610) 940-0292.

Annual dues for Active and Associate Members of the Federation of Societies for Coatings Technology is \$20.00. Of this amount, \$13.50 is allocated to a membership subscription to this publication. Membership in the Federation is obtained through prior affiliation with, and payment of dues to, one of its 26 Constituent Societies. Non-member subscription rates are:

	U.S. and Canada	Europe (Air Mail)	Other Countries
1 Year	\$40.00	\$70.00	\$55.00
2 Years	\$75.00	\$135.00	\$105.00
3 Years	\$110.00	\$200.00	\$155.00

When available, single copies of back issues of the JOURNAL OF COATINGS TECHNOLOGY are priced as follows: \$3.00 each for current calendar year issues; \$4.00 each for all other issues.

Publisher Robert F. Ziegler
 Editor Patricia D. Viola
 Technical Editor Robert F. Brady, Jr.
 Managing Editor Kathleen M. Wikiera
 Assistant Editor Jonna D. Coachman
 Editorial Assistant Mary H. Evangelisto
 Director of Marketing Lyn Pollock
 Subscription Fulfillment Manager Audrey E. Boozler
 National Advertising Representative Mike Venezia
 52 Kate Lane, Tolland, CT 06084;
 (860) 871-1801; Fax: (860) 870-8086

Publications Committee

F. Louis Floyd, Chairman
 B. Brady
 B. Carr
 J. Hinkle
 G. Pilcher
 L. Price
 J. Stauffer
 R. Woodhall
 P.D. Viola
 R.F. Ziegler

Editorial Review Board

Robert F. Brady Jr., Chairman
 D.R. Bauer
 A.H. Braudau
 J.H. Braun
 D. Brezinski
 R.A. Dickie
 F.L. Floyd
 P.R. Guevin, Jr.
 C.R. Hegedus
 H.E. Hill
 L.W. Hill
 T. Hockswender
 S.F. Kia
 J.V. Koleske
 H. Lowrey
 J.W. Martin
 J.L. Massingill
 P.E. Pierce
 G.R. Pilcher
 T. Provder
 R.A. Ryntz
 C.K. Schoff
 R. Stanzola
 J.O. Stoffer

The JOURNAL OF COATINGS TECHNOLOGY has first rights to the publication of papers presented at the Annual Meeting of the Federation and at local and regional meetings of the Federation's Constituent Societies.

The JOURNAL OF COATINGS TECHNOLOGY is available on microfilm from University Microfilms, a Xerox Co., Ann Arbor, MI 48106.

The Federation of Societies for Coatings Technology assumes no responsibility for the opinions by authors in this publication.

Copyright 1995 by the Federation of Societies for Coatings Technology. All rights reserved. No portion of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, recording or by any information storage or retrieval system without permission in writing from the publisher. Authorization to photocopy items for internal or personal use, or the internal or personal use of specific clients is granted by the Federation of Societies for Coatings Technology for users registered with the Copyright Clearance Center (CCC) Transactional Reporting Service, provided that the base fee of \$1.00 per copy, plus .25 per page is paid directly to CCC, 27 Congress St., Salem, MA 01970. For those organizations that have been granted a photocopy license by CCC, a separate system of payment has been arranged. The fee code for users of the Transaction Reporting Service is: 0032-3352/86 \$1.00 + .25.

FSCT Board of Directors—1995-96

PRESIDENT

*DARLENE R. BREZINSKI
 Consolidated Research Inc.
 200 E. Evergreen
 Mount Prospect, IL 60056

PRESIDENT-ELECT

*JAY AUSTIN
 Halox Pigments
 1326 Summer St.
 Hammond, IN 46320

SECRETARY-TREASURER

*THOMAS E. HILL
 Pratt & Lambert
 P.O. Box 22
 Buffalo, NY 14240

MARK D. ALGAIER
 Hillyard Industries, Inc.
 St. Joseph, MO

EVANS ANGELOS
 Omya, Inc.
 Clarendon Hills, IL

FREIDUN ANWARI
 BFGoodrich Co.
 Brecksville, OH

LARRY BRANDENBURGER
 The Valspar Corp.
 Minneapolis, MN

JOSEPH CARAVELLO
 Guardsman Products, Inc.
 Sugar Land, TX

BRENDA L. CARR
 Coatings Development Co.
 Painesville, OH

MARTHA COLIN
 Colin y Lozano S. de RL
 Mexico DF, Mexico

DONALD F. DENNY
 E.W. Kaufmann Co.
 Southampton, PA

MICHAEL L. DEPIETRO
 Pratt & Lambert, Inc.
 Buffalo, NY

J. ANDREW DOYLE
 National Paint & Coatings
 Association
 Washington, D.C.

VAN S. EVENER
 BASF Corp.
 Whitehouse, OH

*FOREST FLEMING
 Akzo Nobel Coatings, Inc.
 High Point, NC

F. LOUIS FLOYD
 Duron, Inc.
 Beltsville, MD

MICHAEL C. FRANTZ
 Daniel Products Co.
 Jersey City, NJ

JAMES E. GEIGER
 Consultant
 Largo, FL

TERRY GELHOT
 Carboline Co.
 St. Louis, MO

JOSEPH D. GIUSTO
 Lenmar, Inc.
 Baltimore, MD

JOHN A. GORDON
 Pacific Technical
 Consultants
 Loma Linda, CA

*GERRY J. GOUGH
 ICI Packaging Coatings
 Holden Surface Coatings
 Ltd.
 Birmingham, England



WILLIAM M. HOLLIFIELD
 Perry & Derrick Co., Inc.
 Cincinnati, OH

WILLIAM F. HOLMES
 Ameritex Chemical &
 Coatings Inc.
 Irving, TX

DAVID JACK
 Technical Coatings Co., Ltd.
 Burlington, Ont., Canada

CHARLES A. KAPLAN
 Gillespie Coatings, Inc.
 Longview, TX

MAUREEN M. LEIN
 Davidson/Textron
 Dover, NH

RONDA K. MILES
 Union Carbide Corp.
 Garland, TX

*J. DICK MULLEN
 G-3 Industries
 Aurora, CO

JOHN J. OATES
 Midland Park, NJ

DENNIS R. OWEN
 Technical Coatings Co.
 Santa Clara, CA

LARRY PITCHFORD
 Reynolds Metals
 Louisville, KY

YVON POITRAS
 Mills Paint Sales, Ltd.
 Delta, B.C. Canada

SUZANNE RICHARDSON
 Tioxide Americas Inc.
 St. Laurent, Que., Canada

PATRICIA SHAW
 Radiant Color
 Richmond, CA

WILLIAM C. SPANGENBERG
 Hammond Lead Products, Inc.
 Pittsburgh, PA

*JOSEPH P. WALTON
 Jamestown Paint Co.
 Jamestown, PA

*Executive Committee
 Members

EXECUTIVE VICE PRESIDENT

ROBERT F. ZIEGLER
 FSCT Headquarters
 492 Norristown Rd.
 Blue Bell, PA 19422

Calling All Members



Since 1922, the FSCT has been recognized as the technical arm of the coatings industry. It is viewed as a resource for the latest information on new and existing technologies, through its 26 Constituent Societies and nationally via its programs and publications. Thus, the activities of the organization have been developed with education in mind.

There is a common denominator throughout every activity of the Federation, the members. Since its inception, individuals have joined for many reasons, usually related in one way or another to their employment in the coatings industry and the need to stay technically up-to-date. One benefit of FSCT membership is the opportunity to participate in the development or planning of activities for other members and the industry.

The examples of these membership contributions are plentiful. The technical papers featured in this issue of the *JCT* were reviewed by the members of the Editorial Review Board (and in many cases written by an FSCT member). The technical sessions at the 1995 FSCT Annual Meeting in St. Louis were developed by the members of the Program Committee, with assistance from the Corrosion, Professional Development and Manufacturing Committees. The recently held FSCT seminar, "Formulating for the New Clean Air Act" was produced by the Professional Development Committee. The new science kit, "Presenting Science Through Coatings: A Spectrum of Possibilities" was created by the members of the Educational Coordinating Committee.

This same spirit of volunteerism is also evident on the local level. The monthly meeting speaker you heard last month was selected by the Society Program Committee. The scholarship your child or your neighbor's child just received was administered by the Society's Educational or Scholarship Committee. The seminar you attended last spring was created by a committee comprised of members of the Society. The list of activities goes on.

The nice thing about participation in an organization such as FSCT is that committee participation is not limited to a certain "select" group of members; anyone can become involved. Today, as members are faced with increased demands on their time, more and more are needed to do the same amount of work. Again and again, members are needed for task driven work, which requires a shorter amount of time.

In the near future, we will be contacting the membership seeking volunteers for both ongoing and upcoming projects. We hope you will remember the benefits you have received as a result of the hard work of your fellow members and consider favorably the opportunity to participate.

Michael G. Bell
Director of Educational Services

TRONOX[®]



TRONOX
30
YEARS
OF QUALITY



These Numbers You Can Trust!

1065C

FOR 30 YEARS, TRONOX[®] HAS MEANT QUALITY. In 1965 Kerr-McGee began producing chloride-process titanium dioxide at Hamilton, Mississippi. Today, Kerr-McGee has become a trusted, worldwide source of TiO₂, with facilities in the United States, Saudi Arabia and Australia. **IN THE NEXT 30 YEARS IT WILL MEAN EVEN MORE.** We'll continue meeting the needs of producers in the next century by developing new TRONOX[®] grades and providing expert technical assistance to help our customers formulate solutions. **EXPECT BETTER. AND GET IT, FROM KERR-McGEE.**

ISO 9002
CERTIFIED
Hamilton, MS
Kwinana, WA



Responsible Care[™]



KERR-McGEE CHEMICAL CORPORATION

TECHNOLOGY AND TEAMWORK
FOCUSED FOR YOU.

P.O. Box 25861 • Oklahoma City, Oklahoma 73125 • (800) 654-3911

SALES OFFICES: Atlanta, Georgia (404) 934-9781 • Dallas, Texas (214) 751-1571 • West Chicago, Illinois (708) 231-8002

J. Crowley, D. Smith, and E. Borman Receive Heckel Award at NPCA's 108th Annual Meeting

The National Paint and Coatings Association, Washington, D.C., has announced that Jerome J. Crowley Jr., Donald Smith, and Earle K. Borman Jr. were the recipients of the George Baugh Heckel Award. The Award was presented during the Honors Sessions Luncheon of NPCA's Annual Meeting in San Francisco, CA, on October 22-24.

Messrs. Crowley, Smith, and Borman were recognized "for their long and tireless efforts to ensure that clean-air regulations applied to the manufacture of certain types of paints and coatings are reasonable and practicable." The three played key roles in representing the coatings industry's interests during the EPA-sponsored regulatory-negotiations process involving architectural and industrial maintenance coatings.

The Heckel Award, presented to Mr. Crowley, of The O'Brien Corp., S. San Francisco, CA, Mr. Smith, of Pratt & Lambert United, Inc., Buffalo, NY, and Mr. Borman, of L&F Products, of Montvale, NJ, is given in recognition of outstanding achievement and the contribution of significant time and energy toward the furtherance of a specific association goal.

Gold Star Award

NPCA honored three local paint and coatings associations with Gold Star Awards.

The Cincinnati Paint and Coatings Association (PCA), Wisconsin PCA, and Chicago PCA, were recognized for their excellence in the areas of membership recruitment, community improvement, legislative/regulatory involvement, national association involvement, meetings, and publications.

Allen W. Clark Award

The 1995 Allen W. Clark Award was presented to four local associations in recognition of outstanding Picture It Painted (PIP) community service programs. The Chicago PCA and Southern California PCA tied for first place.

The Chicago PCA was recognized for its contribution to the "Chicago Cares Serve-a-Thon." Association member companies donated 1,200 gallons of paint and sundries and provided volunteer labor to help paint homeless shelters and schools, clean up parks and playgrounds, plant trees, visit with the elderly, and tutor children.

The Southern California PCA was honored for its participation in Habitat for Humanity's "Jimmy Carter Work Week" in Los Angeles. Volunteers from the association and Los Angeles Society for Coatings

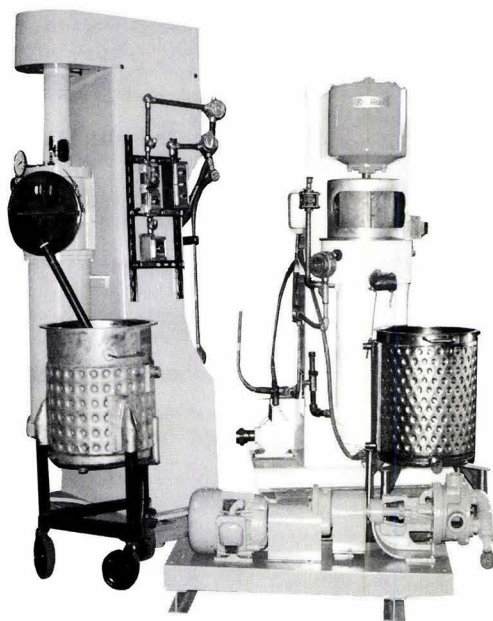
Technology joined the former president and his wife and hundreds of other volunteers in building 31 homes in the city's Watts area by supplying the paint and painting supplies needed for the project.

The two groups also painted 4,000 doors and 110,000 linear feet of moldings and provided all of the on-site labor for paint of the

exteriors and interiors of the homes built, as well as fences. In all, the coatings industry in Southern California contributed more than 800 hours of labor and \$30,000 worth of paint, brushes, and supplies.

Second place winner Louisville PCA teamed up with the Louisville chapter of the
(Continued on next page.)

WESTERN EQUIPMENT COMPANY



*Used Process Equipment for the Coatings Industry
We Also Purchase Surplus Equipment
Call for Current Inventory*

**915 66TH AVENUE - OAKLAND, CA 94621
510-820-8883 - FAX 510-820-9188**

Circle No. 278 on the Reader Service Card

Crowley, Smith, and Borman Accept Heckel Award; NPCA Recognizes Other Companies and Individuals

(Continued from previous page.)

Painting and Decorating Contractors of America and the International Brotherhood of Painters and Allied Trades Local 118 on repainting the exterior of the Meredith-Dunn Learning Center.

The Cincinnati PCA, third place winner, sponsored eight projects: painting an elementary school, a home for chemically

dependent women and their children, a Head Start building, and 14 low-income homes. The association also sponsored two mural projects, an anti-graffiti campaign, and a paint recycling program.

Pollution Prevention

NPCA's Pollution Prevention Award was presented to Benjamin Moore & Co. and the Ace Hardware Paint Division for their efforts to minimize waste during manufacturing of paints and coatings.

Benjamin Moore's Mesquite, TX, facility was recognized for reduction of wastes by using a combination of mechanical equipment designed to increase pipe cleaning efficiency and the recirculation of washwater. In addition, engineering controls were used to reduce VOC emissions and control airborne particulate contaminants.

The Ace Hardware Paint Division, Metteson, IL, reduced hazardous and non-hazardous wastes, virtually eliminating solvent wastes leaving the plant. Nonhazardous waste disposal was significantly reduced with the number of gallons of latex waste sent off-site cut by more than 70%.

Industry Statesman

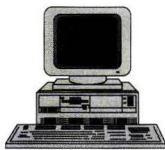
In recognition of long and devoted service to the paint and coatings industry, six were honored with the 1996 Industry Statesman Awards. They are: Leonard C. Afremow, retired, Dexter Corp.; Tom Daly, Ace Paint Division of Ace Hardware Corp.; Jules Knapp, Pratt & Lambert United, Inc.; Richard A. Naves, retired, Jones-Blair Co.;

Eastman Chemical Launches Internet World Wide Web Site

Accessing information on Eastman Chemical Co., Kingsport, TN, just got easier. Effective October 1, Eastman joined the ranks of other chemical companies with a Web site on Internet World Wide Web.

Technical data sheets, design guides, press releases, and other product information are included in the Performance Plastics section of Eastman's Web site. This segment features a search mechanism which matches customer product specifications with Eastman products. In addition, customers and potential customers, seeking information about cellulose or engineering plastics is also available via Eastman's World Wide Web Site.

Eastman plans to add and update information regularly.



Mark Padow, retired, NPCA; and Wallace A. Steele, retired, Pratt & Lambert.

Industry Achievement

Also during the Honors Session Luncheon, the following five industry members received awards for Distinguished Achievement in Community Service Award: Mickey Fennell, of Crozier-Nelson Sales, Inc.; Dianne Owen, of Ashland Chemical, Inc.; Marge Suranovic, of Ace Paint Division, Ace Hardware Corp.; Brenda Svenneke; and J. Kirk Menefee, of Hy Klas Paints, Inc.

The following were recognized for Distinguished Achievement in Service to the Industry: Virgil Flannery, of Akzo Nobel Coatings, Inc.; Mary Ann Hoff, of PPG Industries, Inc.; Kevin Johnston, of Pratt & Lambert United, Inc.; Wayne Thome, of Benjamin Moore & Co.; R. Gary Wulf, of SC Johnson Polymer; Joe Benga, of PPG Industries, Inc.; Gerry Currier, of Akzo Nobel Coatings, Inc.; Jack de Vido, of Aqualon; Peter Nicholson, of Rohm & Haas Co.; Andy Riedell, of PPG Industries, Inc.; Robert Inglis, of BASF Corp.; William McConachie, of DuPont Automotive; and Jon Wiborg, of PPG Industries, Inc.

Sun Chemical Dedicates New Pigments International Facility

Sun Chemical Corp., Fort Lee, NJ, has dedicated the new headquarters of Pigments International, the company's European, Latin American, and Asian pigments operations in Wavre-Nord, Belgium.

The new 30,700 square meter site, which is comprised of almost 9,000 square meters of office space, warehouse, and technical laboratory space, will house the division's administrative sales, and marketing offices, technical service laboratories, and warehouse space. Construction was completed in March 1995.

The site currently employs 40 people and is expandable to twice its present size.

Halox Pigments Approves Construction for New Facility

Plans have been approved by Halox Pigments, Hammond, IN, for construction of a new production facility. Construction will begin in mid-1996 with operations commencing in the fall of 1997. This new facility will produce Halox Pigments as well as chemicals for Hammond Group's product line.

During 1996, Halox will also be doubling capacity at their current Hammond facility.

Coatings Manager

The Haartz Corporation is a world leader in the technology and manufacturing of engineered coated fabrics and foam composites. Haartz is a strong, dynamic company that has grown 50% in the past two years.

We are seeking an individual to manage coatings research and development, color control, color development, and the coatings mixing department. The successful candidate will develop new and improved coatings formulations and coating application techniques for automotive soft trim components. Responsibilities will include implementation and maintenance of QS9000 standards.

Applicants must have a B.S. in Chemistry or equivalent degree, with 10 years of relevant industry experience and three years of management experience. Must be very strong technically and experienced in coatings development and color control. Strong interpersonal, team, and problem solving skills are also required. Must be willing and interested in hands on involvement to solve problems and achieve project goals.

This position is located in Acton, Massachusetts. Haartz offers a competitive salary and benefits program. For consideration, please send resume and salary history to: The Haartz Corporation, Attn: Director of Human Resources, 87 Hayward Rd., Acton, MA 01720-3000.

23rd International Waterborne, High-Solids, and Powder Coatings Symposium Slated for Feb. 14-16

The Southern Society for Coatings Technology, in conjunction with The University of Southern Mississippi (USM), Hattiesburg, MS, will conduct the 23rd Annual International Waterborne, High-Solids, and Powder Coatings Symposium on February 14-16, 1996, at the Hyatt Regency Hotel, New Orleans, LA.

The symposium will focus on the chemistry, formulation, and new developments in waterborne, high-solids, and powder coatings. Topics scheduled for presentation include the following:

Plenary Lecture—"Rheology of Waterborne Coatings"—Roger D. Hester, Dept. of Polymer Science, The University of Southern Mississippi;

"A Concerted Effort to Understand the Environmental Issues in the Wood Finishing Industry and an Analysis of the Possible Technological Solutions"—P. Gerosa, of BASF Corp.;

"The Use of Experimental Design in Waterborne Wood Coating Development"—H.S. Bender, J. Blaisdell, J. Falsone, P. Patel, V. Stanislawczyk, of BFGoodrich Specialty Chemicals;

"The Role of Acetylenic Glycols in Waterborne Coatings"—S. Morell, of S.P. Morell & Co.;

"Performance Enhancement in Environmentally Friendly Coatings: The Reengineering of Wetting and Dispersing"—E.W. Orr, of BYK-Chemie USA;

"Effect of Sulfate/Sulfonate Content of Surfactant on the Properties of Latexes and Paints"—C. Chellappa, A.V. Parikh, and K. Rasheed, of Witco Corp.;

"Legacy of Aubrey K. Lucas, Sixth President of The University of Southern Mississippi"—Shelby F. Thames, of USM;

"Novel Polyols from Lesquerella Oil for Polyurethane Coatings"—S.F. Thames and H. Yu, of USM;

"Oxazolanes—Old Chemistry, New Applications"—G.A. Howarth, of Industrial Copolymer Ltd.;

"Novel Polyurethane Waterborne Coatings"—R.T. Wojcik, A.T. Chen, L.E. Katz, and J.M. O'Connor, of Olin Corp.;

"Enhancement of Mechanical and Optical Properties of Waterborne Polyurethane Lacquers on Plastic Surfaces by Using Ultra Fine Polyamide Powders. A New Approach to Soft Feel Coatings"—F. Galloudec, Mr. Schueffelen, E. Valot, and J. Poncin, of Elf Atochem North America, Inc.;

"High Performance Two-Component Waterborne Polyurethane Coating Systems"—W.O. Buckley, J.M. Snyder, and T.L. Richards, of Air Products and Chemicals, Inc.

"Waterborne Crosslinking Polyurethane Dispersion for Industrial Topcoats"—Diplom. Ing. G. Merten, M. Gerlitz, and P.G. Becker, of Hoechst Celanese Corp.;

"Using LCA to Select Coatings for Optimum Environmental and Cost Performance"—N. Hazel, of BP Chemicals;

"Compatibility Theory—How to Choose the Proper Silicone Additive for Your Needs"—P. Marengo and R.E. Ruckle, of OSI Specialties, Inc.;

"Using UV Block Coatings to Minimize Degradation"—M. Zhao, of Monsanto;

"Pigment Dispersion for High-Solids and Waterborne Paints"—J.M. Akkerman, of Akzo Nobel Coatings Inc.;

"A New Ambient Cure Crosslinking System: The Revitalization of Acetoacetate Chemistry for Coatings Applications"—N. Chen, R.K. Pinschmidt Jr., T.M. Santosusso, and C.-F. Tein, of Air Products and Chemicals, Inc.;

"Mar Resistance of Automotive Clearcoats"—J.L. Courter, of CYTEC Industries, Inc.;

"Silanes in High-Solids and Waterborne Coatings"—M.J. Chen, F.D. Osterholtz, E.R. Pohl, P.E. Ramdatt, A. Chaves, and V. Bennett, of OSI Specialties, Inc.;

"UV Curable Aqueous Dispersions"—Z.J. Wang and J.A. Arceneaux, of UCB Chemicals Corp.;

"Analysis of UV Curable Coatings by Real Time Infrared Spectroscopy (RTIR)"—E.W. Kendall and R.C. Woudenburg, of Markem Corp.;

"Liquid, Sprayable, 'Zero' VOC Coatings Utilizing Cycloaliphatic Epoxies"—R.F. Eaton and K.T. Lamb, Union Carbide Corp.;

"Synthesis and Properties of Waterborne Coatings Based on Modified Epoxy Resins"—K.S. Arora, G.S. Johnson, M. Joyner, and J. Aloye, of Henkel Corp.;

"Structure-Performance Relationships in Alkylene Oxide Modified Epoxy Coatings"—K.A. Anderson, of The Dow Chemical Co.;

"Performance of Ambient Cure Waterborne Coatings Based on Solid Epoxy Resin Dispersions"—D.J. Weinmann and C. Smith, of Shell Chemical Co.;

"Recent Developments in Curing Agents for Waterborne Epoxy Coatings"—F.H. Walker, M.I. Cook, D.A. Dubowik, of Air Products and Chemicals, Inc.;

"Recent Advances in VOC-Compliant Technology for Protective Coatings Applications"—T.G. Wood, of Rohm & Haas Co.;

"The Role of Surface Modifiers in High-Solids Coatings"—W.R. Pistillo, of The Lubrizol Corp.;

"Surface Analysis of High-Solids Coatings via TOF-SIMS"—E.H. Erenrich, E.A. Leone, and R.D. Sedgwick, of AlliedSignal Corp.;

"Silicone Technology for Fouling Release Coating Systems"—G.G. Bausch and J.S. Tonge, of Dow Corning Corp.;

"Butyraldehyde Resin: A Unique Resin for Lowering VOC and Improving Film Properties"—R.R. Stange, of BASF Corp.;

"High-Solids Polyester Coating Based on a Novel Reactive Diluent"—V. Swarup, P.J. Galasso, D.N. King, A.I. Yezrielev, K.R. Rigopoulos, and J.L. Smith, of Exxon Chemical Co.;

"Aluminum Compounds as Additional Crosslinkers for Air Drying High-Solids Alkyd Paint"—K.H. Zabel, R.P. Klaasen, J.C. Hubert, W.J. Muizebelt, R.A.M. Venderbosch, and A.J.A. Lansbergen, of Arnhem;

(Continued on next page.)

**Pacific Northwest Society
for Coatings Technology's**

**49th Annual
Spring Symposium**

**May 3-4, 1996
Seattle, WA**

The 49th Annual Spring Symposium of the Pacific Northwest Society for Coatings Technology is scheduled for May 3-4 at the DoubleTree Suites Hotel, Seattle, WA.

The symposium will focus on new developments for protective coatings in relation to wood and wood composites.

For more information on the symposium, contact Richard C. Tomczak, Specialty Polymers, Inc., 8531 Juanita Dr., Kirkland, WA 98034; Telephone: (206) 979-3875.

USM To Conduct Five Short Courses Prior To Waterborne, High-Solids, and Powder Coatings Symposium, Feb. 10-13

(Continued from previous page.)

"Flame Retardant Brominated Styrene-Based Polymers. X. Dibromostyrene Grafted Latexes"—N.A. Favstritsky and J.-L. Wang, of Great Lakes Chemical Corp.;

"Water-Based Polyester Coating for Chlorinated Polyolefin Primed Polypropylenes"—J.M. Land, M.C. Arjona, M.A. Benz, W.L. Dechent, and J.O. Stoffer, of University of Missouri-Rolla;

"Polyester Polymers Based on Purified Isophthalic Acid, and Trimellitic Anhydride for Use in Low VOC Waterborne Coatings"—R.R. Engelhardt, of Amoco Chemicals;

"A Challenge: Aluminum Pigments in Aqueous Coatings"—D. Chapman, of Silberline Manufacturing Co., Inc.;

"Hydrogel Silica Flattening Agents for Waterborne Coatings"—M.R. Sestrick, H. Schneider, and B.A. Plichta, of W.R. Grace & Co.—Conn.;

"Silicone Elastomers for Enhanced Durability and Wetting of Waterborne Systems"—A.J. Tselepis, P.J. Popa, and T. Easton, of Dow Corning Corp.;

"Utilizing Acetate Esters of Oxo Alcohols as Coalescing Agents to Reduce Dry Times of Waterborne Traffic Paints"—T.M. Larson and R.R. Granger, of Exxon Chemical Co.;

"Material Losses in Powder Coating Manufacturing—The Relationship of Powder Coating Production Lot Size and Non-Recoverable Material Losses"—B. Fawer, of Ruco Polymer Corp.;

"Protective Properties of β -Hydroxyalkylamide Cured Powder Coatings"—A. Pledger, of EMS-Chemie AG;

"Ionomers of Low Molecular Weight Polyethylene Copolymers as Thermoplastic

Powder Coatings"—D.F. Loar, of AlliedSignal, Inc.;

"Organotin Catalysis of Urethanes from Blocked Isocyanates"—S. Seshadri, M. Gitlitz, and C. Bossert, of Elf Atochem North America, Inc.;

"Formulating Lower VOC Coatings with IPDI Trimer"—R. Pauwels, J. Pascoe, and G. Carver, of Hüls America Inc.;

"Oxazolidine-Aldimine Reactive Diluents for High-Solids Polyurethane Coatings"—M.D. Hoffman, M.J. Hourani, and T.L. Johnson, of ANGUS Chemical Co.; and

"A Study of Coatings Based on (Cyclo) Aliphatic Allophanate Modified Trimer (AMT) Polyisocyanates and Their Blends"—R.S. Dearth and H. Mertes, of Bayer AG and P.B. Jacobs and S.D. Hicks, of Bayer Corp.

The sessions conclude with the presentation of the Elias Singer Best Paper Award.

In addition, five short courses that explore topics in polymer science essential to surface coatings science will be offered prior to the symposium at the Hyatt Regency Hotel, on February 10-13.

"Practical Emulsion Polymerization," slated for February 10-11, will enable the attendee to understand and use emulsion polymerization for the design, synthesis, stabilization, characterization, and application of latex polymers.

The second course offered is "The Physical Principles of Formulation." Scheduled for February 10-11, this course is designed to educate professionals on the physical principles that are essential for an understanding of product formulation.

"Modern Coatings Technology" will focus on the conversion from solvent to waterborne formulations and development

and testing of solvent-based, waterborne, high-solids, and powder coatings. The lectures will delineate formulation/performance relationships and convey appropriate methods for technological development of superior yet cost-effective coatings.

Another course offering is "Water-Soluble/Waterborne Polymers." This short course, which was created for industrial scientists, emphasizes synthesis, characterization, kinetics, solution properties, and rheological behavior.

"Reformulating to Waterborne Coatings" will offer practical "how to" information for implementing a variety of waterborne coating processes. Resin design and paint formulation considerations during conversion from a conventional solvent-borne coating to a waterborne coating will be discussed for a number of popular coating types.

The advance registration fee for the Symposium is \$595 and includes admission to the technical sessions, a copy of the *Proceedings*, refreshments, and invitations to the receptions and breakfast buffet.

The advanced registration fee for any short course is \$795 and includes admission to the sessions, preprinted notes, continental breakfast, and refreshments.

For those attending both a short course and the Symposium, a discount of \$100 is offered toward the cost of the Symposium.

Advanced registrations must be postmarked by January 29, 1996. To obtain more information, contact Shelby F. Thames, Director, USM, Box 10063, Hattiesburg, MS 39406.

Conductive Polymers Course Scheduled for Feb. 28-Mar. 1

Advanced Polymer Courses, Falmouth, MA, is hosting a short course on "Inherently Conductive Polymers: An Emerging Technology," slated for February 28-March 1, 1996 at the Ocean Resort Hotel and Conference Center, Deerfield Beach, FL.

This short course, designed for engineers and scientists involved in the R&D of electrical and electronic applications and devices, is divided into three sequences, which consist of the following: (1) properties and processing for coatings and films; (2) applications including ESD, shielding, electronic and electrochemical devices; and (3) in addition to the main lecture, short lectures will be given by scientists from several companies involved in this technology.

For additional information, contact Matt Aldissi, Advanced Polymer Courses, 536 Main St., Unit #1, Falmouth, MA 02540.

Detroit Society for Coatings Technology

Presents

FOCUS '96

"Driving Technology to Meet New Challenges"

April 16, 1996

Michigan State University Conference Center

Troy, MI

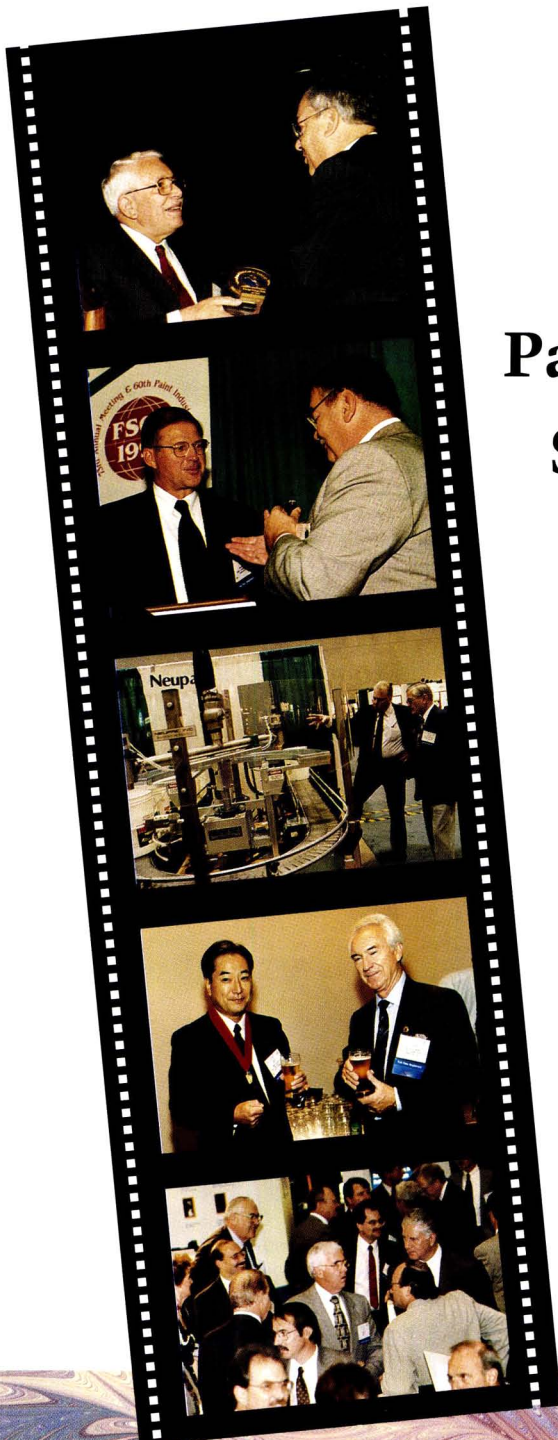
For additional information, contact: Rosemary Brady,
Akzo Nobel Coatings Inc., 1845 Maxwell St., P.O. Box 7062,
Troy, MI 48007-7062

(810) 637-8565 • FAX: (810) 649-7367

Federation of Societies for Coatings Technology

1995 Annual
Meeting &
Paint Industries'
Show Wrap-Up

October 9 - 11
Cervantes Convention
Center
St. Louis, MO



FSCT Annual Meeting & Paint Show Wrap-Up

St. Louis, Missouri. To many of the early American pioneers making their way west, this city personified a spirit of discovery and adventure. That spirit—of challenge, creativity, and community—was again evoked as visitors from around the world recently met in the "Gateway City" to experience the 1995 FSCT 73rd Annual Meeting & 60th Paint Industries' Show. Their expectations were no less ambitious than their predecessors had been many years before—to discover, to overcome obstacles, and to expand beyond traditional boundaries. Now, however, they were not seeking to tame new lands, but to conquer new worlds through advances in science and technology.

Nearly 7,000 visitors, representing 61 countries attended the Annual Meeting & Paint Industries' Show on October 9-11. With its emphasis on "Creativity + Adaptability = Gateway to Success," the FSCT event offered these attendees the opportunity to expand their knowledge of new and exciting technologies.

The number of exhibitors at the Show surpassed all previous records—314 suppliers occupied 92,500 square feet of space with the latest raw materials, equipment, and services the industry has to offer. The number of first-time exhibitors also broke existing records as over 59 companies chose the Paint Show to introduce their products.

Technical sessions featured tutorials on radiation curing, powder coatings, and adhesives; computer applications workshops detailing the use of spread

sheets, experimental design, and formulation applications; and sessions on the state of the industry and international developments. Panel discussions provided insights into the selection of the proper corrosion inhibitive technology, as well as intermix systems and small batch processing. Cutting edge ideas for the future were explored in the Room Awards presentation papers. The Program opened with the Technical Focus Speaker, Jonathan Martin, of NIST, and culminated with the Mattiello Memorial Lecture, presented by Dr. Frank Jones, of Eastern Michigan University.

The pioneer spirit was also evident at the Annual Business Meeting where Chicago Society member Darlene Brezinski was officially sworn in as FSCT President for 1995-96. According to Dr. Brezinski, "We are entering a new era, a time of great change. The Federation is presented with challenges and opportunities. We will move forward to take advantage of the opportunities to change and to grow internationally, to become an even more viable and vibrant organization."

The success of the Annual Meeting & Paint Industries' Show can be credited to the efforts of the exhibiting companies, the attendees, and all of the FSCT Committees members who worked so diligently to insure the highest quality event.

Special recognition is due to the St. Louis Society Host Committee, under the direction of Chairman Dennis Cahill, of Archway Sales, Inc.

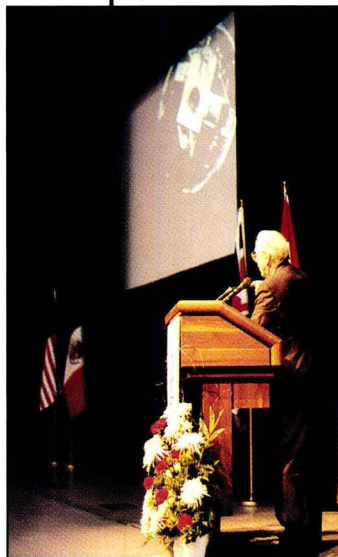


FSCT's "First Lady" Kathy Walton (with scissors) officially opens the Annual Meeting & Paint Industries' Show with the traditional ribbon cutting ceremony. Assisting Mrs. Walton were (from left): President-Elect Darlene Brezinski, Marty Brezinski, President Joseph P. Walton, Kathy Austin, and Secretary-Treasurer Jay Austin

Capt. James Lovell Enthralls Audience with Recounting of Apollo 13 Mission

APRIL 11, 1970: Apollo 13, thought by the public to be a "routine" mission, blasted off from Florida on its way to the dark side of the moon. Hours later, disaster struck and the world held its breath while the three crew members struggled with the challenge of a lifetime. With teamwork, technical skill, and personal courage, they were able to turn this potential disaster into one of the greatest success stories of the 20th Century.

OCTOBER 9, 1995: Attendees at the FSCT Annual Meeting sat spellbound as the Commander of that fateful mission, Captain James Lovell, retold the story of Apollo 13. As he and his crew rocketed toward the moon, 200,000 miles from Earth, an explosion destroyed the ship's crucial oxygen system. The adventure of Apollo 13 once again captured the world's attention this past summer when the movie, *Apollo 13*, the film version of Lovell's best-seller, was released. Joking that "on a \$20 billion program, without tape, plastic, and cardboard, you're lost . . ." Captain Lovell's experiences demonstrated how quick and creative responses can determine the successful resolution to a critical situation.



Market Position Is One of Critical Areas Addressed by Consultant Howard Ellerhorst at FSCT Industry Luncheon

Howard Ellerhorst, President of ChemMark Consulting Group, addressed attendees at the Annual Industry Luncheon on "Identifying Profitable 1995-2000 Coating Market Arenas."

According to Mr. Ellerhorst, it is critical to assess the marketplace and identify the technological position that you occupy within that marketplace to determine the best business plan. He emphasized that any opportunity "is where you have an end-use for a resin, using a specific technology." Through broad industry definitions, he identified these resin species, technologies, and end use segments, and discussed growth trends for formulative technologies.



Three classes of opportunities detailed by the speaker were: declining/mature, growth, and emerging. A successful business plan should be built with these classes in mind, he said. According to Mr. Ellerhorst, nearly one-half the sales in the coatings marketplace have been in declining or mature growth areas, so these segments cannot be ignored. Current position can be determined by classifying opportunities as either: prime (including growth and emerging technologies); transitional (not certain, these must be monitored at least twice annually); or undesirable (which should be run as a cash cow or divested). He stressed that these are broad technological trends, based on broad technological classifications.

In business, he concluded, there is a "battlefield mentality." The best ammunition for success is evaluating the end uses your company is involved in, examining customer relations, and going back to the opportunity identification to determine the best business plan.

James E. Geiger Receives 1995 George Baugh Heckel Award at Federation's Annual Meeting in St. Louis, MO

Other Annual Meeting Awards Presented

James E. Geiger, Past-President of FSCT (1988-89), is the recipient of the prestigious George Baugh Heckel Award for 1995.

Mr. Geiger, Past-President (1984-85) and Honorary Member of the Southern Society, received the Award during the Opening Session of the Federation's Annual Meeting and Paint Industries' Show, at Cervantes Convention Center, in St. Louis, MO, on October 9.

The Heckel Award, FSCT's highest honor, recognizes the outstanding contributions that Mr. Geiger has made to the organization's interest and prestige. Established in 1951, the Award is named in honor of the Federation's first Chairman and Secretary.

Mr. Geiger, a past member of the Executive Committee, has been involved in many Federation activities including the Chairmanship of the Finance, Nominating, and Liaison Committees, as well as Annual Meeting Host Committee Chairman. Most notably he served as Chairman of the Building Committee and was instrumental in the planning, construction, and acquisition of the FSCT Headquarters Building located in the Philadelphia suburb of Blue Bell, PA. Mr. Geiger has held membership in the Educational and Professional Development Committees as well.

Currently, Mr. Geiger serves on the Federation's Planning, Finance, and Investment Committees, the Industry Relations Task Force, as well as the Southern Society Representative to the Federation's Board of Directors.

Mr. Geiger is also the Chairman of the Southern Society's Finance Committee and serves on The University of Southern Mississippi's Advisory Committee. He also is a member of the Gallows Birds.

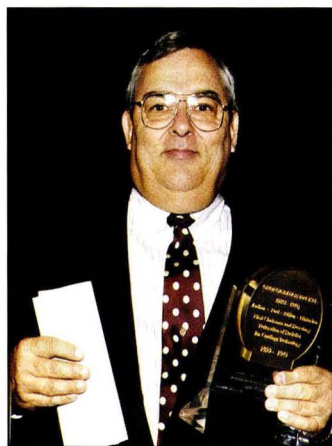
Mr. Geiger was graduated from Northern Illinois University with a B.S. in Chemistry. Mr. Geiger resides in Largo, FL with his wife, Lynne.



In presenting the Heckel Award to Mr. Geiger, FSCT Past-President Clarke Boyce (left) referred to him as the "architect of Blue Bell." Mr. Geiger was instrumental in all stages of the planning, development, and construction of the new Federation Headquarters in Blue Bell.

Mr. Geiger joins the ranks of the past recipients of the Heckel Award who have been responsible for enabling the Federation to grow into the viable, international organization it is today.

He credited the fellow members of the Federation with whom he had served, acknowledging their hard work, cooperation and team effort. Mr. Geiger thanked his wife, Lynne, for her strong support and encouragement and thanked the Heckel Award Committee for their generosity in selecting him for this honor.





Distinguished Service Award

This award was presented to Joseph P. Walton, of the Cleveland Society, in grateful recognition of his valuable contributions to the progress of the Federation while serving as President of the organization in 1994-95. Mr. Walton is Executive Vice President of Jamestown Paint Co., Jamestown, PA.

The Distinguished Service Award is presented to Joseph P. Walton by FSCT President-Elect Darlene Brezinski.



Armin J. Bruning Award

This award, established in 1962, is in memory of Armin "Joe" Bruning, the inventor of a colorimeter. He was devoted to the pursuit of the scientific study of color.

This year's recipient was Dr. Edward Jaffe, who retired as Vice President, Research & Development, of Ciba-Geigy Corp., in December 1994.

Dr. Jaffe received a B.S. Degree in Chemistry from City College of New York, and M.S. and Ph.D. Degrees in Chemistry from New York University.



J.P. Walton congratulates Dr. Jaffe on receiving the Bruning Award.

Throughout his career, Dr. Jaffe was recognized for his contributions for the use of color. He has been credited with the discovery of a new QA chromophore; a solid-solutions-DPP/QA, expanded color space; and solid-state surface treatments for the improved rheological properties of organic colored pigments in auto coatings. In addition, Dr. Jaffe holds 60 U.S. and 200 international patents related to organic colored pigments.

Dr. Jaffe presented "Rheologically Effective Modified Organic Pigments" at the 1993 FSCT Annual Meeting.



Pictured above are the 1995 Roon Award Winners. They are (from left): First place winner—Mitchell Winnik; Roon Chair Clifford Schoff; Third place winner—Kenneth Hoy; and Second place winner—Charles Hegedus.

Roon Foundation Awards

These cash awards and plaques, established by the late Leo Roon, and administered by the Coatings Industry Education Foundation, are for the best technical papers entered in the competition and submitted for presentation at the Federation's Annual Meeting by individual's associated with the organic coatings industry.

FIRST PRIZE (\$2,000)—"Latex Blends: An Approach to Zero VOC Coatings"—Mitchell A. Winnik and Jianrong Feng, of University of Toronto.

SECOND PRIZE (\$1,500)—"Film Formation Mechanism of Two-Component Waterborne Polyurethane Coatings"—Charles R. Hegedus, Andrew G. Gilcinski, and Robert J. Haney, of Air Products and Chemicals, Inc.

THIRD PRIZE (\$500)—"Coalescence and Film Formation from Latexes"—Kenneth L. Hoy, of Applied Science Consulting Services.



Winners of the Society Secretaries Awards are pictured with Committee Chair John Kulnane (far right). First place—John Du (New York) and Second place—Brenda Carr (accepting for Richard Mikol, Cleveland).

Society Secretaries Awards

These awards are made to the Secretaries of Constituent Societies of the Federation who furnish to the JOURNAL OF COATINGS TECHNOLOGY the most interesting reports of Society meetings and discussions following the presentation of papers at those meetings.

FIRST PRIZE (\$500)—John Du (Hüls America Inc.), Secretary of the New York Society.

SECOND PRIZE (\$250)—Richard A. Mikol (Tremco Inc.), Secretary of the Cleveland Society.



Golden Impeller Award

This annual award, offered by Morehouse Industries, Inc., for outstanding achievement in dispersion technology, was presented at the Annual Meeting to Michael P. Kenes, of M.P. Kenes, Inc., Orland Park, IL.



Michael Kenes (left) accepts the Golden Impeller Award from Morehouse representative Arne Salvesen.



Educational Committee Chair Melinda Rutledge congratulates William Purvis on his Hendry Award winning paper.

Alfred L. Hendry Award

Sponsored by a grant from the Southern Society of the Federation, this Award of \$1,000 is for the best undergraduate student paper submitted for competition. The 1995 competition was won by William A. Purvis, of The University of Southern Mississippi, for the paper "Chlorinated-Maleinized Guayule Rubber: A Novel Matting Agent for Powder Coatings."



Presenting the Society Speaker Awards to winners John Baker (Rocky Mountain) and Rudy Berndmaier (New York) is Technical Advisory Committee Chair Gail Pollano.

Society Speaker Awards

These awards are presented to individual members for the Societies who present Society Papers at the Annual Meeting in the best form and manner.

FIRST PRIZE (\$250)—John S. Baker (Retired), Rocky Mountain Society.

SECOND PRIZE (\$100)—Rudy Berndmaier (King Industries), New York Society.



Pictured with Poster Session Chair Steve Hodges (far right) are those awarded for having the best presentations in the Annual Meeting Poster Session: Third place—Bor J. Niu; Second place—Jean Meister; and First place—Anneke Kaminski.

Corrosion Committee Publication Award

A cash prize of \$1,000 was presented for the best corrosion related paper published in the *JOURNAL OF COATINGS TECHNOLOGY* during the 12 months prior to June 30 of the Award year. Equal emphasis was given to originality, scientific importance, and practical value. The 1995 award was won by Molly Moon and Brian Skerry, of The Sherwin-Williams Co., for their work entitled "Interpretation of Corrosion Resistance Properties of Organic Paint Films from Fractal Analysis of Electrochemical Noise Data," published in the April 1995 issue of the *JCT*.



Mattiello Memorial Lecture

In the above photo, J.P. Walton congratulates Frank Jones, of Eastern Michigan University, on his Mattiello Memorial Lecture entitled, "Toward Solventless Liquid Coatings."

Annual Meeting Poster Session

A Poster Session, designed to provide a noncommercial arena for new ideas, new techniques, preliminary results, work that is significant but not ready for full publication, results or ideas that do not fit normal publication criteria, etc., took place at the Annual Meeting.

FIRST PRIZE (\$300)—"Crosslinking Reactions in Urethane Coatings Near Interfaces"—A.M. Kaminski, B.W. Ludwig, and M.W. Urban of North Dakota State University.

SECOND PRIZE (\$200)—"Flow Induced Stress and Iron-Polyelectrolyte Interaction During Circulation Reduced Reflectance of Metal Flake in Automotive Paint Films"—Jean Meister, of University of Detroit-Mercy.

THIRD PRIZE (\$100)—"Latex Coatings: The Effect of Silicone Modification"—Bor J. Niu and Marek W. Urban, of North Dakota State University.



APJ President, W. Clark Voss (far right) presents plaques to the winners of the A.F. Voss/APJ Awards competition. From left: John Baker (Rocky Mountain); Robert C. Matejka (Piedmont); and Rudy Berndlmaier (New York).

A.F. Voss/American Paint & Coatings Journal Awards

These awards are cash prizes presented by the *American Paint & Coatings Journal* for the most constructive papers by Constituent Societies of the Federation in connection with the research, development, manufacture, or application of the industry's products, or of the raw materials entering into their fabrication.

FIRST PRIZE (\$500)—"EPA Reference Method 24 Round-Robin Analysis of Wood Furniture Amino Plast Coatings"—Piedmont Society (Robert C. Matejka).

SECOND PRIZE (\$300)—"Rheology Modifiers for Low VOC Bake Coatings"—New York Society (Rudy Berndlmaier).

THIRD PRIZE (\$200)—"The Effects of Reverse-Side Substrate Insulation on the Exterior Exposure Perfor-

mance of an Acrylic Emulsion Coating"—Rocky Mountain Society (John S. Baker).



Technical Focus Speaker

Melinda Rutledge presents Technical Focus Speaker Jonathan Martin, of National Institute of Standards & Technology with a Certificate of Appreciation for his talk entitled, "Methodologies for Predicting the Service Life of Coating Systems."

Federation Officers—Past and Present



Taking the oath of their office for their respective positions the coming year (from left), Secretary-Treasurer Thomas E. Hill, President-Elect Jay Austin, and President Darlene R. Brezinski, are sworn in by Past-President Joseph P. Walton.



Elected to serve on the Federation's Executive Committee for the year 1995-96 are (from left): Thomas E. Hill, Joseph P. Walton, J. Dick Mullen, Darlene R. Brezinski, Jay Austin, Gerry J. Gough, and Forest Fleming.



Incoming President Darlene Brezinski receives the Presidential Medallion from J.P. Walton



FSCCT Past-Presidents in attendance included: Carlos E. Dorris (1986-87); Kurt F. Weitz (1990-91); A. Clarke Boyce (1982-83); James E. Geiger (1988-89); James A. McCormick (1978-79); Milton A. Glaser (1956-57); William Mirick (1985-86); Joseph A. Bauer (1984-85); William F. Holmes (1991-92); John A. Lanning (1993-94); John Oates (1977-78); and Colin D. Penny (1993-94).

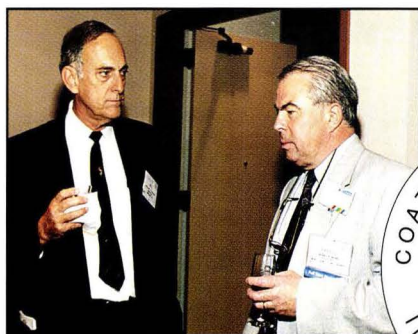


Coatings Societies International Meets in St. Louis

Attending the October 9, 1995 meeting of the Coatings Societies International, in St. Louis, MO, were the following representatives of Member Organizations (from left): Kaare Kleive (President, SLF); Francis Borel (Secretary-General, FATIPEC); Gerry Gough, Delegate,

FSCT); John Ballard (Delegate, FSCT); Fred Morpeth (Past-President, OCCA); Robert Ziegler (Executive Vice President, FSCT); John Lanning (Delegate, FSCT); Mike Symes (General Secretary, SLF); Joseph P. Walton (President, FSCT); Lee Hall (President, SCANZ); Kurt

Weitz (Delegate, FSCT); Darlene Brezinski (President-Elect, FSCT); Prem Thurkal (Honorary Editor, OCCA); Jay Austin (Secretary-Treasurer, FSCT); Isao Kumano (President, JSCM); Colin Penny (Delegate, FSCT); and Garry Torrens (President, SCAA).

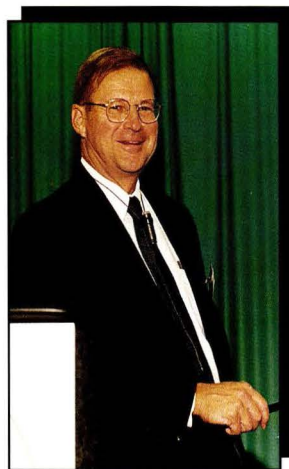


Annual Meeting Program Sessions

"Creativity + Adaptability = Gateway to Success"



Nearly 1,000 attendees gathered in the Cervantes Convention Center for the Annual Meeting Opening Session featuring presentation of the prestigious Heckel Award, the introduction of distinguished guests, and the Keynote Address by Apollo 13 Commander James Lovell



In his presentation of the Mattiello Memorial Lecture, "Toward Solventless Coatings," Dr. Frank Jones described results of an exploratory study of solventless (100% reactive) liquid polyester/melamine resin and polyester/polyisocyanate coatings. The premier technical presentation of the FSCT Annual Meeting program, Dr. Jones' Mattiello Lecture will be published in the January issue of the JCT.

FSCT Program Committee

Louis F. Holzknacht
(Chairman)
Steve A. Hodges
(Vice Chairman)
Steve Bussjaeger
Chris A. Lockhart
Don L. Mazzone
Latoska Price
Rose Ann Ryntz
Clifford Schoff
Jeffrey C. Sturm



Technical Focus Speaker Jonathan Martin spoke on "Methodologies for Predicting the Service Life of Coatings Systems."

He addressed the industry's need for a prediction method that can generate timely, accurate and reliable service life estimates of a coating system.



The FSCT/NPCA Manufacturing Management Committee hosted a panel discussion on "Intermix Systems & Small Batch Processing." Participants Robert Van Ooyen, of Van Wyk Engineering Systems (left) and Peter Cerra, of Tnemec, Inc., reviewed case studies dealing with intermix systems to reduce the need for small batch process and increase efficiencies, quality and customer response.

CIEF Receives Funds from Grace Davison and Troy

During the Federation's Awards Luncheon, the Coatings Industry Education Foundation was the recipient of two monetary gifts, one in the amount of \$5,000 from Grace Davison, a Unit of W.R. Grace & Co.-Conn., and another in the amount of \$2,500 from Troy Corp.

The contribution this year by Grace marks the beginning of an annual gift (minimum of five years) of \$5,000 to provide financial assistance for ongoing CIEF educational programs. The fund will be administered and distributed entirely by the CIEF. The donation by Troy is given annually with proceeds from the "Paint Show 5000," a five-kilometer fitness run held during the Paint Industries' Show. Since the inaugural run in 1987, Troy has donated approximately \$14,000 to the educational activities of the CIEF.

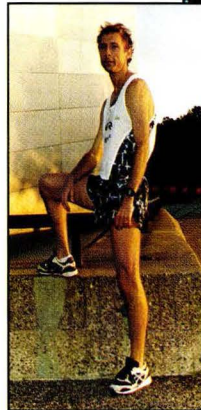
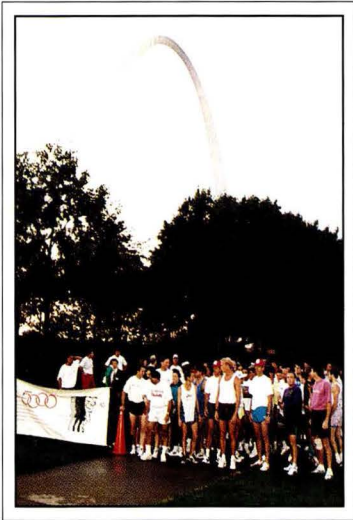


Paul Shimizu, Vice President and General Manager of silicas and adsorbents for Grace Davison (left), presents CIEF President George R. Pilcher, of Akzo Nobel Coatings, with a check for \$5,000.



Mr. Pilcher accepts a check in the amount of \$2,500 from Marie Marabuto, Manager Corporate Marketing Services, of Troy Corp., from the proceeds of the "Paint Show 5000."

Paint Show 5000—Troy Fun Run



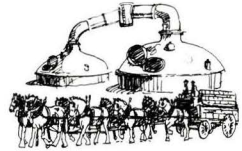
Joe Sarver, of Cerdec, a first-time runner in the Paint Show 5000, won the race at a record time of 17:06. One comment Mr. Sarver did have about the race was, "It's a nice course, but we didn't have much time to enjoy the scenery."



International Visitors Reception



President J.P. Walton and his wife Kathy welcome guests to the International Visitors Reception which was held on Tuesday night, October 10.



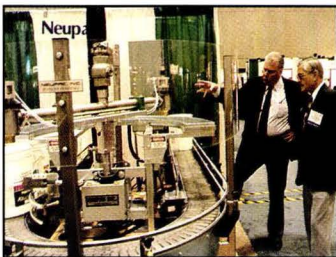
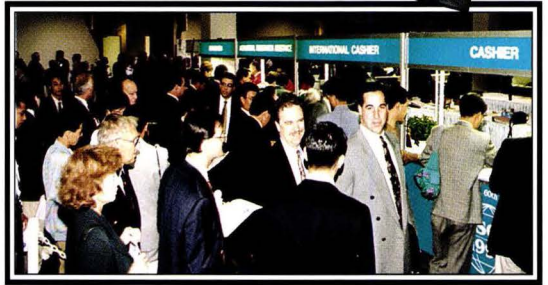
Social Guest Activities



Tori Graves, FSCT Director of Meetings and Conventions (center), is pictured with members of the Social Guest Host Committee.



Welcome to to the Paint Show!



A.P. Dataweigh Corp. • ASTM • Aceto Corp. • ACT Laboratories, Inc. • Advanced Software Designs • Affiliated Chemical Insurance Companies • Al Process Systems Ltd. • Air Products & Chemicals, Inc. • Air Technologies, Inc. • Akzo Nobel Chemicals • Alar Engineering Corp. • Alcan Toyo America, Inc. • Alcoa Industrial Chemicals • AlliedSignal Corp. • Allied Colloids • Alnor Oil Co. • American Chemical Society • American Colors, Inc. • American Paint & Ctgs Journal • Amoco Chemicals • ANGUS Chemical Co. • Anker Labelers USA Inc. • Aqualon • Arco Chemical Co. • Ashland Chemical, Inc. • Atlas Electric Devices • Aztec Peroxides, Inc. • B.A.G. Corp. • BASF Corp. • BatchMaster Software Corp. • Bohlin Instruments, Inc. • Bowers Process Equipment Inc. • Brookfield Engineering Lab. • Brookhaven Instruments Co. • George Brown College • Buckman Laboratories • Buhler Inc. • Bulkcon Systems International USA Ltd • Burgess Pigment Co. • BYK-Chemie USA • BYK-Gardner, Inc. • Cabot Corp. • Caframo Ltd. • Calgon Corp. • Cardolite Corp. • CB Mills • CCP Polymers • Celite Corp. • Center for Applied Engineering Inc. • Chemical & Engineering News • Chemical Marketing Reporter • Chemical Week • Chemir/Polytech Laboratories, Inc. • CIBA-GEIGY Corp. • Cimbar Performance Minerals • Civacon • Clariant Corp. • CMI International • The Coatings Laboratory Inc. • Coatings Magazine • Color and Appearance Technology, Inc. • Columbian Chemicals Co. • Cortec Corp. • CR Minerals Corp. • Crosfield Co. • CYTEC Industries Inc. • D/L Laboratories • Daniel Products Co., Inc. • Datacolor International • Day-Glo Color Corp. • J. De Vree & Co. N.V. • DeFelsco Corp. • Degussa Corp. • University of Detroit-Mercy • Distri-Kleen, Inc. • Dominion Colour Corp. • Dow Chemical Co. • Dow Corning Corp. • Draiswerke, Inc. • Draiswerke GmbH • Drew Industrial Division-Ashland • Dromont SRL • Dry Branch Kaolin Co. • DSA Consulting, Inc. • DSET Laboratories, Inc. • DSM Resins U.S., Inc. • DuPont Nylon Intermediates & Specialties • Eastern Michigan University • Eastman Chemical Co. • Ebonex Corp. • Eiger Machinery, Inc. • Eirich Machines Inc. • Elcometer, Inc. • Elf Atochem North America, Inc. • EM Industries, Inc. • Engelhard Corp. • Engineered Polymer Solutions • Environmental Choice Program • Epworth Mfg Co., Inc. • ERO/Goodrich Forest Products, Inc. • Etna Products Inc. • European Coatings Journal • Exxon Chemical Co. • Fanuc Robotics North America • Fawcett Co., Inc. • F S C T • The Feldspar Corp. • Filter Specialists, Inc. • Fischer Technology, Inc. • Floridin Co. • Fluid Management • FMJ International Publications Ltd. • Fuji Silysia Chemical Ltd. • H.B. Fuller Co. • G A F Filters Systems • Paul N. Gardner Co., Inc. • Garrison Industries, Inc. • GenCorp Aerojet • Georgia Pacific Resins, Inc. • The BFGoodrich Co. • Goodyear Tire & Rubber Co. • Haake, Inc. • The C.P. Hall Co. • Halox • Harcros Pigments Inc. • Hazmatpac, Inc. • HERO Industries Ltd. • Heucotech Ltd. • Hickson Specialities, Inc. • Hilton Davis Co. • Hockmeyer Equipment Corp. • Hoechst Celanese Corp. • Hoover Materials Handling Group, Inc. • Horiba Instruments Inc. • J.M. Huber Corp. • Huls America, Inc. • Hunterlab • Huntsman Corp. • Ideal Manufacturing & Sales Corp. • IKA Works • INDCO, Inc. • Industrial CoPolymers Ltd. • Industrial Paint & Powder Magazine • Inmark, Inc. • Interfibe Corp. • International Compli-

TO THE 1995 PAINT SHOW EXHIBITORS FSCT SAYS "THANK YOU"

ance Center Ltd. • International Specialty Products • IIT Marlow Pumps/IIT A-C Pumps • Jeff Industries • S.C. Johnson Polymers • Kady International • Kemira Pigments, Inc • Kenrich Petrochemicals, Inc. • King Industries, Inc. • Kline & Co. • KTA-Tator, Inc. • Labsphere, Inc. • LaQue Center • Lawter International • Leather Feel Paint-Jewelpak • The Leneta Co. • Liquid Controls Corp. • Littleford Day Inc. • Longview Fibre Co. • The Lubrizol Corp. • Lucas Meyer, Inc. • Luzenac America • 3M/Zeelan Industries, Inc. • 3M, Specialty Chem Division • MacBeth • Magnesium Elektron, Inc. • Malvern Instruments • Malvern Minerals Co. • Manufacturing Business Systems • Mapico Inc. • McWhorter Technologies, Inc. • The Mearl Corp. • Micro Powders, Inc. • Microfluidics International Corp. • Micromeritics • Mid-States Eng & Mfg Co. • Millipore Corp. • Milwhite, Inc. • Mineral Pigments Corp. • Ming-Zu Chemical Industries • MiniFIBERS, Inc. • Minolta Corp. • Mississippi Lime Co. • University of Missouri-Rolla • Modern Paint & Coatings • Morehouse-Cowles, Inc. • Morton International - UCD • Muetek Analytical, Inc. • Myers Engineering • Nacan Products Limited • NACE International • Nametre Co. • National Industrial Chemical • National Paint & Coatings Assoc. • Netzsch Incorporated • Neupak Inc. • New Way Packaging Machinery Inc. • Norman International • North Dakota State University • Obron Atlantic Corp. • Ohio Polychemical Co. • Olin Chemicals • Omnimark Instrument Corp. • OSi Specialities, Inc. • Oxy Chem • Paar Physics USA, Inc. • Paint & Ctgs Ind. Magazine • Paint Research Association • Parasol Systems, Inc. • Parker Hannifin Corp. • Particle Sizing Systems, Inc. • Peninsula Polymers • Phenoxo Associates • Polar Minerals • Poly-Resyn, Inc. • Polyester Corp. • PPG Industries, Inc. • P Q Corp./Potters Industries • Precision Dispensing • Premier Mill Corp. • Priority One Packaging/Langguth GmbH • Progressive Recovery, Inc. • Purity Zinc Metals Co. • Pyosa S.A. De C.V. • Q Sales and Leasing • Q-Panel Lab Products • K.J. Quinn & Co., Inc. • Raabe Corp. • Radtech International North America • Ranbar Technology, Inc. • Reichhold Chemicals Inc. • Rexam, Mulox Inc. • RHEOX, Inc. • Rhone-Poulenc • Rohm and Haas Co. • Rohm Tech Inc. • Ronningen-Petter • Charles Ross and Son Co. • Russell Finex, Inc. • San Esters Corp. • Sartomer Co., Inc. • Schenectady International, Inc. • Schlumberger • Schold Machine Co. • Schuller International Inc. • Schutz Container Systems, Inc. • Semi-Bulk Systems Inc. • SEPR (Ceramic Beads & Powders) • Shamrock Technologies Inc. • Shell Chemical Co. • Sherwin-Williams Chemicals • Silberline Mfg Co., Inc. • Snyder Industries • Software 2000 Inc. • Sonoco Products • South Florida Test Services • Southern Clay Products Inc. • Univ. of Southern Mississippi • Specialty Minerals Inc. • Spencer Machine & Tool Co., Inc. • Spraymaton, Inc. • Startex Chemical Co. • Steel Shipping Container Institute • Steel Structures Painting Council • Stretch-O-Seal Corp. • Sub-Tropical Testing Service • Sud-Chemie Rheologicals • Summit Precision Polymers Corp. • 21st Century Containers Ltd. • Taotek North America, Inc. • Tayca Corp. • Tech Pak, Inc. • Teemark Corporation • Tego Chemie Service USA • Thiele Engineering Co. • Thurman Material Handling Systems • TRICOR Systems, Inc. • Troy Corp. • U.F. Strainrite • U.S. Aluminum, Inc. • U.S. Borax, Inc. • U.S. Polymers, Inc. • U.S. Silica Co. • Ultrablend Systems, Inc. • Union Carbide Corp. • Union Miniere • Union Process, Inc. • United Mineral & Chemical Corp. • United Soy Bean Board • Universal Flow Monitors • Van Waters & Rogers Inc. • VanDeMark Group • R.T. Vanderbilt Co., Inc. • Vero Dispersion Machines, Inc. • Versa-Matic Pump Co. • Vorti-Siv Division • Wacker Silicones Corp. • Washtech Systems Inc. • Western Equipment Co. • Wilden Pump • Witco Corp. • World Minerals Inc. • X-Rite, Inc. • Yamada America, Inc. • Zaclon, Inc. • Carl Zeiss, Inc. • Zeneca Biocides • Zeneca Resins

Winning Booths at Paint Industries' Show

BYK-Gardner, Inc.; Dry Branch Kaolin Co.; Eiger Machinery, Inc.; King Industries; Paint Research Association; Sherwin-Williams Chemicals; Taotek North America, Inc.; Troy Corp.; United Mineral and Chemical Corp.; and Washtech Systems Inc. were recipients of the 1995 Paint Show Awards at the Federation of Societies for Coatings Technology's 1995 Annual Meeting & Paint Industries' Show, at the Cervantes Convention Center, in St. Louis, MO, on October 9-11.

These awards are presented to the companies sponsoring outstanding exhibits in the Show on the basis of technical excellence, educational value, attractiveness, and novelty. The awards are divided into four categories: Raw Materials (single, double, 3-5, 6-9, 10-plus); Production Equipment (single, double, and three plus); Service Industries; and Laboratory and Testing Equipment.

A record-setting number of exhibitors (314) participated in the St. Louis Show, inhabiting 92,500 square feet of floor space at the Cervantes Convention Center.



Cervantes Convention Center
St. Louis, MO
October 9-10-11, 1995



An exhibitor for 42 years, Troy Corp., Newark, NJ, won in the category of Raw Materials—10+ Booths.

In the photo above, Paint Show Exhibits Committee Chair Richard Max (left) and Paint Show General Manager Robert F. Ziegler present the plaque to Troy Representative Marie Marabuto.



King Industries, Norwalk, CT, took the prize for Raw Materials—6-9 Booths. They have been exhibiting in the Paint Show for 12 years. Richard Max and Bob Ziegler present the plaque to company representatives Len Calbo and F. Abi-Karam.

A five-year exhibitor, United Mineral & Chemical Co., Lyndhurst, NJ, was the recipient of the Raw Materials—3-5 Booths award.

The below photo includes: Bob Ziegler; company representatives Irwin Drangel, Elaine Borowiec, Maria Hulwsit, and Michael Sansonetti; and Richard Max.



Dry Branch Kaolin, Union, NJ, an exhibitor for 33 years, took the prize for Raw Materials—Double Booth.

The above photo shows company representative Delores Parry being congratulated by Bob Ziegler and Richard Max.



A 19-year exhibitor, The Sherwin-Williams Co., Coffeyville, KS, was the recipient of the Raw Materials—Single Booth award. Company representative Lisa Wright is congratulated by Messrs. Max and Ziegler.

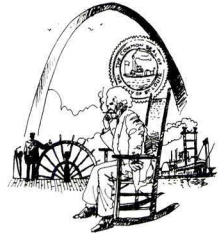
50-Year Paint Show Award

RHEOX, Inc., Hightstown, NJ, was recognized for having participated as an exhibitor for 50 years in the Paint Industries' Show sponsored by the Federation.

A plaque commemorating the occasion was presented to RHEOX by the Federation.

RHEOX joins nine other exhibiting companies participating for 50 or more years in the Show, including: Ashland Chemical Co. (56); Atlas Electric Devices Co. (53); Columbian Chemicals Co. (60); Engineered Polymer Solutions (54); Hüls America Inc. (59); Reichhold, Inc. (57); Rohm & Haas Co. (60); South Florida Test Service (53); and Union Carbide Corp. (60).

RHEOX representatives accepting the plaque commemorating their 50th year exhibiting in the Paint Industries' Show are John J. Gallagher and Melinda Rutledge.



An exhibitor for two years, Taatek North America, Inc./Corob North America Div., Charlotte, NC, won in the category for Production Equipment—3+ Booths.

The above photo shows company representatives Carlos Salas and Diana Vilanova being congratulated by Richard Max and Bob Ziegler.



Eiger Machinery, of Mundelein, IL, took the prize for Production Equipment—Double Booth. They have been exhibiting in the Paint Show for 15 years. The photo includes: Bob Ziegler, Bob Radcliffe, Lisa Kivaterder, Dave Peterson, and Richard Max.



Washtech Systems, Inc., Springfield, MO, took the prize for Production Equipment—Single Booth. They have been exhibiting in the Paint Show for five years. The above photo shows Bob Ziegler and Richard Max congratulating company representatives Fred Wellman and Dean Brown.



A first-time exhibitor, Paint Research Association, Teddington, Middlesex, England, was the recipient of the Service Industries Award. The photo shows Bob Ziegler and Richard Max presenting company representative John Bernie with the plaque.



An exhibitor for 42 years, BYK-Gardner won the Lab and Testing Equipment Award. The below photo shows company representative Dan Pisano and Tom Mulleady being congratulated by Bob Ziegler and Richard Max.



We've gained some weight.

(10,000 tons per year as a matter of fact.)

Starting in September, Degussa will be supplying Degamin IPDA™, a vital and versatile raw material, from a new IPDA production unit at our Antwerp, Belgium complex.

Pilot plant quantities have already been produced at this site for several U.S. customers.

Now, formulators of resins for high-performance industrial coatings can rely on Degussa for a dependable supply of high-quality isophorone diamine, plus the experience and economies we offer our customers in every industry.

So when superior resins and final coatings are the requirement, you supply the demand — and we'll supply the Degamin IPDA™.

Degussa 

Degussa
Corporation



Degamin
IPDA™

Isophorone Diamine



Responsible Care®
A Public Commitment

Degussa Corporation, Chemical Group: Organic & Fine Chemicals Division
65 Challenger Road, Ridgefield Park, NJ 07660, (201) 641-6100, Fax: (201) 641-0385

Circle No. 279 on the Reader Service Card



PANORAMA™

Coatings MSDS CD Retrieval System

A new vista in Material Safety Data Sheet access and storage for the Coatings Industry

Only from the Federation of Societies for Coatings Technology

A Comprehensive MSDS Access, Storage, Retrieval System on CD
Panorama™ is a new vista in Material Safety Data Sheet (MSDS) access and storage for the coatings industry. Each entry on Panorama is fully indexed, and integrated information searching software is included, permitting users to locate an individual MSDS by:

- ▲ Product name
- ▲ Manufacturer
- ▲ CAS number
- ▲ Chemical name
- ▲ Key words
- ▲ Specific in-house codes

Satisfies Government Regulations

Panorama meets the requirements of government legislation mandating that manufacturers maintain a 30-year file of MSDS information, without supporting a mountain of paperwork. The single Panorama CD replaces over 1,000 computer disks or 250,000 pages of typewritten text.

Continuous Improvement, Continuous Updates

In an effort to provide users the most current and comprehensive MSDS information, Panorama is available only by annual subscription. Each quarter, a new Panorama CD will be supplied to subscribers. The updated version will contain all original MSDS, plus all new and revised sheets. Superseded MSDS, while remaining on file as required by law, will be labeled to alert the user that they have been replaced by more current data.

Panorama: Only from the Federation of Societies for Coatings Technology

It was inevitable the Federation of Societies for Coatings Technology (FSCT) would develop the Panorama system. In concert with the FSCT's Chicago Society, Panorama development began in 1991. Today, over 8,700 individual raw material products are contained on the system's single CD, and the number is growing weekly.

Never before has such information been available in a single, affordable, easy-to-use package, providing users with comprehensive information on over 8,000 raw material products in the coatings industry.

Subscribe Today

One and two-year subscriptions are available. Special discounts are provided to FSCT and NPCA member companies.

For Additional Information

To subscribe, or if you have additional questions, call the Panorama InfoLine at 1-610-940-0777. Write inquiries to: Panorama, Federation of Societies for Coatings Technology, 492 Norristown Road, Blue Bell, PA 19422-2350. Fax (610) 940-0292.



PANORAMA™

Instant MSDS access ▲ Information management ▲ User customization
Satisfies government regulations ▲ Developed and backed by the FSCT



Federation of Societies for Coatings Technology
492 Norristown Road
Blue Bell, PA 19422-2350
(610) 940-0777
Fax (610) 940-0292



Panorama is endorsed by the National Paint & Coatings Association

Regulatory Update December 1995

This digest of current regulatory activity pertinent to the coatings industry is published to inform readers of actions which could affect them and their firms, and is designed to provide sufficient data to enable those interested to seek additional information. Material is supplied by National Paint and Coatings Association, Washington, D.C. The Regulatory Update is made available as a service to FSCT members, to assist them in making independent inquiries about matters of particular interest to them. Although all reasonable steps have been taken to ensure the reliability of the Regulatory Update, the FSCT cannot guarantee its completeness or accuracy.

Department of Transportation Research and Special Programs Ad- ministration—60 FR 53321 Elimination of Unnecessary and Du- plicative Hazardous Materials Regulations.

Action: Notice of proposed rulemaking (NPRM)

The Department of Transportation's Research and Special Programs Administration (RSPA) is proposing to remove unnecessary, obsolete, and duplicative regulations contained in the Hazardous Materials Regulations (HMR). RSPA is also proposing to reformat the Hazardous Materials Table and List of Hazardous Substances and Reportable Quantities that could eliminate approximately 100 pages of the CFR. The intended effect of this action is to make the HMR more user friendly, thus enhancing compliance. This action is in response to President Clinton's March 4, 1995 memorandum to department and agency chiefs for a review of all agency regulations.

For additional information, contact John Gale or Jennifer Antonielli, (202) 366-8553, Office of Hazardous Materials Standards, RSPA, Department of Transportation, Washington, D.C. 20590.

November 13, 1995—60 FR 56952 Hazardous Waste Generators; Or- ganic Air Emission Standards for Tanks, Surface Impoundments, and Containers

Action: Notice of postponed effec- tive date.

The U.S. Environmental Protection Agency (EPA) has announced that, for the second time, the effective date of the final rule on Hazardous Waste Treatment, Storage, and Disposal Facilities and Hazardous Waste Generators; Organic Air Emission Standards for Tanks, Surface Impoundments, and Containers has been postponed. The original

effective date of the rule had been June 5, 1995. Based on the first extension, the effective date had been scheduled for December 6, 1995; the new six month postponement makes the rule effective June 6, 1996.

The EPA specified in the final rule a schedule that established the compliance dates by which different requirements of the final rule must be met. The effective date of June 6, 1996 will be for all provisions of the standards, including the applicability of 40 CFR part 265 subparts AA, BB, and CC to 90-day accumulation units at hazardous waste generators; the applicability of 40 CFR part 265 subparts AA, BB, and CC to Resource Conservation and Recovery Act (RCRA) permitted units; and the applicability of the final standards to tanks in which waste stabilization activities are performed. All other compliance dates for the final rule remain as published in the final rule (59 FR 62896).

The supporting information used for the final rule is available for public inspection and copying in the RCRA docket. The RCRA docket numbers pertaining to the final rule are F-91-CESP-FFFFF, F-92-CESA-FFFFF, F-94-CESF-FFFFF, F-94-CE2A-FFFFF, and F-95-CE3A-FFFFF.

For additional information about this postponement, contact the RCRA Hotline at (800) 424-9346 toll-free, or (703) 920-9810.

Storm Water Permits Extended—

The U.S. EPA has announced deadline extensions for the Storm Water Multi-Sector General Permit. Applicants have an additional 90 days to submit notices of intent (NOI) and to develop and implement pollution prevention plans (PPP). The new deadlines are: March 29, 1996 - NOIs; and September 25, 1996 - SWPPPs.

Department of Transportation Research and Special Programs Ad- ministration October 17, 1995—60 FR 53729 Hazardous Materials Pilot Ticketing Program; Extension of Comment Period

Action: Proposed rule; Extension of comment period

On August 21, 1995, RSPA published a notice of proposed rulemaking (NPRM) in the *Federal Register* which invited public comment on a proposal to implement a pilot program for ticketing of certain hazardous materials transportation violations [Docket HM-207E, Notice 95-10, 60 FR 43430]. Under the program, RSPA would issue tickets for violations that do not have substantial impacts on safety. RSPA has received a request from the Hazardous Materials Advisory Council (HMCA) seeking an extension of the comment period in order to have more time to evaluate the proposals contained in the NPRM.

For additional information, contact John J. O'Connell, Jr., Director, Office of Hazardous Materials Enforcement, (202) 366-4700; or Edward H. Bonekemper, III, Office of the Chief Counsel, (202) 366-4400, Research and Special Programs Administration, U.S. Department of Transportation, 400 Seventh Street S.W., Washington, D.C. 20590-0001.

Voluntary Environmental Audit Pro- tection Act (S. 582)

Date of Introduction: March 21, 1995
Last Action Date: November 15
**Status: In Senate Judiciary Commit-
tee**

**Sponsor: Senator Mark O. Hatfield
(R-OR)**

The bill, which would amend Title 28 of the United States Code, would allow industry to conduct voluntary self-assessments to ensure compliance

with environmental laws without fear of judicial or administrative penalty or third-party action. Current law permits EPA to cite and fine environmental lapses found during good faith efforts to comply with the law. At presstime, a hearing on the bill was scheduled before the Senate Judiciary Committee for November 15. The Superfund Reform Act of 1995 (H.R. 2500).

Date of Introduction: October 18, 1995

Last Action Date: November 9, 1995
Status: In House Commerce Committee

Sponsor: Representative Michael Oxley (R-OH)

The Superfund Reform Act of 1995, H.R. 2500, has been approved by a House subcommittee. Introduced on October 18, the legislation includes a limited repeal of retroactive liability covering 1) parties that disposed of waste at municipal landfills; 2) those that contributed less than one percent of waste at any site; and 3) parties that recycled certain materials. The House Commerce, Trade, and Hazardous Materials Subcommittee approved the bill for

full Commerce Committee action on November 11. Rep. Michael Oxley, sponsor of the bill is also the subcommittee chairman. Full committee markup is expected after Thanksgiving and floor debate has been promised in December. However, it is still unlikely that a Superfund reform measure will be passed by the full House this year.

Comprehensive Regulatory Reform Act of 1995 (S. 343)

Date of Introduction: February 2, 1995
Last Action Date: November 9, 1995
Status: In limbo

Sponsor: Senator Robert Dole (R-KS)

The bill, passed by the House, would require regulatory agencies to conduct cost-benefit analyses and risk assessments, which would be subject to court reviews, for major regulations. Major regulations are defined as costing \$100 million or more annually. The bill was withdrawn from the Senate floor in July because of excessive controversial amendments. However, it is possible that yet another vote could be taken this year to end the filibuster and secure passage of the bill. While support has been growing, 60 votes are needed to

end a filibuster, and that level of support is unlikely at this time. Meanwhile, always thinking, the Republicans decided not to wait for passage of the individual legislation, and attached a rider in the form of an amendment to the dept ceiling bill on November 9. The amendment, sponsored by Rep. Bob Walker (R-PA), incorporates many of the House-passed language mandating detailed cost-benefit and risk analyses for major new regulations, but sets the threshold at which those requirements kick in at \$75 million, compared to the House's earlier insistence on \$25 million and the Senate's threshold of \$100 million. The bill also would allow judicial review of regulations if plaintiffs allege that agencies failed to consider the impact on small businesses. The measure includes appropriate exemptions for emergency regulations, such as those designed to protect food safety and public health. The amendment also adopts Senator Don Nickles' (R-OK) proposal allowing Congress to review and vote on regulations before they take final effect.

This bill was vetoed by President Clinton.

States Proposed Legislation and Regulations

ALABAMA

Air Quality (Regulation)—A proposed rule of the Alabama Department of Environmental Management (DEM) would amend the definition of volatile organic compound (VOC) to conform with the federal definition. Contact Ron Gore, DEM, (334) 271-7861.

ALASKA

Air Quality (Regulation)—A proposal issued by the Alaska Department of Environmental Conservation (DEC) would revise standards for determining the potential to emit for air pollutants, provisions of the construction and operating permit programs, and requirements for permit modifications. Contact John Kuterbach, DEC, (907) 465-5100.

ARKANSAS

Lead (Regulation)—A proposal of the Arkansas Department of Pollution Control and Ecology (DPCE) would establish a lead-based paint hazard program, including requirements for

the certification of workers engaged in lead-based paint activities. Contact Rhonda Sharp, DPCE, (501) 570-2186.

ARIZONA

Air Quality (Regulation)—The Arizona Department of Environmental Quality (DEQ) proposed a regulation which would require all prime coat operations at automobile assembly plants to use the best system of continuous emission reduction. Additionally, it would add emission standards for stationary sources, synthetic organic chemical manufacturers, industrial process cooling towers, halogenated solvent cleaning, and epoxy resin producers. Contact Amy Wainwright, DEQ, (602) 207-2225.

CALIFORNIA

Air Quality—CA A. 1777 (Brewer) requires the adoption of a methodology to calculate the value of emission reduction credits from stationary and areawide sources. On October 12, the governor signed the legislation.

COLORADO

Air Quality (Regulation)—A final regulation of the Colorado Air Quality Control Commission (AQCC) incorporates revisions to the federal prevention of significant deterioration standards by replacing the current total suspended particulate increment with PM-10 increments. The rule was effective October 30, 1995. Contact AQCC, (303) 692-3100.

The Colorado AQCC adopted a final rule which incorporates the federal standards for hazardous organic NESHAP and for general hazardous air pollutants. The regulation was effective October 30, 1995. Contact AQCC, (303) 692-3100.

A proposal of the AQCC would incorporate by reference the federal definition of VOC, including the exemption of acetone from VOC regulation. A hearing on the rule is scheduled for December 21 in Denver; written comments must be received by that date. Contact AQCC, (303) 692-3100.

Hazardous Waste (Regulation)—A proposed regulation of the Colorado Hazardous Waste Commission

(HWC) would modify hazardous waste requirements by incorporating federal air emission control standards for tanks, containers, and surface impoundments, and by amending testing and monitoring regulations. Contact Karen Osthus, HWC, (303) 692-3321.

CONNECTICUT

Air Quality (Regulation)—The Connecticut Department of Environmental Protection (DEP) adopted a regulation which establishes an operating permit program, applicable to hazardous air pollutants, stratospheric ozone protection and enhanced monitoring requirements. The rule became effective September 20. Contact Ellen Walton, DEP, (203) 424-3027.

FLORIDA

Air Quality (Regulation)—The Florida Department of Environmental Protection (DEP) adopted a rule, effective October 11, which postpones the deadline for the submission of air permit applications for Title V sources. Contact Larry George, DEP, (904) 488-0114.

GEORGIA

Air Quality (Regulation)—A proposed regulation of the Georgia Department of Natural Resources (DNR) would, among other things, amend the state implementation plan for ozone by requiring the use of emission reduction credits in the event of the promulgation of a national rule for automotive refinishing and for architectural coatings. Contact Marlin Gottschalk, DNR, (404) 363-7000.

Hazardous Waste (Regulation)—The Georgia Department of Natural Resources (DNR) proposed a regulation which would establish universal treatment standards for land disposal; adopt air emission requirements for hazardous waste management; and add 58 chemicals to the list of products that are considered hazardous when discarded. Contact Bill Mundy, DNR, (404) 656-7802.

IDAHO

Air Quality (Regulation)—A proposal of the Idaho Department of Health and Welfare (DHW) would amend the current definition of VOC to conform with the federal definition by removing acetone and volatile methyl siloxanes. Contact Tim Teater, DHW, (208) 334-5898.

INDIANA

Air Quality (Regulation)—A regulation adopted by the Indiana Department of Environmental Management (DEM) amends the current definitions of VOC and nonphotochemically reactive hydrocarbon to reflect changes to the federal definitions. The rule was effective October 5. Contact Philip Doyle, DEM, (317) 232-8420.

Hazardous Waste (Regulation)—The Indiana Department of Environmental Management (DEM) announced that it intends to issue a proposal concerning hazardous waste management, applicable to container storage, empty containers and tanks, warning signs for reactive wastes, and closure certification. Contact Elaine Roemer, DEM, (317) 232-8883.

IOWA

Water Quality (Regulation)—A final rule of the Iowa Environmental Protection Commission (EPC) incorporates by reference the federal amendments for effluent, pretreatment and toxic effluent standards. The regulation went into effect on November 15. Contact EPC, (515) 281-8693.

KENTUCKY

Air Quality (Regulation)—The Kentucky Department of Environmental Protection (DEP) intends to amend current regulations to incorporate federal guidelines for operating permits. The rule would provide descriptions of emissions not regulated at the source, require the submission of lists of insignificant activities, and exclude specific operations and activities from the application process. Contact John Hornback, DEP, (502) 573-3382.

A proposed rule issued by the Kentucky DEP would set up standards for determining whether a source is major and must obtain a Title V operating permit. In addition, it would establish monitoring, recordkeeping, and reporting provisions. Contact John Hornback, DEP, (502) 573-3382.

LOUISIANA

Air Quality (Regulation)—The Louisiana Department of Environmental Quality (DEQ) adopted regulations which, among other things, set up emission controls for sources of industrial wastewater in specific areas that emit 50 tons or

more of VOCs per year and which amend the current permitting fee schedule for small businesses. The rules were effective September 20. Contact Patsy Deaville, DEQ, (504) 765-0399.

The Louisiana DEQ has proposed a regulation which would increase fees for air toxics, accident prevention, Stage II vapor recovery, and criteria pollutants by five percent. Contact Patsy Deaville, DEQ, (504) 765-0399.

MASSACHUSETTS

Toxics-in-Packaging—MA H. 5557 (Committee on Science & Technology) reduces heavy metals in consumer packaging. The bill, which is being substituted for H. 3389, was introduced on October 17.

MICHIGAN

Solid Waste—MI H. 5380 (Sikkema) provides for liability for underground storage tanks. Introduced on November 7, the bill was referred to the House Committee on Conservation, Environment, and Great Lakes.

MINNESOTA

Hazardous Waste (Regulation)—A final regulation of the Minnesota Pollution Control Agency (PCA) amends current requirements by incorporating federal standards for corrective action management and temporary units. The rule was effective October 2. Contact Nathan Cooley, PCA, (612) 297-7544.

Lead (Regulation)—The Minnesota Pollution Control Agency (PCA) intends to propose a rule concerning the use of abrasive blasting and other methods to remove lead-based paint from steel structures, including methods for the identification of lead in paint. Contact Gordon Anderson, PCA, (612) 296-7667.

MISSOURI

Hazardous Waste (Regulation)—Proposals issued by the Missouri Department of Natural Resources (DNR) would incorporate by reference federal revisions concerning general requirements for the hazardous waste management system; the standards for labeling and marking hazardous waste containers; the regulations for hazardous waste, treatment and storage facilities; and the management requirements for loading and unloading hazardous wastes. Contact DNR, (314) 751-3176.

NEW JERSEY

Air Quality—The New Jersey Department of Environmental Protection (DEP) has made available three air quality permitting technical manuals to the general public. The manuals address compliance stack emission test programs, continuous emissions monitoring systems and continuous opacity monitoring systems. Contact Map Sales and Publication Office, (609) 777-1038.

Spray Paint Restrictions—NJ S. 2283 (LaRossa and McGreevey) prohibits the sale, transportation and possession of certain spray paints and indelible markers. Introduced on October 19, the bill was sent to the Senate Committee on Commerce.

NEW MEXICO

Air Quality (Regulation)—The Albuquerque/Bernalillo County Air Quality Control Board (ABCAQCB) adopted a regulation to reduce air pollution from sources that emit particulate matter, fumes, smoke, or aerosols in order to reduce visible air contaminants, including stationary sources. The rule was effective November 1. Contact Environmental Health Department, P.O. Box 1293, Albuquerque, NM 87103.

NORTH CAROLINA

Hazardous Waste (Regulation)—A proposed rule of the North Carolina Department of Environment, Health, and Natural Resources (DEHNR) would incorporate by reference federal requirements to streamline hazardous waste management systems for the collection and management of universal wastes. Contact Grady Ballentine, DEHNR, (919) 733-4618.

OKLAHOMA

Air Quality (Regulation)—A proposal issued by the Oklahoma Department of Environmental Quality (DEQ) would extend the time that new minor sources can operate before they must obtain an operating permit and would detail general information on the air quality permitting process. A hearing on the proposed rule will be held in Oklahoma City on December 19. Contact Jan Yue, DEQ, (405) 271-5220.

The Oklahoma DEQ proposed a rule which would set up a schedule for the submittal of Part 70 operating permits based on the standard industrial classification code of the affected facility. Contact Scott Thomas, DEQ, (405) 271-5220.

RHODE ISLAND

Lead (Regulation)—A final rule adopted by the Rhode Island Department of Health (DOH) establishes standards and procedures for blood lead screening, sets up criteria for lead inspections, and establishes procedures for lead hazard abatement. The regulation went into effect August 28. Contact Patricia Nolan, DOH, (401) 277-2231.

SOUTH DAKOTA

Hazardous Waste (Regulation)—A final regulation of the South Dakota Department of Environment and Natural Resources (DENR) amends current standards concerning the generation, treatment, storage and disposal of hazardous wastes in order to meet federal requirements. The rule went into effect October 2. Contact DENR, (605) 773-5559.

TENNESSEE

Air Quality (Regulation)—The Tennessee Department of Environment and Conservation (DEC) proposed a rule which would amend current regulations to conform with federal standards for hazardous waste management. Under the proposal, air emissions limits would be placed on tanks, surface impoundments, and containers; 58 chemicals would be added to the list of commercial chemicals that are considered hazardous waste when discarded; and universal hazardous waste management standards would be established. Contact Gerald Ingram, DEC, (615) 532-0850.

A proposal issued by the Tennessee DEC would prescribe test methods and compliance procedures for determining the VOC content of coatings and inks. Contact Ron Redus or John Mills, DEC, (615) 532-0577.

TEXAS

Lead (Regulation)—A proposed rule of the Texas Department of Health (DOH) would require the reporting of elevated blood lead levels in children, would establish reporting and information confidentiality procedures, and would allow the establishment of a registry of children with lead poisoning. Contact Jean Brender, DOH, (512) 458-7222.

VIRGINIA

Air Quality (Regulation)—The Virginia Air Pollution Control Board (APCB) intends to propose a rule which would amend current air

quality control regulations by modifying the maximum allowable air quality increments for particulate matter, and by setting guidelines for estimating ambient air concentrations for the prevention of significant deterioration. Contact Karen Sabasteanski, DEQ, (804) 762-4426.

WASHINGTON

Air Quality (Regulation)—The Southwest Air Pollution Control Authority (SWAPCA) proposed a regulation which would establish limits on VOC emissions in the Vancouver area for architectural coatings, automotive refinishing, and aerosol coatings, and would require the use of high efficiency spray guns in most refinishing operations. Contact Jennifer Brown, SWAPCA, (360) 574-3058.

WEST VIRGINIA

Air Quality (Regulation)—A rule adopted by the West Virginia Division of Environmental Protection (DEP) defers operating permit requirements for three years, applicable to non-major sources in categories subject to regulation under Sections 111 or 112 of the Clean Air Act. The rule went into effect October 5. Contact Dale Farley, DEP, (304) 348-2275.

WISCONSIN

Air Quality (Regulation)—A regulation adopted by the Wisconsin Department of Natural Resources (DNR) requires resin and coatings manufacturing facilities to monitor flanges on an annual basis and establishes a VOC emission limitation exemption for low-use or specialty coatings. The rule will go into effect January 1, 1996. Contact Mark Harder, DNR, (608) 267-2016.

A final rule of the Wisconsin DNR incorporates federal standards for new source performance and introduces new requirements for calciners and dryers in synthetic organic chemical manufacturing industries reactor processes. The regulation will be effective January 1, 1996. Contact Mark Harder, DNR, (608) 267-2016.

Hazardous Materials Transportation (Regulation)—A final regulation of the Wisconsin State Emergency Response Board (SERB) establishes a hazardous materials transportation registration and fee program, as well as specifying exemptions from the inventory fee. The rule was effective November 1. Contact Jan Grunewald, SERB, (608) 242-3232.

FEDERATION OF SOCIETIES FOR COATINGS TECHNOLOGY

Fall 1995 Board of Directors Meeting



Thirty-six members and 25 guests attended the Fall Meeting of the Board of Directors of the Federation of Societies for Coatings Technology, on October 8, 1995, in St. Louis, Missouri.

The following persons were in attendance:

Officers

President Joseph P. Walton
President-Elect Darlene Brezinski
Secretary-Treasurer M. Jay Austin

Society Representatives

Baltimore Joseph D. Giusto
Birmingham Gerry J. Gough
C-D-I-C William Hollifield
Chicago Evans Angelos
Cleveland Brenda Carr
Dallas Charles Kaplan
Detroit Van Evener
Golden Gate Timothy Donlin
Houston Joseph Caravello
Kansas City Mark Algaier
Los Angeles Philip Bremenstuhl
Louisville Larry Pitchford
Mexico Martha Colin
Montreal Suzanne Richardson
New England Maureen Lein
New York Michael Frantz
Pacific Northwest William Shackelford
Philadelphia Donald Denny
Piedmont Forest Fleming
Pittsburgh William Spangenberg
Rocky Mountain J. Dick Mullen
St. Louis Terry Gelhot
Southern James E. Geiger
Toronto Arthur Hagopian
Western New York Michael DePietro

Other Members

Freidun Anwari Cleveland
J. Andrew Doyle NPCA
Milton A. Glaser Chicago
Thomas Hill Western New York
John Lanning Louisville
John Oates New York
Rose Ryntz Detroit

Guests

Federation Past Presidents John Ballard, Joseph Bauer, Clarke Boyce, Carlos Dorris, William Holmes, William Mirick, Colin Penny, and Kurt Weitz. (Board Members Geiger, Glaser, Lanning, and Oates are also Past-Presidents of the FSCCT.)

Federation Committee Chairs Dennis Cahill (Annual Meeting Host), Louis Holzknacht (Annual Meeting Program), and Richard Himics (Planning). Marisa McGruther, of the Annual Meeting Host Committee.

George Pilcher, President of the Board of Trustees of Coatings Industry Education Foundation.

Alan Hatloe, President, and Ernest Stewart, Executive Vice President, National Decorating Products Association.

Robert Herold, President, Professional Decorating Contractors of America.

Fred Morpeth, Past-President, Oil & Colour Chemists' Association.

Francis Borel, Secretary-General, FATIPEC.

Garry Torrens, President, Surface Coatings Association Australia.

Lee Hall, President, Surface Coatings Association New Zealand.

Kaare Kleive, President, and Mike Symes, Past-President, SLF.

Jorge Hijuleos, President, Mexico Society, and Dr. John Weaver, Cleveland Society.

Joseph Maty, Editor, *American Paint & Coatings Journal*.

Federation Staff Members Michael Bell, Director of Educational Services; Victoria Graves, Director of Meetings & Conventions; Lyn Pollock, Director of Marketing; Charles Schmidt, Controller; Patricia Viola, Director of Publications; and Robert Ziegler, Executive Vice President.

Following a roll call of members, on a motion by Mr. Shackelford, seconded by Mr. Hollifield, the report of the Spring 1995 Meeting of the Board of Directors was approved as published in the July 1995 issue of the *JOURNAL OF COATINGS TECHNOLOGY*.

Reports of the Officers and Staff

President Walton

As my term of office draws to a close I'm somewhat gratified to see where we have progressed—primarily in the area of planning, but at the same time I'm somewhat disappointed that we weren't able to get more done in this area.

The year has been very exciting and has seen many challenges which the Federation must address, but I truly believe we are poised for even bigger and better things as we expand our scope and try to embrace more of the coatings market for the future growth of our organization. This has also been a particularly trying time for our Staff since we really haven't finished defining where we want to go, thus making it difficult for them to carry out our objectives. However, I can tell you with confidence that we are very fortunate to have the quality of professionals working for us at the Federation office, and I'm sure that they will be equal to the task as we continue to move forward.



From left: Executive Vice President Robert F. Ziegler and President Joseph P. Walton (Cleveland)

On behalf of both myself and my wife, Kathy, I would like to thank all the members of the Federation for the privilege of having represented them during the past year. In addition to visiting many of the stateside Societies, we also had the pleasure of representing the Federation in Canada, Mexico, and the United Kingdom.

Our organization is extremely well regarded around the world and, in many ways, even more so outside of the United States. Often times I got the impression that the technical area isn't taken so much for granted in other parts of the world and this is something I hope we are able to improve upon in the future.

In closing I would like to thank the many volunteers for all their efforts on behalf of their local Societies individually and the Federation collectively. A special thanks to the various committee chairpersons and their committees for all the work they did during the past year and to the Annual Meeting Program and Host Committees for their work in putting on this year's meeting and show in St. Louis.

JOSEPH P. WALTON
President

President-Elect Brezinski

Following the Board of Directors spring meeting in Cancun, I have had an opportunity to attend the following meetings: the Host Committee meeting, Finance Committee meeting and Executive Committee meetings in St. Louis; the Technical Advisory Committee meeting in Washington, D.C.; a joint strategic planning committee meeting with the Planning Committee in Chicago; a meeting of the Professional Development Committee in Blue Bell; and the first meeting of the North American Coatings Council in Chicago.

A significant amount of time was spent appointing the chairpersons of various committees for the coming year. As has always been the case, it is most rewarding to find such an enthusiastic and dedicated volunteer group. This is also reflected in the committee activities that I have observed and been fortunate enough to attend. The hard working, dedicated volunteers and good leadership that I have seen at the committee level shall serve the Federation well as we progress through many changes in our forward growth.

Meetings have also occurred to address priorities and implementation of the strategic plans that have been endorsed. Our future is very dependent on sound planning and implementation of these plans.

A balanced budget was prepared for the coming year; it is conservative and should take us through the next year without difficulty. Strategic planning action already in effect will have a positive impact on future financial growth.

The Annual Meeting Program and Host Committees have done a wonderful job in putting together the 1995 show. It appears that it shall be quite successful and I commend all the volunteers that have worked so hard toward this goal. The facilities for the show and program are very nice and afford convenience for attendees.

Last, but not least, the staff is to be commended for all their efforts over the past year. They have been of great assistance to all our members and certainly of great help to me.

DARLENE R. BREZINSKI
President-Elect

Secretary-Treasurer Austin

Since the last Board of Directors Meeting held in Cancun, I have had the opportunity to participate in the following activities:

Strategic Planning—I attended the Strategic Planning Session held at headquarters on September 26 and 27. This session aided in developing definitive action plans to carry out the objectives of our overall strategic plan.

Additionally, I had the opportunity to facilitate a planning session with the Professional Development Committee on August 30 and 31. Many of the ideas generated during this meeting were used as aids in the September planning meetings. My thanks and appreciation to the committee for their valued input.

Local Society Meetings—I, together with Bob Ziegler, had the opportunity to visit the joint meeting of the Western Coatings Societies during July 28 through 30. We were brought up to date on Society activities and also on the merger attempts by the SCPCA.

In conjunction and as a result of this visit, we had the opportunity to visit a couple of key manufacturers; Deft, Inc. on August 1 and Dunn-Edwards Corp. on August 9. We found both companies supportive of the LASCT and the Federation and not in favor of a merger with the SCPCA.

Additionally, I visited the Northwestern Society on September 12.

Planning Committee—On August 10, I attended a meeting of the Planning Committee where we discussed the potential role that the Planning Committee should play in long-term strategic planning for the Federation.

Finance and Executive Committees—These meetings were held in St. Louis on August 10 and 11. The Finance Committee prepared a proposed balanced budget for fiscal 1996 for presentation at this meeting. A FIRST!! They also did some advance budgeting of expenses for 1997 and 1998, an excellent start to strategic implementation.

Our balance sheet remains strong and at this point in the year we remain close to budget.

The last five months have been extremely busy. We are facing several challenges to the continued successful future of the Federation. I'm looking forward to working with the Board of Directors and local Societies in forging strategies to ensure our continued success.

M. JAY AUSTIN
Secretary-Treasurer

Executive Vice President Ziegler

FINANCIAL

As of this writing, third quarter financial reports are unavailable. However, figures will be distributed to the Board at its meeting of October 8 for review.

The FSCT Finance Committee and staff will prepare a preliminary operating budget for 1996 for the Board's consideration at the October 8 meeting. Financial projections through 1998 will also be reviewed.

Steps have been taken in the past six months regarding several areas of interest, i.e., marketing and advertising. Marketing and promotion of FSCT publications has increased with the placement of advertising in several industry periodicals as well as the procurement of outside mailing lists; in addition, an outside advertising representative has been retained for the solicitation of advertising for FSCT publications, including the *JCT*, *Year Book*, and *Annual Meeting*

Program Book. While initial results have been encouraging, it is expected that the transition and start-up in this area will not produce significant results for six to nine months.

PUBLICATIONS

JCT—The new “look” and content of the *JCT*, initiated in January, is recognized as a step forward and responses from the readers have been positive. The editorial department is investigating a variety of measures to not only expand the editorial content of the *JCT* via solicitation of “practical” articles, but to also reduce the cost of producing the publication. One very visible step in this area was to mail the *JCT* without the envelope carrier to domestic destinations. This act reduces the overall cost and, at the same time, increases the visibility of the *JCT*. Initial mailings have proven effective in both of these areas.

Paint Stone—Production of the FSCT newsletter was suspended for the balance of 1995 due to budgetary restraints. It is anticipated that the newsletter will continue publication as a tear-out section of the *JCT* with the January 1996 edition. In addition, separate mailings of the newsletter will be made to non-member interested parties as part of the FSCT marketing program, e.g., NPCA members, and other affiliated industry organizations.

Series Booklets—Of the three manuscripts noted in the Spring report, “White Pigments,” by Juergen Braun, has been published. The publication of “Methodologies for Predicting Service Lives of Coatings Systems,” and “Silicones” has been delayed until after the Annual Meeting due to the production efforts for the *Coatings Encyclopedic Dictionary*. It is expected that these booklets will be published by year’s end.

Year Book—Production of the 1996 *Year Book/Membership Directory* will be made through the use of the FSCT’s new membership computer system. The 1996 edition will include cross referencing via three sections: a member alphabetical listing containing all pertinent information; a Society membership listing of companies and members; and a listing by manufacturer and supplier companies. This new format will increase the usefulness of the publication while keeping costs within budget.

Coatings Encyclopedic Dictionary—Editorial production has been completed and the volume will shortly be on press. However, it is unlikely that books will be available for release at the convention in St. Louis. While disappointing, the editorial delays incurred were necessary to make the final published version as complete as possible. Pre-press sales of the book are very good and promotion at the FSCT exhibit and Publications Store at the Annual Meeting will be significant. We greatly thank its Editor, Stan LeSota, for his good work and counsel.

Panorama Coatings MSDS CD Retrieval System—While production costs have stabilized during 1995, subscriptions to the System are so far disappointing. Staff will survey the current and prospective manufacturing and supplier subscribers to investigate the system’s use and potential, as well as the overall potential of future CD-ROM products. The System will be demonstrated in St. Louis and also at company sites as well as industry meetings. To date there are 121 subscribers to the System, which has 23,000 MSDS records in place, representing 165 suppliers on the CD.

Recently, a major coatings software systems supplier has developed programs linking Panorama to its product making the system more useful to and compatible with its formulation development software being used by manufacturers.

SciQuest CD-ROM Coatings Tutorial—The Federation has begun promotion of the Consolidated Research-produced educational CD-ROM product, *SciQuest*. This unique learning tool presents many different aspects of coatings formulation technology and production

via both text and graphics. Both of the above CD-ROM products will be demonstrated at the FSCT Resource Center in St. Louis.

MEMBERSHIP

Prior to the November Society update, the current membership total is 7,466, broken down into the following categories: 4,340, Active; 2,303, Associate; 661 Other (Educator, Student, Retired, Honorary); 162, Affiliate. During the same period last year the total stood at 7,542.

The 1996 Membership Services Committee, chaired by Jeff Shubert, Southern Society, will meet with a cross-section of Society Membership Chairs to formulate proposals to revise the current membership recruitment policies in accordance with the strategic plan. It is expected that the committee’s proposals will be available for Board review at the May 1996 meeting.

ANNUAL MEETING AND PAINT INDUSTRIES’ SHOW

With the theme “Creativity + Adaptability = The Gateway to Success,” the 1995 Annual Meeting and Paint Industries’ Show will feature a technical program which addresses the practical issues as well as the newest research and development topics. Thanks are offered to the Program Committee (Louis Holzknecht, Louisville Society, Chair) for its efforts in preparing an outstanding agenda of presentations. The Paint Industries’ Show will, meanwhile, feature exhibits of 308 supplier companies in over 89,100 sq. ft. of exhibit space. Both events will be held in the newly renovated Cervantes Convention Center. Early indications are that attendance will compare favorably with past conventions.

The Host Committee, under the leadership of Dennis Cahill, has been busy making preparations to welcome these visitors and we sincerely thank him and his committee for their efforts.

With the continuing change in industry priorities, the FSCT will continue to move forward to expand educational offerings to the membership and the industry. A proposal to revise the format of the Annual Meeting and Paint Industries’ Show will be brought to the Board for consideration.

PAN-AMERICAN COATINGS EXPO

As approved earlier, the Federation in conjunction with the Mexico Society and the Mexico Paint Manufacturers Association (ANAFAPYT) will present an exhibition in Mexico City on August 15-17, 1996. Plans are well underway and we sincerely thank our Mexican colleagues for their support and cooperation. We are pleased to announce that the official title of the event is the “Pan-American Coatings Expo” which will be held in conjunction with the annual technical conference of the Mexico Society and the annual convention of ANAFAPYT. Complete details will be made available at this year’s Paint Show and promotional information will be sent to prospective exhibitors.



President Joseph P. Walton (Cleveland) and President-Elect Darlene Brezinski (Chicago)



Joseph D. Giusto (Baltimore) and Secretary-Treasurer Jay Austin (Chicago)

FSCT SPRING WEEK

The Federation is very pleased to cooperate with the Pacific Northwest Society in returning to Seattle for the 1996 Spring Board of Directors Meeting, to be held in conjunction with the Pacific Northwest Society's Symposium. The schedule of events will have the Society Symposium being held on Friday and Saturday, May 3-4, followed by the Incoming Society Officers Meeting on Saturday, May 4 and the FSCT Board of Directors Meeting on Sunday, May 5.

As approved by the Executive Committee, the 1997 Spring Meeting of the Board is scheduled to be held in Stratford, England. The meeting, hosted by the Birmingham Club, will be the first of its kind for the FSCT, and we sincerely appreciate the invitation from the Birmingham membership. While plans are still being considered, we anticipate that the meeting will be held in conjunction with an educational symposium sponsored by the Club. The Incoming Society Officers Meeting, which has in the past been held during the Spring Meetings will be held, beginning in 1997, near the Blue Bell Headquarters of the FSCT. This change will allow the future leaders of the Societies to become more familiar with Federation Staff operations and its capabilities. Further details will be made known as they are developed.

STRATEGIC PLANNING

Since the adoption of the FSCT Strategic Plan in May 1995, the Federation has moved forward in several areas, notably marketing



Francis Borel, Secretary General, FATIPEC, presents FSCT President Walton with a commemorative photograph

and advertising promotion. As mentioned above, international areas have also been addressed by the scheduled Pan-American Coatings Expo and the 1997 Spring Meeting in England. Currently, however, the plan is more an outline for action than an operational blueprint. In September, the Officers and Staff will meet to develop specifics in the prioritization, implementation and coordination of the following action items: Marketing and Promotion; Society Interaction and Programming; Membership Development; Educational Programs; Internationalization; Staffing Requirements; Financial Resources. It is expected that the results of this meeting will be discussed at the Fall Meeting of the Board.

NPCA COOPERATION

While no formal discussions have been held with the NPCA regarding future areas of cooperative activity since the last report, items concerning joint promotional efforts have been considered and approved. These involve the marketing of Panorama, as well as reciprocal promotional activities. Plans are being made to hold the 1996 FSCT and NPCA annual meetings in concert in Chicago.

OFFICER/STAFF VISITS

Since the Spring 1995 report, visits have been made to the following events: West Coast Societies Board Meeting, during which the FSCT met with Southern California manufacturers to discuss future FSCT/Society activities and the recent proposals made by the Southern California PCA regarding industry association merger in California. Both meetings were very productive and indicated that there was little unanimity regarding a merger at this time. This experience prompted plans to meet with other manufacturers during future Society/industry events. Visits were also made to the August 29-31 Latin American Coatings Show in Mexico City to review plans for the FSCT event in 1996 with Mexico industry representatives, as well as visits to the Northwestern Society monthly meeting and the annual convention of the National Decorating Products Association.

HEADQUARTERS STAFF

In efforts to coordinate on-going activities with future plans and directions in connection with the strategic planning discussions, it is apparent that the current staff will be insufficient to provide all that is necessary to bring the Federation into the future. Therefore, a review of staffing requirements is underway and proposals will be made to not only increase, if necessary, the current staff number but to also realign responsibilities to accommodate future needs. Careful consideration will be given to outsourcing, as well as financial constraints to provide increased and efficient service to the membership.

Currently, the following individuals continue to serve the Federation well in their respective positions: Michael Bell, Director of Educational Services; Victoria Graves, Director of Meetings and Conventions/Membership Services; Patricia Viola, Director of Publications; Lyn Pollock, Director of Marketing; Charles Schmidt, Controller; Kathleen Wikiera, JCT Managing Editor; Jonna Coachman, JCT Associate Editor; Mary Evangelisto, Assistant Editor; Audrey Boozer, JCT Subscription Fulfillment; Lisa McGlashen, Secretary to Mr. Ziegler; Mary Sorbello, Secretary to Mr. Bell; Marie Wikiera, Meetings Coordinator; Linda Madden, DTP Operator; Meryl Simon, Order Dept.; and Dorothy Kwiatkowski, Receptionist.

ROBERT F. ZIEGLER
Executive Vice President

DIRECTOR OF EDUCATIONAL SERVICES BELL

COMMITTEE LIAISON

Educational Coordinating Committee—The Educational Coordinating Committee has met once since the last meeting of the FSCT Board of Directors, on June 1-2, 1995 at FSCT Headquarters in Blue Bell, PA. This meeting was combined with a meeting of the

full Educational Committee, comprised of the Education Committee Chairs of the 26 Constituent Societies. The next meeting of the ECC will be held on Friday, October 27, 1995 in Toronto. The Chair of the Educational Coordinating Committee is Melinda Rutledge of the Los Angeles Society. The committee has been involved with two major projects in recent months:

Science Kit—The committee unveiled its Science Kit, entitled "Presenting Science Through Coatings: A Spectrum of Possibilities" at the Educational Committee meeting in June. The packet provides information which can be used by interested parties involved with outreach-type programs. The Kit is divided into sections on experiments (basic to advanced), research and science fair projects, information on mentoring to young students, presenter notes and a reply questionnaire. All of the experiments are designed to be conducted with materials which may be purchased at most local building supply stores. The Kit has already generated a great deal of interest from many sections of the Federation, and well over 125 have been distributed, both to the Societies and other interested parties. It is intended to be a living document and has been assembled to allow the sections to be updated and replaced as new ideas are received.

Society Speakers Program—The Society Speakers program was launched by the Pittsburgh Society at its March meeting, and this resulted in a significant increase in attendance. In addition, Louisville and Philadelphia Societies plan to participate this Fall. The committee will review these test runs at its next meeting and begin to promote the program Federation-wide shortly thereafter.

Test Drilling Projects—Since the developmental work is complete on the Society Speakers Program and the Science Kit, the ECC has begun the task of developing new projects. Significant time was devoted to this at the June Educational Committee Meeting and these ideas will all be evaluated at the next meeting.

Additional Activities—The committee also continues to work on the following projects: Administering the activities surrounding the Southern Society's A.L. Hendry Award for the Best Student Paper, which will be awarded at the Annual Meeting; and reviewing the applications and distributing funds for the Small Society Scholarship program (the 1995 requests will be evaluated and funding decisions made at the next meeting).

Technical Advisory Committee—The last meeting of the Technical Advisory Committee was held on August 17-18, 1995 in Washington, D.C. This meeting included the Constituent Society Technical Chairs and featured a tour of the FBI Forensics Lab. The next meeting of the TAC is tentatively scheduled for February, 1996 in Boston and will include a visit to the monthly meeting of the New England Society for Coatings Technology. The committee will also hold a breakfast meeting in St. Louis during the Annual Meeting.

The Chair of the TAC is Gail Pollano of the New England Society. She will be succeeded at the conclusion of the Annual Meeting by Fred Anwari of the Cleveland Society.

The committee has the following Mission Statement:

"The mission of the FSCT Technical Advisory Committee is to establish guidelines, facilitate projects and encourage Constituent Societies to participate in programs in a way that will advance understanding in coatings and related areas so that there will be a continuity of technical projects which will result in the presentation of a technical paper at the Annual Meeting and publication in the *Journal of Coatings Technology*."

The committee is currently working on the following projects:

Society Technical Committees—The TAC Adoptive Society program continues to be the direct line between the Societies and the Committee, and this was evident by the large attendance of Technical Chairs at the recent meeting in Washington, DC. Each committee member has assigned responsibility to maintain contact with four to five Societies. In addition to assisting in meeting notification, this



Garry Torrens, President, Surface Coatings Association
Australia

program gives each Society a resource on the TAC for project development and committee management information.

APJ/Voss Award—The committee has assumed the responsibility of the administration of the APJ/Voss Awards, and recently completed the judging of the entries for the 1995 program. These awards are presented for the outstanding Society papers submitted for the program. The TAC has spent a considerable amount of time reviewing the status of the program and revised the judging form used in the event. These revisions were presented to the Technical Chairs and this information will hopefully improve the quality of the papers submitted for award consideration.

Society Speakers Program—The committee has also taken over this role beginning with the 1995 Annual Meeting. This award is given to the best presentations of Society Technical Papers at the Annual Meeting. The committee completely revised the judging form used by the committee and this information was provided to the Society Technical Committee chairs at the last meeting. Attendees had the opportunity to use the form to judge the meeting's guest speaker, Mary McKnight from NIST, to get the feel for how the judging will work.

Joint Coatings/Forest Products Committee—The last meeting of the Joint Coatings/Forest Products Committee was held in Chicago, IL on September 8, 1995. This meeting included a tour of the F.E. Wheaton Lumber Co., a prefinishing operation located in Carol Stream, IL. The next meeting of the committee will be held on March 25, 1995 in Madison, WI.

The committee is preparing a series of articles which have been published in the *American Painting Contractor* and the *Paint Dealer*.



William Hollifield (CDIC) and Gerry J. Gough (Birmingham)



Fred Morpeth, Past-President, OCCA

The titles currently being prepared are: Surface Preparation, Changing Wood Resources, Finishes Checklist, Mildew, New Wood Treatments, Finishing Shakes and Shingles, and Water Repellents. The committee is also investigating several other topics for possible articles. Each of the papers is prepared by a task group of participants, with representatives of the wood and coatings committees represented. The committee is also assisting the Pacific Northwest Society with the selection of speakers for the 1996 Spring Week technical program.

The Chairman of the Joint Coatings/Forest Products Committee is Bob Springate of the Chicago Society.

Corrosion Committee—The Corrosion Committee last met on July 25, 1995 at FSCT Headquarters in Blue Bell, PA. The next meeting will be held on October 11, 1995 at the Annual Meeting in St. Louis.

The Chair of the Corrosion Committee is Mike Jackson of the Louisville Society. He will be succeeded by Charlie Hegedus of the Philadelphia Society at the conclusion of the Annual Meeting.

The committee is currently involved with the following projects:

1995 Annual Meeting Symposium—The committee has changed the format for this symposium from traditional technical papers to a panel discussion. The committee hopes this format will encourage more interaction between the speakers and the attendees and to attract a more varied audience. The theme for the session is: "High Solids or Waterborne: Selecting the Appropriate Corrosion Inhibitive Coating."



Brenda Carr (Cleveland) and Evans Angelos (Chicago)

Monograph—The committee is developing a monograph for the FSCT Series on Coatings Technology. The title of the manuscript is "Methodology for Assessing Corrosion Inhibiting Performance in Coatings." A general outline has been prepared and an author has been selected by the committee.

Interaction with Corrosion-Related Societies—The committee continues to maintain contact with the following related organizations: NACE International, Steel Structures Painting Council (SSPC), ASTM and the Electrochemical Society.

Corrosion Committee Publication Award—The committee is revising the rules for the award. As it stands now, the award is given to the best paper that has appeared over the last twelve months in the *Journal of Coatings Technology*. The committee hopes to actively solicit papers for the competition, which would in turn provide a larger selection of corrosion-related papers for the JCT.

Manufacturing Committee—The transformation of the Manufacturing Committee continues to run smoothly. The committee is now known as the Joint FSCT/NPCA Manufacturing Management Committee and last met on March 8-10, 1995 in San Francisco, CA. The next meeting will be held in St. Louis, MO on October 10, 1995.

Don Mazzone of the Golden Gate Society is the Chair of the Manufacturing Committee.

The committee is currently involved in the following projects:

1995 FSCT Annual Meeting Symposium—The committee is currently preparing a symposium for the 1995 FSCT Annual Meeting. The theme for the session will be "Small Batch Processing" and will include case studies.

Society Interaction—A booklet entitled "The Guide for Society Manufacturing Chairs" has been distributed to each Society. The purpose of this document is to provide guidance to Society Manufacturing Committee chairs regarding the position and information for Societies interested in forming a Manufacturing Committee.

Manufacturing Seminar—The committee has begun to plan for a two day seminar and is currently in the organization phase.

Professional Development Committee—The Professional Development Committee last met on August 30-31, 1995 at FSCT Headquarters in Blue Bell, PA. This meeting was to begin the development of a Strategic Plan for the committee and to provide input for the overall FSCT plan. The next meeting will be held on November 16-17, 1995 in Dallas, TX. The PDC will also hold a short meeting in St. Louis, MO on Sunday, October 8, 1995.

The Chair of the PDC is Rose Ryntz of the Detroit Society.

The Mission Statement for the PDC is as follows:

"The purpose of the FSCT Professional Development Committee is to promote and maintain individual technical competence from basic techniques through state of the art technology within coatings and related industries in a way that will meet the needs of the individuals through appropriate educational and training mechanisms (short courses, technical symposia, and Annual Meeting sessions) so that coatings professionals can effectively contribute to the success of their respective employer within the global marketplace."

Listed below are the projects currently being worked on by the committee:

"Formulating for the New Clean Air Act"—The first of two scheduled seminars was held on March 21-22, 1995 in Cleveland, OH with 65 attendees. The seminar will be repeated in Denver on November 6-7, 1995. The committee is expecting that the second seminar will draw from the western states and has made adjustments based on the review of the Cleveland session to further improve the offering. The initial program drew mainly from States east of the Mississippi River.

"Polymer Chemistry for the Coatings Formulator"—The "Polymer Chemistry for the Coatings Formulator" seminar was held at the Chicago Marriott - Schaumburg in Schaumburg, IL on June 20-21, 1995. There were 101 attendees at the event, which was well over the budgeted attendance of 75. The overall reviews of the seminar were positive and the committee will investigate the possibility of enhancing this program and conducting it again in 1996.

1995 Annual Meeting Session—The PDC has produced a session entitled "Computer Applications for the Coatings Industry." The session features a unique format to encourage "hands-on" interaction for the attendees and will be held twice at the Annual Meeting. The session will include a general overview of computers and also have breakout sessions where attendees can learn about specifics on formulating, spread sheets, and design of experiments.

Additional Seminars—The committee has begun investigating the possibility of conducting additional seminars in 1996. One topic to be considered is adhesives.

Strategic Planning—The committee spent two days at FSCT Headquarters working on the development of a Strategic Plan. The committee considered strengths; weaknesses; conducted an environmental analysis and an internal analysis; evaluated the current and future considerations that will affect the PDC and the Federation; and brainstormed ideas on future activities and ways to improve both the committee and FSCT.

Annual Meeting Program Committee—The theme for the 1995 Annual Meeting Technical Program is "Creativity + Adaptability = Gateway to Success." The program will include tutorials on Powder Coating, Radiation (EB/UV) Curing, and Adhesives, in addition to Early Bird Sessions, the Technical Focus Speaker, sessions from the Professional Development, Corrosion, and Manufacturing Committees, Room and APJ/Voss Award Competition Papers, and the Mattiello Lecture. The committee received a record number of abstracts for consideration as presentations. Fifteen papers passed the review phase and were incorporated into the program.

The Chair of the 1995 Annual Meeting Program Committee is Louis Holzkecht of the Louisville.

The 1996 Annual Meeting Program Committee met in September to begin planning the 1996 event. The entire nature of the technical program will be enhanced for 1996 and the committee has been working on the development of course structures and formats, setting learning goals for attendees and reviewing other considerations to ensure the successful transition from its current format.

A significant amount of time has been devoted to this project, including conducting research on what has been done in the past, learning the reaction of attendees to the existing technical program and expectations for future activities, investigation of the activities of similar organizations and the development of a timeline to be followed when implementing this new structure.

Steve Hodges of the Chicago Society is the Chair of the 1996 Committee.

Other Activities—The following activities are being done independent of committee activity or as a result of several committees working in unison:

Technical Focus Speaker—This again will be held as the initial technical presentation during the Annual Meeting. This year's speaker is Jonathan Martin of NIST. He was selected by a committee made up of the Chairs of the Professional Development, Technical Advisory, Educational Coordinating and Annual Meeting Program Committees.

FSCT Video Offerings—The video "VOC Determination" continues to sell well and is available to interested parties. The video was prepared by the Technical Committee of the New York Society for Coatings Technology.



Joseph Caravello (Houston) and Timothy J. Donlin (Golden Gate)

Two other videos, "Good Tests, Bad Testing" and "Structure/Property Relationships for Thermoset Coatings" continue to be offered to Societies for their monthly meetings.

List of Talks Available—This again will be made available to the Societies. The list has become a valuable resource for Societies when planning monthly meeting presentations. The list has been purged for 1995 to ensure it is current and timely.

Room Award—The committee has reviewed the papers for the 1995 competition. This year there were seven entries seeking the award.

FSCT Travel—Since the last meeting of the FSCT Board of Directors, I addressed the High School Science Teachers program at Eastern Michigan University, attended the Host Committee Meeting in St. Louis, and the Annual Meeting of the American Society of Association Executives in Washington, DC, in addition to the various committee meetings cited in the course of this report.

MICHAEL G. BELL
Director of Educational Services

Bylaws

Proposed Amendments to the Bylaws For Second and Final Ready

The following amendment was proposed by the Executive Committee and the Board approved this action at its May 15, 1994



Ernie Stewart and Alan Hatloe, National Decorating Products Association



Kaare Kleive, President, SLF

meeting. This Bylaws change was presented for first reading at the Spring 1995 Board Meeting and passed. It was presented here for second and final reading.

I. Dues Increase

WHEREAS the Federation of Societies for Coatings Technology Board of Directors approved the following action on May 15, 1995 and properly passed the first reading of the following Bylaws change at the Spring 1995 Board meeting be it

RESOLVED that the first paragraph of the Bylaws Article XII, Section A be amended to read as follows:

Article XII—Dues

A. Active and Associate Members

Each Constituent Society shall pay to the Federation office annual dues of twenty-five dollars (\$25.00) in U.S. funds per capita for each active and associate member of the Constituent Society.

On a motion by Ms. Lein, seconded by Mr. Shackelford, the above amendment passed unanimously. Affected by the passage of this amendment is that the annual dues for Retired and Society Honorary Members, which are one-half the amount of Active and Associate Members, will increase to \$12.50 per annum.



Martha Colin (Mexico) and Suzanne Richardson (Montreal)

Financial Report

THIRD QUARTER 1995
STATEMENT OF INCOME AND EXPENSE

The Statement of Income and Expenses for the third quarter showed income at \$2,437,658, and expenses at \$1,988,062.

Mr. Oates noted that the income account for the Panorama System will likely be less than budgeted for the year and inquired if mechanisms were in place to assure that a break-even would be reached at some point in the future. Mr. Austin reviewed the Panorama budget and advised that the 1996 Operating Budget is divided by quarter so that controls can be put into place.

REVIEW OF INVESTMENTS

Mr. Geiger, Chair of the Investment Subcommittee, provided a review the Federation's current investment status.

The Federation currently has \$700,000 invested in stocks and mutual funds. These funds were invested based on a time frame of 10 years. The Investment Subcommittee considers the following funds and stocks purchased to be conservative long term investments based on our time window limited asset growth.

<u>Vanguard Lifestrategy Moderate Growth Portfolio</u>	<u>\$400,000</u>
Total Stock Market	35%
European and Pacific	10%
Fixed Income Securities	25%
Asset Allocation	30%

<u>Vanguard Independent Adviser Conservative Growth Portfolio</u>	<u>\$200,000</u>
GNMA Fund	17%
International Growth Fund	20%
Primecap	28%
Windsor II	11%
Horizon Capital Opportunity	10%
MM Prime	14%

This is a portfolio recommended by the Vanguard newsletter which covers all the Vanguard family of funds and sells fund recommendations and monthly profit/loss information on each fund. Their portfolios have been very successful over the past 10 - 12 years. The above portfolio "is appropriate for investors seeking to match the market's returns over time with less volatility. Since inception it has been just 80% as volatile as the stock market."

<u>Blue Chip NYSE Stock Portfolio</u>	<u>\$100,000</u>
U.S. West	\$25,000
Exxon	\$25,000
Scana Corp.	\$25,000
Coca-Cola	\$25,000

These stocks were purchased as conservative, prudent investor long-term growth investments.

Review of Actions of the Executive Committee

AUGUST 11, 1995

That the 1996 Program Committee proposal to redesign the format of the 1996 Annual Meeting Technical Program be approved.

That the following recommendations of the Finance Committee be approved:

(1) That the Federation make matching contributions of up to 2.5% of salary to a staff employee's individual retirement plan.

(2) That the Federation survey current and prospective subscribers of the Panorama System to determine its use and future potential.

(3) That the Annual Meeting and Paint Show fees be revised to allow for separate attendance to both specialized programming and to traditional programming and the exhibition, with the fees to attend the traditional program and exhibition set at \$75 for members; \$125 for non-members.

(4) That the 1996 contribution to Coatings Industry Education Foundation be set at \$50,000.

(5) That the Federation Investment Portfolio be based on moderate growth in a balanced fund with a ten-year window on total investments.

(6) That JCT non-member subscription rates be increased for 1996.

That the proposal to retain Exposition Management, Inc., to assist staff in the management of FSCT expositions be tentatively approved.

That the proposed revisions to the FSCT Bylaws to accommodate outdated gender terms be forwarded to the Bylaws Committee for consideration and recommendation.

That the Spring 1997 Board of Directors Meeting be held in Stratford, England.

That the following statement of autonomy be approved for consideration by the Board of Directors:

"While the Federation of Societies for Coatings Technology is open to opportunities to cooperate with allied organizations in areas of mutual interests, the FSCT affirms its intention to remain an independent and autonomous organization in pursuing its primary purpose as presented in the following Mission Statement:

The Mission of the FSCT is to provide technical education and professional development to its members and the industry through its Constituent Societies and collectively as a Federation."

That the following incentives to exhibitors which participate in both the Pan-American Coatings Expo and the 1996 Paint Industries' Show be approved: (1) Priority space assignment for the 1996 Paint Show; (2) 50% discount on 1996 Program Book Advertising; (3) One set of mailing labels for 1996 Paint Show attendees.

That to complement the revised technical programming of the Annual Meeting and strategic planning initiatives, the name of the Paint Industries' Show be revised to the International Coatings Expo.

That, if possible, in conjunction with the normal officer and staff visits to a Society monthly meetings, the FSCT also schedule visits with local manufacturers.

That the following proposals by NPCA for cooperation be approved:

(1) That the FSCT offer a one-year Panorama complimentary subscription to new manufacturing members of NPCA.

(2) That the FSCT and NPCA enter into a reciprocal exchange of advertising in their respective Membership Directories.

(3) That NPCA's "Coatings Advantage" video be considered for inclusion in the FSCT Science Teachers Kit.

(4) That the FSCT and NPCA investigate the possibility of exchanging information on their respective Electronic Bulletin Board Services (when in place).

(5) That the FSCT Director of Marketing and Director of Publications meet with NPCA staff to discuss mutual assistance in marketing efforts.

(6) That the FSCT offer a page in the JOURNAL OF COATINGS TECHNOLOGY for affiliated industry organizations to publish news of interest to FSCT members.



Membership Committee Chair Brenda Carr (center) presents Membership Certificates to the Society Representatives whose Societies showed the largest increase in membership for 1994-95 (from left): Maureen Lein (New England), Terry Gelhot (St. Louis), Art Hagopian (Toronto), and Dick Mullen (Rocky Mountain)

Mr. Oates noted that while the Finance Committee's recommendation for Federation contributions to the staff individual retirement plans was directed by the Board at its Spring 1995 meeting, in consideration of the impact it may have on staff that the headquarters employees be asked for their input. Following a motion the Board agreed to table this particular recommendation.

On a motion by Mr. Oates, seconded by Mr. Gough, the actions of the Executive Committee for August 11, 1995 were unanimously approved.

OCTOBER 7, 1995

That the Third Quarter 1995 Statement of Income and Expense, showing Income at \$2,437,658, and Expense at \$1,988,062, be approved.

That the fee structure for the 1996 Annual Meeting and Paint Industries' Show be revised as follows: Full Conference: Members - \$395; Nonmembers - \$495; Show & Technical Program Only: Members - \$75; Nonmembers - \$125; One-day (show only): Members - \$40; Nonmembers - \$70; Final Day (show only): Members \$35; Nonmembers - \$55; Student: \$15.

That the Federation be represented at the next meeting of the North America Coatings Council.

That the Federation grant \$5,000 directly to each of the State Paint Councils in support of their activities.

That the 1996 Operating Budget balanced at \$3,631,500.



Lee Hall, President, Surface Coatings Association
New Zealand



Thomas Hill (Western New York) and Philip C. Bremenstuhl (Los Angeles)

That, procedurally, the Executive Committee determine an overall percentage for staff salary increases for the next budget at its August meeting.

That the following strategic plan items be approved for Board consideration:

Strategic Planning Goals and Objectives

- (1) Organizational Development —
To ensure the strength and future of the FSCT by developing an organizational structure that allows us to respond to and to create new growth opportunities in a changing global industry.
 - a. Membership
 - b. Committee Restructure
 - c. Staffing Assessment
 - d. Non-geographical Common Interest Groups
- (2) Technological Umbrella —
To include under the FSCT umbrella all coatings technologies.
 - a. Contact allied coatings organizations to liaison with re. Technical affiliation
 - b. Expand the technical programming of annual convention
 - c. Expand exposition opportunities
 - d. Expand publications, seminars, training programs and technical communications opportunities
 - e. To develop programs for Societies in various technical and manufacturing topics
 - f. Determine technological and professional development needs through conducting a survey of membership
- (3) International Opportunities —
To become truly international in providing services.
 - a. To discuss potential international opportunities with CSI
 - b. Exhibit at the Asia-Pacific Show in 1996
 - c. To sponsor Pan-American Coatings Expo in Mexico City in 1996
 - d. To exhibit at four (4) international expositions in 1997.

Mr. Walton requested that the Board vote on approval of the above actions with the exceptions of that of the 1996 Operating Budget and the goals and objectives of the strategic plan, which he asked to be discussed separately. On a motion by Mr. Denny, seconded by Mr. Shackelford, the request was approved.

Mr. Doyle advised that the recommendation to donate funds to the State Paint Councils was made without the knowledge of the NPCA, and that this action be tabled so that the NPCA may study the grant and respond. The motion to table was seconded and approved.

On a motion by Mr. Evener, seconded by Mr. Shackelford, the actions of the Executive Committee, with exception of the 1996 Operating Budget and the goals and objectives of the strategic plan, were unanimously approved.

Elections

Mr. Lanning, Chair of the Nominating Committee read the names of the slate of nominees placed before the Board at its Spring 1995 Meeting. He noted that there were no additional nominees.

President-Elect—M. Jay Austin (Chicago Society), Halox Pigments, Hammond, IN.

Secretary-Treasurer—Thomas E. Hill (Western New York), Pratt & Lambert Co., Buffalo, NY. (One-Year Term).

Executive Committee—J. Dick Mullen (Rocky Mountain Society), G-3 Industries, Aurora, CO. (Three-Year Term).

Board of Directors—Members at Large (Two-Year Terms Each):
Ronda Miles (Dallas Society), Union Carbide Corp., Garland, TX.

Dennis R. Owen (Golden Gate Society), Technical Coatings Co., Santa Clara, CA.

Board of Directors—Past-President Member (Two-Year Term):
William F. Holmes (Dallas Society); Ameritex Chemical & Coatings, Inc., Irving, TX.

On a motion by Mr. Giusto, seconded by Mr. Frantz, the above slate of nominees for FSCT Officer, Executive Committee, and Board positions was unanimously elected.

Society Business

CERTIFICATES OF APPRECIATION

The Membership Committee presented four Membership Awards, in recognition of those Societies whose rosters reflected the largest increase by size for the 1994-95 year. The recipients were: Rocky Mountain, Toronto, St. Louis, and New England Societies.

New Business

NORTH AMERICAN COATINGS COUNCIL

Mr. Walton presented a report on the September 9 meeting of the ad hoc North American Coatings Council. The meeting, called by representatives of the NPCA, brought together several coatings industry organizations to discuss the possibility and potential of forming an umbrella group which would review the concerns of the industry and set priorities for the use of resources of the various industry organizations to meet the overall needs. Represented at this initial meeting were the NPCA, FSCT, Powder Coatings Institute, Roof Coatings Manufacturers Association, and the Canadian Paint & Coatings Association. Also present were representatives of major manufacturers and suppliers to the industry.

Mr. Walton indicated that the group discussed the formation of an informal organization to see how the industry groups can interact. The NACC, he said, has no formal power nor budget and discussion would be for informational purposes only. However, it was apparent from comments made by suppliers and manufacturers that they believed that revenue from the industry's trade shows (both FSCT and PCI) should be used to assist in regulatory efforts.

The Board discussed the motivations which prompted the meeting and the attitude of the participants. Of note were prior comments made regarding a possible trade show sponsored by the NPCA and the effect that this action would have on the FSCT and the industry. It was

noted that education and professional development were not mentioned in NPCA's list of priorities.

Mr. Doyle, speaking from NPCA's perspective, advised that there is felt a general frustration by manufacturers and suppliers in obtaining a perceived value from supporting the industry's organizations, that although the major issues concern the bottomline, i.e., governmental issues, that education is important and should be supported also.

Overall discussion indicated both a concern about threats of non-support and merger, as well as statements supporting cooperation and addressing common problems.

Mr. Walton advised that the NACC is scheduled to meet again in November and that he would chair the meeting. The agenda items will include the proposal to include additional industry organizations in any future discussion.

STRATEGIC PLANNING

Mr. Austin reviewed the meeting of officers and staff at which was discussed the implementation of the strategic plan. In their discussion it was agreed that in order to survive, grow, and to meet goals, as well as to respond to threats and create opportunities that a restructuring and/or reorganization of the FSCT should be investigated. Several goals and objectives were reached which were placed before the Executive Committee at its meeting of October 7. These included:

(1) Organizational Development —

To ensure the strength and future of the FSCT by developing an organizational structure that allows us to respond to and to create new growth opportunities in a changing global industry.

- a. Membership Examination
- b. Committee Restructure
- c. Staffing Assessment
- d. Formation of Non-geographical Common Interest Groups

(2) Technological Umbrella —

To include under the FSCT umbrella all coatings technologies.

- a. Contact allied coatings organizations to liaison with re. technical affiliation
- b. Expand the technical programming of annual convention
- c. Expand exposition opportunities
- d. Expand publications, seminars, training programs and technical communications opportunities
- e. To develop programs for Societies in various technical and manufacturing topics
- f. Determine technological and professional development needs through conducting a survey of membership

(3) International Opportunities —

To become truly international in providing services.

- a. To discuss potential international opportunities with CSI
- b. Exhibit at the Asia-Pacific Show in 1996
- c. To sponsor Pan-American Coatings Expo in Mexico City in 1996
- d. To exhibit at four (4) international expositions in 1997.

Mr. Austin continued to say that these items would be reviewed, expanded upon and developed into proposals for Board consideration during a meeting of officers, selected Board Members and staff on December 11-12. Dr. Brezinski advised that she, as 1996 President, has called a special meeting of the Board for February 24-25 to discuss the implementation of the plan.

Mr. Walton called for a motion to continue discussion of the above items. Such a motion was made by Ms. Lein, seconded by Mr. Gough, and unanimously approved.

1996 OPERATING BUDGET

Mr. Austin reported that the budget presented to the Board was modified by the Executive Committee to allow for funding of an FSCT

exhibit in the 1996 Asia-Pacific Show and to provide a grant to the State Paint Councils. The revised budget is balanced at \$3,631,500. He also noted that the budget was estimated by quarter so that both income and expenses may be monitored and appropriate adjustments made if needed.

On a motion by Mr. Hollifield, seconded by Ms. Carr, the 1996 operating budget was unanimously approved.

Committee Reports

Annual Meeting Host Committee

The Host Committee met in St. Louis on August 10th at the Cervantes Convention Center with the Federation Officers, Program Committee and Staff.

Each Host Subcommittee Chairman was asked to report on their committee's progress to include the number of volunteers that they have recruited and how many additional volunteers they would need.

The St. Louis Host Committee consists of: Steve Crouse, of Brod Dugan, is Registration Chairman; Terry Gelhot, of Carboline Co., is Program Chairman; Marisa McGruther, of U.S. Paint, is handling the Social Guest program. Mike Hefferon, of Walsh & Associates is in charge of the FSCT booth; Dave Rickard, of Cemsac Chemicals, will chair the Hospitality Suite Committee for the FSCT at the St. Louis Marriott; and John Folkerts, of Futura Coatings, will head up the Information Committee which will have a booth located by the FSCT registration area at the Cervantes Convention Center.

Earlier that day Floyd Thomas and Marisa McGruther of the Social Guest Committee participated in the same tour that the attendees will take on Tuesday, October 10. They reported that this may be the best social guest program ever, since the participants are given several options. Those on the tour can sightsee and shop the St. Charles Casino with some "One Arm Bandits." Following lunch at a popular St. Charles restaurant overlooking the Missouri River, the guests can browse through the St. Louis History or Art Museums, both established during the 1904 World's Fair, or go to the new Science Center with hands-on exhibits which is highly recommended.

The Host Committee reports nearly 100 volunteers from 30 area companies from the St. Louis Society have signed up. The Host Committee has also received help from Tim Walsh, President of the St. Louis Paint Association, Dr. Jim Stoffer of the University of Missouri-Rolla, and even some members of the Kansas City Society have asked to help.

The St. Louis paint community and the convention facilities are really excited about the October Paint Show coming to St. Louis. Many positive changes in St. Louis have occurred since the 1985 Paint Industries' Show including the new Metro Link light rail system



Van Evener (Detroit) and Charles Kaplan (Dallas)



J. Andrew Doyle (NPCA), Rose A. Ryntz (Detroit), and Freidun Anwari (Cleveland)

connecting Lambert Airport to downtown St. Louis, several new hotels, expanded cab service, the improved and larger convention center, more restaurants, river boat casinos, and an exciting opening session featuring Captain James Lovell, Commander of the Apollo 13 mission.

The St. Louis Host Committee is right on schedule, but we still have a lot of work to do before the Show opens.

G. DENNIS CAHILL
Chair

Annual Meeting Program Committee

Since the Spring 1995 meeting of the Board of Directors, the program for the 1995 Annual Meeting in St. Louis was finalized. Jonathan Martin, of NIST, was chosen as Technical Focus Speaker. He will make a very interesting and pertinent presentation entitled "Service Life Prediction Methodologies." The tutorials for radiation curing, powder coatings, and adhesives, sealants and caulks are in place as is the workshop on computer applications. Several early bird sessions will cover areas, such as the state of the coatings industry, technology assessment, and the international coatings market. This year a case study will be presented by the FSCT/NPCA Manufacturing Management Committee, and the Corrosion Committee will host a forum on selecting the appropriate corrosion inhibitive technology. Additionally the Program Committee reviewed 27 transom papers and chose 16 for presentation in the technical program complementing the usual Room and Society presentations.

This year's program certainly highlights creative and adaptive technologies and through education of this kind, we will have the key that unlocks the Gateway to Success.

LOUIS F. HOLZKNECHT
Chair

Bruning Award Committee

The 1995 Armin J. Bruning Award will be presented to Dr. Edward Jaffe, who recently retired as Vice President of Research and Development from Ciba-Geigy Corporation's Pigments Division in Newport, Delaware. Dr. Jaffe holds 60 United States and 200 international patents related to organic colored pigments. Dr. Jaffe is an expert on quinacridone pigments, and was a Lecturer of Organic Chemistry at New York University, has lectured extensively, and has authored a number of publications including a chapter on organic pigments in the "Encyclopedia of Chemical Technology."

Robert T. Marcus
Chair

Manufacturing Committee

Final plans for the Manufacturing Seminar to be held Tuesday morning at 9:00 a.m. are complete. The title of the Seminar is "An Internix System to Reduce the Needs for Small Batch Process and Increased Efficiencies, Quality and Customer Response."

Speakers are Pete Cerra of Tnemecc, Kansas City and Robert Van Ooyen of Van Wyk Company, a Dutch Company.

An individual has been selected to receive the Morehouse Cowles Golden Impeller Award. This award is presented annually to a person who has made significant contributions in the areas of Manufacturing and Dispersion. Recipient will be announced at the Manufacturing Seminar on Tuesday.

The Committee plans a business meeting on Tuesday immediately following the Seminar in St. Louis. At this meeting there will be a presentation of Title 5 Air Permit Requirements. On Wednesday October 11, 1995 at 1:00 p.m. the Committee will tour CZ Ink Company, Inc. This tour promises to be very interesting.

DON L. MAZZONE
Chair

Planning Committee

During 1994-1995, the Planning Committee (PLC) met twice in person in Cancun and Chicago, and five times by teleconference. Most PLC activities were concerned with several topics as follows:

PLC Duties—With a gradual shift to a longer-range planning outlook, the PLC has redefined its role, duties, and scope to serve the best interests of the FSCT and to be compatible with Executive Committee (EC) expectations and guidelines.

Ad Hoc Strategic Planning Committee—Members of the PLC served on the Society Communications Task Force which presented the FSCT strategic plan to various Societies.

Paint Industries' Show—PLC suggestions to improve value to show exhibitors included setting aside meeting rooms during the show for commercial presentations.

Internationalization—Latin America was selected for cooperative alliances to explore expansion of FSCT activities in the region. Concrete plans for establishment of key relationships in areas of the Americas were recommended. Proposals were also made to introduce Spanish-language elements into FSCT technical programs and publications.

Finance—PLC recommended to the EC that a multi-year financial plan be submitted by Finance Committee and that all major spending projects be accompanied by financial projections to provide better information for EC consideration.

Publications—PLC supported the addition of a Marketing Director and also proposed that the JCT consider certain features such as an executive interview page and the inclusion of more practical articles.

Industry Relations—Proposals included the improvement of relationships with the key managers of coatings manufacturers and suppliers, coordination and collaboration with allied coating industries, and the maintenance of a wary, watchful view toward unwelcome takeover attempts of any FSCT assets.



Arthur Hagopian (Toronto) and Michael DePietro (Western New York)

To date, the PLC has presented eight recommendations to the EC to which it reports and will strive to better communicate and coordinate its activities. PLC members for 1994-95 were James Geiger, James McCormick, Colin Penny, and Saul Spindel.

RICHARD J. HIMICS
Chair

Professional Development Committee

The Professional Development Committee (PDC) has developed a Mission Statement (attachment 1) in 1995 and continues to plan and host seminars in conjunction with its Mission to educate the individual in coatings' science. All of the goals set for 1995 (attachment 2) will have been met by the Annual Meeting this year.

The two seminars held so far this year were:

Formulating for the Clean Air Act (March 21-22, 1995 Cleveland) and Polymer Chemistry for the Coating Formulator (June 20-21, 1995 Chicago).

It is with pleasure that the PDC can announce the success of both seminars. The "Formulating for the Clean Air Act" seminar was attended by over 70 participants while the "Polymer Chemistry for the Coating Formulator" Seminar had over 100 people attend. The "Formulating for the Clean Air Act" Seminar will be held again in Denver, November 6-7, 1995.

A meeting will be held in Blue Bell on August 30-31, 1995 in an attempt to coordinate a strategic plan for FSCT committees. This meeting will be attended by the FSCT President-Elect, FSCT Treasurer, and FSCT Marketing Director. Development of a plan from this meeting will be included in the goals of the PDC for 1996.

The PDC will again coordinate a series of seminars for the Annual Meeting Session in St. Louis. The topic covered will be "Computer Applications in the Coatings Industry" which will run twice on October 9th (afternoon session) and October 10th (morning). The seminar will include "break-out" sessions where the individual will learn formulating and database management as well as statistical design of experiments. After the success of the PDC hosted seminar at the Annual Meeting last year ("Advances in Test Methodology—A Hands on Tutorial") in which "break-out" sessions were well received, we decided to again host such a session.

The PDC budget for 1996 was submitted and includes the costs associated with hosting four (4) seminars in 1996. It also includes monies necessary to implement a "focus group" to ascertain the interest within the Coatings Industry in training and specifically what type of training is wanted and needed. In this way the PDC will be better apt to develop seminars to meet the needs of the individuals. The goals of the PDC for 1996 are included in this report (attachment 3).

ROSE A. RYNTZ
Chair

Professional Development Committee Mission Statement

To:

Promote and maintain individual technical competence from basic techniques through state of the art technology within coatings and related industries.

In a Way That:

Will meet needs of the individuals through appropriate educational and training mechanisms (short courses, technical symposia and annual meeting sessions).

So That:

Coatings professionals can effectively contribute to the success of their respective employer within the global marketplace.

PDC Goal for 1995

Goal	Accomplishment	
	Proposed Rev*	Actual Rev* Exp
Mission Statement.....		done
Strategy Planning for FSCT August 30-31, Blue Bell, PA		done
Formulating for the Clear Air Act March 21-22, 1995 Cleveland	15K	11K
November 6-7, 1995 Denver	11K	11K
Polymer Chemistry for the Coatings Formulator June 20-21, 1995 Chicago.....	15K	11K
Annual Meeting Session Computer Applications in the Coatings Industry		done
Plan to run twice at AM in St. Louis		
Total	45K	33K

*rev=revenue (all dollar amounts)

PDC Goal for 1996

Goal	Accomplishment	
	Proposed Rev*	Actual Rev* Exp
Strategy Planning for Seminar Development	6K	
Submit plan to Executive Committee		
Polymer Chemistry for the Coating Formulator to be offered 2X during year	30K	22K
Seminar TBD possibly Computer Applications	15K	11K
Seminar TBD possibly Adhesion Science/Plastics	15K	11K
Annual Meeting Session		
Total	60K	50K

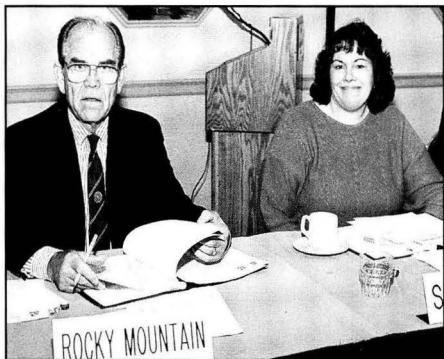
*rev=revenue (all dollar amounts)

Note: the travel budget for the PDC should be increased to allow for airline reimbursement of at least one PDC member to act as moderator for each seminar.

Roon Awards Committee

The quantity and quality of papers submitted for this year's Roon Awards Competition was excellent. There were eight entries, all fine papers, vying for the \$4,000 in cash prizes. The committee had considerable difficulty in making the final choices, but winners have been chosen and will be announced at the FSCT Industry Luncheon on Tuesday, October 10, 1995.

CLIFFORD SCHOFF
Chair



J. Dick Mullen (Rocky Mountain) and Terry Gelhot (St. Louis)

Technical Advisory Committee

The Technical Advisory Committee (TAC) met in Washington, D.C. on August 16, 1995 before the joint meeting with the Society Technical Chairs. The purpose was to review the final plans for the joint meeting, and to focus on the criteria that was previously established for the Voss Awards and the Society Speak Awards. All TAC members were in attendance.

Voss and Society Speakers Awards—A set of rating criteria for each of these awards was established at a previous meeting. These criteria were re-evaluated to ensure that they were still valid.

The criteria for the Voss Society paper awards was classified into three categories: Originality, Thoroughness of Work Supporting Conclusions, and Composition. Each category was weighted, with a bulk of the importance placed on the thoroughness of work supporting conclusion. Each of these categories had sub sections and the rankings for each subsection were determined to be as follows: Deficient (worth 0 points), Average (worth 2 points), and Excellent (worth 4 points). Total points would determine the best paper. Judging would be done by the members of the TAC. Should a TAC member's Society submit a paper, that TAC member would be disqualified from ranking his/her on Society's paper.

The criteria for the Speaker's Award was reviewed and categorized as follows: Delivery, Organization, and Knowledge. These individual categories would be reviewed with the Society Technical Chairs during the meeting for a twofold purpose: To ensure their understanding in the ranking criteria and to enlist potential judges for the Annual Meeting Society Presentations. (The TAC had determined that the Technical Chairs would rank the guest speaker scheduled for the upcoming meeting to ensure complete understanding in the process). It was also determined that a minimum of three judges would be needed for selecting a winner. The judges must be present for all presentations.

Joint Meeting with Constituent Society Technical Chairs—The meeting with the joint Technical Chairs was held in Washington, D.C. on August 17-18, 1995. A tour of the FBI Forensics Lab was held in the morning of August 17. The lab included a description of the Paint files held as reference for Federal cases. Following the tour, each Society presented a five-minute update on their projects status. Several projects where collaboration among two or more Societies were noted.

Darlene Brezinski, incoming FSCT President, presented an update on the Federation activities, including the status of the Strategic Planning sessions. Her presentation was well received among the Technical Chairs.

On August 18, the TAC reviewed the criteria for both the Voss and Speaker awards. This was followed by a presentation on Lead Abatement issues and updates by Dr. Mary McKnight of NIST. She graciously allowed the TAC and Technical Chairs to use the Speaker Award criteria to rank her presentation. The August 18 meeting

ended with a Brainstorming session on key projects of interest followed by breakout groups to establish an objective for the project/topic and experimental design to support the objective.

New Business—The mission statement prepared by the Technical Advisory Committee was shared for comments with the Technical Chairs. All comments were positive. The mission statement reads, "The Mission of the FSCT Technical Advisory Committee is to establish guidelines, facilitate technical projects and encourage Constituent Societies to participate in programs in a way that will advance understanding in coatings and related areas so that there will be a continuity of technical projects which will result in the presentation of a technical paper at the Annual Meeting and publication in the JOURNAL OF COATINGS TECHNOLOGY."

Gail Pollano
Chair

Society Reports

Baltimore

Seven monthly meetings featured technical presentations, two of which were hosted by the Educational and Manufacturing Committees . . . A tour of the U.S. Naval Laboratories in Annapolis, MD, held in February, was well-attended . . . Merit citations were presented to Gary Morgereth, of McCormick Paint; John Kurnas, of Mineral Pigments; Peter Rengel, of RJ Chemicals; and Jane Takesian, of Henkel Corp. . . . Scholarships were presented to Bret Jortland and Vanessa Allison, both children of members.

Birmingham

Membership totals 203 . . . Seven regular meetings were held, with attendance averaging 90 . . . Visits to Cray Valley Products and Cabot in South Wales were successful and well-attended . . . The Club continues to evaluate the possibility of starting an Educational Program . . . A Symposium has been organized for 1996, entitled "Paint at the Crossroads."

CDIC

Membership totals 189. Twenty new members were added during the year . . . Two new Committee Chairpersons were introduced. Ed Watkins will serve as Educational Committee Chairman and John Stemann volunteered to head the Social Committee . . . The Manufacturing Committee arranged the first meeting of the year, including a tour of the Whirlpool Washer and Dryer Plant in Marion, OH . . . Scholarships for continuing education were presented to Laura Miller, of Perry & Derrick Co., and Jadwiga Wojtowicz, of Akzo Nobel . . . Twenty-five year membership pins were presented to Ed Watkins, Ray Podlewski, and Dale Bluett . . . On April 10, the Society celebrated its 75th Anniversary with a commemorative banquet. Seventy-one people attended.



Michael Frantz (New York), Maureen Lein (New England), and Larry Brandenburger (Northwestern)

Cleveland

Eight meetings were held during the year, including six technical meetings . . . The Educational Committee gave Cleveland area schools, including John Jay High, Parma High School, and Holy Name, money for their science programs. A \$1,000 scholarship was given to a high school student . . . The Committee also sponsored the 38th Annual Technical Symposium in May, entitled "Focus on the Future," and the well-attended November technical meeting and environmental seminar . . . The Manufacturing Committee sponsored a manufacturing symposium on April 11 with the Cleveland Paint and Coatings Association . . . The Annual Memorial Scholarship was awarded to Steven Alessandro, of University of Akron, and Anthony Ramic, Case Western Reserve University . . . Membership Committee reported the passing of Thomas V. Mammano, William M. Tomc, and Ronald C. Ohm.

Dallas

A presentation of the FSCT Strategic Plan was conducted by FSCT Past-President Bill Holmes for information and comment . . . Joint opportunities with the NPCA included an invitation to meet with the Texas Paint Council at their regular meetings and the Dallas Paint and Coatings Association at their annual Christmas party . . . Upcoming goals include increasing membership and accelerating emphasis on education and membership participation . . . Society hosted a successful 52nd Southwestern Paint Convention in March 1995. This joint Dallas and Houston Society project is alternately hosted by one of the two Societies. The theme was "Paint: Covering the Costs" . . . A grant was made to the University of Southern Mississippi science department.

Detroit

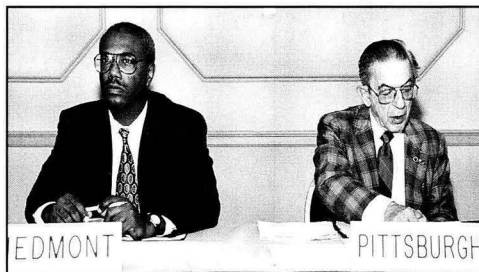
Membership totals 443, up from 432 last year . . . Continuing working in cooperation with Detroit Paint and Coatings Association. Joint meetings were held every other month, with alternating responsibility, starting in September and concluding in May . . . Seven courses were held through the University of Detroit/Mercy . . . Research and educational awards of about \$7700 were presented in area schools and universities, \$700 of which went to promoting a high school teachers' workshop at EMU . . . Hosted annual Future of Coatings Under Study (FOCUS) program, which was well-attended with more than 180 people, a more than 12% growth from last year . . . A paper is being prepared for presentation at the 1996 Paint Show by the Technical Committee . . . Society provided donation of toys and cash for "Toys for Tots" . . . Society regrets the loss of George Brewer and Linda Knowlton-Wagner, who died this past year.

Golden Gate

Membership totals 237 . . . 1,600 attendees and 86 exhibiting companies were welcomed to the 22nd Biennial Western Coatings Societies Symposium and Show, which was held at San Francisco Hilton on February 20-22, 1995. The theme was "New Opportunities, Challenges and Solutions." The Society extended nearly 300 complimentary registration vouchers to retirees; laboratory, factory, and sales personnel; and students who otherwise might not have attended . . . Manufacturing Committee sponsored an all-day seminar entitled "Engineering Your Manufacturing Process" on June 19, 1995 . . . Three \$1,000 scholarships given to returning college students . . . The Executive Board attended the 42nd Annual Meeting of the Western Societies for Coatings Technology at Irvine, CA, along with officers from the Pacific Northwest, Los Angeles, and Rocky Mountain Societies, as well as FSCT Secretary-Treasurer Jay Austin and Executive Vice President Robert F. Ziegler.

Houston

Membership totals 112 . . . Eight business technical meetings were held . . . Three scholarships totaling \$2500 were awarded . . .



Forest Fleming (Piedmont) and William Spangenberg (Pittsburgh)

FSCT Past-President Bill Holmes visited in May to discuss strategic planning of the FSCT . . . 53rd Southwestern Paint Convention will be held March 20-22, 1996 at the Del Lago Resort, Conroe, TX . . . The Society regrets to report the passing of James Ignatow, Sam Bishkin, Wilmer Davis, Larry Hardcastle, and John Garret.

Kansas City

Ten meetings were held, with topics such as accelerated weathering, extender pigments, titanium dioxide durability, and quality . . . Two presentations were made on FSCT strategic planning, one by Mike Bell, FSCT Director of Educational Services and the other by Jay Austin, FSCT Secretary/Treasurer . . . Educational Night was held in May. At this meeting, Annual KCSCT Science Fair Award was presented to teacher Audra Porter and her students, David Becker and Eli Caseman, for their science fair projects "Greatest Green" and "A Study of Water-Based Sealers on Wood Substrates" . . . Society elected to change "going through the chairs" order from Treasurer, Secretary, President, Vice President, to Treasurer, Secretary, Vice President, President.

Los Angeles

The Society is currently dealing with a number of issues, including company consolidations and the request to share funds from the Western Coatings Societies Biennial Symposium with the to-be-reformed California Paint and Coatings Association. Because of these situations, there has been a lowering of attendance at monthly meetings. In response, the Society formed an ad hoc committee to study the situation. While plans are not yet finalized, a preliminary report from the committee was presented which strongly stated the desire of the LASCT and GGSCT to remain autonomous Societies and members of the FSCT. The committee also indicated that the Society wished to continue its cooperative efforts with the California Paint & Coatings Association in a way that would be beneficial to the West Coast coatings industry . . . A new focus is being sought for the monthly meetings to interest members of the manufacturing, ink, and adhesives industries . . . Scholarship activities are being maintained, having given \$13,750 to 13 students, five of whom are in the polymers and coatings program at Cal Poly State University, San Luis Obispo . . . Current members are being encouraged through grants of up to \$500 to take continuing education courses to help them in their jobs.

Louisville

Diverse technical presentations included such topics as additive chemistry, precipitated silica advancements, and polyurethane technology. Manufacturing Night featured a presentation on tank and part washing innovations . . . The Spring Symposium was held, the theme being "A Spectrum of Coatings Science" . . . Educational opportunities continued to be provided with the LSCT Educational Grant, designed to provide educational tuition expenses to people attending coatings-related courses. This year's recipient was Tim



William Shackelford (Pacific Northwest) and Donald Denny (Philadelphia)

Franklin . . . Meeting plans for the current program year include emphasis on the strengthening of technical programs and the quality of guest speakers, as well as strengthening the Educational Committee.

Mexico

Membership decreased 24% compared with the previous period. Efforts continue to increase total membership by recruiting from other organizations in Latin America . . . Sponsored a two-day seminar on "Bases for Your Own Environmental Inspection" May 31-June 1 . . . Held eighth Annual Technical Symposium in Jurica, Qro., which was well-attended . . . Nine technical talks presented at monthly meetings, averaging 65 attendees . . . Seventeen Society Executive Committee Meetings were held . . . Sponsored fourth Paint and Ink Technician's Day to celebrate all the major contributions to the coatings industry in Mexico made by any member of the Mexico Society. Attendance totaled 100 . . . There were two visits from FSCT representatives to plan the Pan- American Coatings Expo, to be held in 1996 . . . The FSCT Spring Week activities were held May 17-18 in Cancun . . . Increased number of technical books in the Mexico Society library . . . Society has worked on the Spanish translation for the FSCT *Series on Coatings Technology*.

Montreal

Seven regular monthly dinner meetings were held. A symposium was held in February which was well-attended . . . A survey was conducted to determine the needs of the members. A good response was obtained. The scattering of members over a large territory, climactic conditions, speaker quality, and lack of employer support have an influence on attendance. Incentives will be tried out to attract audience, as well as cooperation with other Societies facing a similar situation to find areas of mutual benefits . . . Technical Committee currently working on a variety of projects, including: joint project with Northwestern Society on the influence of acid rain, effect of ultra-fine TiO_2 on the durability of semi-transparent stains, and appearance of latex paint over light joint cement compound . . . Decrease in membership due to closures and mergers . . . The Society remains in healthy financial status due to controlled expenses . . . Two members, Pierre Lemay and Gerry Feagan, passed away last year.

New England

Close cooperation between the Society and the New England Paint and Coatings Association resulted in many well-attended joint meetings. The practice of holding meetings in several different locations throughout the year provides greater opportunity for members

to attend . . . Seven technical meetings were held, with topics chosen that appealed to both architectural and industrial suppliers . . . Awarded \$2500 in scholarships to four recipients, all children of Society members . . . A NESCT/NECA assisted event was a three-town "Paint Swap" held in southern New Hampshire. This Swap has been used by the New Hampshire Department of Environmental Services Solid Waste Division as a model of how to run a successful swap.

New York

Seven monthly regular dinner meetings were held, six of which included technical presentations . . . Joint NYSCT/MNYPCA Legislative Update Meeting was held in February with talks by industry experts and New York, New Jersey, and national regulatory organizations . . . The Technical Committee has completed a paper on "Rheology Modifiers for Low VOC Bake Coatings," which will be presented at the Annual Meeting. In addition, the committee organized a two-day technical seminar on "Recent Advances in Additives for Modern Coatings" . . . Donald Brody presented two one-semester courses on coatings technology, "Understanding the Basics of Coatings I and II." Ten students enrolled for the first semester and 11 for the second . . . Society Scholarship Committee administered two \$1000 scholarships to dependents of members of the Society. The Melvin M. Gerson Memorial Scholarship, funded by Daniel Products Co., Inc., was awarded to Ronald M. Lau. The NYSCT Scholarship was awarded to Lisa Budman. The Mattiello Scholarship, administered by the Mattiello Memorial Library Fund, Polytechnic University, was awarded to Myongsoo Kim . . . Marvin J. Schnall was presented with the PaVaC Award. Roger Blacker and Kenneth DePaul were both recipients of the President's Service Award . . . The membership year began with 522 members, and 65 were added during the course of the year . . . The most pressing problem continues to be the erosion of attendance at monthly meetings. The NYSCT Board of Directors is addressing this problem through interfacing with the members to find what areas for technical presentation are of the most interest.

Northwestern

Eight technical presentations were made at monthly meetings. Topics of general interest were also presented . . . 24th Annual Symposium held, themed "2001: A Paint Odyssey" . . . "Education Night" was focus of April meeting, with students from local colleges and universities invited to attend. Students and professors from North Dakota State University made presentations. A check for \$2500 was presented to Dr. Marek Urban from NDSU to be used towards scholarships in the school's coatings program . . . Environmental Committee has been working with the Minnesota Paint Council tracking bills through the Minnesota Legislature that could have an impact on local paint manufacturing companies . . . Technical Committee has been revising its paper on the effects of acid rain



Larry Pitchford (Louisville) and Mark Algaier (Kansas City)

on coatings, which has been provisionally accepted for publication in the JOURNAL OF COATINGS TECHNOLOGY. The paper, "The Study of the Effects of Acid Rain on Alkyd, Polyester and Silicone Modified High Solids," received third place at the 1994 Annual Meeting.

Pacific Northwest

Membership continued to increase and is at an all-time high of 281 . . . Each of the three sections received \$1000 to distribute as scholarships. Portland supplemented their \$1000 so that two \$700 scholarships could be awarded for attendance of the California Polytech Introductory short course; Seattle awarded one \$1000 scholarship for attendance of the same short course; Vancouver, B.C. awarded \$1000 to an undergraduate college student. The practice of contributing 20% of surplus funds from the annual Spring Symposium to the California Polytech Paint School was continued . . . Portland Section conducted eight two-hour classes on waterborne formulations; Puget Sound Section provided two half-day seminars for paint store personnel; Vancouver continued their paint short course at Kwantlen College . . . Annual Spring Symposium held at Red Lion, Lloyd Center in Portland, OR, May 4-6, 1995 . . . 1996 Symposium will be held in conjunction with FSCT Spring Week on May 2-4, 1996, at Doubletree Suites Hotel near Sea-Tac Airport.

Philadelphia

Membership stands at 335, an increase of 37 over the previous year . . . Eight technical presentations held at monthly meetings, one of which was held with the Philadelphia Paint and Coatings Association . . . Ben Franklin Award for long-time service to the coatings industry was given to David Engler . . . J. Richard Kiefer was elected a Federation Honorary Member at spring Board of Directors meeting . . . Annual Spring Seminar in May was attended by 76. Theme was "Industrial Maintenance Coatings—More Than Just a Coat of Paint" . . . Formulator's Data Disk is no longer being actively pursued . . . Planning has begun for Eastern Training Conferences to be held May 8-9, 1996. This program is designed to provide information to those new to the coatings industry on the uses of raw materials and coatings testing, applications, history, and calculations.

Piedmont

Membership continues to increase and currently stands at 209 . . . Nine monthly meetings held, one of which was attended by Robert F. Ziegler and Jay Austin . . . Educational Committee awarded four \$1,000 scholarships to chemistry majors who have a career interest in the coatings industry . . . Held very successful Mini-Technical and Exhibition trade show with 54 exhibitors and almost 400 attendees.

Pittsburgh

Educational Committee active in school presentations and sponsored prizes at Buehl Science Fair . . . Scholarship recipient, who is

attending University of Southern Mississippi, qualifies for continuance. Society plans to eventually build to four scholarships . . . Manufacturing Committee arranged for tour of Miles, Inc. . . . Technical programs covered rheology, pigments, corrosion protection, testing, design, and market needs . . . Society appreciates visit of Joe Walton to describe new progressive programs and strategic plans at the Federation . . . Featured in 1996 will be a tour of G.M. Lordstown Plant and technical subjects of coatings for plastics, unique pigments, additives, and special coatings. Career night will be implemented.

Rocky Mountain

Arizona has been added as a section of this Society, which has increased membership to 97. For three years membership has grown by over 30% . . . Technical Committee presented "Effects of Substrate Temperature on Color Stability of Exposed Panels" at 1995 Annual Meeting . . . "1994-95 Directory and Reference Guide" has been published, and proved to be a good way to generate income. Society plans to produce a directory every two years . . . Denver will be one of two locations to host FSCT seminar entitled "Formulating for the Clean Air Act" . . . Held a well-attended "June Outing" in Taos, NM . . . Educational Committee plans to send a member to a coatings short course in 1996. This is a biennial event planned to coincide with profits received from Western Coatings Societies Symposium and Show . . . Society regretfully reports the death of Bob Trousil.

Toronto

Membership of 466 is an increase of 7.1% from the previous year, the first increase after several years of decline . . . Kurt Weitz was elected to Society Honorary membership . . . 63 students currently enrolled in coatings course at George Brown College. Four students will be graduating this fall from the Distant Learning Program . . . Ontario Paint Association has approached Society to develop two educational programs, one for plant operators on paint knowledge and application techniques and another to improve paint knowledge and application techniques of store employees . . . Technical Committee presented a talk on "Non Toxic Anti-Corrosive Pigments in Aqueous Primer Formulations" at Annual Meeting. New project is under investigation on the use of small particle emulsions in outdoor semi-transparent stains . . . Attendance at monthly meetings increased substantially due to variety of talks and program highlights . . . Mini-symposium in January attracted 110 and regular annual symposium in April attracted a record 151 . . . 75th anniversary celebration held November 19, 1994 at the Old Mill restaurant in Toronto, with over 250 in attendance, including FSCT President Joseph P. Walton and Executive Vice-President Robert F. Ziegler.

Meeting of the Stockholders of the Coatings Industry Education Foundation

The Joseph A. Vasta Memorial Scholarship in Coatings Science—The Vasta Scholarship Fund is in excellent shape, and has clearly attained a degree of recognition once reserved for older, more established scholarships. The 1994 scholarship was awarded to Ms. Ligia Martin, a top-performing senior in the Department of Polymer and Coatings at North Dakota State University, and the 1995 Vasta Scholarship will be awarded to a student at the University of Missouri-Rolla. Donations to the Vasta Fund for 1995 totaled \$1,000 through August; total donations to date stand at \$57,833. Although the interest generated by the Vasta Fund currently falls slightly short of the \$2,500 scholarship, the Trustees voted to supplement the short-fall—at least for the near-term future—from general CIEF funds.

The Coatings Industry Honor and Remembrance Fund—This new fund, established in 1992 at the suggestion of Colin Penny, has basically stalled. The initial donations and pledges, through 1995, total \$16,900, and represent the support of nine individuals, five Societies, and one corporation. (There were apparently two additional donations made near the end of 1994, but all attempts to obtain information regarding either the sources or the amounts of these gifts from the Federation office have proven futile.) Letters of explanation were sent during the Summer of 1992 to the presidents of all FSCT Societies—and again, in December, 1993 to both the Society president and the NPCA Association presidents—seeking their generous support for this Fund, which offers a truly significant means of recognizing outstanding contributions by industry members, both past and current. I regret to report that, in 1994, only the Baltimore Society responded, with a gift of \$500 in remembrance of Richard D. McCloskey, and only the Chicago Society, which donated the \$2000 which it received as the recipient of the Union Carbide Coatings Technology Award, has made a contribution so far in 1995.

In New Orleans, the Trustees presented a plaque, at the Thursday Luncheon, for installation in FSCT headquarters, listing all donors to the Honor and Remembrance Fund, with sufficient space so that new donors can be added as time passes. This fund has come a long way in a short period of time, but—to begin generating sufficient interest for important educational activities—the fund will need to at least double. We urge all members Societies, industry employers and individuals to consider furthering their commitment to the education of tomorrow's coatings chemistry by making a donation to the Honor and Remembrance Fund today.

Review Schedule for Recipients Schools Established—To assure that a proper assessment can be made regarding the effectiveness of the programs at the various institutions with coatings programs receiving financial support from CIEF, each school will be visited, on a rotating basis, by one or more Trustees, who will review the entire program. During 1995, the following institutions have been scheduled to be visited and formally reviewed, and the results will be discussed at our October meeting in St. Louis. California Polytechnic University—George Pilcher (delayed until 1996); North Dakota State University—George Pilcher; Kent State University—Mary Brodie; University of Waterloo—Sidney Lauren; University of Missouri-Rolla—Sidney Lauren; and De Paul University—Jay Austin.

Note: Whenever possible, the review visits are scheduled in conjunction with other business or personal travel, so that administrative costs to CIEF can be held to an absolute minimum.

Educators' Luncheon to be Held at the Annual Meeting in St. Louis—In St. Louis, the Trustees will hold the fourth "Educators Luncheon" for representatives of the eight coating schools currently identified by CIEF as having substantial coatings programs. (Two others schools, University of Detroit-Mercy, and University of Massachusetts-Lowell, are not currently being considered for CIEF funding.) The purpose of this luncheon is to allow the educators and Trustees to meet and get to know each other and also to discuss on-going funding programs and mutual concerns. Our first luncheon, in 1992, was highly produc-

ive, and resulted in the final set of "CIEF Funding Proposal Guidelines" which cover, in a comprehensive fashion, staffing focus, student composition, past funding, selection criteria, handling of funds, targeted uses for new funds, and methods to assess usefulness of CIEF funds for the coatings programs which are seeking CIEF support. These goals and methods were further refined at our 1993 and 1994 luncheons, and deadlines for submissions by the schools—and replies by the Trustees—were revised to more easily accommodate the educators' needs and activities at the outset of the academic year. At our luncheon this year, we will discuss how well the new deadlines have (or have not) served the various participants' needs. We will also, of course, discuss the significant curtailment in CIEF funds which are available to support coatings education, the negative impact that this will have to the coatings schools, and the steps which CIEF may be able to take to partially address the situation.

Recommendations for Appointments to the Board of Trustees—The Trustees have recommended to incoming FSCT President Darlene Brezinski the following candidates for three-year appointments to the CIEF Board: Mary G. Brodie—Re-appointment of Miss Brodie and Percy E. Pierce—William F. Holmes.

George R. Pilcher, President of CIEF for the past six years, has announced that he will not seek re-election for 1996. He will, of course, serve out his term as a Trustee, which runs through the end of 1997, so that the CIEF leadership can be transferred in an orderly and effective manner.

Transfer of the Ernest T. Trigg Foundation to CIEF—The control of the funds for the NPCA's Trigg Foundation, in the amount of \$99,686.94, is now in the hands of the CIEF, although legal ownership of the NPCA Trigg Foundation has yet to be transferred to CIEF. These funds will significantly enhance CIEF's ability to provide educational support for tomorrow's coatings chemists and technologists, and also serve as an excellent example of the way in which NPCA and the Federation can collaborate in areas of mutual interest. The Trustees have decided to reinstate the Trigg scholarship but have decided to decrease the annual number given from four to two, while increasing the amount of each scholarship from—\$1200 to \$2500. The recipient schools of the 1995 Trigg scholarships were Eastern Michigan University and California Polytechnic State University, and will be the University of Missouri-Rolla and North Dakota State University in 1996.

Educational Funds Granted for Academic Year 1995-96—Requests for funding of \$266,280 outran the \$72,250 that the Trustees were able to give, by \$194,030. Since all requests represented genuine, well-documented needs, it was with deep regret that the Trustees were compelled to turn down 73% of them. This was done only after lengthy, detailed discussion on the merits of each and every proposal, and reflects strictly on the crisis condition of available funding, not the worthiness of the proposals. As has always been our policy, CIEF has requested that each recipient school seek matching funds for all scholarships and fellowship requests. The following table summarizes both the funding requests and the actual CIEF pledges against these requests (see Table 1). The trustees consider to represent quite an impressive capture ratio, at a very reasonable cost. Requests for funding for academic year 1996-97 total \$192,325 from seven institutions; available funds, while currently unknown, are estimated to be around \$65,000. The Trustees will meet in January, 1996, to allocate whatever funds are available among the seven schools.

Strategic Planning—At our May 1994, meeting we got an excellent start on a directed, long-term planning program for CIEF, which included discussions on our mission, the multi-disciplinary nature of our industry, public opinion, vis-à-vis the coatings (chemical) industry, education of "industry-ready" potential employees, the creation and maintenance of centers of coatings expertise, training, "remote

learning," the potential for coatings courses at junior colleges, and many other topics. This was continued as a major topic of discussion at our October meeting in New Orleans, at which time it was suspended pending a clarification of the FSCT's financial and philosophical commitment to education in the future. This was presented both verbally by Bob Ziegler and in writing by Joe Walton. Both seem to agree that the FSCT's financial support of the CIEF will be limited to the \$50,000-70,000/annum range, and both see a future in which the FSCT will focus with increasing attention on the membership of the FSCT, rather than on the potential membership which is supported by CIEF. In response to this bleak outlook, the Trustees met with a professional fund-raiser to discuss options for the future. Following many hours of discussion, it became obvious that—to raise sufficient funds for CIEF to be self-sustaining—the Trustees would need to raise capital in the range of \$3-5 MM, with a single donor supply between \$600,000-\$1,000,000 of that amount. The cost to CIEF to mount an appropriate fund-raising campaign would be in the neighborhood of \$300,000-\$500,000, and would require intensive personal involvement by all Trustees, as well as additional, highly-placed industry volunteers. Since the Federation's current direction, as represented by both Bob and Joe, indicates a dramatic departure from past philosophy and actions—and since the Trustees cannot continue, in the future, to deplete capital funds to supplement the Federation's donation, as we were forced to do in 1995—the CIEF Trustees met in emergency session on June 19 to discuss whether or

not CIEF could even survive as a viable entity in the future, and—if so—how. Our basic decision, at that meeting, was that CIEF is needed to support both our industry, as well as the public's perception of it. It is clear that CIEF cannot go into the future on a totally "self-sustaining" basis, but it may be able to function in a meaningful capacity as long as it is financially assisted by the Federation. While creating a realistic strategic vision for the future will involve several additional brainstorming sessions, the Trustees currently envision a five-year, four-stage strategic process which look something like this:

- Stage I. Developing a Strategic Vision and Mission Statement (1995).
- Stage II. Creating Significantly Enhanced Awareness and Recognition of CIEF Throughout the Industry (1995-97).
- Stage III: Developing an Increased Annual Income (1986-98).
- Stage IV. Accruing an Endowment (1996-2000).

This is, of course, a huge undertaking, and CIEF must rely upon the volunteer efforts of a very small number of (fortunately very dedicated) people to pursue such a strategy. All suggestions for realizing this strategic vision will be warmly welcomed and thoughtfully considered.

GEORGE R. PILCHER
CIEF President

Institution	Type of Request				
	Capital Grant	Scholarship	Fellowship	Research Grant	CIEF Funds Committee
De Paul University	\$12,000	—	\$8,075	\$33,500	\$7,500 Fellowship
California Polytechnic State University	\$24,000	\$9,000	—	—	\$6,000 Scholarship \$2,500 Trigg Scholarship
University of Waterloo	—	—	\$8,000	—	No funding committed
University of Missouri-Rolla	—	\$11,500	\$12,000	—	\$10,000 Scholarship \$2,500 Vasta Scholarship
University of Southern Mississippi	—	\$20,000	\$12,500	—	\$15,000 Scholarship
North Dakota State University	\$30,325	\$15,000	\$20,000	\$25,380	\$11,250 Scholarship
Eastern Michigan University	\$25,000	\$18,000	\$12,000	—	\$15,000 Scholarship \$2,500 Trigg Scholarship
Kent State University	—	—	—	—	No request
Sub-Totals	\$91,325	\$73,500	\$72,575	\$28,880	
					Scholarships: \$57,250 Fellowships: \$7,500 Capital Grants: None Research Grants: None Vasta Scholarship: \$2,500 Trigg Scholarship: \$5,000 \$72,250
TOTAL FUNDS REQUESTED:	\$266,280				
TOTAL FUNDS PLEDGED:	\$72,250				

In Memoriam

We report with deep regret the passing
of the following members during the past year

Birmingham

J.R. Bourne (Retired)

Chicago

Al Kutun (Retired) Sun Chemical Corp.
Richard A. McGrenera Megan Chemical Group
Carroll M. Scholle (Retired) Sherwin-Williams Co.
Federation Past-President
Federation Board Member
50-Year Member
Society Past-President

Cleveland

Edward G. Bobalek Environmental Protection Agent
Society Honorary Member
Thomas V. Mammano Seegott Corp.
Society Honorary Member
Ronald Ohm
Eugene Ott Federation Past-President
Thomas Sullivan
William M. Tomc Glidden Co.
Society Past-President

Detroit

Mark Agorgiantis A.E. Fleming
George E.F. Brewer Consultant
Linda Knowlton-Wagner BASF, Whitehouse
Terry Sherban Harry Holland Co.

Houston

Sam Leon Bishkin Eltex Chemical Co.
50-Year Member
William Davis Monarch Paint
John W. Garrett Society Past-President
50-Year Member
L.B. "Larry" Hardcastle Spartan Color
James Ignatow Jet-Lube Inc.
Society Past-President

Kansas City

Howard Bartley Burchett, Jr. Abner Hood Chemical
Society Past-President

Morris R. Keyser (Retired) Rohm & Haas
Earl E. Stover (Retired) Welco Manufacturing Co.
Society Past-President

Los Angeles

Andrew Corty (Retired)
Dr. Henry W. George (Retired) Trail Chemical
Ed A. Gross (Retired)
Charles G. Munger (Retired)

New York

Charles Kahn Kahn Tech.

Northwestern

John (Hans) Dirks Retired
Society Past-President
Richard (Dick) Gurney Albeco Consulting

Pacific Northwest

John Filchak Consulting Coating Chemist

Philadelphia

Frederick D. Rotar Union Process, Inc.
Robert Washburne Rohm and Haas Co.

Pittsburgh

Edward T. Ryan PPG Industries, Inc.

Rocky Mountain

Bob Trousil R.E. Trousil Co.
Society Past-President

Southern

Tom Marek Coronado Labs.

Durability and Gloss

Juergen H. Braun—DuPont, Retired*

Daryl P. Cobranchi—DuPont

INTRODUCTION

Gloss retention, the ability of a paint film to retain a flashy gloss during exposure, is a test that attempts to predict the service life of a coating, often an automotive coating. From the automotive industry's point of view, such prediction of service life is appropriate. After all, glossy finishes sell cars. The customer wants to own a bright and shiny car. When the car's shininess goes, its glamour fades. Gloss retention data predict the ravages of aging on gloss. Aging is presumed to be the result of weathering.

Pigment involvement is crucial to service life, affecting gloss as well as chalking performance, thus frequently the focus of durability studies. Pigments, because they are particulates, help generate the surface roughness of the coating that degrades its gloss; as oxidation catalysts, white pigments can accelerate the degradation of polymeric binder.

The techniques of exposure testing are straightforward though cumbersome. For pigment evaluation, experimental pigments and pigment standards are ground into otherwise identical test paints. The paints are applied to metal panels; the panels are exposed, outdoors or in lab exposure cabinets; glosses or chalking effects are measured repeatedly, over several years for outdoors or many months for lab testing; the data are summarized and sometimes evaluated statistically. The interpretation of exposure results and their extrapolations to actual product performance remains controversial.

The prediction of service life by exposure testing seems realistic and results are considered credible. In reality, exposure testing is unreliable, because the reproducibility of results is much poorer than is generally appreciated. This poor reproducibility escapes attention because exposures are rarely replicated since data points are exceedingly expensive—several hundred dollars each. Poor reproducibility afflicts all exposures, chalking and gloss retention, outdoors as well as lab accelerated. Accelerated exposures suffer an additional, serious shortcoming because acceleration itself introduces factors that can drive degradation into reaction paths that do not contribute to natural weathering.

The test protocols of gloss retention and chalk testing are similar except for the salient performance criteria, gloss versus chalking. Gloss can be measured directly, reliably, and quickly.

The durability of high gloss industrial and automotive coatings, their service life, is usually predicted from gloss retention data. Because of time pressures, business decisions are often based on data of an early phase of exposure.

Evidence and conclusions are presented that show that initial gloss retention results of coatings pigmented with TiO₂ involve phenomena of film formation rather than weathering. We show that film formation of automotive finishes continues after cars leave the baking ovens, albeit on a time scale of months rather than the minutes for which the paint film is baked. Later in the service life of a paint film, weathering sets in. Oxidation of the polymeric binder takes place involving the combined actions of UV light, water, and oxygen. As a result, the film surface erodes and its gloss degrades far beyond effects of film formation.

According to our hypothesis, high gloss rather than good durability of the TiO₂ pigment in the coating makes for good initial gloss retention. Eventually, of course, the durability of the TiO₂ pigment, that is, the inhibition of its surface catalytic activity, becomes important for film performance.

Chalking is difficult to measure; it can only be rated.* Several versions of chalk testing are practiced.¹ Some involve wiping the chalking surface with a black cloth and rating the amount of chalk on the cloth. The most sophisticated of tests for the chalking propensity of TiO₂ pigments, Daiger and

*Presented at the 73rd Annual Meeting of the Federation of Societies for Coatings Technology, on October 9-11, 1995, in St. Louis, MO.

*Pigment Consultants, Inc., 614 Loveville Road, Building E-1-H, Hockessin, DE 19707-1616.

*The ratings do not translate into quantitative statements of durability. A coating "A" can be shown to last longer than a coating "B," but one cannot tell from the ratings how much longer A can be expected to last than B.

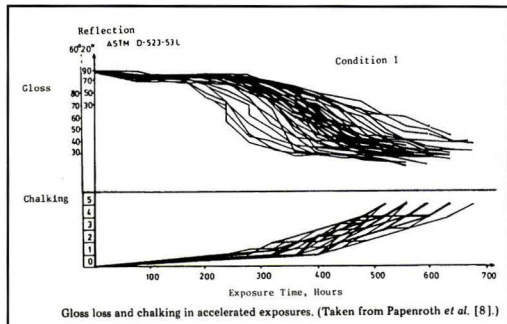


Figure 1—Gloss loss and chalking in accelerated exposures. (Taken from Papenroth et al.⁵)

Madson's "chalk/fade" protocol² measures the increase in whiteness (the fading) that is caused as a film of white chalk develops on a blue finish.* For maximum contrast between the blue coating and the white chalk, red light reflectance is measured. In red light, the blue paint film looks black and the chalk looks white. This black/white contrast enhances test precision.

The chalk/fade test has a pseudo standard deviation of about 4 on a rating scale on which an interior TiO₂ grade rates 10 and a superdurable grade about 30.³ Exterior pigment grades can be distinguished from interior grades reliably and without replication. To detect variability within product grades, say establish performance differences between competing products, requires a large number of test replicas.

By contrast, the experimental error of gloss retention results is much larger than the error of chalk testing. The Association of Automobile Industries⁴ and Papenroth⁵ (Figure 1) compared the tests and report that gloss retention discrepancies of ±50% must be accepted. Such test reproducibility is too poor to distinguish reliably between grossly different pigments unless exposures are replicated.

The automotive and coatings industries have some confidence in gloss retention results. Much of the United States' TiO₂ industry distrusts gloss retention and prefers chalk testing for the prediction of the effects that pigments have on the service life of coatings.

Chalk tests had their origin in the U.S. paint and pigment industries and were developed for exterior house paints of moderate or low gloss. In the U.S., house paints have a large market. They are applied over the wood surfaces of conventional frame constructed houses. In much of Europe, masonry construction prevails and the market for exterior house paints is small. For house paint, some chalking was acceptable, even considered desirable and advertised as "self-cleaning." Appropriately, service life of an exterior house paint ended when it had eroded to almost primer interface.

With regard to chalking, house paints and automotive finishes differ in an important aspect. The service life of an exterior house paint ends near the end of chalking. In stark

contrast, service life of an automotive finish ends with the beginning of chalking. Both gloss retention and chalk testing are appropriate for service life predictions, each within the industry which they serve. We shall see, however, that the two manifestations of the aging of paint films—chalking and loss of gloss—involve quite different features of the pigment within the finish.

Chalking of paint films pigmented with TiO₂ is fairly well understood. It involves catalytic characteristics of the TiO₂ surface. The mechanisms and the chemistry of chalking were explained by contributions of numerous investigators. Kämpf⁶ illustrated (1) the protective function of TiO₂ particles that absorb UV light, protecting binder in their shadow and (2) the destructive effects of the TiO₂ surface which catalyses oxidative degradation of organic polymer. Many investigators, foremost Völz,^{7,8} elucidated the chemistry by which UV photons, water, and oxygen generate free radicals in a cyclic reaction sequence. The free radicals, in turn, initiate the oxidative degradation of binder ultimately to carbon dioxide and water. The TiO₂ pigment becomes an oxidation catalyst for the degradation of organic polymer.

Chalk/fade testing facilitated a spectacular development of durable pigments. The most durable ones are encapsulated in a shell of silica glass⁹ which isolates the TiO₂ surface from the polymeric binder thus disrupting the catalysis. Encapsulation reduces the catalytic activity of the TiO₂ surface to one-tenth of the activity of a conventional rutile pigment,¹⁰ increasing the service life of durable coatings five, perhaps tenfold.

In contrast to chalking, we did not know much about the mechanism by which pigment affects the gloss of paint films. Now, we understand that gloss degrades while paint films dry by an interplay of surface tension with structures that develop

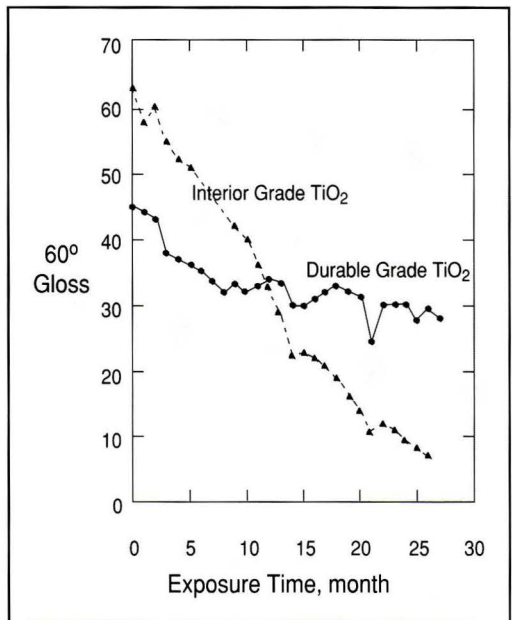


Figure 2—Florida exposure effects on gloss, exterior and interior grade TiO₂ pigments in a chalk/fade² test formula.

*Blue works better than black because black pigment would compete with the TiO₂ in the absorption of UV radiation. With black rather than blue pigments, the precision of exposure results would be diminished.

within the film.^{11,12} Particulates in the paint—pigments, extenders, and flattening agents—contribute prominently to the developing structure. Simpson¹³ observed that higher baking temperatures result in lower glosses of alkyd amino paints. Low gloss surfaces suffer larger effects.

We compared chalk/fade with gloss retention results for various TiO₂ pigments and became aware of inconsistencies. Data were at odds with preconceived notions. Some durable, non-chalking pigments had poor gloss retention, while some pigments prone to chalking, retained gloss surprisingly well. Figure 2 shows gloss data for an exterior, non-chalking and an interior, chalking pigment grade in Daiger and Madson's chalk/fade formula.² Initially, the interior pigment shows and retains a higher gloss level than the exterior pigment. Eventually, the coating chalks and its gloss decreases below that of the durable grade.

Granted, not all exposure series were as decisive as the one pictured. At that, the discrepancy between performance expectations and data for pigments considered durable and non-durable could not be explained by the poor reproducibility of exposure data.

The discrepancy between gloss retention and chalking data has been noted by other observers within the TiO₂ industry: "... the excellence of gloss retention does not entirely correlate with the order of photochemical activities of TiO₂ ..." ¹⁴ and "Conclusions concerning the resistance to weathering which are based on measurements of the decrease of gloss vary frequently from those based on measurements of chalking ..." ¹⁵ However, no satisfactory explanations were advanced.

EXPERIMENTAL

Experiments were performed on three systems: (1) a white, baked, alkyd truck finish "30J"; (2) a white, baked industrial polyester coating; and (3) a blue, air-dried alkyd paint used for exposure testing. We adhered to conventional lab procedures and practices. Statistical techniques were used to sharpen perceptions and test the validity of conclusions. Most experiments were performed with groups of pigments and sets of panels. Reported are means and standard deviations for most data sets. The significance of conclusions was examined using the statistical methodology of the student's "t" test.

30J Paints

This is a coating which was adapted to the gloss evaluation of TiO₂ pigments. It is an alkyd-based, baked finish with 66 wt% solids in the paint, 19% pigment volume concentration, all TiO₂.

Panels were subjected to analyses and to experiments involving gloss, weight loss, and solvent swelling.

Exploratory experiments established that paint films suffered no pronounced thermal degradation as judged by weight loss and discoloration in the temperature range from 95 to 150°C. However, heating to 200°C for periods up to one hour caused distinct and probably destructive weight loss.

Exposures

Paint panels were prepared and exposed in Florida by the chalk/fade protocol.² The paint is a medium blue, air-dried,

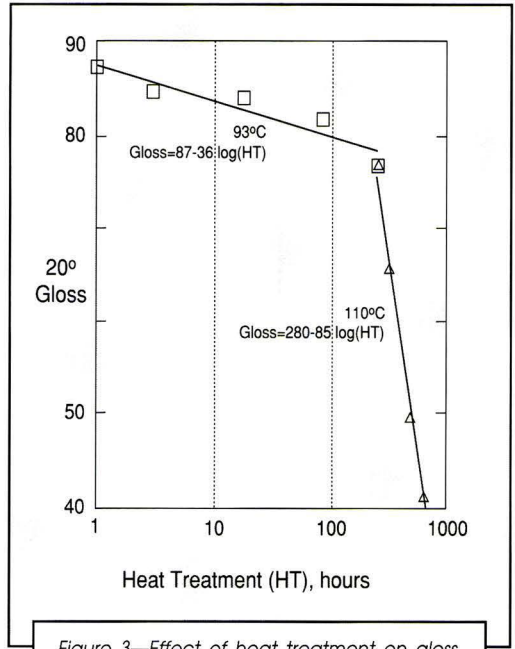


Figure 3—Effect of heat treatment on gloss, first exposure to 93°C, followed by exposure to 110°C.

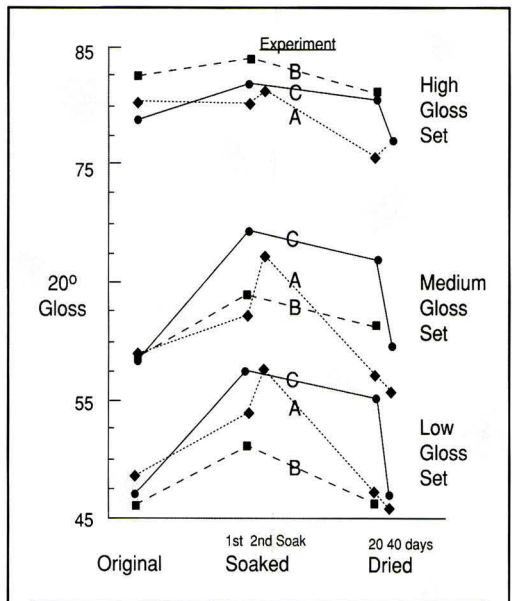


Figure 4—Gloss effects of binder swelling of baked paint films, three experiments, "A," "B," and "C," each with three sets of paint panels, "low," "medium," and "high" gloss, measured first "original," then "soaked" in OMS in two stages, finally "dried" for 20 and 40 days in air.

Table 1—Gloss Retention Studies—30J Paints 22—Pigment Samples in Three Sets of Seven and Eight Panels Each

Gloss Category of the Set	20°C Gloss							
	Initial Gloss		90°C, 8 Days		110°C, 1 Day		110°C, 4 Days	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Low	47	5	36	5	31	6	23	8
Medium.....	63	3	45	3	35	3	16	1
High	74	2	69	4	60	6	19	2

Table 2—Weight Loss Studies—30J Paints—22 Pigment Samples in Three Sets of Seven and Eight Panels Each

Gloss Category of the Set	Weight Loss, mg					Relative Weight Loss, % of Resin			
	90°C			110°C—1 Day		90°C			110°C
	1 Day Mean	2 Days Mean	9 Days Mean	Mean	Std. Dev.	1 Day Mean	2 Days Mean	9 Days Mean	1 Day Mean
Low	1.3	1.9	9.5	13	5	0.6	1.0	4.8	6.6
Medium.....	4.1	5.7	13.9	17	2	2.0	2.8	7.0	8.6
High	2.6	4.1	9.1	15	2	1.4	2.0	4.6	7.6

Table 3—Swelling Experiments—30J Paints—10 Pigment Samples in Three Sets of Three and Four Panels Each

Gloss Category of the Set	20°Gloss, Initial		Gloss Increase by Soaking, Soaked minus Initial		Net Gloss Increase by Soaking and Drying, Dried minus Initial
	Mean	Std. Dev.	Mean	Std. Dev.	Mean
Low	47.2	3.2	10.4	0.8	-0.2
Medium.....	58.3	1.4	11.2	3.2	1.5
High	79.0	1.4	2.9	1.0	-1.7

medium oil alkyd, pigmented at a pigment/binder weight ratio (P/B) of 90/100 and a TiO₂/CPC (copper phthalocyanine blue) weight ratio of 100/12.5. Duplicate panels were protected from light, moisture, and temperature extremes.

Figure 2 illustrates the downward drift of gloss that occurred during an exterior exposure in Florida. Typically not even the character of the curves reproduces well, let alone individual points.

We measured and compared the gloss of “fresh” and “aged” paint panels of a series of 32 pigments. “Fresh gloss” were data for panels measured a week or two after preparation and before their routine exposure. “Aged gloss” were the readings on companion panels not exposed but retained for three years in a dark, dry storage cabinet in a heated and air conditioned room:

	20° Gloss	
	Fresh	Aged
Mean of 32 Panels.....	79.4	70.3
Standard Deviation.....	1.2	4.5

The data show a significant loss of gloss by aging under conditions that preclude weathering, that is, the combined actions of light, water, and oxygen upon the coatings.

Gloss Studies

30J panels from routine quality control testing were subjected to weight loss experiments. They were heated to temperatures that could be approached in demanding service, say, cars parked in Arizona sunshine.

Panels were selected from among many to fall into three categories of pigment gloss characteristics: low (20° gloss: 40 to 50), medium (20° gloss: 60 to 70), and high (20° gloss: 70 to 80). Several pigment grades were represented. The panels were used within a few weeks of preparation. Glosses were measured with a BYK-Gardner haze/gloss meter at a 20° specular angle reflecting the high gloss regime of interest to us.* Several measurements were performed on each panel. The data were reduced to means and standard deviations for each set in the low, medium, and high gloss categories.

Table 1 shows the gloss results. The loss of gloss increased significantly with the severity of the heat treatment. Gloss category and gloss loss did not correlate.

A second group of experiments is illustrated by Figure 3 which shows the downward drift of gloss that occurs as paint

*The specular angle of gloss measurement is chosen for instrumental reproducibility, 20° for high gloss finishes, 45° or 60° for moderately glossy finishes, 85° for flat coatings.

films are heated, first for 247 hr to 93°C, then for an additional 406 hr to 110°C. The paint system was an industrial, melamine crosslinked polyester coating with TiO₂ pigments and Aropiaz® 6025-R-70 resin, pigment/binder = 1 wt/1 wt (PVC: 20%); pigment/binder/solvent = 37 wt/37 wt/26 wt (64 wt% solids) pigmented with a variety of commercial TiO₂ pigments including low as well as high gloss products. The experiment involved 43 pigments and paint panels. Plotted are gloss means for the set. Pooled standard deviations were ±3 and ±8 for the 93° and 110°C exposures, respectively. Differences between pigment grades were too small to be statistically significant.

Weight Loss Studies

Fresh sections of the same paint panels used in the gloss experiments were heat treated to observe weight loss effects. We heated the panels in an oven, some at reduced pressure, some in air at ambient pressure. A few weight loss results are shown in Table 2.

Weight loss differences between the three pigment sets were not statistically significant. To convert weight losses into estimates of film shrinkage, film thicknesses were measured with an Elcometer coating thickness gage on all panels (mean: 1.45 mil, standard deviation: ±0.13 mil). Film areas were measured on one panel (72.0 cm²) and film density calculated from the paint formula ($\rho=1.49$ g/mL).

Losses of 1 to 9% of resin weight are approximately equivalent to losses of 1 to 9% of binder volume. Equivalent shrinkage of binder reduces a film thickness of 36 μm (1.45 mil) by an average of about 0.3 to 3 μm , unevenly distributed on microscopic scale because the binder shrinks but not the pigment.

A second set of 27 30J panels was heated to 80°C for 14 days. They averaged a weight loss of 3.7±1.0 mg, similar to the 3.9 mg weight loss we observed in two days at 90°C. Weight loss differences between the three pigment sets—low, medium, and high gloss—were not statistically significant.

With a second paint, the melamine crosslinked polyester finish described previously, we obtained quite similar results. Ten panels each were heated to 110°C in a vacuum for four and 11 days. They lost 5.9±1.4 and 6.3±1.8 mg in weight, respectively, equivalent to an average of 7.8±1.9 and 8.4±2.4 wt% of the resin. Films averaged 12±0.15 μm (0.46±0.06 mil) in thickness and 77.0 cm² in area.

Solvent Swelling Experiments

If film shrinkage causes submicroscopic surface roughness which, in turn, reduces gloss, then, we reasoned, film swelling should reduce the very roughness caused by shrinkage thus increase the gloss of a film that had been shrunk by cure and aging. A weathering hypotheses would not lead to such conclusion. Film swelling would not be likely to improve gloss of a film that has suffered surface erosion.

To test the hypothesis we studied the gloss effects of swelling caused by solvent intrusion and re-shrinkage by subsequent solvent removal. We solvent soaked and dried baked paint panels and measured their glosses. All experiments were conducted with 30J paint panels and odorless mineral spirits (OMS), a solvent that causes slight swelling of the crosslinked

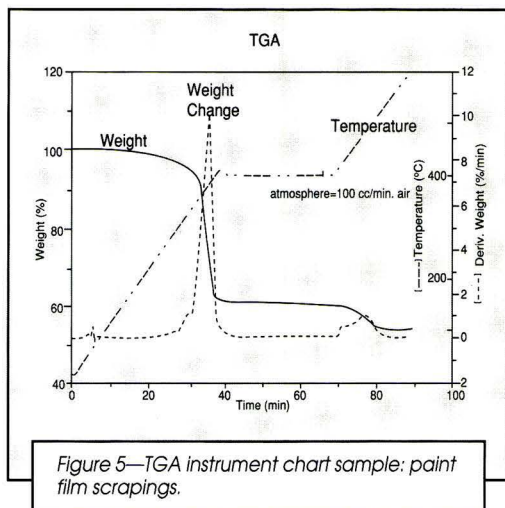


Figure 5—TGA instrument chart sample: paint film scrapings.

30J coatings but does not cause perceptible softening nor dissolution or etching of the films. Glosses were measured conventionally.

Results of one of three experiments are shown in Table 3. Sections of baked and aged paint panels were measured, then immersed in OMS. Soaking was carried out at ambient temperature for nine days because preliminary experiments had shown gloss to continue its increase for a few days. After the soaking, the panels were wiped and measured again, then allowed to “dry” in the open at ambient temperature, first for 20 days and then for another 20 days. All gloss measurements—original, soaked once and twice and dried for 20 and 40 days—were carried out in the same region of each panel.

Data from swelling experiments are plotted in Figure 4. Invariably, swelling caused gloss to increase; drying reduced gloss back to near its original level. The lower the initial gloss of the coating, that is, the lower the pigment gloss, the larger

JUERGEN H. BRAUN is an expert in the technologies and applications of white and color pigments. He graduated as a Diplom-Ingenieur in Chemistry from the Technische Universität Berlin, Germany, in 1951 and received the Ph.D. in Inorganic/Physical Chemistry from the University of Texas (Austin) in 1956. Dr. Braun consults in matters of pigment, particle, and coatings technologies, is affiliated with Consolidated Research, Inc., and is an Adjunct Professor in the Department of Polymers and Coatings of North Dakota State University.



From 1955 to 1993, he was employed by DuPont in a wide range of assignments involving pigments and including exploratory research, product and process development, engineering liaison, and manufacturing operations. His special interests are crystallography, optics, and fine-particle technology.

Dr. Braun has lectured worldwide, holds several patents, and has authored numerous publications. He is a member of the Editorial Review Board of the JOURNAL OF COATINGS TECHNOLOGY.

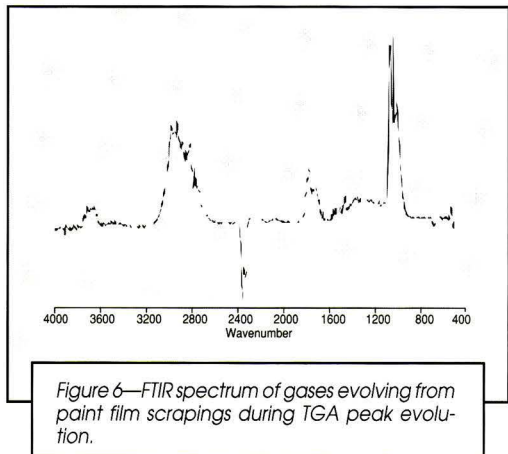


Figure 6—FTIR spectrum of gases evolving from paint film scrapings during TGA peak evolution.

was the gloss increase caused by solvent swelling of the paint film. Effects were pronounced and are statistically firm.

Chemical Analyses — Daryl P. Cobranchi

Painted and baked panels were stored for a few weeks. Then, scrapings from the panels were subjected to combined thermogravimetric analysis (TGA) and Fourier transform infrared (FTIR) analyses of the effluent gases. In effect, analyzed was the amount and composition of gases liberated by carefully controlled heating.

We analyzed the melamine crosslinked Syntex paint, pigment/binder 1/1, 74 wt% solids. From the paint scraping, 2.4% methanol evolved. Figure 5 shows the TGA traces. Gases are liberated in a distinct peak in the temperature range from 170 to 300°C. Figure 6 shows the Mid-IR spectrum of the gases evolving at 274°C. The negative-going (decreasing) features in the spectrum are due to spectral subtraction and are attributed to carbon dioxide. The identification of methanol was confirmed by comparison with library spectra.

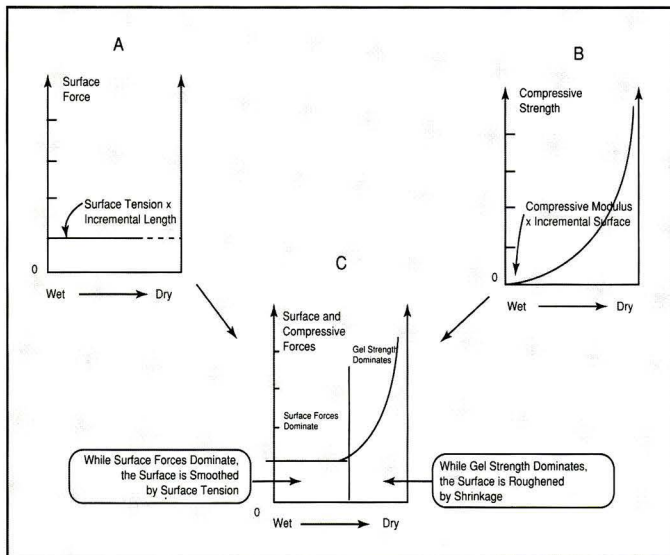


Figure 7—Forces acting on a paint film while it dries/cures (schematic).

Similar results were obtained for the melamine crosslinked polyester formula of gloss and weight loss studies. Here, 0.9 wt% methanol evolved. A30J coating evolved 18.7 and 19.2 wt% volatiles between ambient and 100°C, 3.2 and 2.1 wt% between 150 and 250°C.

Methanol is the condensation product of the reaction that crosslinks the polymer. Results indicate that only one-third of the condensation methanol evolves during the bake; two-thirds are still retained in the coating when its service life starts. The data do not show whether the delay in the release of methanol is due to the crosslinking reaction or to slow diffusion.

Other Data

The formula of a typical automotive refinish paint, a Syntex 8388 system, contains 15 wt% Varsol® #1 and 15 wt% Xylol® as solvents. Half of the Varsol #1 distills above 175°C. These high boilers may not diffuse completely out and evaporate from the finish during a baking operation during which the film temperature of the finish itself may not rise much above 200°C.

We note that the Ford Motor Company advises buyers of Ford automobiles in their owner's manuals not to wax their new cars while the finish is fresh.

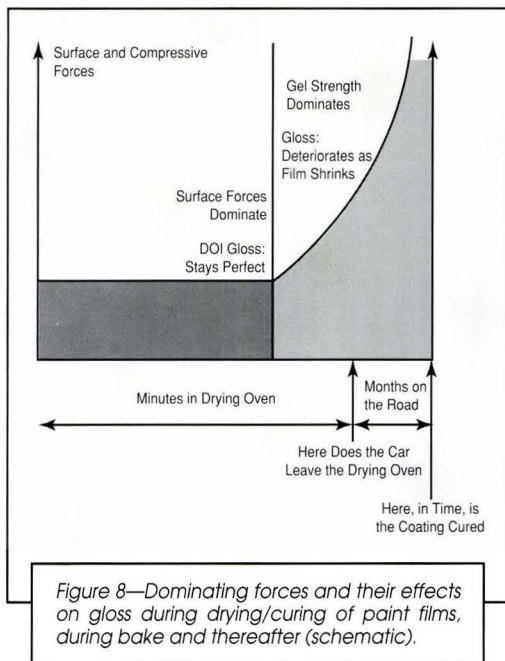
DISCUSSION

Preceding experiments show that typical coatings, an automotive and an industrial finish, can undergo changes on aging that are unrelated to weathering, that is, the impact of the elements—light, air, and water—upon the coating. These changes involve loss of film weight. They have pronounced effects on gloss.

The coatings:

- Suffer a decrease of gloss during aging in protected storage;
- Lose weight upon heating to temperatures no higher than they encounter in some automotive service;
- Lose gloss upon heating to automotive service temperatures;
- Experience a gloss increase when solvent swelled. Drying and shrinking thereafter reduces the gloss to its original level;
- Retain low molecular weight products of the crosslinking condensation reactions even after the bake;
- Contain volatile components that are, however, unlikely to evolve during the bake.

These circumstances will cause shrinkage of paint films during exposure, albeit slowly over months rather than minutes.



Such shrinkage will cause gloss to decrease. Calculations show that mass losses, shrinkage, surface roughnesses, and gloss effects are of consistent magnitude. Optical theory for light interacting with smooth and rough surfaces tells¹¹ that sinusoidal roughness of 0.01 μm reduces gloss by 40%.

The picture that emerges extends an hypothesis of processes that occur during film formation, an interplay between surface tension and structure within the drying paint film.^{11,12} Figure 7 explains the hypothesis. It shows drying/curing sequences of paint films, from wet to dry. Plotted in Figure 7A is the effect that drying has on surface forces, the product of surface tension times perimeter of a protrusion from the surface. Surface tension of the wet film itself does not change much while it is fluid. Figure 7B illustrates the effects of drying on the strength of structure within the paint film. Structural forces, that is, yield strength, rise exponentially from zero for the liquid film to very large values characteristic of cured paint films. Figure 7C combines and superimposes Figures 7A and B showing the intercept of the curves where surface forces equals structural forces. This intercept divides drying into two regimes, a wetter one in which surface forces dominate and a drier regime where structural forces exceed surface forces. While surface forces dominate, the film surface is maintained at molecular smoothness; the quality of reflected images and the distinctness-of-image component of gloss stays "perfect." On the drier side of the intercept, surface forces can no longer overcome the compressive strength of structure within the film; the film shrinks unevenly; roughness develops; gloss deteriorates.

We had assumed that film formation was complete when the new automobile leaves the baking oven. Not so. Now, we recognize that film formation continues on the road, albeit on a time scale of months instead of minutes (Figure 8). In the years that follow the film formation, weathering sets in and causes further loss of gloss.

We can picture these events as four stages in the life of a paint film (Figure 9), wet, baked, aged, and weathered:

(1) Wet—within seconds after application, the film is fluid, its surface smoothed to molecular dimensions by surface tension. Its reflected-image quality and the distinctness-of-image component of gloss is perfect.¹¹

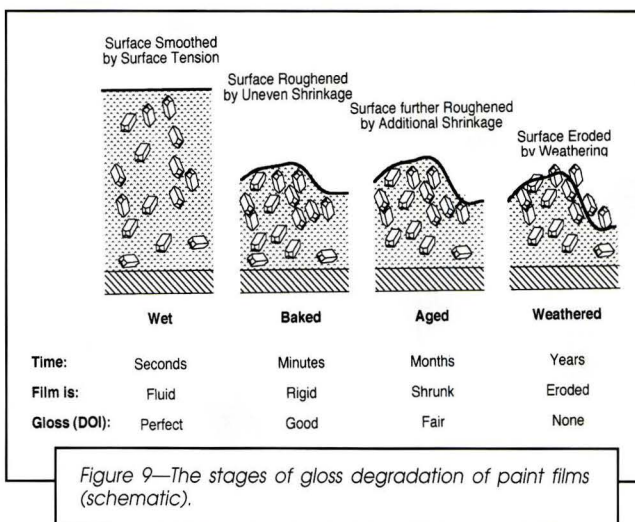
(2) Baked—minutes after application, the film is rigid. Its surface is rough because shrinkage is uneven on the microscopic scale since the polymer shrinks but not the pigment. How much the gloss is reduced by shrinkage depends on pigment concentration and oil absorption as well as on the contribution that pigment agglomerate size makes to loss of gloss.¹²

(3) Aged—after months in service, the film has shrunk some more. Pigment effects on surface roughness and gloss have become more pronounced.

(4) Weathered—after years of exposure, the coating had its surface roughened by the impact of the elements—UV light, air, and water—on the integrity of the polymeric binder of the film.

The late stages of aging and the early stages of weathering are likely to overlap. How much overlap occurs depends on (1) the specifics of the paint formula and (2) on exposure conditions. Pigment effects on surface roughness and gloss increase with the TiO₂ pigment's catalytic activity, with pigment concentration in the paint film and with the pigment's oil absorption and its particle size within the coating. Surface erosion caused by weathering increases with the severity of UV and humidity exposure. Thus, geographic latitude matters, as does climate, exposure geometry, and a variety of lesser factors.

The sequence of the events we described has implications for coating and pigment technologies. It contradicts the pre-



vailing views that insist that initial gloss retention of a coating reflects damages caused by weathering^{14,15} as well as views according to which baked finishes do not undergo shrinkage related to film formation "because all solvents are driven out by applied heat."¹⁶

CONCLUSION

Initial gloss retention data, that is, the data upon which business and formulating decisions are based, reflect gloss performance of the pigments rather than their durability. Early during exposure, high gloss pigments of low durability show better gloss performance than low gloss pigments of high durability.

Later in the life of the coating, weathering characteristics of the pigment affect its performance. For moderately durable pigments in highly durable, UV stabilized polymers, this later stage may occur after the consumer has lost pride in his automobile, particularly if the car has served in temperate climates, that is, was exposed to low UV incidence.

The pigment manufacturer can contribute to the satisfaction of automotive customers through gloss improvement of his most durable products. The coatings manufacturer can improve performance by the selection of a high gloss, superdurable pigment and by manipulating the coatings formula to minimize the shrinkage of polymer and minimize the retention of volatile components in the film.

ACKNOWLEDGMENTS

I wish to thank my former DuPont colleagues for their contributions to these studies, in particular Dr. J.E. McNutt who pointed out unexpected discrepancies of pigment performances

and who reviewed this manuscript. Drs. R.E. Marganski, A. Baidins helped clarify the conclusions. The experimental work was performed most ably by Patricia Kelleher and the analyses by T. E. Laughlin.

References

- (1) *Gardner/Sward Paint Testing Manual*, Part 7, 13th Ed., ASTM, Philadelphia, 1972.
- (2) Daiger, W.H. and Madson, W.H., "Chalk-Fade Evaluation of Pigmented Finishes By Use of Instrumentation and Computer Analysis," *JOURNAL OF PAINT TECHNOLOGY*, 39, No. 510, 399 (1967).
- (3) Braun, J.H., *Prog. Org. Coatings*, 15, 249, 1987.
- (4) Association of Automobile Industries, "Comparison of Outdoor and Accelerated Exposure Methods—Results of a Round-Robin Test," *JOURNAL OF COATINGS TECHNOLOGY*, 58, No. 734, 57 (1986).
- (5) Papenroth, W. et al., *Dtsch. Farben-Z.*, 32, 102, 1978.
- (6) Kämpf, G., Papenroth, W., and Holm, R., "Degradation Processes in TiO₂-Pigmented Paint Films on Exposure to Weathering," *JOURNAL OF PAINT TECHNOLOGY*, 46, No. 598, 56 (1974).
- (7) Völz, H.G., Kämpf, G., and Fitzky, H.G., *Prog. Org. Coatings*, 2, 223, 1974.
- (8) Völz, H.G., Kämpf, G., Fitzky, H.G., and Klaeren, A., ACS Symposium Series, No. 151, Pappas, S.B. and Winslow, F.H. (Eds.), ACS, p. 12, 1981.
- (9) Iler, R.K., U.S. Patent No. 2,885,366 (1959); Werner, A. J., U.S. Patent No. 3,437,502 (1969).
- (10) Braun, J.H., "TiO₂'s Contribution to the Durability and Degradation of Paint Film II. Prediction of Catalytic Activity", *JOURNAL OF COATINGS TECHNOLOGY*, 62, No. 785, 37 (1990).
- (11) Braun, J.H., "Gloss of Paint Films and the Mechanism of Pigment Involvement," *JOURNAL OF COATINGS TECHNOLOGY*, 63, No. 799, 43 (1991).
- (12) Braun, J.H. and Fields, D.P., "Gloss of Paint Films II. Effects of Pigment Size," *JOURNAL OF COATINGS TECHNOLOGY*, 66, No. 828, 93 (1994).
- (13) Simpson, L.A., *Prog. Org. Coatings*, 6, 1, 1978
- (14) Anon., Ishihara Tipaque News, TE-42 "Titanium Dioxide Pigments," p. 17, 1990.
- (15) Anon., "Kronos Guide," KRONOS Titanium Companies Press, 1968.
- (16) Schmidt, E.V., *Exterior Durability of Organic Coatings*, FMJ International Publications, Redhill, Surrey, England, 1989.

The Reactions of Amines with Melamine Formaldehyde Crosslinkers in Thermoset Coatings

P.E. Ferrell, J.J. Gummesson, L.W. Hill, and L.J. Truesdell-Snider—Monsanto-Indian Orchard

INTRODUCTION

Increasing numbers of coating suppliers are moving to waterborne technology in order to meet volatile organic content (VOC) targets set by the "Clean Air Act." A widely used thermoset coating technology continues to be based on acrylics or polyesters containing carboxyl and hydroxyl groups. These materials are commonly reacted with melamine formaldehyde (MF) crosslinkers during the curing cycle of the thermoset coating. The primary crosslinking reaction takes place between a preferably primary hydroxyl group on the coreactant and an alkoxyethyl on the MF crosslinker. The alkyl ether is usually a methyl, butyl, or isobutyl group. These types of thermoset coatings have many excellent performance properties including light stability and water resistance. This is important for products that will be subjected to exterior exposure.

The challenge in waterborne technology is in obtaining adequate water solubility or dispersibility with all of the coating components. Many of the acrylic and polyester materials are too hydrophobic for direct incorporation into water systems. The use of low molecular weight surfactants¹ is not preferred since this will usually reduce water and humidity resistance. An alternative method of improving water dispersibility is by neutralizing some of the carboxylic acid groups on the polymer backbone. This is usually accomplished with amines, and the salts that are formed help to provide necessary water solubility or dispersibility.

The level of amine depends on extent of neutralization, but is certainly high enough that effects on the coating must be considered. Wicks and Chen² considered what happens to the amine during cure and its effect on film properties. They studied amine volatility, rate of permeation, base strength, and secondary reactions (transesterification and amidation between the acrylic polyol and the amino alcohol). It was found that the selection of amine could significantly impact the extent of cure and wrinkling.^{2,3} Wicks and Chen² focused on reactions between amines and the acrylic copolymer.

This work focuses on understanding the reactions between amines commonly used in waterborne systems and the MF crosslinker. Effects of varying amine type (primary, secondary, and tertiary) and MF crosslinker composition are analyzed.

Amines have had a long history of use in melamine formaldehyde (MF) coatings. The primary uses are blocking agents for the acid catalyst and neutralization of acid groups as well as pH adjustments for waterborne systems. In the latter case, the level of amine in the coating will become quite significant.

Work has been done to characterize reactions between the MF resin and the amine used in the coating. It has been shown that these reactions are dependent both on amine type and MF resin composition. The effects of these reactions on the cured film properties will be discussed.

EXPERIMENTAL

Materials

A summary of the materials used for all of the studies can be seen in Table 1. Table 2 lists important properties of amines that were studied. AMP and DMEA were compared throughout the study whereas DIIOPA was included only in one phase of this work.

Effect of Amine Structure on Cured Film Properties

Clear waterborne coatings were prepared according to the formulations shown in Table 3. These coatings were prepared with a commercial water-reducible polyester (PE) polyol resin (72-7289[®] from McWhorter) with approximate carboxyl eq wt of 1020 g/eq and approximate hydroxyl eq wt of 342 g/eq. The resin is not neutralized, as received, making it a good choice for investigating the effect of amine type. These formulations have an approximate PE to MF crosslinker ratio of 75/25 on total resin solids. These coatings also contain a developmental leveling agent for waterborne systems (Modaflow[®] AQX 3000, Monsanto). The main cosolvent is

Presented at the 73rd Annual Meeting of the Federation of Societies for Coatings Technology, October 9-11, 1995, St. Louis, MO.
*730 Worcester St., Springfield, MA 01151.

Table 1—List of Materials and Suppliers Used

Material	Description	Supplier
Resimene® 745	Hexamethoxymethylmelamine (HMMM)	Monsanto
Resimene 735	High methylol HMMM	Monsanto
AMP	2-amino-2-methylpropanol	Pfaltz and Bauer
DIIOPA	Diisopropanolamine	Aldrich
DMEA	N,N-Dimethylethanolamine	Aldrich
72-7289®	Polyester polyol	McWhorter
K-Cure® 1040W	40% p-Toluenesulfonic acid	King Industries
Formalin®	56% Formaldehyde	Monsanto
Modaflow® AQX 3000	Exp. waterborne flow modifier	Monsanto

propylene glycol monopropyl ether (PP) which is the solvent in which the PE resin is supplied. Films were prepared by draw down on 3 in. × 6 in. tinplated steel panels (Q-Panel Co.), air flashed for 10 min, and cured for 30 min at 130°C. Films were removed from the panels by the mercury amalgamation method,⁴ and thickness was determined with a micrometer. Dynamic mechanical analysis (DMA) was used to determine the extent of cure. DMA was performed at an 11 Hz oscillating frequency with a temperature scan from 10 to 190°C ramped at a rate of 2°/min on an Autovibron® instrument (Imass, Inc.). This DMA method and interpretation of DMA data have been previously described in detail.^{4,5}

Gas Chromatography and Mass Spectrometry (GC/MS)

Amines and MF resins were mixed in small vials with and without p-TSA. The percentage of amine remaining, after 72 hr, was determined by quantitative GC. In some cases, the mixtures were heated to simulate cure (safety note: closed vial work was done with a septum acting as a safety rupture disk). The initial amounts of amine (5%) and p-TSA (0.5%) were selected to be in a range characteristic of a waterborne formulation at about 70/30 polyol/MF and 80% extent neutralization. For GC injection, samples were diluted 1:100 in acetone with 2% tridecane as an internal standard. The GC analysis was performed with an HP 5890 with FID detection and fitted with a 30 m Restek Stabilwax DB capillary column (0.32 mm id, 0.5 µm film). The injection temperature was 185°C, 1 µL split, split flow 35 mL/min, 4 mm liner. The oven program was 75°C for 2 min, 10°/min to 180°C, and 0.5 min hold. The detector temperature was 250°C and head pressure was 11 psi.

Although addition products of amine plus melamine reactions were too high boiling for GC elution, peaks for lower

molecular weight products were observed in GC. Structures of compounds giving these peaks were determined by GC/MS. GC/MS was carried out two weeks after the GC work. The GC/MS work was performed on an HP 5890 interfaced to an HP 5895A MS. The oven program was changed to 50°C for 2 min, 10°/min to 200°C, and the head pressure was adjusted to accommodate the vacuum system. The other parameters were the same as the GC

work. The MS was scanned in EI mode from 25 to 300 amu. Chemical ionization was also used to obtain molecular masses on some of the reaction products. A minimum of four replicates were run on the GC to obtain quantitative information on the amines. Only one injection was made on the GC/MS to obtain qualitative information.

Vial Reactions with Size Exclusion Chromatography (SEC) Analysis

Solutions containing amines, MF resins, and p-TSA were heated to cause self-condensation (oligomerization) of the MF resin. Compositions are described in Table 4. These studies included two MF crosslinkers, Resimene® 745 (R745) and Resimene 735 (R735). R745 is a hexamethoxymethylmelamine (HMMM) type, and R735 is a high methylol type. Samples were placed in vials capped with a septum. These samples were analyzed by SEC first unheated, then after heating 30 min at 82°C, and after heating 30 min at 130°C. SEC was carried out on a Waters 410 with THF at 1.00 ml/min and a 45 min elution time. Four PLgel 5µ mixed-D columns were used. Oligomerization was estimated from the sum of peak areas for trimer and higher oligomers.

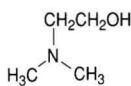
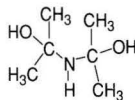
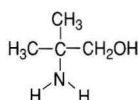
RESULTS AND DISCUSSION

Effect of Amine Structure on Cured Film Properties

Storage modulus (E') plots are shown in Figure 1 for films prepared from the water-reducible polyester polyol. Formulations (Table 3) are the same except for the amine used as neutralizer. Values of E' at the left are characteristic of glassy, amorphous polymers. The large decrease in E' at intermediate temperatures results from the glass transition. If T_g is taken as the temperature at which E' falls to 1×10^9 dynes/cm², values are 72°C and 99°C for films containing DMEA and AMP, respectively. These values are nearly the same as those obtained from the maximum in the loss tangent plots [not shown here, see reference (5)]. The region of nearly unchanging E' at higher temperatures is called the rubbery plateau. The lowest value of storage modulus in the rubbery plateau, called $E'(\text{min})$, is directly proportional to crosslink density of the cured film.⁴ Values of $E'(\text{min})$ are 1.4×10^8 and 3.4×10^8 dynes/cm² for films containing DMEA and AMP, respectively. Thus, the crosslink density of the AMP film is 2.4 times higher than

Table 2—Properties of the Amines Studied

Amine	AMP 2-Amino-2-Methyl Propanol	DIIOPA Diisopropanol Amine	DMEA Dimethyl Ethanol Amine
Type	Primary	Secondary	Tertiary
B.P., °C	165	248.7	133
pK _a	9.8	8.8	9.2
Mol wt	89.14	133.19	89.14



that of the DMEA film. Both T_g and $E'(min)$ indicate that the extent of cure is much greater with AMP.

Co-condensation and self-condensation of MF resins has been reviewed recently.⁶ Since both curing reactions are acid catalyzed, inhibition by retained amine is expected. Results of Figure 1 indicate that inhibition by AMP is much weaker than inhibition by DMEA. Properties of the amines (Table 2) show that AMP is less volatile than DMEA based on boiling point. AMP is a slightly stronger base than DMEA based on pK_a . Both of these differences should cause more, not less, inhibition by AMP. Therefore, we attribute the weakness of inhibition by AMP to reactions with other coating components. In the following, we show that reactions occur between AMP and volatiles produced from MF during cure. These reactions are believed to reduce system basicity so that both co-condensation and self-condensation can take place readily with little or no inhibition.

GC and GC/MS Analysis of MF/Amine Mixtures

Quantitative GC was used to determine the percentage of amine remaining after heating MF/amine/pTSA mixtures. Figure 2 shows the chromatogram obtained before heating when the neutralizing amine was DMEA. The retention time for DMEA is 5.0 min. The peak at 6.8 min (off scale) is for the internal standard, tridecane. Methanol elutes at 2.7 min. There are two sources of methanol in unheated samples. The MF resin contains approximately 1.5% methanol, and the acetone, used in large volume for GC injection, contains trace quantities of methanol. Figure 3 shows the chromatogram after heating for 30 min at 129°C. The area of the DMEA peak has undergone very little change, and the area of the methanol peak has increased slightly. We conclude that DMEA has not reacted. The increase in methanol is attributed to a moderate amount of self-condensation of the MF resin. Methanol is given off when MF resins self-condense.⁶ Figure 4 shows the chromatogram before heating for similar mixtures except with AMP as the neutralizing amine. The retention time of AMP is 8.0 min. Peaks 3 and 4 represent

Table 3—DMEA and AMP Containing Waterborne Coating Formulations

Component	R745/AMP Coating	R745/DMEA Coating
72-7289	30.00	30.00
AMP (50% in water)	3.30	
DMEA (50% in water)		3.30
Water	30.00	30.00
AQX 3000 (10% solution	3.00	3.00
in Butyl Cellosolve/water)		
K-Cure 1040W	1.50	1.50
Resimene 745	7.65	7.65
Butyl Cellosolve	1.20	1.20
Water	23.35	23.35
Total	100.00	100.00

Note: The total solids of the coating was 30%.

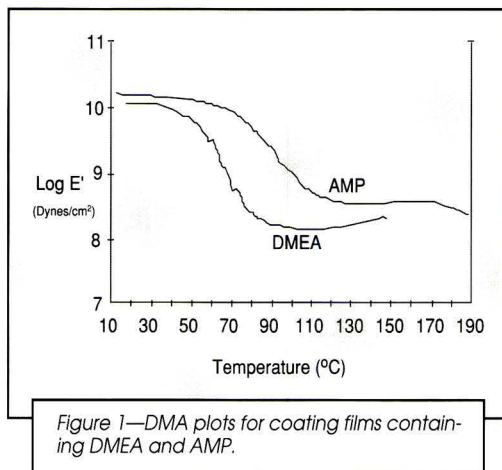
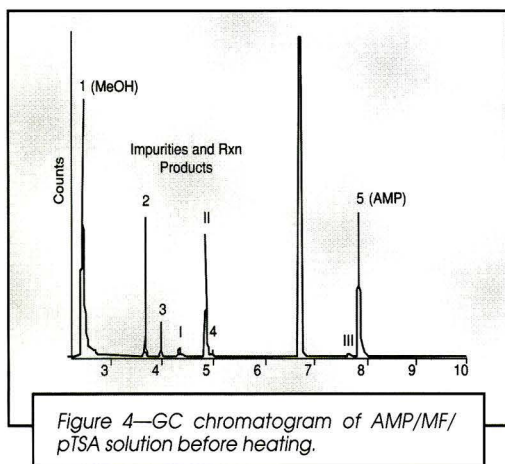
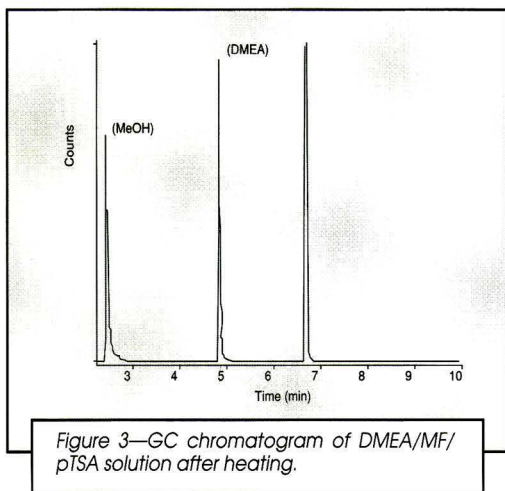
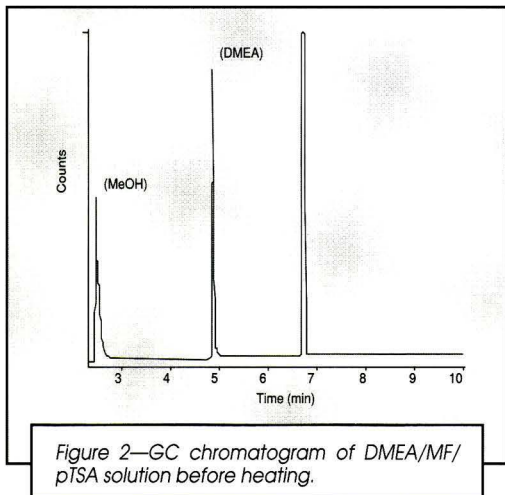


Figure 1—DMA plots for coating films containing DMEA and AMP.

Table 4—Sample Compositions for SEC Studies

	Sample Components (on Solids Basis)								
	R-745	R-735	DMEA	AMP	DILOPA	PTSA	Isopropanol	Water	Total
Melamine without amine	50	0	0	0	0	0	22.50	27.5	100
	0	50	0	0	0	0	22.50	27.5	100
Formulations approximating waterborne formulations with amine as the acid catalyst blocking agent	50	0	0.65	0	0	1.25	21.65	26.455	100
	50	0	0	0.65	0	1.25	21.65	26.455	100
	50	0	0	0	0.97	1.25	21.50	26.279	100
	0	50	0.65	0	0	1.25	21.65	26.455	100
	0	50	0	0.65	0	1.25	21.65	26.455	100
	0	50	0	0	0.97	1.25	21.50	26.279	100
Formulations approximating waterborne formulations with amine as the acid catalyst blocking agent and hydroxy functional coreactant neutralizer	50	0	8.77	0	0	1.25	17.99	21.989	100
	50	0	0	8.77	0	1.25	17.99	21.989	100
	50	0	0	0	13.1	1.25	16.04	19.6075	100
	0	50	8.77	0	0	1.25	17.99	21.989	100
	0	50	0	8.77	0	1.25	17.99	21.989	100
	0	50	0	0	13.1	1.25	16.04	19.6075	100



impurities in AMP, and peak 2 (retention time 2.7 min) represents the oxazolidine structure formed from AMP and diluent (acetone), 2,2,4,4-tetramethyloxazolidine (m.w. = 129, see Figure 6). To check this peak assignment, acetonitrile was used as diluent in place of acetone, and the 2.7 min peak was eliminated. Peaks labeled I, II, and III represent products that were not identified until GC/MS was completed (see the following). Figure 5 shows the chromatogram with AMP after heating 30 min at 129°C. The peaks for AMP and for impurities (peaks 2 and 3) are completely gone, and peak areas have increased strongly for methanol and for I, II, and III. The difference between DMEA (no loss on heating) and AMP (complete loss on heating) is very striking. The rather large increase in methanol is attributed to substantial self-condensation of MF. The loss of AMP could result from reaction of its -OH group with MF by transesterification. Since DMEA also has an -OH group it potentially could react in a similar manner, but it does not (see Figure 3), possibly because DMEA causes strong cure inhibition whereas AMP causes little or no inhibition. Since an adduct of AMP and MF would be too high-boiling to elute, there is no direct evidence from GC for its formation.

GC results for amine retained are summarized in Table 5. Within experimental uncertainty, all of the DMEA was retained except when the mixture was heated in an open vial. Loss from the open vial on heating could be from volatilization. In contrast, AMP was lost even from the unheated samples and from MF-free control samples. AMP loss from the unheated control is attributed to reaction with acetone. AMP loss from the MF-containing samples is attributed to reaction with the MF resin, with formaldehyde and with acetone. Catalyst addition and/or heating cause large increases in the AMP loss. The differences between DMEA and AMP are very large. As previously noted, the difference is attributed to amine type. The primary amine group of AMP can react to reduce system basicity, but the tertiary amine group of DMEA cannot react in a similar manner. Reduced system basicity favors reaction of AMP with either MF or with cure volatiles produced from MF.

Peaks I, II, and III, which are seen in Figures 4 and 5, were thought to result from reactions between AMP and low molecular weight by-products of self-condensation. Jones⁶ has confirmed recently that volatile products include formaldehyde, methanol, methylal, and higher condensates of formaldehyde and methanol. Reactions of formaldehyde and methanol with AMP are shown in Figure 7. Structure assignment is based on GC/MS. Chemical ionization MS was used to obtain molecular weights, and EI MC was used to observe fragmentation patterns. Compound II, 4,4-dimethyloxazolidine, is an expected product based on commercial use of AMP as a formaldehyde scavenger,^{7,8} and well established synthetic routes to oxazolidines more generally.⁹ The strongest peak in the fragmentation of II is at 71 M/Q, corresponding to the remainder after the two methyl groups are lost from the ring. Compound III, 3-methoxymethyl-4,4-dimethyloxazolidine, is indicated by molecular weight, known reactions of formaldehyde and methanol, and fragmentation pattern. The strongest peak in the fragmentation of III is at 45 M/Q, which corresponds to the methoxymethyl group. Observation of compound I, 3,4,4-trimethyloxazolidine (mol wt 115, retention time 4.4 min), is surprising because it has a methyl group on the nitrogen atom. The strongest peak in the fragmentation of I is at M/Q 100, corresponding to the remainder after loss of

Table 5—Percent of Amine Remaining in Solution

Amine/MF Solution	%DMEA Detected	%AMP Detected
Amine with catalyst	96	91
Amine with MF crosslinker	100	72
Amine/MF/catalyst (before heating)	100	49
Amine/MF/catalyst (heated ^a in closed vial)	100	0
Amine/MF/catalyst (heated ^a in open vial)	89	0

(a) 30 min at 129°C.

one methyl group, presumably the one located on the nitrogen atom. (Recall that Compound II likes to lose two methyl groups.) In other respects, the pattern for I is similar to that for II. The model reaction with Formalin[®] and AMP also results in formation of Compounds I and II. This finding is consistent with the reaction sequence of Figure 7.

To understand how the methyl group gets on the nitrogen in Compound I, one can note that primary amines are converted to secondary and tertiary N-methyl amines by formaldehyde/formic acid reagent in an oxidation/reduction (disproportionation) reaction (organic associates tell us this is the Eschweiler-Clarke reaction).¹⁰ We know we have the requisite formaldehyde, and small amounts of formic acid could be formed by oxidation. There are several impurities in AMP that could give a mol wt of 115 by a reaction sequence similar to Figure 7, but none are present in sufficient amount to account for the size of the Compound I peak in Figure 5. The reactions of Figure 7 explain how system basicity could be reduced substantially even if the remnants of AMP are still in

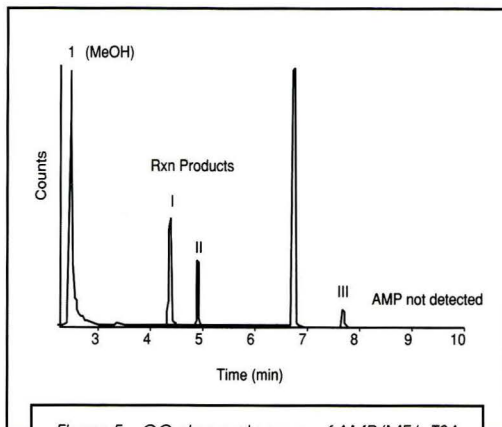


Figure 5—GC chromatogram of AMP/MF/pTSA solution after heating.

the film. These or similar ring compounds may be present in cured films from formulations containing AMP as neutralizer, but reactions of AMP with the polyol (omitted in this work) must also be considered.^{2,5}

Vial Reactions Analyzed by SEC

Area percent of trimer plus higher oligomer peaks in SEC is a sensitive indication of extent of MF self-condensation (oligomerization). In Table 6, it is evident that R735 is more highly oligomerized than R745 to start. Acid catalysis (p-



PATRICIA E. FERRELL is a Technical Assistant to Dr. Loren W. Hill in the Coatings Performance Materials Section, Specialty Resins, The Industrial Products Group, of the Monsanto Company. She holds a degree in Environmental Science from Holyoke Community College from which she graduated as President of the class in 1981. Employed by Monsanto for over 13 years, she has worked in the customer service areas of both adhesives and specialty resins before joining Dr. Hill.



LOREN W. HILL is a Senior Fellow in the Coatings Performance Materials Section, Specialty Resins, Monsanto Company. He received the B.S. Degree from North Dakota State University in 1961 and the Ph.D. Degree from Pennsylvania State University in 1965.

His research interests include structure/property relationships of coatings films, rates and mechanisms of crosslinking reactions in thermoset coatings, and determination of physical property changes during weathering of coatings. Dr. Hill presented the 1991 Mattiello Memorial Lecture at the Annual Meeting of the Federation of Societies for Coatings Technology in Toronto, Ontario, Canada.

JOEL J. GUMMESON is currently the Technical Leader of Specialty Resins Applications at Monsanto's Indian Orchard plant in Springfield, MA. He is a chemistry graduate of the University of Wisconsin-Parkside with graduate work at the Milwaukee School of Engineering.

Mr. Gummesson has a broad background in coatings, although his most recent work includes the development of the first UV curable unsaturated melamine resin and crosslinker development for waterborne systems. He has held memberships with the American Chemical Society, Radtech, and the New England Society of FSCT. Mr. Gummesson has presented papers to the PMSE Division of the ACS and the European Eurocoat Congress.



LAURIE J. TRUESDELL-SNIDER is employed in Specialty Resins R&D in the Specialty Products Group of Monsanto.

She received the B.S. Degree in Animal Science from the College of Agriculture and Life Sciences at Cornell University, in Ithaca, NY. She joined Monsanto in 1988 to work in coatings development. Prior to joining Monsanto she was employed at Albany Medical College, working in the Biochemistry Department on glycolipid research.

Presently, she is working on waterborne basecoat development in the automotive area.



Table 6—Oligomerization of MF/Amine Samples

Sample Description	Amine	Trimer and Higher Oligomers (Area Percent in SEC Trace)					
		Starting Samples		30 min at 82°C		30 min at 130°C	
		R 745	R 735	R 745	R 735	R 745	R 735
MF crosslinker only	None	13	35	No data	No data	13	35
MF crosslinker in solution ^a	None	14	35	No data	No data	13	35
Solutions with amine level	AMP	15	37	23	55	Gelled	Gelled
	DIIOPA	13	38	22	56	Gelled	Gelled
	DMEA	13	35	13	36	74	Gelled
Solutions with amine level	AMP	14	35	No data	No data	13	53
	DIIOPA	12	34	No data	No data	12	60
	DMEA	13	35	No data	No data	12	33

(a) See Table 4.

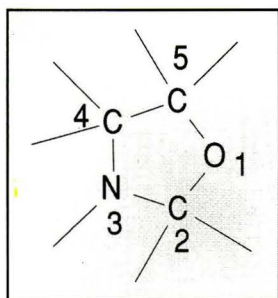


Figure 6—Naming scheme for oxazolidine compounds.

TSA) promotes oligomerization and amines inhibit this catalysis. The MF control samples (first two rows, Table 6) do not contain either p-TSA or amine (see Table 4). Heating the uncatalyzed controls at 130°C does not cause oligomerization as indicated by no change in area percent. The high level of isopropanol (see Table 4) in these solutions is believed to reduce the tendency to oligomerize. The next three rows of Table 6 are for samples containing the small amount of amine required for blocking the catalyst (see Table 4). Heating at 82°C causes oligomerization of R745 and R735 when the blocking amine is AMP or diisopropanol amine (DIIOPA) but not when the blocking amine is DMEA. We conclude that with AMP, basicity is reduced by reactions shown in Figure 7. DIIOPA, a secondary amine, can undergo similar reactions and also experience reduced basicity. DMEA, however, cannot add formaldehyde at its tertiary nitrogen, and basicity cannot be reduced in this way. Heating the same solutions at 130°C caused extensive oligomerization as indicated by gelation. All samples except R745/DMEA gelled.

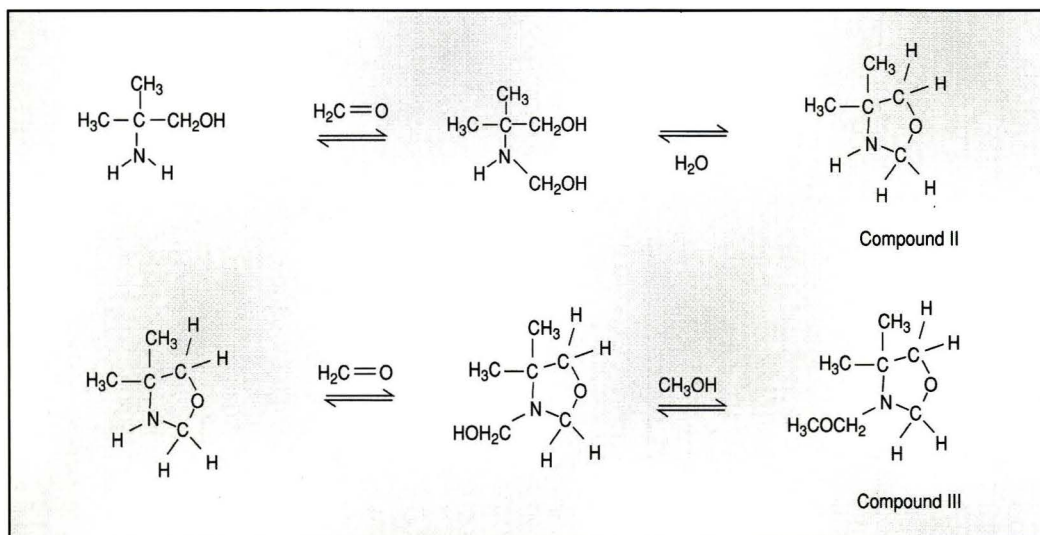


Figure 7—Reactions of MF and amine with cure volatiles.

The difference between R735 and R745, in this experiment, is attributed to more extensive formaldehyde evolution from R735. R735 has more methylol ($-\text{CH}_2\text{OH}$) groups than does R745, and such groups are the direct precursors of formaldehyde during heating. We propose that reactions of Figure 7 are more advanced with R735 because it generates more formaldehyde.

The last three rows of data in Table 6 are for samples containing rather large amounts of the indicated amine (see Table 4). This larger amount of amine prevents gelation during 130°C heating. Data (lower right corner) distinguish nicely according to both MF type and amine type. With either AMP or DIIOPA, R735 oligomerizes but R745 does not. With R735, AMP and DIIOPA systems oligomerize, but the DMEA system does not. These findings are consistent with DMA results and GC/MS results.

SUMMARY AND CONCLUSIONS

By combining results from DMA, quantitative GC, GC/MS, and SEC, advances have been made in understanding reactions and interactions between amines and MF resins. Acid catalysis of the main curing reaction is strongly inhibited by DMEA but very weakly inhibited by AMP. Indirect evidence suggests that AMP reacts with MF resins but DMEA does not. The AMP/MF reactions add further insight to the previously established effects of reactions between AMP and carboxyl and hydroxyl functional coreactants used in water reducible coatings.

Cure response is also influenced by reactions between AMP and small molecules evolved from MF during cure. Reaction with formaldehyde and subsequent water elimination to form substituted oxazolidines has been clearly documented. Such reactions are believed to reduce the overall system basicity

and thereby reduce cure inhibition by AMP. Oligomerization by self-condensation of MF resins has been followed and shown to be consistent with the basicity modification explanation. Effects of amine type (primary vs. tertiary) and MF type (moderate methylol vs. high methylol) on the extent of oligomerization are readily understood by the basicity reduction concept.

ACKNOWLEDGMENTS

The authors wish to recognize the significant contributions from Patricia Ball, Mark Heininger, Harold Higginbottom, Michael Krejsa, Sheree Morgan, and Richard Wilson.

References

- (1) Padgett, J.C., "Polymers for Water-Based Coatings—A Systematic Overview," *JOURNAL OF COATINGS TECHNOLOGY*, 66, No. 838, 89 (1994).
- (2) Wicks, Z.W. Jr., and Chen, G-F., "Amine Solubilizers for Water-Soluble Acrylic Coatings," *JOURNAL OF COATINGS TECHNOLOGY*, 50, No. 638, 39 (1978).
- (3) Hill, L.W. and Wicks, Z.W. Jr., *Prog. in Org. Coat.*, 8, 161 (1980).
- (4) Hill, L.W., *Paint and Coating Testing Manual*, Chapter 46, Koleske, J.V. (Ed.), 14th Edition, ASTM, Philadelphia, 1995.
- (5) Hill, L.W., Ferrell, P.E., and Gummeson, J.J., "Effects of Amine Solubilizer Structure on Cured Film Properties of Water-Reducible Thermoset Systems," presented in the PMSE Division of ACS, August 20-25, 1995.
- (6) Jones, F.N., Chu, G., and Samaraweera, U., *Prog. Org. Coat.*, 24, 189 (1994).
- (7) ANGUS Chemical, *Formaldehyde Control with Nitroparaffins and Their Derivatives*, TR No. 4.
- (8) Tanaka, H., Murakami, Y., and Morilei, Y., *Jap. Kokai* 75,33,289: to Dainippon (1975).
- (9) Robinson, G.N., Alderman, J.F., and Johnson, T.L., "New Oxazolidine-Based Moisture Scavenger of Polyurethane Coating Systems," *JOURNAL OF COATINGS TECHNOLOGY*, 65, No. 820, 51 (1993).
- (10) *Merck Index*, 10th Edition, Windholz, M. (Ed.), Merck & Co., Inc., Rahway, NJ, 1983, p. ONR-28.

▶ What Do These Terms Have In Common?

ACETYLATED CONGO S.B.P. SPIRITS SAGGING

They can all be found in the NEW Coatings Encyclopedic Dictionary

This is the world's most up-to-date, comprehensive, authoritative reference for the language of YOUR INDUSTRY.

- ▶ Over 6,000 industry terms defined
- ▶ Cross referenced for synonyms and related categories
- ▶ Current industry vocabulary, including state-of-the-art technologies and regulatory terms
- ▶ Quick, clear references for technical, as well as commonly used industry terms

This is a **MUST HAVE** resource for *anyone* working in the paint, coatings, ink, art, visual and related industries. Perfect for marketing, sales, R&D, chemists, government and regulatory workers, artists, architects, manufacturers, technicians, teachers, students and more. Developed and approved by the Federation of Societies for Coatings Technology.



Call 610-940-0777

Fax 610-940-0292

Or use the order form below.

**CALL
NOW TO
RESERVE
YOUR
NEW EDITION!
610-940-0777**

YES! Send me the *NEW EDITION* of the *COATINGS ENCYCLOPEDIA DICTIONARY NOW!*

Please refer to #JC1295 when ordering.

Number of Copies _____	Federation Members	Soft Cover	Hardback
	Non-Members	\$80*	\$105*
		\$105*	\$135*

I am paying by: Check or money order Company Purchase Order (please attach)
 MasterCard Visa American Express

Credit Card Number _____ Exp. Date _____

Signature _____

Name _____

Address _____ City/State/Zip _____

Mail to: Federation of Societies for Coatings Technology, 492 Norristown Rd., Blue Bell, PA 19422-2350

*Volume pricing is also available on orders of 5 or more. Please call for more information. Shipping and handling charges and appropriate sales tax (PA 6%) are additional.

Cationic Photopolymerization of Epoxy Modified Silicones for Application to Silicone Release Papers: A New Photoinitiator

C. Priou, A. Soldat, and J. Cavezzan—
Rhône-Poulenc Chimie*

F. Castellanos and J.P. Fouassier—
Laboratoire de Photochimie Generale†

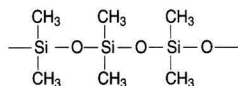
INTRODUCTION

During the past 20 years, development of compounds that are effective polymerization initiators when subjected to irradiation allowed the development of several new commercially important technologies.¹ Their use in UV curable coatings is particularly worth recording. The most widely used photoinitiators that have been explored to date are radical photoinitiators. This technology has led to many applications, in spite of some drawbacks² (e.g. O₂ inhibition and monomer toxicity). The recent development of diaryliodonium, arylsulfonium, and ferrocenium salts as highly efficient photoinitiators for cationic polymerization has generated a new class of fast polymerizations.³ This paper is concerned with the design of new improved cationic photoinitiators displaying higher reactivity and lower toxicity. An example of application in silicone release coatings is given.

OUTLINE OF THEORY

Silicone Curing Reactions

The properties inherent in silicone materials, regardless of cure system, are due to the structure of the polydimethylsiloxane molecule:



Silicones provide excellent temperature, chemical, moisture, and environmental resistance as well as good electrical characteristics. The two common types of curing reactions for silicones are condensation reactions and addition reactions. In the case of the condensation cure, an end-capped silanol polymer may react with a methylhydrogensiloxane polymer in the presence of an organotin catalyst. As it is apparent, this system liberates hydrogen and, thus, is suitable only for thin coatings.⁴

The synthesis and the characteristics of new cationic photoinitiators are described. These compounds are endowed with high reactivity in such nonpolar media as silicone resins. They offer advantages over thermal cure systems that are working at lower temperature, and make faster curing available for all types of plastic substrates. An example of application in release paper coating is given.



For thicker sections as well as some coatings, the following reactions are preferred, since alcohol is liberated and slowly evaporates from the cured article.⁴



Addition cure systems also involve a methylhydrogen fluid, but use a vinylsilicone polymer instead of a silanol polymer.



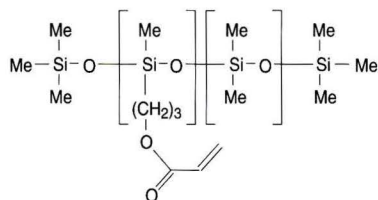
This reaction is catalyzed by certain transition metal compounds, mostly platinum or rhodium.⁵ As with the condensation cure systems, the addition cure systems can cure rapidly and completely at room temperature. Unlike the condensation cure system, however, the addition cure systems may employ thermal inhibitors.

Radiation Curing

A very elegant technology for curing silicones was developed some years ago by General Electric⁶ and Goldschmidt.⁷

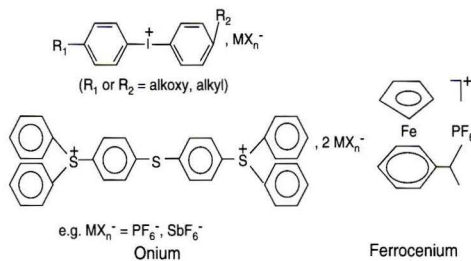
*Silicone Division, 1 rue des Frères Perref, BP 22, 69191 Saint Fons, Cédex, France.
†Unité de recherche associée au C.N.R.S., URA n° 431, Ecole Nationale Supérieure de Chimie, 3 rue A. Werner, 68093 Mulhouse, Cédex, France.
This paper was presented in part at Radtech America in Orlando, May 1994.

Because they are transparent to ultraviolet light, radiation curing is particularly suitable for silicone polymers. Radiation curing refers to polymerization induced by radiation, e.g., electron beams, visible, or ultraviolet light. Radiation cured silicones display several advantages: rapid curing, low volatile emission, and the ability to coat thermally sensitive substrates such as plastics. In 1983, radiation curable 100% solvent-free silicone acrylates were launched on the market.⁸ This system can be cured either by ultraviolet light (UV) or electron beams (EB). Similar in design to peroxide initiators, silicone acrylate systems employ photoinitiators to generate free radicals and initiate a cure that is based on the polymerization of the acrylic double bond via a radical chain reaction. A typical acrylic functional polydimethylsiloxane can be represented as:

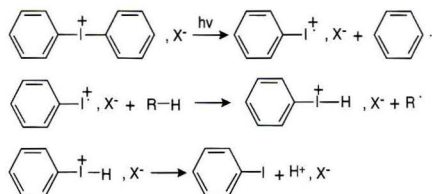


Although photoinitiated radical polymerizations are widely employed, particularly for surface coatings, they suffer from several inherent problems: among these deficiencies, the strong inhibiting effects of atmospheric oxygen may be mentioned (the growing radical chain is easily terminated by reaction with oxygen; this unwanted effect can be eliminated by curing under an inert atmosphere) and the toxicity of monomers [see reference (1)].

In recent years, considerable efforts have been directed towards the design of new, more efficient photoinitiators with the object of increasing the overall polymerization rates in the presence of air. Anionic polymerizations can be immediately ruled out since they are even more sensitive to the presence of oxygen or impurities than radical chain polymerizations. In contrast, cationic polymerizations do not suffer from the same limitations, and in fact, possess certain highly desirable characteristics which make them attractive candidates in UV curing. This type of polymerization proceeds at very high rates even at temperatures as low as -100°C . These high reaction rates have been attributed to the lack of significant chain terminating side reactions. In the 1970s, new cationic photoinitiators have been introduced.⁹ On absorption of UV or visible light, they undergo a fast photolysis, with formation of a Brønsted acid capable of initiating the polymerization. This photoinduced cationic curing of epoxides and vinyl ethers that involves the photogeneration of a Brønsted acid is well documented today. The most popular photoinitiators are onium salts (iodonium and sulfonium) although the recently introduced ferrocenium salts are gaining ground. The general structure of these three major classes of cationic photoinitiators is shown in the following. Diaryliodonium and arylsulfonium salts can be employed for all known cationically polymerizable monomers, while ferrocenium salts are best suited for the ring opening polymerization of epoxides. Several anions can be used, such as Cl^- , BF_4^- , PF_6^- , AsF_6^- , SbF_6^- .¹ It would be worth pointing out that commercially available arylsulfonium salts involve SbF_6^- and arylsulfonium salts are associated with PF_6^- or SbF_6^- .

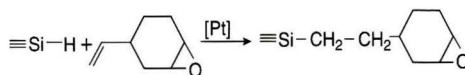


The photodecomposition of the diaryliodonium salts yields a Brønsted acid¹⁰ and can be represented by the following equations, which show one of the main operative photochemical processes:

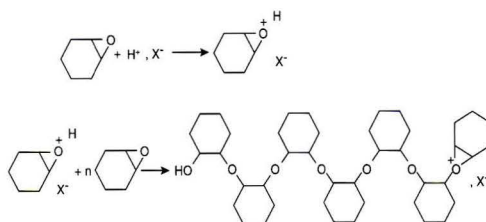


Where R-H stands for a proton source, e.g., the solvent or the monomer. Much light has been shed on the mechanism of the photolysis of these compounds.¹¹ Onium salts which carry the smallest nucleophilic counterions and, therefore, generate the strongest acids, lead to the highest rates of UV cure. In particular, those onium salts which contain the SbF_6^- and PF_6^- anions are specially active in ring opening polymerizations.

It is well established that cycloaliphatic epoxy-functional organic and silicone materials are much more sensitive to acid-catalyzed ring opening polymerization than their aliphatic counterparts. The reactive epoxy groups of all epoxysilicones described herein are, therefore, derived from the hydrosilylation addition of 4-vinylcyclohexene oxide (VCHO) to an Si-H functionality:



The mechanism of polymerization is shown. A proton attacks an epoxide group to yield a protonated species in the initiation step. The protonated epoxide can attack a second epoxide ring and propagation continues in this fashion until the growing chain is terminated. Termination may be envisioned to occur in several ways. First, the growing epoxy chain can cyclize, resulting in proton abstraction, or alternatively, chain transfer agents can terminate the chain growth and initiate a new chain. In addition, impurities may quench the acid:



A performance deficiency of UV cure epoxysilicone systems is the limited solubility of the photoinitiators in silicone media and, more generally, in nonpolar monomers. Only silicones with a high epoxide content can be used with unsubstituted diaryliodonium salt photoinitiators. An additional problem associated with simple diaryliodonium salts is their toxicity. Diphenyliodonium hexafluoroantimonate¹² has an oral LD50 of 40 mg/Kg (rats). Progress toward these goals has been reported¹³ with the development of the photoinitiator bisdodecylphenyl iodonium hexafluoroantimonate supplied by General Electric as UV9310c. The long alkyl groups attached to phenyl rings greatly enhance its solubility, and its toxicity is much lower than that of the diphenyl derivative. However, this photoinitiator is not a pure compound, but rather a mixture of a large number of isomeric and related alkyl substituted diaryliodonium salts.

EXPERIMENTAL

ANALYSIS: The synthesized onium borate salts and the epoxysilicones were characterized by NMR (300 MHz), UV absorption, and by mass spectrometry (FAB).

SYNTHESIS: All starting materials for the synthesis of the photoinitiators were obtained from Aldrich, and used without further purification. Vinylcyclohexene oxide was from Union Carbide.

Diphenyliodonium tetrakis(pentafluorophenylborate)

Bromopentafluorobenzene (21.3 g i.e. 0.086 mole) and isopropyl ether were fed, in inert atmosphere, to a 500 ml flask equipped with a mechanical stirrer, a condenser, and a dropping funnel. The mixture was stirred and cooled to -78°C by using a bath consisting of acetone and carbon dioxide ice.

52.3 ml of 1.6 M hexane solution of *n*-butyllithium (0.97 eq) was fed in the dropping funnel and added within ca 10 min. The mixture was then allowed to stand for 30 min at -78°C with stirring. The dropping funnel was replaced by another one, containing 19 ml of a 1.0 M hexane solution of boron trichloride, that was added within 15 min. After being left to stand for 30 min at -78°C with stirring, the reaction mixture was allowed to return to room temperature within ca one hour. On addition of 100 ml of a saturated aqueous KCl solution, the mixture became twophase and homogeneous. The isopropyl ether was distilled away. KB $(\text{C}_6\text{F}_5)_4$ (which is a known product whose synthesis has been described¹⁴) precipitated towards the end of the distillation, was filtered off, washed with 100 ml of a saturated KCl solution and vacuum-dried at 35°C . A product containing 97% of the expected substance was obtained with a yield of 99%. NMR¹⁹F $\delta(\text{CDCl}_3)$: -130.2 (sm, 2F); -162.1 (sm, 1F); -165.9 (sm, 1F). NMR¹³C $\delta(\text{CDCl}_3)$: 125.8 (sm, 1C); 137.7 (dm, 2C, $J_{\text{CF}} = 251.6$ Hz); 139.9 (dm, 2C, $J_{\text{CF}} = 251.6$ Hz); 149.6 (dm, 1C, $J_{\text{CF}} = 251.6$ Hz). UV $(\text{CH}_3\text{OH}) \lambda_{\text{max}}(\epsilon)$: 225 (4730). IR (cm^{-1}) : 1645.5 m (penta subst. benz.); 1515.5 s (penta subst. benz.); 1278.0 m (penta subst. benz.); 1090.2 vs $(\text{C}_{\text{aromatic}}-\text{F})$; 1032.1 w; 979.8 s; 775.2 m; 756.9 m; 684.1 m; 660.3 m (B-C). 7.17 g (i.e. 22.6 moles) of diphenyliodonium chloride was dissolved in 300 ml of water contained by a 1000 ml Erlenmeyer flask. 15.52 g (i.e. 22.6 moles) of tetrakis lithium (pentafluorophenyl) borate dissolved in 250 ml of water was added dropwise. The

Table 1—Characterization by GPC (Gel Permeation Chromatography) of the Resulting Polymers Issued from the Polymerization of Cyclohexeneoxide

	Mn (GPC)	Dp
SbF ₆ ⁻	2000 g	20
B(C ₆ F ₅) ₄ ⁻	4100 g	42

mixture was left to stand for 30 min with stirring and then filtered. The filtrate was vacuum-dried (133 Pa) for one night, away from the light. 16.33 g of tetrakis diphenyliodonium (pentafluorophenyl) borate was, thus, recovered (with a yield of 75%). NMR¹⁹F $\delta(\text{CDCl}_3)$: -130.2 (sm, 2F); -162.1 (sm, 1F); -165.9 (sm, 1F). NMR¹H $\delta(\text{CD}_3\text{OD})$: 7.52 (tm, $4\text{H}_{\text{aromatic}}$, $J_3 = 7.2$ Hz); 7.65 (tm, $2\text{H}_{\text{aromatic}}$, $J_3 = 7.2$ Hz); 8.16 (dm, $4\text{H}_{\text{aromatic}}$, $J_3 = 7.2$ Hz). UV $(\text{CH}_3\text{OH}) \lambda_{\text{max}}(\epsilon)$: 227 (17800). IR (cm^{-1}) : 1644.5 m (penta subst. benz.); 1514.9 s (penta subst. benz.); 1462.8 vs (mono subst. benz.); 1276.1 m (penta subst. benz.); 1086.1 s (Caro-F); 979.2 s; 775.1 m; 683.9 m; 661.5 m (B-C); 645.0 w; 605.9 w.

Other Onium Borates Carrying Substituents

All the analogues of diphenyliodonium tetrakis (pentafluorophenyl)borate were synthesized according to the method described previously. To compare the influence of the cation, the synthesis was carried out with bis-toluyliodonium chloride and bis-cumyliodonium chloride.¹⁵

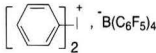
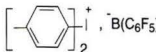
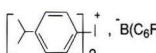
Epoxy Silicone Fluids

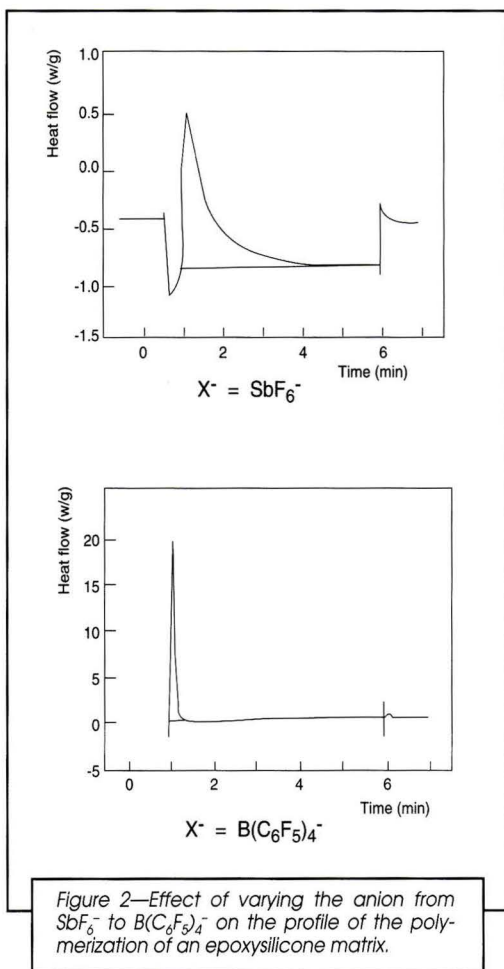
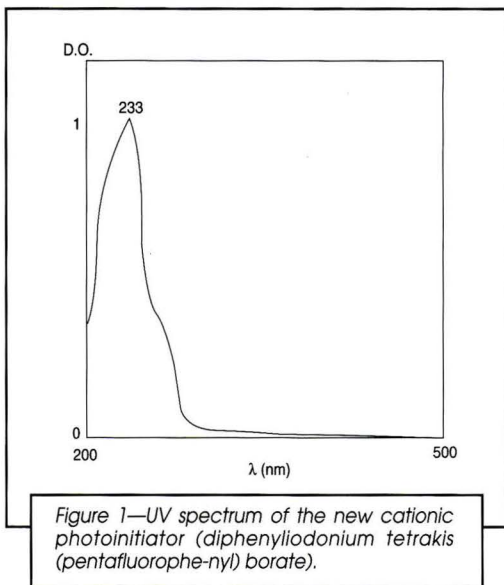
Epoxysilicone fluids were prepared via platinum assisted hydrosilylation addition of vinylcyclohexene oxide to the analogous SiH functional prepolymer.

RESULTS AND DISCUSSION

It is well-known that the rate of the propagation step of a cationic polymerization depends on the reactivity of the monomer and the stability or the degree of separation of the ion pair. The larger the negative charged ion, the more loosely it

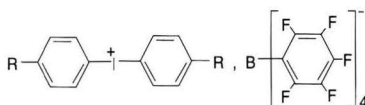
Table 2—Study on the Toxicity on a Series of Photoinitiators with Various Substituents. Classical LD50 Test Carried Out by an Independent Laboratory Acting at Rhône-Poulenc's Request (according to Test Procedure n°10929 TAR) on Sprague-Dawley ICR Rats (Six Animals). LD50 of the Unsubstituted Diphenyliodonium Hexafluoroantimonate Salt is 40 mg/Kg; LD50 of (Octyloxy-phenyl) Phenyl iodonium Hexafluoroantimonate is 5000 mg/Kg; LD50 of NaCl is 3750 mg/Kg¹²

Structure	LD50 (rats) mg/Kg
	200 < LD50 < 2000
	200 < LD50 < 2000
	> 2000



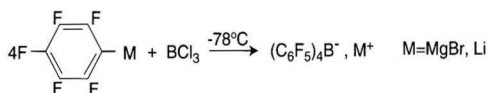
is bound to the growing cationic chain end, and the more active the propagating cationic species is in the polymerization. Therefore, it is necessary to prepare diaryliodonium salts exhibiting such counterions as BF_4^- , PF_6^- , AsF_6^- , and SbF_6^- . These anions are weakly coordinating anions. For this series, SbF_6^- is the largest anion and the most loosely bound while BF_4^- is the smallest and therefore most tightly bound anion. From a practical standpoint, the most reactive onium salt photoinitiators which have been found hitherto for epoxy-based monomers are those containing the SbF_6^- anion.

On the basis of this analysis, it was decided to develop new weakly coordinating anions which will be associated with diaryliodonium salts. After a few trials, our attention centered on a class of interesting compounds known as tetra-arylborate salts. These compounds are very stable, crystalline compounds and are insensitive to air or moisture. The authors found that some of these salts, described later on in this paper, are excellent cationic photoinitiators when associated with a diaryliodonium cation. The following scheme shows the general structure of the new cationic photoinitiator: diaryliodonium tetrakis (pentafluorophenylborate).¹⁶

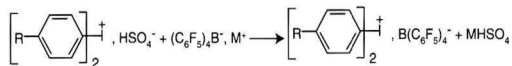


These compounds are easily prepared by straightforward synthetic techniques and display exceptional solubility in nonpolar media like silicone oils. Their photoresponse characteristics make them especially attractive for use in UV curing applications. The solubility characteristics of these photoinitiators can also be modified by appropriate substitution on phenyl rings of the iodonium cation. For example, introduction of an alkyl chain into the diaryliodonium salt allows the photoinitiator to be totally soluble in low epoxy content silicone oil.

The general synthetic methodology which was employed for the preparation of a series of tetraarylborate salts during the course of this work is as follows:



Simple metathesis in water of the diaryliodonium bisulfate with an alkali salt of the above borate salt affords the desired active photoinitiator in very good yield:



Absorption Spectrum

It should be pointed out that the UV absorption characteristics of diaryliodonium salts depend only on the character of the organic cation and are independent of the anion. Figure 1 shows the UV spectrum of the simplest borate salt, diphenyliodonium tetrakis(pentafluorophenyl)borate. The same spectrum was recorded for the corresponding BF_4^- , PF_6^- , or SbF_6^- salt. When methanol is taken as a solvent, the spectra consist of major bands at approximately 233 nm with a long tail extending out as far as 360 nm. The spectra absorption characteristics of these compounds can be changed by

introduction of appropriate chromophores to respond to virtually every portion of the UV spectrum.¹⁷

Mechanism of Polymerization

It was worthwhile to ascertain whether the mechanism of photolysis of those photoinitiators was different from the mechanism of conventional iodonium salts. The results of an investigation into the photolysis of diphenyliodonium tetrakis(pentafluorophenyl)borate and diphenyliodonium hexafluoroantimonate solutions reveal that the same quantity of radicals was produced. Some organic products resulting from the photodecomposition were also identified, and corresponded with those described in an earlier report.¹¹ It is clear that tetraarylborate salts do not interfere in the photolysis step of the process.

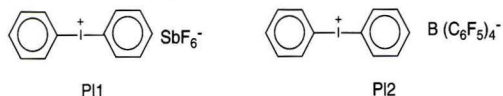
To verify their previous hypothesis, the authors studied the polymerization of cyclohexeneoxide initiated by the new photoinitiator and the same iodonium cation associated with anion SbF_6^- . The polymerization was carried out in a 50/50 weight mixture of cyclohexeneoxide and toluene, with only 2.61×10^{-7} mole of photoinitiator per gram of mixture. This very low concentration is justified by the high exothermicity of the reaction. The two resulting polymers were characterized by gel permeation chromatography (GPC). The results are shown in Table 1.

As polymerization proceeds through a cationic mechanism, if no chain transfer or termination takes place, the degree of polymerization should be equal to the initial epoxide concentration divided by the photoinitiator concentration. As revealed by the data in Table 1, the chain length with SbF_6^- is much shorter than that with $\text{B}(\text{C}_6\text{F}_5)_4^-$, which means that the termination or the chain transfer is more significant with the former anion.

Starting with an LD50 of 40 mg/Kg (classified as highly toxic) for the unsubstituted diphenyliodonium hexafluoroantimonate,¹¹ there is a marked decrease in oral toxicity when SbF_6^- is substituted by $\text{B}(\text{C}_6\text{F}_5)_4^-$. This product is classified as moderately toxic. The third compound in Table 2 was found to be nontoxic and nonirritant.

Reactivity

Photoinitiator reactivity studies were performed with the aid of a DuPont 930 differential scanning calorimeter. All the differential photo calorimetry (DPC) experiments were conducted on 0.5-3 mg of the epoxy samples containing the photoinitiator. The samples were placed in aluminum pans, allowed to equilibrate for several minutes at 25°C in the DPC and then irradiated by opening the shutter. The course of the polymerization followed by recording the evolved heat. Figure 2 shows the effect of varying the anion from SbF_6^- to $\text{B}(\text{C}_6\text{F}_5)_4^-$ on the profile of the polymerization of an epoxysilicone oil (the cationic moiety is diphenyl iodonium):



With new borate photoinitiators, polymerization takes place very rapidly. DPC studies provide useful information which can be used to compare the reaction rates of the two systems. Some results are shown in Table 3. Assuming conversion of all

Table 3—Results of the DPC Studies of the Two Systems

	Ar_2I^+ $\text{B}(\text{C}_6\text{F}_5)_4^-$	Ar_2I^+ SbF_6^-
Enthalpy	81 J/g	64.2 J/g
Peak maximum	2.8 s	31.4 s
Reacted at peak	26.3%	17%
Induction time	1.4 s	20.3 s

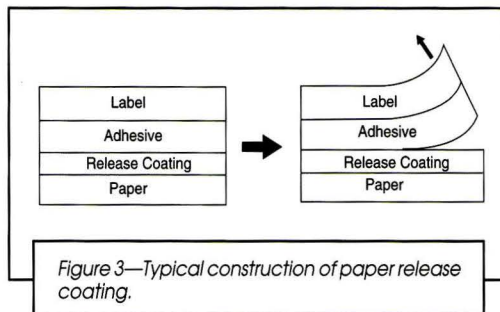


Table 4—Speed of Coating of Different Films or Paper Substrates with the UV system. PET: Polyester Terephthalate; HDPE: High Density Polyethylene; OPP: Polypropylene Oxide; PP: Polypropylene; PE: Polyethylene

Substrates	Speed (m/mn)
Films	
Pet terphane 6028 (RP)	> 200
HDPE	> 200
OPP (Mobil)	> 200
PP (Folie)	> 200
Papers	
Glassine kammerer	180
Glassine sibille	> 200
Claycoated kammerer	200
Pe coated (Lohjan Paperl)	> 200

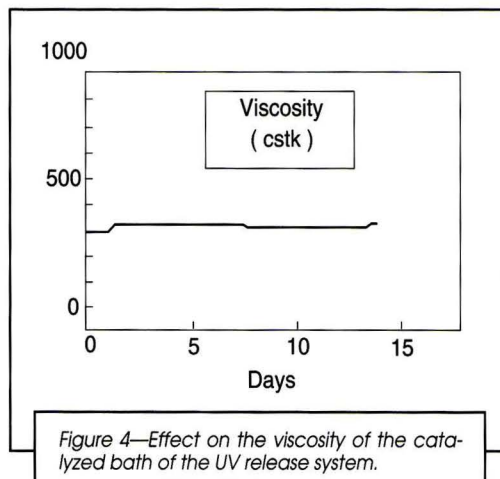


Table 5—Extraction Levels Measured on the Various Substrates Crosslinked at 200 m/mn

Substrates	Coat weight (g/m ²)	Extractibles (%)
Films		
Pet terphane 6028 (RP)	0.7	1.3
HDPE	1.0	1.4
OPP (Mobil)	0.9	1.6
PP (Folie)	1.0	1.5
Papers		
Glassine sibille	1.1	2.5
Claycoated kammerer	0.9	4.5
PE coated (Lohjan Paper)	1.1	1.6

the epoxide functions to polymer, the total theoretical heat of polymerization was found to be 85 J/g. This value was calculated from heats of reaction for cycloaliphatic epoxide monomers in the order of 94.5 KJ/mol.¹⁸

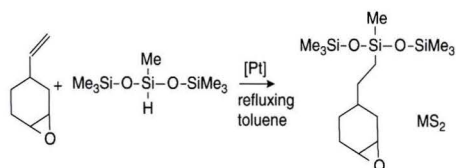
Kinetics of Polymerization

The rate constant of the propagation step is directly related to the nature of the ion pair formed by the active species and the counterion. The wider the components of the ion pair stand apart (are free), the higher will be the rate of the propagation step. Considering that the polymerization takes place according to a conventional scheme where an initiation, a propagation, a termination, and a transfer reaction are successively involved,¹ active centers are formed through various mechanisms and remain active until they are destroyed by a termination reaction.

Monomer **M01** (3,4-epoxycyclohexylmethyl-3',4'-epoxycyclohexane carbonate from Ciba-Geigy as CY179) was used in this study. Since it contains two epoxy groups, a three-dimensional network was formed when polymerization took place. The resin was applied as a 15 μm thin layer on a polypropylene film. The IR spectrophotometer was adjusted at the detection wavelength corresponding to the maximum absorption of the stretching band of the epoxy function i.e. 790 cm^{-1} . The photosensitive mixture contained 10^{-2} mole/l of photoinitiator. A maximum rate of $R_p = 0.26 \text{ mole}\cdot\text{l}^{-1}\cdot\text{s}^{-1}$ was found for system (**M01/PI2**). For system (**M01/PI1**), it

only attains $R_p = 0.12 \text{ mole}\cdot\text{l}^{-1}\cdot\text{s}^{-1}$. It is, therefore, apparent that, in organic medium, the propagation rate constant in the presence of **PI2** is a ca twice higher than that **PI1**. It is also worthy to note that the conversion ratio varies from system to system: 50% for **PI2** and 30% for **PI1**. These low conversion ratios can be attributed to a quick solidification of the sample that prevents diffusion of the residual monomer.

Since the IR band of the epoxy function of monomer **MS1** (epoxysilicone macromer prepared by Rhône-Poulenc and similar to the commercial product of General Electric UV 9300) is overlaid by that of the siloxane functions, it was not possible to follow the crosslinking kinetics of this monomer. An epoxy silicone monomer (**MS2**) having a higher epoxy/siloxane ratio was prepared through the following hydrosilylation reaction:



The disappearance kinetics of the epoxy function of this monomer can be followed at 787 cm^{-1} . It was found that for system **MS2/PI2**, the maximum rate is $R_p = 0.72 \text{ mole}\cdot\text{l}^{-1}\cdot\text{s}^{-1}$. For system (**MS2/PI1**), it only attains $R_p = 0.29 \text{ mole}\cdot\text{l}^{-1}\cdot\text{s}^{-1}$. It is also worthy to note that the conversion ratio varies from system to system: 75% for **PI2** and 60% for **PI1**. In silicone medium, the rate constant of propagation of anion in the presence of **PI2** is 2.5 times higher than that observed with **PI1**. Detailed experiments will be published elsewhere.¹⁹

Toxicity

In view of the rather high order of oral toxicity of simple diaryliodonium salts associated with the hexafluoroantimony counterion¹² (see also legend in Table 2), attention was given to the introduction of the borate anion into the photoinitiator and its effect on the toxicity of this substance. A preliminary study was performed on a series of photoinitiators with various substituents. Some results are shown in Table 2.

Effect of Anion Nature on the Photochemical Reactivity of Various Photoinitiators

The reactivity of cationic photoinitiators carrying various anions was tested in organic and silicone medium. This study was carried out under real conditions (a UV lamp fitted with a conveyor was used). The polymerization was performed on glassine. The results achieved with photoinitiators, triarylsulfonium and diaryliodonium salts that were fitted with SbF_6^- anion, demonstrate unambiguously that tri- and diarylsulfonium salts have the same order of reactivity, and are much more reactive than ferrocenium salts. It should be noted that the order of reactivity for the anions is as follows: $\text{B}(\phi\text{F}_5)_4 > \text{SbF}_6^- > \text{AsF}_6^- > \text{PF}_6^- > \text{BF}_4^-$. In these experiments of film polymerization with various photoinitiators, the tetrakis diphenyliodonium (pentafluorophenyl) borate salt (**PI2**) displayed a reactivity of the same order as its hexafluoroantimonate homologue (**PI1**) in organic media (**M01**) and proved more effective in silicone medium (**MS1**). The reactivity of photoinitiator **PI2** is substantially higher than that of the other commercially available cationic photoinitiators.

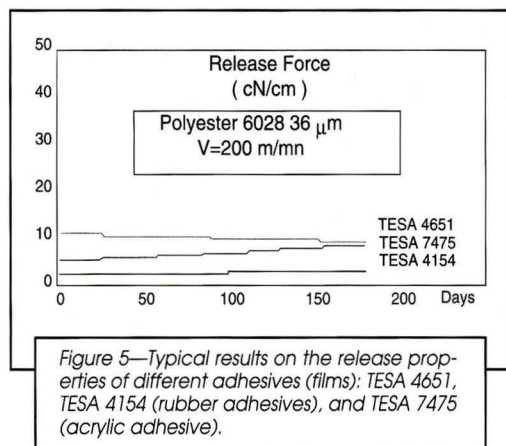
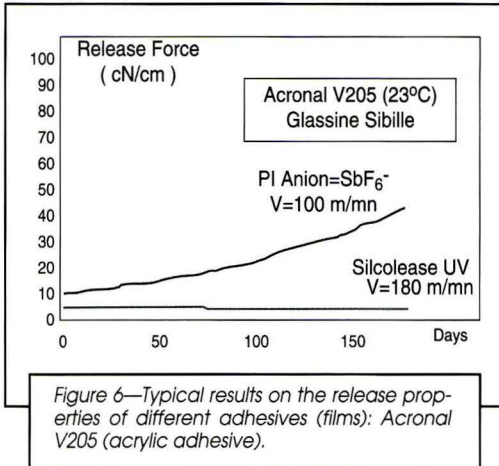


Figure 5—Typical results on the release properties of different adhesives (films): TESA 4651, TESA 4154 (rubber adhesives), and TESA 4154 (acrylic adhesive).



Semi-industrial testing (1 Fusion lamp H) revealed that photoinitiator PI_2 allows curing speeds higher than 200 m/min to be attained, whereas under the same conditions one can only proceed at 100 m/min with commonly used systems.²⁰ Detailed results will be published in reference (21).

APPLICATION TO PAPER RELEASE COATINGS

The use of silicones as release coatings for pressure-sensitive adhesives has been well documented over the last 30 years. A typical construction (Figure 3) consists of a paper or a film substrate upon which the silicone release coating has been cured, an adhesive, and finally the adhesive laminate. The label and adhesive are removed from the release liner and used in subsequent application. The force required to remove the label from the liner is called the release force.

There are several requirements for a satisfactory release liner. It must provide adequate and reproducible release; the release agent must be firmly anchored, and the properties must not change upon aging. Silicones are utilized because they provide a low release force. This is a consequence of their low surface tension, low polarity, highly flexible backbone, and incompatibility with organic polymers.

The basic system which is proposed for paper release applications is composed of two main components:

- A silicone oil, functionalized with epoxy groups
 - Silcolease® UV200Poly
- an original photoinitiator
 - Silcolease® UV200Cata

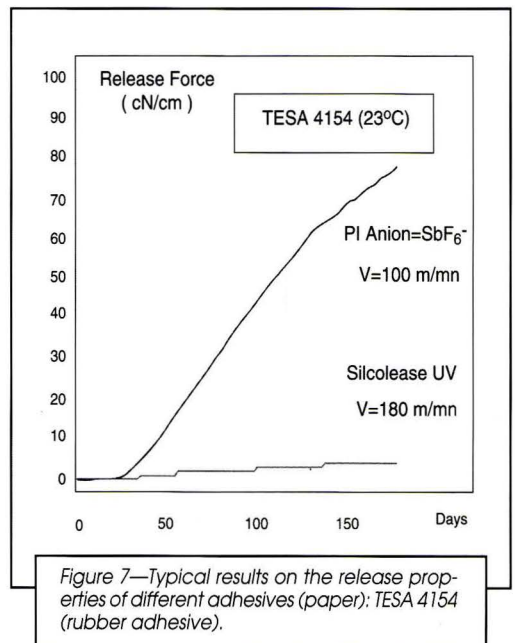
Epoxy-silicones developed for release coatings are 100% solid silicone fluids with viscosities in the range of 200-500 cps. They can be coated by typical converting techniques for solventless silicones which include three roll offset and four to five roll transfer techniques. The compact construction of a radiation unit takes up considerably less space than curing ovens, and in a number of cases it is possible to insert such a unit into an existing conventional production line without extensive changes. The UV lamp which is used with this system is very important to its success. The Silcolease® UV200Cata photoinitiators are most active in the deep UV region of the UV spectrum, particularly at wavelengths

of < 260 nm. For this reason, the Fusion Systems “H” bulbs were used in all experiments described in this paper. As a result of the ability of this system to cure at room temperature, the use of a large palette of substrates, especially heat sensitive ones, is possible. No direct heat is applied to the substrate. Additionally, no paper shrinking occurs and the remoisturizing unit is no longer necessary.

A certain number of films and papers were coated with this UV system. Very good performance and fast cure were observed on PET film Terphane 6028 of 45 μm thickness with the system described previously, even with concentration photoinitiators as low as 0.5% weight. Under conditions (one lamp, 120 W, 1% weight photoinitiator), the cure rates of the epoxy-silicone polymer were too fast to measure by using a pilot conveyerized cure system with a maximum speed of 200 m/min. Under the same irradiation conditions, the cure rates with the SbF_6^- anion were below 160 m/min, even with higher photoinitiator concentrations.

The suitability of this UV system for other films or paper substrates was also studied, since paper substrates have been and will continue to be a large part of the release liner industry (Table 4). Among the tested papers is glassine 9464 from Sibille. Research work performed to date by the authors has shown that the performance of the UV system on paper substrates is very promising. Under the same conditions as with PET films, at photoinitiator levels of 0.5%, a tack-free cure speed of more than 200 m/min was attained by using a single 120 W lamp according to results reported,¹³ the cure speed being directly proportional to the number of lamp rows, one can hope to increase it by adding another UV lamp.

In contrast with the relatively short bath life of thermal release systems (a few hours), stabilities up to several days can be achieved with the catalyzed bath of the UV release system described in the present paper. Figure 4 shows that the catalyzed bath which was tested exhibited no change in viscosity



C. PRIOU received his Ph.D. Degree in 1990 from the University of Montpellier (France) for work in the group of Professor Corriu. He joined the Silicone Research Department of Rhône-Poulenc Chimie in Saint-Fons. His research interests are in the areas of organometallic chemistry and polymer synthesis.

A. SOLDAT joined Rhône-Poulenc in 1958 and worked in analytical service of the Research Centre of Saint-Fons. He obtained his chemistry degree in 1970 and then worked in the labeled compounds division of CEA (Department of Radioelements). From 1977 to 1984, he was employed in the organical department of Rhône-Poulenc and from 1985 in the silicone application department.

JACQUES CAVEZZAN received the Ph.D. Degree in Organometallic Chemistry from Paul Sabatier University in Toulouse. He joined Rhône-Poulenc in 1980 and worked in the Research Centre of Saint-Fons on synthesis of new platinum catalysts for hydrosilylation. In 1986, he joined the formulations department for the synthesis and development of new radiation curing silicone resins and catalysts.

JEAN-PIERRE FOUASSIER obtained the Ph.D. Degree in 1975 at the University of Strasbourg. In 1993, Prof. Fouassier was elected as Director of Ecole Nationale Supérieure de Chimie de Mulhouse. His current research interests include time-resolved laser spectroscopies, excited state processes in photoinitiators and photosensitizers, photopolymerization reactions, development of photosensitive systems for laser imaging and UV curing.

over a period of 15 days. In addition, the reactivity of the bath remained the same after this period of storage. The quality of the polymerization at high speed is excellent in every case, as shown by the extraction levels measured on the various substrates crosslinked at 200 m/mn (Table 5).

A full investigation of the release properties of cured coating films and papers was carried out to determine the level of release and the temporal stability of the release properties. Immediately after curing, different adhesives were laminated onto these release liners and then stored under defined conditions. After a given time the release values were evaluated and compared with those of the original materials. Some typical results are shown in Figures 5, 6 (films), and 7 (papers) against different characteristic adhesives:

- acrylic adhesives: TESA 7475 and ACRONAL V205
- rubber adhesives: TESA 4154 and TESA 4651 (70°C)

The release performance for epoxysilicone systems is as stable as in the case of conventional thermal solventless silicones. The level of release was slightly higher than for the thermal solventless system, due to the epoxy content in the base polymer. Different release levels were observed for the different types of adhesives. It is nowadays well established that many variables, including the type of silicone polymer, and especially the type of adhesive, affect this level of release. This preliminary work showed that modification of the UV photoinitiator allowed to obtain a system with more stable release performance on film or paper substrates than with most of comparable UV commercial systems.²⁰

CONCLUSIONS

Today's growing concern to use environmentally friendly products and technologies makes cationic UV curing a safe and

attractive alternative to the widely utilized acrylate-based system. Some years ago, the development of a new class of practical cationic photoinitiators that are effective in non- or low-polar media like silicone oil became a fantastic challenge. New developments have led to a family of onium salts with optimized efficiency, solubility, and lack of toxicity. This new system is based on a patented photoinitiator: bisaryliodonium tetra-arylboration.^{16b,22} Associated with an epoxy-functionalized polyorganosiloxane, this photoinitiator has led to exceptional performances in release coatings. The most remarkable features are: a fast cure at room temperature, the stability of the release forces in terms of aging a catalyzed bath-life of up to several days, a lack of oxygen inhibition, a low shrinkage which greatly improves the adhesion to the substrate, and a lack of odor and toxicity which makes the handling easier. The original photoinitiator is available for tests on the market from Rhône-Poulenc Company (Silcolase UV200Cata).

Further research work on new UV photoinitiators is now in hand. Other new developments involve controlled release additives for this system.

ACKNOWLEDGMENTS

The authors express sincere thanks to Prof. M. Abadie for recording DPC charts and to Rhône-Poulenc Company for permitting presentation of this work.

References

- (1) (a) *Radiation Curing Science and Technology*, S.P. Pappas (Ed.), Plenum Press, New York, 1992; (b) *Radiation Curing in Polymer Science and Technology*, J.P. Fouassier and J.F. Rabek (Eds.), Chapman & Hall, London, 1993; (c) *SITA Books for UV and EB Chemistry*, Sita, London, 1990; and (d) Fouassier, J.P., *Photoinitiation, Photopolymerization, Photocuring*, Hanser, 1995.
- (2) Change, et al., *Handbook of Coatings Additives*, Vol. 2, p. 1-50, 1992.
- (3) Crivello, J.V., *Radiation Curing in Polymer Science and Technology*, J.P. Fouassier and J.F. Rabek (Eds.), Chapman & Hall, London, 1993.
- (4) *Silicones: Production and Applications*, Techno-Nathan (Ed.), 1988.
- (5) *Comprehensive Handbook on Hydrosilylation*, Marciniak, B. (Ed.), Pergamon Press, 1992.
- (6) U.S. Patent 4,399,071 (March 12, 1982), U.S. Patent 4,310,469 (December 29, 1978) to General Electric.
- (7) European Patent 281,681 (February 6, 1987) to Goldschmidt.
- (8) Vewers, D., *Radtech Europe Edimburg*, p. 1-7, 1991.
- (9) (a) Crivello, J.V. et al., *J. Radiat. Curing*, 5, 1 (1978); (b) 3,981,897 (1975), 4,417,061 (1981), 4,407,759 (1981), 4,161,478 (1974), 4,399,071 (1982) to General Electric.
- (10) Knapczyk, J., Lubinkowski, J.J., and McEven, W.E., *Tetrahedron Letters*, 35, p. 3739, 1972.
- (11) Dektar, J.L. and Hacker, N.P., *J. Org. Chem.*, 55, 639 (1990).
- (12) Crivello, J.V. and Lee, J.L., *J. Polymer Sci., Part A, Polymer Chem.*, 27, 3951-3968 (1989).
- (13) U.S. Pat. 4,279,717 (July 21, 1981); U.S. Patent 4,421,904 (Dec. 20, 1983).
- (14) Massey, A.G. and Park, A.J., *J. Organometal. Chem.*, 2, 245-250 (1964).
- (15) Berry, D.A., Greenlee, R.W., Ellis, W.C., and Baldwin, M.M., *12th Congress Pure and Appl. Chem.*, New York, September 1951, p. 465.
- (16) (a) Castellanos, F., Ph.D. Thesis, Mulhouse, 1993; (b) Castellanos, F., Fouassier, J.P., Priou, C., and Cavezzan, A., European Patent 562,897 (1993); and (c) Priou, C., Soldat, A., Cavezzan, J., Fouassier, J.P., and Castellanos, F., *Proc. Radtech Orlando*, p. 186, 1994.
- (17) Crivello, J.V. and Lam, J.H.W., *J. Polymer Sci., Polym. Chem. Ed.*, 18, 2677 (1980).
- (18) *Comprehensive Polymer Science*.
- (19) Priou, C., Cavezzan, J., Fouassier, J.P., and Castellanos, F., *J. Appl. Polymer Sci.*, in press.
- (20) Riding, K.D., *Radtech U.S. 92 Boston*, p. 112, 1992.
- (21) Castellanos, F.C., Fouassier, J.P., and Priou, to be published.
- (22) Other patents pending.

JCT

JOURNAL OF COATINGS TECHNOLOGY

1995 Annual Index of the Journal of Coatings Technology

Volume 67 — Numbers 840-851
January-December, 1995

Keyword Subject Index

Additives

Cationic Photoinitiator	Dec., p. 71
Defoamers	Jan., p. 21
Dispersants	Jan., p. 21
Flow Agents	June, p. 89
Wetting Agents	Jan., p. 21

Analysis

Atomic Force Microscopy	June, p. 59; Sept., p. 101
Casson Equation	Aug., p. 69
Corrosion Resistance	Apr., p. 35
Cross-Polarized Light Microscopy	Mar., p. 23
Differential Scanning Calorimetry	May, p. 67
Digital Image	Mar., p. 23
Electrochemical Noise	Apr., p. 35
Elemental	Apr., p. 29
Exposure	Dec., p. 55
Fourier Transform Raman	Aug., p. 63
Fox Equation	July, p. 53
FTIR	May, p. 37
FTIR/ATR	Sept., p. 89
Gas Chromatography	Feb., p. 53
Glass Transition Temperature	Apr., 29; May, p. 46; July, p. 53
Hardness	Jan., p. 61
NMR	Nov., p. 29
Numerical Simulation	Jan., p. 35
Optical Birefringence Microscopy	Mar., p. 23
Photoelectron Spectroscopy	Apr., p. 29
Solvents	Apr., p. 45
Spectroscopy	May, p. 46
Surfaces	Sept., p. 101; Nov., p. 19
Titration	Feb., p. 53
VOC	Feb., p. 53
Weathering	Aug., p. 53

Chemical Compounds

Peroxides	Feb., p. 31
-----------------	-------------

Chemical Process

Catalysis	Mar., p. 33
Chemical Vapor Deposition	Apr., p. 57
Corrosion	Apr., p. 35
Transesterification	Feb., p. 23
Weathering	Aug., p. 53

Coatings Components

Acrylics	Feb., p. 31
Aldimine	Oct., p. 41
Alkyds	Sept., p. 113
Blocked Isocyanates	Mar., p. 33
Carboxylic Acids	Feb., p. 39
Epoxy Emulsion	Nov., p. 45
Esters (Poly-)	Mar., p. 49; Aug., p. 53; Nov., p. 19
Melamine Formaldehyde	Dec., p. 63
Organosilane	Feb., p. 39
Oxazolidine	Oct., p. 41
Photoinitiators	Mar., p. 49; Oct., p. 27
Polycarbodiimide	July, p. 43
Polyguanidine	July, p. 43
Reactive Diluents	Oct., p. 41

Coatings

Adhesion	Jan., p. 35; Apr., p. 45; June, p. 79
Cathodic Deposition	June, p. 79
Chlorinated Alkyd	May, p. 29
Corrosion (Anti-)	Apr., p. 35; July, p. 59
Crosslink Density	Apr., p. 29; Apr., p. 23; Sept., p. 89
Crosslinkers	Mar., p. 33; July, p. 43; Oct., p. 19; Nov., p. 45; Dec., p. 63
Crosslinking	July, p. 43; Nov., p. 29
Crosslinking Agents	Feb., p. 39
Curing	May, p. 46
Defects	Jan., p. 21

Delamination	Mar., p. 23
Depth Profiling	Apr., p. 29
EB Cure	Oct., p. 27
Enamel	Jan., p. 47
Exposure	Nov., p. 19
Exterior	Sept., p. 113
Fire Retardant	May, p. 29
Flexibility	Feb., p. 23
Flow	Feb., p. 39; June, p. 89
Friction	Mar., p. 47
Hardness	Jan., p. 61
High-Build	Mar., p. 49
High Performance	Mar., p. 41
High Solids	Jan., p. 47; Feb., p. 23; Oct., p. 41; Nov., p. 19
Impact	Jan., p. 35; Mar., p. 23
Impact Resistance	Feb., p. 23
Latex	Aug., p. 63; Sept., p. 101; Nov., p. 37
Lubrication	Mar., p. 47
Melamine/Formaldehyde	Apr., p. 29
Metallic	July, p. 59
Particle Coalescence	June, p. 59
Performance	June, p. 89
Pigment Content	Aug., p. 63
Pigment Volume Concentration	Nov., p. 37
Polyurethane	Mar., p. 33; Sept., p. 89; Oct., p. 41
Powder	Feb., p. 39; Feb., p. 23; Apr., p. 23; July, p. 43
Shipboard	May, p. 29
Smoothness	June, p. 79
Solvent-Based	May, p. 29
Stability	May, p. 57; Aug., p. 53
Stress	Jan., p. 35
Thermoset	May, p. 46; Dec., p. 63
Thermoset Cure	Feb., p. 23
Thermosetting	Apr., p. 23
Tribology	Mar., p. 47
UV Cure	Oct., p. 27
Viscoelasticity	Aug., p. 69
Viscosity	Jan., p. 47
VOC	Feb., p. 53; Sept., p. 113
Water-Based	June, p. 59; July, p. 59; Aug., p. 81; Sept., p. 113; Sept., p. 89; Oct., p. 19; Nov., p. 45; Dec., p. 63
Water Diffusion	May, p. 37
Wear	Mar., p. 47
Wood	Mar., p. 49

Computer Applications

Color	Jan., p. 53
CPVC	Nov., p. 37
Coatings Formulation	Jan., p. 53
Fractal Analysis	Apr., p. 35
Matching	Jan., p. 53

Films

Acrylic	Aug., p. 63
Curing	Mar., p. 41; Dec., p. 55
Diffusion	May, p. 37
Durability	Dec., p. 55
Formation	June, p. 59; Sept., p. 101
Free Volume	May, p. 46
Gloss	Dec., p. 55
Gloss Retention	Dec., p. 55
Mass Transport	June, p. 71
Polymeric	June, p. 71
Stress	June, p. 71
Structure	Sept., p. 101

Swelling	June, p. 71
UV Curing	Mar., p. 49
Weathering	Dec., p. 55

Formulation

Annealing	Apr., p. 23
High Solids	Jan., p. 47
Quenching	Apr., p. 23
Temperature	Jan., p. 47

Industry Management

ASTM	Jan., p. 61
EPA	Nov., p. 19
Safety	Aug., p. 81

Liquids

Rheology	Aug., p. 69
----------------	-------------

Manufacturing

Initiators	Feb., p. 31
Permanent Total Enclosures	July, p. 63
Polymerization	Feb., p. 31; Oct., p. 27

Oils

Castor Oil	Feb., p. 47
Linseed Oil	Apr., p. 23
Styrenation	Feb., p. 47
Sunflower Oil	Feb., p. 47

Pigments

Aluminum	July, p. 59
Calcium Carbonate	Aug., p. 63
Effect	Apr., p. 57
Iron Oxide	Apr., p. 57
Suspension	Aug., p. 69
Titanium Dioxide	Aug., p. 63; Dec., p. 55

Pollution/Health

Acid Rain	Nov., p. 19
California	Feb., p. 53
Environment	Sept., p. 113; Nov., p. 19
Europe	Sept., p. 113
VOC Containment	July, p. 63

Polymeric Components

Alkyls	May, p. 67
Allyl Ether	Mar., p. 49
Amines	May, p. 46; Dec., p. 63
Epoxy	Feb., p. 23; May, p. 46; Nov., p. 45
Epoxy Modified Silicones	Dec., p. 71
Esters	May, p. 57
Glycidyl Ether	Mar., p. 41
Novel Amine Adduct	Mar., p. 41
Styrene	July, p. 59
Urethane	Oct., p. 19

Polymer

Acrylic Copolymers	July, p. 53
Catalysts	Mar., p. 33
Curing Kinetics	May, p. 67
Dendrimers	Oct., p. 35
Hydrolytic Stability	May, p. 57
Hyperbranched	Oct., p. 35
Oligomer	Jan., p. 47
Melamine/Formaldehyde Resin	Sept., p. 89
Photopolymer	Nov., p. 29
Photopolymerization	Dec., p. 71
Polyacrylates	Feb., p. 31
Polymerization	Nov., p. 29
Polyolacrylates	Nov., p. 29
Polyester Resins	May, p. 57; Oct., p. 35
Spontaneous Polymerization	Mar., p. 41
Thermoset	May, p. 67
UV Cure	May, p. 67

Pretreat/Application

Conductive Coatings	Aug., p. 81
Electrocoat	June, p. 79
Electrostatic	Aug., p. 81
Mixed Systems	Aug., p. 81

Spray	Jan., p. 21
Voltage Block	Aug., p. 81
Waterborne Coatings	Aug., p. 81

Productivity

Creativity	Sept., p. 109
Economy	Sept., p. 109
Innovation	Sept., p. 109
Intuition	Sept., p. 109
Research	Sept., p. 109

Solvents

Evaporation	Apr., p. 45
-------------------	-------------

Substrates

Aluminum	June, p. 79
Coating Interface	May, p. 37
Corrosion	June, p. 79
Injection Molded Plastic	Jan., p. 35
Plastic Morphology	Jan., p. 35
Plastics	Mar., p. 23
Thermoplastic Olefin	Jan., p. 35; Apr., p. 45

Alphabetical Listing of Papers

A

- An Additives Approach to Defect Elimination in Thermoplastic Waterborne Industrial Maintenance Coatings—J. Schwartz and S.V. Bogar, Jan., p. 21.
- Adherence Strength and Smoothness of Cathodically Deposited Paints on Aluminum—F. Beck and U.A. Krüger, June, p. 79.
- Aliphatic Epoxy Emulsion Crosslinker for Waterborne Coatings—D.R. Eslinger, Nov., p. 45.
- Aliphatic Isocyanates Blocked with Volatile Alcohols for Decorative Coatings—Y. Huang, G. Chu, M. Nieh, and F.N. Jones, Mar., p. 33.
- Alkyd-Based Thermosetting Resins: Influences of Temperature and UV Radiation on Curing Kinetics—N. Delahaye, J.M. Saiter, M. Lizard, and L. Podgorski, May, p. 67.
- Anionic Blocked Isocyanate-Containing Urethane Prepolymer Dispersions for Coating Applications—H. Xiao, H.X. Xiao, B. Suthar, and K.C. Frisch, Oct., p. 19.

B

- Bivariate Approach to Viscosity Adjustment—M.J. Eisman, Jan., p. 47.

C

- Cationic Photopolymerization of Epoxy Modified Silicones for Application to Silicone Release Papers: A New Photoinitiator—C. Priou, A. Soldat, J. Cavezzan, F. Castellanos, and J.P. Fouassier, Dec., p. 71.
- Characterization of Particle Coalescence in Waterborne Coatings Using Atomic Force Microscopy—R.M. Rynders, C.R. Hegedus, and A.G. Gilcinski, June, p. 59.
- Computer Simulation of Particle Packing in Acrylic Latex Paints—G.T. Nolan and P.E. Kavanagh, Nov., p. 37.

- Computer-Aided Design and Manufacturing of the Color of Decorative and Protective Coatings—D.C. Rich, Jan., p. 53
- Correlation of Thermal History and Performance in Thermosetting Powder Coatings—K.G. Panjani, S.D. Pace, and S.F. Thames, Apr., p. 23.
- Crosslinking of Waterborne Polyurethane Dispersions—V.J. Tramontano and W.J. Blank, Sept., p. 89.

D

- Depth Profiling of Acrylic/Melamine Formaldehyde Coatings—G. Haacke, J.S. Brinen, and P.J. Larkin, Apr., p. 29.
- Durability and Gloss—J.H. Braun, Dec., p. 55.

E

- ECO at All Costs? An Ecological Balance of Some Water-Based Paints—A. Hofland, Sept., p. 113.
- Effects of Coating Solvents on the Morphology of Thermoplastic Polyolefins (TPO)—R.A. Ryntz, Q. Xie, and A.C. Ramamurthy, Apr., p. 45.
- Epoxy Nucleophile Catalyzed Transesterification—G.P. Craun, Feb., p. 23.
- Estimation of the Glass Transition Temperature of Acrylic Copolymers—M.K. Gupta, July, p. 53.

F

- Flow Modifiers: A Key to Developing High Quality Surface Coatings—M.A. Grolitzer and D.E. Erickson, June, p. 89.
- Fourier Transform Raman Spectroscopy for the Analysis of Pigmented Acrylic Latex Films—A.S. Davie, P.E. Kavanagh, and W.H. Leong, Aug., p. 63.
- Free Radical and Cationic Photoinitiators in Ultraviolet Light Curable Coatings—L.N. Price, Oct., p. 27.

I

- Influence of Novel Amine Adduct on Curing of Epoxy Resins in Presence of Vinyl Acetate—A.V. Rao and P.V. Sapre, Mar., p. 41.
- Initiators for High-Solids Polyacrylates Resins: Selection Guidelines and Performance Review—G.G. Myers, Feb., p. 31.
- Interpretation of Corrosion Resistance Properties of Organic Paint Films From Fractal Analysis of Electrochemical Noise Data—M. Moon and B. Skerry, Apr., p. 35.

M

- Macroscopic Volume, van der Waals Volume and Free Volume after Cure Versus Chemical Conversion for a High-T_g Epoxy/Amine Thermosetting System—R.A. Venditti, J.K. Gillham, Y.C. Jean, and Y. Lou, May, p. 47.
- Method for Measuring Water Diffusion in a Coating Applied to a Substrate—T. Nguyen, D. Bentz, and E. Byrd, May, p. 37.

N

- Novel Organosilane Crosslinking Agents for Powder Coatings—S.F. Thames, K.G. Panjani, S.D. Pace, M.D. Blanton, and B.R. Cumberland, Feb., p. 39.

P

- Polyester Weatherability: Coupling Frontier Molecular Orbital Calculations of Oxidative Stability with Accelerated Testing—C.J. Sullivan and C.F. Cooper, Aug., p. 53.
- Practical Considerations of Design and Installation of Permanent Total Enclosures—I. Frankel and G. Bisonett, July, p. 63.

R

- The Reactions of Amines with Melamine Formaldehyde Crosslinkers in Thermoset Coatings—P.E. Ferrell, J.J. Gummeson, L.W. Hill, and L.J. Truesdell-Snyder, Dec., p. 63.
- Reconsidering the Shipboard Use of Chlorinated Alkyd Paints—L.V. Wake, J.R. Brown, and Z. Mathys, May, p. 29.
- A Report on the Paint/Coatings Industry in the Russian State and Forecasts for the Future—B.B. Kudryavtsev, Feb., p. 61.
- Rheology of Suspensions—T. Sato, Aug., p. 69.
- The Role of Intuition in Innovative R&D—M.A. Glaser, Sept., p. 109.

S

- Solution and Solid C¹³ NMR Studies of Multifunctional Polyolacrylate Networks—A. Lungu and D.C. Neckers, Nov., p. 29.
- Stabilization of Aluminum Pigments in Aqueous Alkaline Media by Styrene Copolymers—B. Müller, July, p. 59.

- State-of-the-Art Instruments to Measure Coating Hardness—P.R. Guevin, Jr., Jan., p. 61.
- Statistical Study of Hydrolytic Stability in Amine-Neutralized Waterborne Polyester Resins as a Function of Monomer Composition—T.E. Jones and J.M. McCarthy, May, p. 57.
- Stone Impact Damage to Painted Plastic Substrates—R.A. Ryntz, A.C. Ramamurthy, and J.W. Holubka, Mar., p. 23.
- Study on the Chemistry of Polyguanidines as Precursors for Polycarbodiimide Crosslinkers in Powder Coatings—J.W. Taylor, M.J. Collins, and D.R. Bassett, July, p. 43.
- A Study of the Effect of Acid Rain on Alkyd, Polyester, and Silicone-Modified High-Solids Coatings—Northwestern Society for Coatings Technology and Montreal Society for Coatings Technology, Nov., p. 19.
- Styrenation of Oils Based on Secondary Esters of Castor Oil—O.S. Kabasakal, F.S. Güner, A.T. Erciyes, and Y. Yagci, Feb., p. 47.
- Surface Structure of Latex Films, Varnishes, and Paint Films Studied with an Atomic Force Microscope—H.J. Butt and R. Kuroпка, Sept., p. 101.
- Swelling Stresses and Strains Associated with Mass Transport in Polymeric Films—C.S. Jou, S.T. Sackinger, and R.J. Farris, June, p. 71.
- Synthesis, Characterization, and UV Curing of Acrylate Functional Hyperbranched Polyester Resins—M. Johansson and A. Hult, Oct., p. 35.

T

- Teamwork Brings Innovative Effect Pigments to Light—R. Iden, Apr., p. 57.
- Thermal and Impact Induced Stress Failure in Painted TPO: The Role of Surface Morphology—R.A. Ryntz, A.C. Ramamurthy, and D.J. Mihora, Jan., p. 35.
- Tribology & Tribochemistry for Innovations in Organic Coatings—M.A. Glaser, Mar., p. 47.

U

- Ultra-Low Viscosity Oxazolidine and Aldimine-Based Reactive Diluents for High-Solids Polyurethane Coatings—T.L. Johnson, Oct., p. 41.
- UV Curing of Pigmented High-Build Wood Coatings Based on Non-Air-Inhibited Unsaturated Polyesters—M.J. Dvorchak, Mar., p. 49.

V

- VOC Testing Comparison: EPA Method 24 Versus the Cal Poly Method—Los Angeles Society for Coatings Technology, Feb., p. 53.

W

- Waterborne Coating Application System Design Using Voltage Block Technology—R.D. Konieczynski, Aug., p. 81.

Author Index

B

- BASSETT, D.R.—See Taylor, J.W.
- BECK, F. and KRÜGER, U.A.—Adherence Strength and Smoothness of Cathodically Deposited Paints on Aluminum, June, p. 79.
- BENTZ, D.—See Nguyen, T.
- BISONETT, G.—See Frankel, I.
- BLANK, W.J.—See Tramontano, V.J.
- BLANTON, M.D.—See Thames, S.F.

- BOGAR, S.V.—See Schwartz, J.
- BRAUN, J.H.—Durability and Gloss, Dec., p. 55.
- BRINEN, J.S.—See Haacke, G.
- BROWN, J.R.—See Wake, L.V.
- BUTT, H.J. and KUROPKA, R.—Surface Structure of Latex Films, Varnishes, and Paint Films Studied with an Atomic Force Microscope, Sept., p. 101.
- BYRD, E.—See Nguyen, T.

C

- CASTELLANOS, F.—See Priou, C.
 CAVEZZAN, J.—See Priou, C.
 CHU, G.—See Huang, Y.
 COBRANCHI, DARYL P.—See Braun, J.H.
 COLLINS, M.J.—See Taylor, J.W.
 COOPER, C.F.—See Sullivan, C.J.
 CRAUN, G.P.—Epoxy Nucleophile Catalyzed Transesterification, Feb., p. 23.
 CUMBERLAND, B.R.—See Thames, S.F.

D

- DAVIE, A.S., KAVANAGH, P.E., and LEONG, W.-H.—Fourier Transform Raman Spectroscopy for the Analysis of Pigmented Acrylic Latex Films, Aug., p. 63.
 DELAHAYE, N., SAITER, J.M., LIZIARD, M., and PODGORSKI, L.—Alkyd-Based Thermosetting Resins: Influences of Temperature and UV Radiation on Curing Kinetics, May, p. 67.
 DVORCHAK, M.J.—UV Curing of Pigmented High-Build Wood Coatings Based on Non-Air-Inhibited Unsaturated Polyesters, Mar., p. 49.

E

- EISEMAN, M.J.—Bivariate Approach to Viscosity Adjustment, Jan., p. 47.
 ERCIYES, A.T.—See Kabasakal, O.S.
 ERICKSON, D.E.—See Grolitzer, M.A.
 ESLINGER, D.R.—Aliphatic Epoxy Emulsion Crosslinker for Waterborne Coatings, Nov., p. 45.

F

- FARRIS, R.J.—See Jou, C.-S.
 FERRELL, P.E., GUMMESON, J.J., HILL, L.W., and TRUESDELL-SNIDER, L.J.—The Reactions of Amines with Melamine Formaldehyde Crosslinkers in Thermoset Coatings, Dec., p. 63.
 FOUASSIER, J.P.—See Priou, C.
 FRANKEL, I. and BISONETT, G.—Practical Considerations of Design and Installation of Permanent Total Enclosures, July, p. 63.
 FRISCH, K.C.—See Xiao, H.

G

- GILICINSKI, A.G.—See Rynders, R.M.
 GILLHAM, J.K.—See Venditti, R.A.
 GLASER, M.A.—The Role of Intuition in Innovative R&D, Sept., p. 109.
 GLASER, M.A.—Tribology & Tribochemistry for Innovations in Organic Coatings, Mar., p. 47.
 GROLITZER, M.A. and ERICKSON, D.E.—Flow Modifiers: A Key to Developing High Quality Surface Coatings, June, p. 89.
 GUEVIN, JR., P.R.—State-of-the-Art Instruments to Measure Coating Hardness, Jan., p. 61.
 GUMMESON, J.J.—See Ferrell, P.E.
 GÜNER, F.S.—See Kabasakal, O.S.
 GUPTA, M.K.—Estimation of the Glass Transition Temperature of Acrylic Copolymers, July, p. 53.

H

- HAACKE, G., BRINEN, J.S., and LARKIN, P.J.—Depth Profiling of Acrylic/Melamine Formaldehyde Coatings, Apr., p. 29.
 HEGEDUS, C.R.—See Rynders, R.M.
 HILL, L.W.—See Ferrell, P.E.
 HOFLAND, A.—ECO at All Costs? An Ecological Balance of Some Water-Based Paints, Sept., p. 113.
 HOLUBKA, J.W.—See Ryntz, R.A.
 HUANG, Y., CHU, G., NIEH, M., and JONES, F.N.—Aliphatic Isocyanates Blocked with Volatile Alcohols for Decorative Coatings, Mar., p. 33.

HULT, A.—See Johannson, M.

I

- IDEN, R.—Teamwork Brings Innovative Effect Pigments to Light, Apr., p. 57.

J

- JEAN, Y.C.—Venditti, R.A.
 JOHANSSON, M. and HULT, A.—Synthesis, Characterization, and UV Curing of Acrylate Functional Hyperbranched Polyester Resins, Oct., p. 35.
 JOHNSON, T.L.—Ultra-Low Viscosity Oxazolidine and Aldimine-Based Reactive Diluents for High-Solids Polyurethane Coatings, Oct., p. 41.
 JONES, F.N.—See Huang, Y.
 JONES, T.E. and MCCARTHY, J.M.—Statistical Study of Hydrolytic Stability in Amine-Neutralized Waterborne Polyester Resins as a Function of Monomer Composition, May, p. 57.
 JOU, C.-S., SACKINGER, S.T., and FARRIS, R.J.—Swelling Stresses and Strains Associated with Mass Transport in Polymeric Films, June, p. 71.

K

- KABASAKAL, O.S., GÜNER, F.S., ERCIYES, A.T., and YAGCI, Y.—Styrenation of Oils Based on Secondary Esters of Castor Oil, Feb., p. 47.
 KAVANAGH, P.E.—See Davie, A.S.
 KAVANAGH, P.E.—See Nolan, G.T.
 KONIECZYNSKI, R.D.—Waterborne Coating Application System Design Using Voltage Block Technology, Aug., p. 81.
 KRÜGER, U.A.—See Beck, F.
 KUDRYAVTSEV, B.B.—A Report on the Paint/Coatings Industry in the Russian State and Forecasts for the Future, Feb., p. 61.
 KUROPKA, R.—See Butt, H.J.

L

- LARKIN, P.J.—See Haacke, G.
 LEONG, W.-H.—See Davie, A.S.
 LIZIARD, M.—See Delahaye, N.
 LOU, Y.—Venditti, R.A.
 LUNGU, A. and NECKERS, D.C.—Solutions and Solid C^{13} NMR Studies of Multifunctional Polyacrylate Networks, Nov., p. 29.

M

- MATHYS, Z.—See Wake, L.V.
 MCCARTHY, J.M.—See Jones, T.E.
 MIHORA, D.J.—See Ryntz, R.A.
 MOON, M. and SKERRY, B.—Interpretation of Corrosion Resistance Properties of Organic Paint Films From Fractal Analysis of Electrochemical Noise Data, Apr., p. 35.
 MÜLLER, B.—Stabilization of Aluminum Pigments in Aqueous Alkaline Media by Styrene Copolymers, July, p. 59.
 MYERS, G.G.—Initiators for High-Solids Polyacrylates Resins: Selection Guidelines and Performance Review, Feb., p. 31.

N

- NECKERS, D.C.—See Lungu, A.
 NGUYEN, T., BENTZ, D., and BYRD, E.—Method for Measuring Water Diffusion in a Coating Applied to a Substrate, May, p. 37.
 NIEH, M.—See Huang, Y.
 NOLAN, G.T. and KAVANAGH, P.E.—Computer Simulation of Particle Packing in Acrylic Latex Paints, Nov., p. 37.

P

- PACE, S.D.—See Panjinani, K.G.
 PACE, S.D.—See Thames, S.F.

PANJNANI, K.G., PACE, S.D., and THAMES, S.F.—Correlation of Thermal History and Performance in Thermosetting Powder Coatings, Apr., p. 23.
PANJNANI, K.G.—See Thames, S.F.
PODGORSKI, L.—See Delahaye, N.
PRICE, L.N.—Free Radical and Cationic Photoinitiators in Ultraviolet Light Curable Coatings, Oct., p. 27.
PRIOU, C., SOLDAT, A., CAVEZZAN, J., CASTELLANOS, F., and FOUASSIER, J.P.—Cationic Photopolymerization of Epoxy Modified Silicones for Application to Silicone Release Papers: A New Photoinitiator, Dec., p. 71.

R

RAMAMURTHY, A.C.—See Ryntz, R.A.
RAMAMURTHY, A.C.—See Ryntz, R.A.
RAMAMURTHY, A.C.—See Ryntz, R.A.
RAO, A.V. and SAPRE, P.V.—Influence of Novel Amine Adduct on Curing of Epoxy Resins in Presence of Vinyl Acetate, Mar., p. 41.
RICH, D.C.—Computer-Aided Design and Manufacturing of the Color of Decorative and Protective Coatings, Jan., p. 53.
RYNDERS, R.M., HEGEDUS, C.R., and GILICINSKI, A.G.—Characterization of Particle Coalescence in Waterborne Coatings Using Atomic Force Microscopy, June, p. 59.
RYNTZ, R.A., RAMAMURTHY, A.C., and HOLUBKA, J.W.—Stone Impact Damage to Painted Plastic Substrates, Mar., p. 23.
RYNTZ, R.A., RAMAMURTHY, A.C., and MIHORA, D.J.—Thermal and Impact Induced Stress Failure in Painted TPO: The Role of Surface Morphology, Jan., p. 35.
RYNTZ, R.A., XIE, Q., and RAMAMURTHY, A.C.—Effects of Coating Solvents on the Morphology of Thermoplastic Polyolefins (TPO), Apr., p. 45.

S

SACKINGER, S.T.—See Jou, C-S.
SAITER, J.M.—See Delahaye, N.
SAPRE, P.V.—See Rao, A.V.
SATO, T.—Rheology of Suspensions, Aug., p. 69.
SCHWARTZ, J. and BOGAR, S.V.—An Additives Approach to Defect Elimination in Thermoplastic Waterborne Industrial Maintenance Coatings, Jan., p. 21.

SKERRY, B.—See Moon, M.
SOLDAT, A.—See Priou, C.
SULLIVAN, C.J. and COOPER, C.F.—Polyester Weatherability: Coupling Frontier Molecular Orbital Calculations of Oxidative Stability with Accelerated Testing, Aug., p. 53.
SUTHAR, B.—See Xiao, H.

T

TAYLOR, J.W., COLLINS, M.J., and BASSETT, D.R.—Study on the Chemistry of Polyguanidines as Precursors for Polycarbodiimide Crosslinkers in Powder Coatings, July, p. 43.
THAMES, S.F., PANJNANI, K.G., PACE, S.D., BLANTON, M.D., and CUMBERLAND, B.R.—Novel Organosilane Crosslinking Agents for Powder Coatings, Feb., p. 39.
THAMES, S.F.—See Panjnani, K.G.
TRAMONTANO, V.J. and BLANK, W.J.—Crosslinking of Waterborne Polyurethane Dispersions, Sept., p. 89.
TRUESDELL-SNIDER, L.J.—See Ferrell, P.E.

V

VENDITTI, R.A., GILLHAM, J.K., JEAN, Y.C., and LOU, Y.—Macroscopic Volume, van der Waals Volume and Free Volume after Cure Versus Chemical Conversion for a High- T_g Epoxy/Amine Thermosetting System, May, p. 47.

W

WAKE, L.V., BROWN, J.R., and MATHYS, Z.—Reconsidering the Shipboard Use of Chlorinated Alkyd Paints, May, p. 29.

X

XIAO, H., XIAO, H.X., SUTHAR, B., and FRISCH, K.C.—Anionic Blocked Isocyanate-Containing Urethane Prepolymer Dispersions for Coating Applications, Oct., p. 19.
XIAO, H.X.—See Xiao, H.
XIE, Q.—See Ryntz, R.A.

Y

YAGCI, Y.—See Kabasakal, O.S.

Constituent Society Papers

A Study of the Effect of Acid Rain on Alkyd, Polyester, and Silicone-Modified High-Solids Coatings—Northwestern Society for Coatings Technology and Montreal Society for Coatings Technology, Nov., p. 19.

VOC Testing Comparison: EPA Method 24 Versus the Cal Poly Method—Los Angeles Society for Coatings Technology, Feb., p. 53.

Announcing . . .

1996

Pan-American Coatings Expo

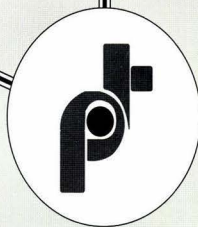
co-sponsored by

ANAFAPYT



*Federation of
Societies for Coatings
Technology*

*Instituto Mexicano
de Técnicos en
Pinturas y Tintas*



August 15-17, 1996

***Sheraton Maria Isabel Hotel
Mexico City***

For more information, contact

Federation of Societies for Coatings Technology

492 Norristown Road • Blue Bell, Pennsylvania 19422-2350

(610) 940-0777 • Fax: (610) 940-0292

GOLDEN GATE—SEPTEMBER

Election of Society Officers

Robert Backlin, of Hüls America Inc., presented the Hüls Gavel to Incoming Society President Rich Cooper, of Synergistic Performance Corp. Mr. Cooper then presented the following Society Officers for 1995-96: Vice President—Eve Blackburn, of The Flecto Co., Inc.; Treasurer—Don Mazzone, of Western Equipment Co.; Secretary—Jeffery I. Buchman, of Morton International Inc.; and Society Representative—Patricia Shaw, of Radiant Color.

Scholarship Chair Ray Benedetti, of Triangle Coatings Inc., introduced the recipients of this year's scholarships: Benjamin Turner, Stephen Conn, and Gregory Conn.

Louie Sanguinetti, Library Committee Chair, noted that 10 new books have been donated to the Society library.

Pamela Cefaratti, of Orr & Boss, delivered the evening's presentation on "OPTIMIZING FORMULATIONS TO MINIMIZE WASTE."

Since there are many sources of waste in the paint industry, the speaker explored different techniques for minimizing waste. Ms. Cefaratti stressed the importance of an optimized formulation, since it impacts upon product quality, product reproducibility, cost to manufacture, performance, repeat sales, and quality. Other concerns that need to be addressed include: does it match the customer's need; does it have the lowest raw material cost; and is it easily manufacturable?

Ms. Cefaratti stated that the design of experiments (DOE) technique aids in the optimization process. DOE, also known as experimental design or the Taguchi method, is a minimum statistical number of experiments used to determine the impact of certain specified raw materials on the quality of the finished product by varying the levels of those raw materials, critical amounts, and either a high or a low level. The method used to determine the number of experiments is called the fractional factorials method.

The fractional factorial tool is used not only in the formulation stage, but also on the manufacturing floor. This technique allows a moderate number of trials compared to a full factorial. The number of trials can be reduced to one tenth the number of mixes by concen-

trating on those ingredients that will probably have the greatest impact on the desired properties.

In manufacturing, formulas that show consistent quality and low colorant needs are required.

According to the speaker, the cost of waste depends on the type of coating. Automotive paint manufacturers only make about 70% of their raw materials into finished product while the industrial manufacturers produce about 94%. This waste results in an extra two dollar per gallon charge being added to the finished product.

The sources of waste in raw materials occur in lost materials and the labor needed to dispose of that waste. Ms. Cefaratti estimated that in the paint industry, waste costs are twice the cost of labor at any given facility.

Some standards are written by weight and manufactured in gallons resulting in a small amount left over. The speaker stressed that when a batch is written for manufacture, it should be for the exact amount needed.

Ms. Cefaratti stated that the following are three areas where raw materials are subject to losses: input losses—short fills from suppliers and other external factors affecting raw material amounts before they enter the plant; process losses—deal with stack and evaporation losses; and cleaning losses—encompass the use of reclaimed solvent for cleanup and whether that technique is truly cost effective.

JEFFERY I. BUCHMAN, *Secretary*

GOLDEN GATE—OCTOBER

"Wood Loves Water"

Linda Hoselton, of Dorsett & Jackson, was introduced as the new Co-Chair for the Membership Committee.

Louie Sanguinetti, Library Committee Chair, announced that Kathy Shields, of

the Redwood City Library, has returned as the librarian.

Gordon Pioch, of Eureka Chemical Co., reported that Don Nolte, of John K. Bice Co., was approved as the new Symposium Chair.

The evening's speaker was Linda S. Smith, of Rohm & Haas Co. She provided an overview of her company's effort to replace traditional nitrocellulose type finishes with water-reducible alternatives in "WOOD LOVES WATER."

Dr. Smith reviewed the wood market in both the United States and Europe. The comparison showed that 65% of the coatings in the U.S. were nitrocellulose. Europe, on the other hand, only has 25%. Europe, specifically Italy, employs polyurethane at 40%, while the U.S. has zero percent. The U.S. employs two percent of its wood technology as UV-curable compared to Europe at 20%. Finally, water occupies about the same share in both markets at one to two percent.

The speaker stated that long-time users of nitrocellulose coatings must undergo a paradigm shift. For the past couple of decades, manufacturers believed that the better the protection, the poorer the appearance. Appearance problems have hindered the general acceptance of water-reducible coatings. Air, microfoam, and gel particles are contributors to this.

In most cases, water-reducible coating systems cannot be dropped into a typical North Carolina facility. The impetus is there as more counties in that region move under the Title V umbrella. However, the movement toward water-reducible technologies by regulation is unpredictable.

Thermoset coatings show great advantages over thermoplastic systems because of recent breakthroughs. Low molecular weight morphology allows for low viscosity advantages with the molecular weight increasing during the curing process retaining the high MW properties.

Current goals for formulating new technology water-reducible vehicles include low toxicity, low or no heat, and iziridine quality films. The rate for crosslinking will determine properties. Fast crosslinked systems tend to be brittle and hard with good mar and block resistance while slowly crosslinked films are softer and more flexible.

JEFFERY I. BUCHMAN, *Secretary*

LOS ANGELES—SEPTEMBER

Installation of Officers

A moment of silence was observed for the passing of Charles R. Munger.



Elected Officers of the Golden Gate Society for the coming year (from left): Society Representative—Patricia Shaw; Treasurer—Don Mazzone; Secretary—Jeffery I. Buchman; President—Richard L. Cooper; and Vice President—Eve Blackburn.



Elected Officers of the Dallas Society for 1995-96 are (seated from left): President—Chip Newcomb; Vice President—Don McBride; Secretary—Mike Templin; and Treasurer—Bill J. Bristow. Standing: Society Representative—Charles Kaplan; Technical Representative—Noel Harrison; Membership Chair—Barry Clinger; and Publicity Chair—Ed Spradlin.

Outgoing President Philip C. Bremenstuh, of Zeneca Resins, thanked outgoing Board Member and Past-President James Hall, of Sinclair-Ameritone Paint Co., for his support of the Society.

Mr. Bremenstuh introduced the Society Officers for 1995-96. The new officers are: President—John C. Kulnane, of Sinclair-Ameritone Paint Co; Vice President—Robert Skarvan, of Engineered Polymer Solutions; Treasurer—Joseph B. Evans, of Trail Chemical Corp.; and Secretary—Arthur W. Lorenz, Sinclair-Ameritone Paint Co.

Mr. Kulnane presented the Past-President's Award to Mr. Bremenstuh.

Robert Backlin, of Hüls America Inc., presented the Hüls Commemorative Gavel to President Kulnane.

Frank Peters, instructor for the LASCT Paint Technology Course, reported that 11 students were graduated from the course. The Outstanding Student Award was presented to Rachel Omelas.

Education Committee Chair, Sandra Dickinson, of Fine Line Paint Corp., announced the following recipients of the \$1,000 scholarships: Philip Balucan, Sonya Dhaliwal, and Anand Sheth.

Environmental Committee Chair, Dave Muggee, of E.T. Horn Co., reported on the following:

Acetone—Approved by CARB and SCAQMD as exempt may come by the end of October;

Rule 1136—Extension of the current rule to July 1, 1996 appears to have SCAQMD approval;

VOC Reclaim—Staff at SCAQMD has decided that VOC reclaim needs to be reworked.

Isophorone diisocyanate—Is still on the extremely hazardous lists despite requests to have the material delisted.

Toxics Reporting Inventory—The CMA has indicated that it will sue the EPA to not include the 286 new chemicals the EPA has proposed to add to the TRI list. The CMA indicated that the EPA has not used good review techniques.

Melinda Rutledge, of RHEOX, Inc., announced that the FSCT Professional Development Committee is sponsoring a two-day seminar on "Formulating for the Clean Air Act" on November 6-7.

The evening's speaker was Gail Pollano, of Zeneca Resins. She discussed "ADVANCES IN WATERBORNE URETHANE TECHNOLOGY."

Ms. Pollano began with a brief history of waterborne urethanes and cited the following types of urethanes: polymerized, two-component, moisture cured, oil modified, blocked, and solvent-based.

The speaker focused on solvent-based urethanes, noting that the choice of diisocyanate determines if the urethane will be aliphatic or aromatic. Two of the aromatic diisocyanates in water-based systems are TDI and MDI with toluene diisocyanate probably being the first one used. The aromatic isocyanates produce some very good properties and tend to be lower in cost.

ARTHUR W. LORENZ, Secretary

LOS ANGELES—OCTOBER

Waterborne Wood Technology

Environmental Committee Chair, Dave Muggee, of E.T. Horn Co., reported on the following:

Methylene Chloride—The Halogenated Solvents Industry Alliance has requested

OSHA reopen rulemaking for methylene chloride due to new evidence. The Alliance stated "as a result of this research program, it appears there are not foreseeable conditions of human exposure in which the carcinogenic effects seen in mice would be expected to occur in humans." OSHA said it would carefully examine the scientific data;

Zinc oxide—EPA has denied industry requests to remove zinc oxide from the Toxic Release Inventory. EPA agreed that zinc oxide is generally recognized as safe, but there is sufficient evidence that it causes aquatic toxicity;

CFC-11, CFC-12—DuPont has stopped manufacturing CFC-11 and CFC-12, also known as Freon 11 and Freon 12;

1,1,1, trifluoroethane—EPA is considering revocation of the significant new usage registration (SNUR) for 1,1,1 trifluoroethane. This product is to be used as a propellant for aerosols and is an exempt SCAQMD solvent;

Open head fiber board drums—DOT's Research and Special Program Administration terminated rulemaking docket feasibility of alternate standards for open head fiber drum packaging. Basically open head fiber drums must pass the same tests as other open head drums;

Drug testing—DOT said rules on controlled substances and alcohol testing will apply to foreign based drivers and employees; and

Acetone—SCAQMD said the acetone exemption as a VOC will come before the board November 17, 1995.

John Kulnane, of Sinclair-Ameritone, added that the deadline for companies to apply to SCAQMD for an exemption under Rule 1113 concerning the reporting of sales data has been extended from October 1 to October 25, 1995.

Technical Committee Chair, Bud Jenkins, reported that a one-day seminar on horizontal milling will be held in February.

The technical portion of the meeting featured Linda Smith, of Rohm & Haas Co., discussing "WOOD LOVES WATER."

According to Dr. Smith, the preconceived notion that a coating that looks good on wood does not necessarily have good protection properties must be reconsidered. Another idea subject to rethinking is that since waterborne coatings are known to have good properties, it is assumed that they will not have good appearance.

The speaker showed a slide demonstrating a thermosetting water-based acrylic versus a solvent-based nitrocellulose finish. This slide depicted the superior properties of the thermoset product. Dr. Smith explained that thermoset in this case does not mean that heat is required to cure the system, but rather that if heat were to be applied to a cured film, it would not flow.

Dr. Smith then reviewed the wood market in both the United States and Europe.

The comparison showed that about 10% of the North American market is waterborne products, up three percent from last year. Most of the coatings used are nitrocellulose products including residential furniture. Alkyd-urea finishes are used on kitchen cabinets, but not necessarily in California. Catalyzed lacquer is typically used on office furniture. Waterborne technology is being used in all three areas. Thermoset technology is used much more in Europe, as opposed to thermoplastic types used in the United States.

The speaker recommended different types of systems for specific lines. For example, she suggested a water white system, which would require an aliphatic isocyanate that may need some heat. Dr. Smith also stated that the most versatile system is the aromatic carboimide, which is not water white because the aromatic protection will yellow when exposed to UV light, about to the same extent as a nitrocellulose system or an alkyd urea. There is also a full range of thermoplastic products available.

In conclusion, a wide variety of waterborne polymers with many different properties now are available that are much better than just a few years ago.

ARTHUR W. LORENZ, *Secretary*

NEW ENGLAND—SEPTEMBER

"Adhesion Promoters"

President Chuck Shearer, of Zeneca Resins, advised the membership of the change in Secretary from Richard Green to Richard Twomey, of KRONOS, Inc.

President Shearer also announced the successful completion of the "Paint Up-Fix Up" project at a home for the elderly in Peabody, MA. Members of both the New England Society and New England Paint & Coatings Association participated.

Larry Cohen, of Chartwell International, Inc., spoke on "ADHESION PROMOTERS FOR ENHANCED PERFORMANCE OF VOC COMPLIANT COATINGS."



New England Society Officers for 1995-96 are (from left): Secretary—Richard P. Twomey; Vice President—Mike Iannuzzi; President—Charles Shearer; and Treasurer—Gene Anderson.

Mr. Cohen presented a contrast of traditional adhesion agents (silanes) versus Chartwell's adhesion products, with applications in waterborne, powder, and solvent-borne coatings.

The speaker stated the following benefits: low cost; ease of formulation inclusion, use in liquids or solids, whether solvent or waterborne; and shelf stability up to 18 months.

RICHARD TWOMEY, *Secretary*

NEW ENGLAND—OCTOBER

"Titanium Pigment"

President Chuck Shearer, of Zeneca Resins, announced the tentative formation of a Technical Committee with a potential chair and members being contacted. Confirmation is expected by the November meeting.

"UNIVERSAL TITANIUM PIGMENT FOR THE COATINGS INDUSTRY" was discussed by Steve Valente, of KRONOS, Inc.

Mr. Valente reviewed three types of current TiO₂ grades (enamel, general purpose, and universal grade) and explained how the major differences between the new universal grades were its particle size, lower organic treatments resulting in higher gloss, and typically better tinting strengths.

The speaker then covered a series of latex, semi-gloss, and gloss formulations where minor reductions in the vehicle, plus the addition of clays would provide the higher gloss and tinting strengths plus additional weathering (non-chalking) improvements over the enamel and general purpose TiO₂ pigments.

RICHARD TWOMEY, *Secretary*

NEW YORK—OCTOBER

"Laboratory/Production Interface"

President Cary Grobstein, of LBL Sales, honored Rudy Berndlmaier, of King Industries, with the A.F. Voss/APJ Award for his presentation of the Society's technical paper "Rheology Modifiers for Low Bake Coatings" at the 1995 FSCT Annual Meeting in St. Louis.

John Du was also recognized for his first place finish for the Society Secretaries Award.

Larry Waelde, of Troy Chemical Corp., reported that a new Technical Commit-

tee on reactive diluents has been formed. John Pascoe, of Hüls America Inc., will be sub-chairing the committee. Mr. Waelde also stated that the powder coatings traffic sign study has been placed on hold.

Society Representative Mike Frantz, of Daniel Products Co. Inc., congratulated the Society for their representation and achievements at the 1995 FSCT Annual Meeting and Paint Show.

New York Society member, Deborah Grumski, of Akzo Nobel Coatings Inc., delivered the evening's presentation "LABORATORY/PRODUCTION INTERFACE—SHIFTING THE PARADIGMS."

Ms. Grumski's goal was to reduce the number of batch color adjustments from an unacceptably high average of eight per batch to zero. This improvement should result in more spontaneous batch production, reduction of back orders, and elimination of the generation of off-spec material.

According to the speaker, the existing paradigms that need to be shifted are the following: the laboratory believes that production cannot reproduce formulas; production believes that the lab does not write good formulas; paint batches have to be adjusted; preshipment samples of finished goods are required by an untrusting customer; and employees in general do not do a good job.

Ms. Grumski then displayed a batch sheet with adjustments for viscosity, gloss, wrinkle, cure time, and color.

New paradigms opposite of the previously mentioned ones were created and the following new steps were taken: new production equipment was brought in; batch makers were more precise with their additions—more accurate scales were used; tinting colors were made homogeneous with better mixers; and raw material suppliers gave on-spec materials using tighter specs and certification.

With production/laboratory working together as a team, their goal of zero color adjustments was almost reached. An average of one adjustment per batch was attained in the new process. This amount is tremendous coming from an average of eight hits.

In conclusion, Ms. Grumski gave specific examples of how the improved process gave much fewer color adjustments.

ROBERT W. SCHROEDER, *Secretary*

NORTHWESTERN—SEPTEMBER

Federation Officer Visit

The meeting featured a visit from FSCT Executive Vice President Robert F. Ziegler and FSCT Secretary-Treasurer Jay Austin, of Halox Pigments.

Mr. Ziegler discussed the new *Coatings Encyclopedic Dictionary* and the tutorial sessions planned for the Annual Meeting. He

Constituent Society Meetings and Secretaries

BALTIMORE (Third Thursday—Martin's West, Woodlawn, MD). JOSEPH SCHILARE, The Valspar Corp., 1401 Severn St., Baltimore, MD 21230.

BIRMINGHAM (First Thursday—Strathallan Hotel, Birmingham, England). DAVID C. MORRIS, PPG Industries (UK) Ltd., P.O. Box 359, Rotton Park St., Birmingham, B16 0AD, England.

CDIC (Second Monday—Location alternates between Cincinnati, Columbus, Dayton, and Indianapolis). THERESA CASE, Fibreglass Evercoat Co., Inc., 6600 Cornell Rd., Cincinnati, OH 45242.

CHICAGO (First Monday—Sharko's Restaurant, Villa Park, IL). GERRY K. NOREN, DSM-Desotech, Inc., 1122 St. Charles St., Elgin, IL 60120.

CLEVELAND (Third Tuesday—Monthly meeting site TBA). JAMES CURRIE, Jamestown Paint Co., 108 Main St., Jamestown, PA 16134.

DALLAS (Second Thursday following first Wednesday—Dallas Medallion Hotel, Dallas, TX). MIKE TEMPLIN, Hilton-Davis Co., 1696 Dickerson Dr., Arlington, TX.

DETROIT (Second Tuesday—meeting sites vary). RAY STEWART, Akzo Nobel Coatings, Inc., 1845 Maxwell St., P.O. Box 7062, Troy, MI 48007-7062.

GOLDEN GATE (Monday before third Wednesday—alternates between Francisco's in Oakland, CA, and Holiday Inn in S. San Francisco). DON MAZZONE, Dowd & Guild, Inc., 14 Crow Canyon Ct., #200, San Ramon, CA 94583.

HOUSTON (Second Wednesday—Medallion Hotel, Houston, TX). KEN MUNDY, Ribelin Sales, Inc., 7786 Blankenship Dr., Houston, TX 77055.

KANSAS CITY (Second Thursday—Cascone's Restaurant, Kansas City, MO). CURRY SANDERS, Trnec Co., Inc., 123 N. 23rd Ave., N. Kansas City, MO 64116.

LOS ANGELES (Second Wednesday—Steven's Steakhouse, Commerce, CA). ARTHUR W. LORENZ, Sinclair-Ameritone Paint Corp., 6100 S. Garfield Ave., Los Angeles, CA 90040.

LOUISVILLE (Third Wednesday—Executive West Motor Hotel, Louisville, KY). PAUL BAUKEMA, Akzo Nobel Coatings, Inc., R&D Div., 4730 Crittenden Dr., P.O. Box 37230, Louisville, KY 40233.

MEXICO (Every fifteen days—Gabriel Mancera, Mexico City, Mexico). SERGIO ROJAS, Pinturas International, S.A. De C.V., Ganaderos 234, Col. Granjas Esmeralda, 09810 Mexico, D.F., Mexico.

MONTREAL (First Wednesday—Restaurant Le Bifhèque, St. Laurent, Quebec). ROBERT BENOIT, KRONOS Canada Inc., 3390 Marie Victorin, Varennes, Que., J3X 1T4 Canada.

NEW ENGLAND (Third Thursday—Best Western TLC, Waltham, MA). RICHARD TWOMEY, Kronos, Inc., 68 Fisher St., Medway, MA 02053-2004.

NEW YORK (Second Tuesday—Landmark II, East Rutherford, NJ). ROBERT W. SCHROEDER, Daniel Products Co., 400 Claremont Ave., Jersey City, NJ 07304.

NORTHWESTERN (Tuesday following first Monday—Jax Cafe, Minneapolis, MN). MICHAEL D. COAD, McWhorter Technologies, 1028 S. Third St., Minneapolis, MN 55415.

PACIFIC NORTHWEST (PORTLAND SECTION—Tuesday before third Wednesday—Tony Roma's, Mall 205, Portland, OR; SEATTLE SECTION—Third Wednesday—Wyndham Gardes Hotel, Sea-Tac, WA; VANCOUVER SECTION—Thursday after third Wednesday—Abercorn Inn, Richmond, B.C.). KENNETH WENZEL, Chemical Distributors, Inc., P.O. Box 10763, Portland, OR 97210.

PHILADELPHIA (Second Thursday—DoubleTree Guest Suites, Plymouth Meeting, PA). PATRICIA M. PETERSON, ARCO Chemical Co., 3801 West Chester Pike, Newtown Square, PA 19073-3230.

PIEDMONT (Third Wednesday—Ramada Inn Airport, Greensboro, NC). ALEX BUAHNIK, Chemcraft Sadolin, Inc., P.O. Box 669, Walkertown, NC 27051.

PITTSBURGH (Second Monday—Montemurro's Restaurant, Sharpsburg, PA). JAMES GIAMMARCO, Lockhart Chemical Co., 2873 W. Hardies Rd., Gibsonia, PA 15044.

ROCKY MOUNTAIN (Monday following first Wednesday—Monthly meeting site TBA). JOHN ELVERUM, Hauser Chemical Research, 5555 Airport Blvd., Boulder, CO 80301.

ST. LOUIS (Third Tuesday—The Salad Bowl Restaurant, St. Louis, MO). ROBERT PHELPS, P.D. George Co., P.O. Box 66756, St. Louis, MO 63166.

SOUTHERN (GULF COAST SECTION—third Thursday; CENTRAL FLORIDA SECTION—third Thursday after first Monday; ATLANTA SECTION—third Thursday; MEMPHIS SECTION—bi-monthly on second Tuesday; and MIAMI SECTION—Tuesday prior to Central Florida Section). EVE DE LA VEGA-IRVINE, J.M. Huber Corp., One Huber Rd., Macon, GA 31298.

TORONTO (Second Monday—Speranza Restaurant & Banquet Hall Convention Centre, Brampton, Ont., Canada). MIKE MOLNAR, CIBA Pigments, P.O. Box 2000, Mississauga, Ont., L5M 5N3 Canada.

WESTERN NEW YORK—MARKO MARKOFF, 182 Farmingdale Rd., Cheektowaga, NY 14225.

also informed the members on the hiring of a Director of Marketing, Lyn Pollock.

Secretary Austin addressed the members on the Federation's commitment to strategic planning and the need for change.

Joe Mills, of Milsolv®/Minnesota, received a gavel/trophy as the Incoming President.

Mustafa Bacchus, of The Valspar Corp., is seeking suggestions for a Northwestern Society Mission Statement.

The meeting's technical speaker was Robert Ruckle, of OSi Specialties, who spoke on "COMPATIBILITY THEORY—HOW TO CHOOSE THE PROPER SILICONE ADDITIVE."

Dr. Ruckle advised the members on selecting a silicone additive based upon the limited information supplied by silicone additive companies. He demonstrated that within a given silicone chemistry family, one could determine the best additive based upon the levels of silicone, polyethylene oxide (PEO), and ethylene oxide (EO).

According to the speaker, the trends of compatibility are the following: the higher the level of silicone, the lower the compatibility; and ethylene oxide is more compatible with water whereas polyethylene oxide is more compatible with oils. Therefore, an EO based silicone resin that is high in EO and low in silicone would have the best compatibility with a waterborne paint, whereas a resin that is high in PEO and low in silicone would have the best compatibility with a solvent-borne alkyd.

Dr. Ruckle stated that better compatibility leads to good flow and leveling, as well as easy incorporation into a formula. Poor compatibility leads to defoaming, but can also result in more film defects. High silicone levels help mar resistance, but will result in poor overcoat.

The optimum formula is a balance of properties that can be guided by a knowledge of silicone additive compatibility.

The evening's second speaker was Michael James, a former Northwestern Society member, who custom blends paint for use in the set designs for the Guthrie Theater.

JEFF GUNDRY, Secretary

PACIFIC NORTHWEST (VANCOUVER SECTION)— SEPTEMBER

"Waste Minimization"

Society and Manufacturing Committee Chair, Valerie Braund, of General Paint Ltd., reported that a manufacturing course will begin in February.

Technical Committee Chair Yoichi Seo, of Flecto Coatings Ltd., stated that the results of the survey have been compiled and they will be mailed out shortly.

Mr. Seo also reported that Ms. Braund attended the FSCT Technical Advisory Committee meeting in Washington, D.C. One of the ideas under consideration is the making of a video tape on test methods, in order to standardize various test methods.

Environmental Committee Chair, Paul Andreassen, of Consolidated Coatings stated that he recently spoke with Paul Iverson, of B.C. Paint Care. Mr. Iverson said that six depots are now operating, with 20 to be operational by the end of September. There is also an agreement for six depots in Victoria. One hundred and forty events have resulted in the collection of one million litres of waste paint.

Dick Stewart, of Firestop Systems Inc., stated that there is no provision in the By-laws for more than one reading for membership. Flora Wong, of Saguaro Ltd., favors the two reading format and suggested that the Vancouver section be autonomous on this subject.

Ed Linton, of Cloverdale Paint Inc., stated that due to an increasingly busy schedule, Dave Pasin, of Gibson Paint, relinquished the Education Committee Chair. Tom Fairley, of Calcoast Labs Canada Inc., will replace Mr. Pasin.

Pamela Cefaratti, of Orr & Boss, presented the evening's talk, "WASTE MINIMIZATION THROUGH BETTER FORMULATING."

KELVIN J. HUGET, *Secretary*

PHILADELPHIA—OCTOBER

"Coatings for Big Jobs"

Stan Le Sota, Editor of the *Coatings Encyclopedic Dictionary*, discussed the work involved in the compilation of this reference tool.

Carol Baxter, of Cannon-Sline, spoke on "THE COATINGS REQUIREMENTS ON BIG (HEAVY MAINTENANCE) JOBS."

Using the industrial contractor's point of view, Ms. Baxter stressed the importance of timely delivery of environmentally correct coatings to job sites. Due to strict budgets of today's industrial contracts, little leeway is allowed to the contractor.

The speaker also emphasized the importance of technical support at the site. The coatings manufacturer must be ready to customize formulations to accommodate each job's particular challenges, not the least of which is the presence of an OSHA or EPA inspector.

Ms. Baxter stressed that the burden of performance is with the applicator, even though the coating systems often are specified by the customer. Some of the systems discussed were the following: epoxy, waterborne, electrostatic, and powder. The speaker also covered the advantages and disadvantages of these systems.

Photographs of heavy equipment were presented by Ms. Baxter. She also listed the cost of equipment needed by today's maintenance contractors.

PATRICIA M. PETERSON, *Secretary*

TORONTO—SEPTEMBER

"New Approaches to Mildew Control"

Rod Staveley, of Hüls, presented President Bob Ng, of Hoechst Canada, Inc., with the President's gavel.

Dave Jack, of Technical Coatings, presented Kurt Weitz, of The Feldspar Corp., with a plaque honoring him as an Honorary Member of the Toronto Society. Mr. Weitz served as Toronto Society President in 1974-75 and FSCT President in 1991-92.

William Hill, of Rohm & Haas Co., Inc., discussed "NEW APPROACHES IN MILDEW CONTROL."

Mr. Hill defined both mildew and mildewcides. He also covered the many types of mildewcides, as well as the advantages of isothiazolone chemistry.

MIKE MOLNAR, *Secretary*

TORONTO—OCTOBER

"Waterborne Latexes"

President Bob Ng, of Hoechst Canada, Inc., thanked the Toronto Society Technical Committee for their paper "Non-Toxic Anitcorrosive Pigments in Aqueous Primer Formulation," which was presented as part of the A.F. Voss/APJ Competition at the 1995 FSCT Annual Meeting in St. Louis.

The Committee will also study the performance of small particle emulsions for

wood stains in a joint project with the Montreal Society.

The program for 1995-96 was reviewed. The upcoming program is highlighted by a mini-symposium on "Coatings for Plastics, The Future is in Plastic." This meeting will be held in conjunction with SPE and SPI.

The technical presentation was delivered by Tom Boyce, of Dow Chemical Co. His topic was "THE EFFECT OF COALESCENT CHOICE ON FILM PROPERTIES OF WATERBORNE INDUSTRIAL LATEXES."

Mr. Boyce discussed the research in understanding film properties of industrial latexes when changing the coalescent blends. His two-part presentation focused first on the kinetics of film formation followed by a consideration of engineering film properties.

In the study, one high T_g and one low T_g were chosen. In addition, four coalescent blends with varying evaporation rates were selected. Weight loss studies were done on glass under controlled drying conditions and constant film thickness. Film formation was studied with atomic force microscopy. Various film properties were assessed for the pigmented films, block resistance, hardness development, cold checking, early rust corrosion resistance, adhesion, and gloss.

According to Mr. Boyce, the following conclusions were drawn from the study:

- coalescing efficiency of solvent blends is a combination of initial concentration evaporation rate, molecular weight, and partitioning between the polymer and water;
- an empirical relationship has been developed to better assess the coalescing efficiency of solvents and solvent blends;
- increased coalescent efficiency provides higher quality films but this must be balanced with the trade off of solvent retention which retards ultimate film properties; and
- for homogeneous latex systems, solvent retention appears to increase as the initial T_g increases.

MIKE MOLNAR, *Secretary*



Elected Officers of the Toronto Society for 1995-96 are (seated from left): Society Representative—David Jack; President—Bob Ng, Educational Chair—Walter Fibiger; and Art Hagopian. Standing: Membership Chair—Linda Cruz; Vik Rana; Program Chair—Brad McPhee; Entertainment Chair—Alex King; Treasurer—Natalie Janowsky; Vice President—Kevin Pelling; Bob Snyder; and A.R. Monteith.

Baltimore

- (Jan. 18)—“DECISION MAKING FOR CORROSION AND AESTHETIC CONTROL”—Randy Binter, Montgomery Chemical Co., Inc.
- (Feb. 15)—Joint Meeting (Outing)—Columbus Marine R & D Center.
- (Mar. 21)—General Meeting—Mattyey Reymont, Shell Chemical Co.
- (Apr. 18)—“GOOD TESTS—BAD TESTING”—Saul Spindel, D/L Laboratories, Inc.
- (May 16)—General Meeting and Elections.

Birmingham

- (Jan. 11)—“BACK TO BASICS: DURABILITY AND TiO₂”—John Balfour, Tiioxide.
- (Feb. 1)—“SECURITY MARKING OF COATINGS”—M.G. Martindill, Glowbug Luminescent Colours.
- (Feb. 29)—Symposium: Paint at the Crossroads—Strathallan Hotel.
- (Mar. 28)—POWDER COATINGS: “WE MIGHT STILL BE GREEN BUT WE ARE NOT WET”—David Bate, H.B. Fuller Coatings.
- (Mar. 30)—60th Anniversary Dinner Dance.
- (May 2)—67th Annual General Meeting.

Chicago

- (Jan. 8)—“REACTIVE DILUENTS FOR HIGH SOLIDS POLYURETHANE COATINGS”—Thomas Johnson, ANGU Chemical.
- (Feb. 5)—“PROBLEMS ASSOCIATED WITH WATERBORNE COATINGS FOR WOOD”—David Setzke, SC Johnson Polymer.
- (Mar. 4)—“PIGMENTS FOR TRAFFIC MARKING SYSTEMS”—Mike Issel, Sino-American Pigments.
- (Apr. 1)—“FIELD OBSERVATIONS AND LATEX CHEMISTRY”—Violette Stevens.
- (May 10)—Annual Awards Banquet.

Los Angeles

- (Jan. 13)—“THE NEXT GENERATION OF HIGH PERFORMANCE UNIVERSAL PRIMERS”—Mike Wildman, EPS, Inc.
- (Mar. 10)—“AN ADDITIVES APPROACH TO DEFECT ELIMINATION IN THERMOPLASTIC WATERBORNE INDUSTRIAL MAINTENANCE COATINGS”—Joel Schwartz, Air Products & Chemicals Co.
- (Apr. 10)—“RHEOLOGICAL MEASUREMENTS AND HOW THEY APPLY TO THE PAINT AND COATINGS INDUSTRY”—Scott Krane, Haake Instruments.
- (May 8)—“THE LATEST TRENDS IN ACCELERATED CORROSION TESTING: PROHESION,

QUV AND AUTOMOTIVE CYCLIC CORROSION TESTING”—Steve Grossman, Q-Panel Corp.

New York

- (Jan. 9)—“PAINTING CONSERVATION”—Christopher McGlinchey, Metropolitan Museum of Art.
- (Feb. 13)—Legislative Update.
- (Mar. 12)—“NOVEL HARDENERS FOR POLYURETHANE POWDER COATINGS”—Ron Guida, Hüls America, Inc.
- (Apr. 9)—“THE LOBBYING PROCESS: FROM BEGINNING TO END”—William Pascrell, Princeton Public Affairs Group.
- (May 14)—PaVac Awards Night. “COLORED ORGANIC PIGMENTS FOR THE COATINGS INDUSTRY”—Peter Lewis, Sun Chemicals.

Pacific Northwest

- (Jan.)—“THE NEXT GENERATION OF HIGH PERFORMANCE UNIVERSAL PRIMERS”—Mike Wildman, EPS, Inc.
- (Mar.)—“AN ADDITIVES APPROACH TO DEFECT ELIMINATION IN THERMOPLASTIC WATERBORNE INDUSTRIAL MAINTENANCE COATINGS”—Joel Schwartz, Air Products & Chemicals Co.
- (Apr.)—“RHEOLOGICAL MEASUREMENTS AND HOW THEY APPLY TO THE PAINT AND COATINGS INDUSTRY”—Scott Krane, Haake Instruments.
- (May)—“THE LATEST TRENDS IN ACCELERATED CORROSION TESTING: PROHESION, QUV AND AUTOMOTIVE CYCLIC CORROSION TESTING”—Steve Grossman, Q-Panel Corp.

Philadelphia

- (Jan. 11)—Joint Meeting with PPCA. “STRATEGIES OF SUCCESSFUL INVESTORS APPLIED TO THE INDIVIDUAL”—John Matthews, Villanova University.
- (Feb. 8)—Manufacturers Night. “ADVANCES

IN COLOR INSTRUMENTS”—Danny Rich, Data Color.

- (Mar. 14)—“WHO BUYS TRADE SALES PAINTS, WHERE, AND WHEN”—Allen Irish, NPCA; Bill Cook, Wm. Cook & Co., and John Stauffer, Rohm & Haas Co.
- (Apr. 26)—Awards Night
- (May 8-10)—Eastern Training Conference and Technical Seminar.

Rocky Mountain

- (Jan. 8)—“THE NEXT GENERATION OF HIGH PERFORMANCE UNIVERSAL PRIMERS”—Mike Wildman, EPS, Inc.
- (Mar. 11)—“AN ADDITIVES APPROACH TO DEFECT ELIMINATION IN THERMOPLASTIC WATERBORNE INDUSTRIAL MAINTENANCE COATINGS”—Joel Schwartz, Air Products & Chemicals Co.
- (Apr. 8)—“RHEOLOGICAL MEASUREMENTS AND HOW THEY APPLY TO THE PAINT AND COATINGS INDUSTRY”—Scott Krane, Haake Instruments.
- (May 6)—“THE LATEST TRENDS IN ACCELERATED CORROSION TESTING: PROHESION, QUV AND AUTOMOTIVE CYCLIC CORROSION TESTING”—Steve Grossman, Q-Panel Corp.

Toronto

- (Jan. 8)—“THE FUTURE IN PLASTICS.”
- (Feb. 12)—Joint Meeting with OCCA—“THE IMPACT OF REGULATIONS ON THE PRINTING INKS AND COATINGS INDUSTRY”—Speaker from the Ministry of the Environment.
- (Mar. 18)—“HEAVY DUTY MAINTENANCE COATINGS—THE CANADIAN EXPERIENCE”—Speakers from the Ministry of Transportation and the Corrosion Service Co., Ltd.
- (Apr. 15)—Annual Technical Symposium.
- (May 13)—“THE APPLICATION OF SCIENCE TO THE EXAMINATION AND CONSERVATION OF MUSEUM OBJECTS”—Sandra Lawrence, Ontario Gallery of Art.

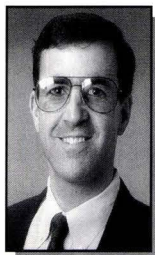
Special Cleveland Society Monthly Meeting

January 16, 1996 • Wellington, Highland Hts., OH

Several speakers are scheduled to speak about the future regulations for manufacturers and users of paint and coatings. Scheduled to appear are:

Linda Herring, EPA; Robin Medlock, OSHA;
TBA, State Legislator; Dave Puryear, Harrison Paint Co.

This is also a joint meeting with CPCA. For more information, call Bridget Vaughn at 216-371-3044.



M.S. Zibit

Michael S. Zibit has joined Troy Corp., East Hanover, NJ, as Market Manager for Coatings. Mr. Zibit, a member of the Pacific Northwest Society, will manage market strategies for fungicides, biocides, and additives in domestic and international markets.

Daniel Products Co., Inc., Jersey City, NJ, has hired **Thomas R. Laakso** as Director, International Operations. The New York Society member will be responsible for a network of agents, distributors, and technical salespeople in more than 50 countries.

Paul Mueller has assumed the position of Business Manager of the Building, Sealants, and Coatings Group at Wacker Silicones Corp., Adrian, MI. In this position, he will manage and develop business related to the building, sealants, and coatings industries in North America.

OBITUARIES

William M. Tate, of the Baltimore Society, died on September 28, 1995. He was 70 years old.

Mr. Tate, Past-President of the Baltimore Coatings Association, was also active in the Piedmont Coatings Association and the Piedmont Society for Coatings Technology. He also started the first Baltimore "Crab Feast," which has become an annual event.

Mr. Tate is survived by his wife, Cleo.

Abdullah M. Melik passed away on October 11, 1995. The Chicago Society member was 77.

Mr. Melik was President of Aquaday International Ltd. He was co-founder of Aquaday and founder of A.M. Melik Associates.

He is survived by his wife, Adele; a son, Erol; a daughter, Sibel; and three grandchildren.

Gerald Moore, founder and President of GMD Systems, Inc., passed away on September 24, 1995.

In over 30 years in the gas detection field, Mr. Moore was responsible for the development of many commercial instruments. He founded GMD in 1979, which became affiliated with Bacharach in 1989. Over the past two years, Mr. Moore assumed responsibility as Senior Vice President of Technology at Bacharach.

NPCA's Padow and Ludwig Announce Retirement

Two longtime staff members of the National Paint and Coatings Association, Washington, D.C., have announced their plans to retire. **Mark Padow**, Director of Industry Affairs, has been with NPCA for 31 years, serving an intermediary between member representation and the association staff. **Marilyn Ludwig**, Director of Communications, has had a variety of responsibilities including her many writing credits, such as the "Annual Report to the Members," "The Finishing Touch," and the "Issue Backgrounder" newsletters. Both will retire effective December 31, 1995.

B A S F I N T E R M E D I A T E S

1,6 HDO® Hexanediol



Can HDO work for you?

Look at these performance characteristics

- Improved flexibility
- Greater elasticity
- Better oil resistance
- Good anti-leaching properties
- Good adhesion
- Surface hardness
- Hydrolytic stability

Look at some applications in Polyurethanes:

- Automotive coatings
- Hot melt adhesives
- Epoxy adhesives
- Personal care
- Food additive lubricant

In Polyesters:

- High solids formulation for coil coatings
- Modifier for PE resins

In Acrylics:

- Radiation curable coatings

Call us!

Mike Travers
(800) 526-1072
Ext: 4773
Fax: (201) 426-4752

Creative Chemistry for Creative Chemists.

BASF

HDO is a registered trademark of BASF Corporation

Circle No. 280 on the Reader Service Card

Cook Composites and Polymers, Kansas City, MO, has announced a series of management changes. **Guy Harkness** has been named Vice President of the Polymers Division; **Mark Riemann** has been appointed Sales Manager for the Polymers Division; the new Vice President of Composites is **Del Wilkinson**; **Robert Koncos** has been named Vice President, Quality; and **Michael Weber** has been named Director of Corporate Marketing.

Larry Cooper has been named President of the International Division of Liquid Carbonic, Oak Brook, IL. He previously served as President of Chicago Bridge & Iron Co.'s International Division.

Frank J. Meyer has been named Director of Sales, Chemical Processes for CSM Environmental Systems, Inc., Union, NJ. Mr. Meyer brings to his new position over eight years of international sales, marketing, and technical development experience in the environmental control industry.

Gary E. McGuire has been elected 1996 President-Elect of The American Vacuum Society, New York, NY. Mr. McGuire is Director of Electronic Materials and Devices at MCNC, Research Triangle Park, NC.

The Society has also presented its 1995 honors and awards, including: the Peter Mark Memorial Award to **Emily Carter**, University of California; The Medard W. Welch Award to **Gerhard Ertl**, Fritz-Haber Institut der Max-Planck-Gesellschaft; the John A. Thornton Memorial Award and Lecture to **Jan-Eric Sundgren**, Linkoping University; and the Albert Nerken Award to **Donald M. Mattox**, Management Plus, Inc.

Degussa Corp., Ridgefield Park, NJ, has announced that **Michael Steven Darsillo** has been appointed Director, Akron Technical Center, within the company's Silica Division. Based in Akron, OH, Dr. Darsillo will be responsible for the management of the Akron Technical Center. He has been with the company since 1991.



S. Gurkin



M. Metivier

Susan Gurkin has accepted the position of Director of Technical Services for Lucas Meyer, Inc., Decatur, IL. In her new role, Ms. Gurkin will oversee the coordination of technical and research activities in the United States, Canada, and Mexico.

In other news, the company has hired **Mark Metivier** as Manager, Distributor Sales. He will take charge of indirect sales, working with distributors and brokers that handle the company's products in the United States, Canada, and Mexico.

Raffi and Swanson, Inc., Wilmington, MA, has elected **William J. Kotek** President and General Manager. Mr. Kotek will also continue as Chief Financial Officer and Human Resources Manager.

In a related move, two new Vice Presidents have been chosen. Elected are **Richard H. Harrington, Sr.** and **Theodore J. Kubacki**.

Frank Baker, Chairman of the Board for International Wallcoverings, Brampton, Ontario, Canada, has been named recipient of The Allman Award from Wallcoverings Association, Chicago, IL.

The National Decorating Products Association, St. Louis, MO, has elected **Arlan Hatloe** President. Mr. Hatloe is the fourth-generation owner of a decorating store in Everett, WA.

CDF Corp., Plymouth, MA, has appointed **Eric Jakobowicz** National Sales Manager. Mr. Jakobowicz brings over 15 years of experience in the development, manufacture, and sale of industrial and plastic products, as well as resins, to this position.

A. Michael DeRuosi has been appointed General Manager, Specialty Chemicals for Albright & Wilson plc, Richmond, VA. In his new role, Mr. DeRuosi is responsible for the commercial functions of the group in Europe and the Americas.

Donald W. Griffin has been elected President and Chief Executive Officer of Olin Corp., Stamford, CT. He succeeds **John W. Johnstone, Jr.**, who will remain as Chairman of the Board.

Classified Advertising

Wanted—Experienced Paint Chemist/ Technical Director

Great opportunity to join an established Trade Sales manufacturer located in sunny El Paso, Texas. We're looking for an experienced TS chemist with at least five years of experience formulating trade sales, light industrial, and VOC compliant coatings. Stimulating and challenging work environment. Excellent compensation package in a part of the country with ideal year-round climate. MOST importantly, we offer a growth opportunity for the future. Our employees know of this ad. Send confidential resume with employment/salary history to W.M. Tunno, Hanley Paint Co., P.O. Box 12130, El Paso, TX 79913.

For Sale

Quality Used Equipment

For the Paint & Chemical Industry. Mills, Dispersers, Tanks, Laboratory Packaging and Material Handling Equipment

Western Equipment Co.

(510) 820-8883

FAX: (510) 820-9188

Formulations/Applications Scientist—Paints/Inks

High-growth specialty pigment manufacturer seeks an experienced formulations/applications scientist in the area of flake/effect pigment incorporation for a wide range of coating and ink systems. Technical service/support, lab management, and supervisory experience are vital. Expertise in flake/effect pigments, color science, paint/pigment characterization, and paint stylings is desirable. The ideal candidate would be a current or former employee of an auto paint manufacturer or auto pigment supplier. A B.S. or advanced degree in Chemistry, Colloid Science, or equivalent, with 5 years of experience in paint or ink applications is required. Effective communication skills and a willingness to travel are essential. Located in the beautiful wine country just 50 miles north of San Francisco, we offer high career growth potential, and an innovative work environment. Send resume to: Human Resources, Dept. 138, FLEX PRODUCTS, INC., 2793 Northpoint Parkway, Santa Rosa, CA 95407-7350.

BIRMINGHAM

Active

Williams, Michael John—Albright & Wilson, Oldbury, Warley, West Midlands.

Associate

Kale, Philip A.—BIP Speciality Resins, Oldbury, Warley, West Midlands.

Rimmer, Martin R.—Wacker Chemicals Ltd., Halifax, West Yorks.

CDIC

Active

Dave, Dilip I.—Koch Material Co., Heath, OH.
Trev, Philip S.—PPG Industries, Inc., Delaware, OH.

DETROIT

Active

Brown, David D.—Palmer Paint Products Inc., Troy, MI.

Burkhart, Theresa I.—BASF Corp., Southfield, MI.

Coots, Tim—Vemco, Inc., Grand Blanc, MI.

Karaban, Curt A.—Chrysler Corp., Clinton Township, MI.

Lathia, Nirali A.—BASF Corp., Southfield.

McElligott, Terrence—Albar Industries, Lapeer, MI.

Mendoza, Walter E.—BASF Canada Inc., Windsor, Ont.

Middleton, Bill K.—Palmer Paint Products Inc., Troy.

Schafer, Brett R.—BASF Corp., Southfield.

Skrzycki, Stephen M.—Akzo Nobel Coatings, Inc., Troy.

Smith, Steven R.—Akzo Nobel Coatings, Inc., Troy.

Strunk, Stephen E.—Palmer Paint Products, Inc., Troy.

Williams, Maury—Canton, MI.

Witucki, Gerald L.—Dow Corning Corp., Midland, MI.

Associate

Disegna, Wayne L.—Tiger-Drylac, Holland, MI.
Loring, Richard R.—Painters Supply & Equipment, Jackson, MI.

Moran, Michael D.—Schabel Products Corp., Brighton, MI.

Nowak, Paul J.—The Mearl Corp., Ypsilanti, MI.

Patzel, Robert R.—Nortru Inc., Detroit, MI.

Rose, Michael A.—Sartomer Corp., Exton, PA.
Soubliere, Craig S.—EM Industries, Inc., Troy, MI.

GOLDEN GATE

Active

Balcom, Jim H.—Eureka Chemical Co., Bay Point, CA.

Burkes, Louis E.—Harris Specialty Chemical Co., Newark, CA.

Fontaine, David M.—US Cellulose Co., Inc., San Jose, CA.

Jansons, Markus W.—Hewlett-Packard, Santa Clara, CA.

Kingsbury, William G.—R.J.R. Polymers, Oakland, CA.

Tinianow, Jeff N.—Huls America, Pleasanton, CA.

Pisinski, Patrice M.—Ashland Chemical Inc., San Francisco, CA.

LOS ANGELES

Active

Barnard, Harrison B.—Hanley Paint, El Paso, TX.

Kapadia, Shailan John—Coatings Resources Corp., Huntington Beach, CA.

Associate

Farshler, Thomas R.—World Minerals, Newport Beach, CA.

Taylor, Stewart M.—Tioxide Americas Inc., Lake Forest, CA.

Umphrey, Thomas J.—EPS Inc., Los Angeles, CA.

LOUISVILLE

Active

Coward, Mark R.—Courtaulds Coatings Inc., Louisville, KY.

DeGooyer, William J.—Devoe Coatings Co., Louisville.

Hope, Stanley E.—Kurpees Coatings, Louisville.

Prebys, Ronald T.—Color Corporation, Louisville.

Wardrip, David D.—A.F. Wolke Paint Co., New Albany, IN.

Associate

Cope, Donald E.—Kohl Marketing Inc., Lexington, KY.

McCain, Brian G.—Koresell Paint, Evansville, IN.

Permody, Robert E.—PB&S Chemical Co., Louisville, KY.

MONTREAL

Active

Adriana, Santini—Sika Canada, Inc., Pointe-Claire, Que.

Blanchette, Denis—Les Produit Chemcraft, Princeville, Que.

Camire, Christian—Peintures Can-Lak, Daveluyville, Que.

Cloutier, Mariejosee M.J.—Betonek Ltee., Terrebonne, Que.

Girouard, Jean-Pierre—St. Lawrence Chemical, Baie Dufré, Que.

Gosselin, Steve—Sika Canada Inc., Pointe-Claire.

Savard, Michel—Benjamin Moore & Co., Montreal, Que.

Thnguy, Pierre Robert—MF Paints, Ste-Rose, Que.

Associate

Shefford, Ross S.—ISP Canada, St. Laurent, Que.

NEW YORK

Active

Ament, Edward A.—Technical Coatings Co., Nutley, NJ.

Bonner, Michael A.—Benjamin Moore & Co., Flanders, NJ.

Cecala, Joseph C.—Mark-Tex Corp., Englewood, NJ.

Rike, Dennis A.—Sonoco Products Inc., Carteret, NJ.

Retired

Brody, Donald E.—Delray Beach, FL.

Jaffe, Harold L.—Millburn, NJ.

Spector, J.E.—Livingston, NJ.

Swenson, C. Richard—Bereley Heights, NJ.

SOUTHERN

Active

Glover, Charles A.—W.M. Barr & Co., Memphis, TN.

Reynolds, Joe—Ferro Corp., Nashville, TN.



Join the FSCT at the

International Coatings Technology Conference and Expo

(formerly Annual Meeting and Paint Industries' Show)

October 23-25, 1996

McCormick Place North

Chicago, IL





Equipment

Blast/Recycling System

A new advanced technology recyclable abrasive blasting system is available. The Alpha 100 portable blast/recovery system is designed for industrial lead abatement and other surface preparation coating removal jobs on fixed steel structures such as water tanks, petrochemical storage tanks, and power plants. The IPEC, Inc. unit provides continuous closed-loop blasting, classification, and recovery.

Circle No. 30 on Reader Service Card

Conveyor Oven

The Grieve No. 755 is an electrically heated belt conveyor oven with a maximum operating temperature of 350°F. The unit can be used for preheating various aluminum parts. An 18KW heat input is provided to the oven heating zone, which has four inch insulated walls throughout.

Circle No. 31 on Reader Service Card

Spray Booth

A recirculating paint spray booth, designed for all types of wet coatings, is introduced by JBI Inc. The custom designed system can reportedly provide 100% VOC capture, 99.9% particulate removal down to 5 microns, and a reduction in exhausted air and heated air make-up. The system provides the means for recirculating air through a spray booth for both manual and automatic paint spray booths.

Circle No. 32 on Reader Service Card

Asphalt Mixer

The Silverson Machines in-line polymer modified asphalt mixer is engineered for high temperature disintegration and solubilization of polymers into asphalts. The mixer's high-speed rotor/stator workhead is designed to provide rapid, complete solution of polymers such as SBS, APP, PVC, and EVA to produce modified asphalts for the road surfacing and roofing industries.

Circle No. 33 on Reader Service Card

Gear Pumps

Northern® Pump, a division of McNally Industries, Inc., has introduced the Northern Dura Series line of positive displacement rotary gear pumps. The series was developed to provide chemical formulators with a long-lasting gear pump that handles both water and solvent-based solutions. Design features include stainless steel construction, self-lu-

bricating carbon graphite bearings, Teflon® packing, mechanical seals, nonmetallic (PEEK) composite gears, flexible design, and modular construction.

Circle No. 34 on Reader Service Card

HazMat Buildings

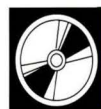
Safety Storage, Inc., has announced that their hazardous materials storage buildings and lockers are now available with stainless steel interiors for use in applications where corrosive materials are dispensed and stored. Factory installed at time of order, the interiors may be specified in a range of combustible steel and fire-rated buildings and lockers.

Circle No. 35 on Reader Service Card

Cleaning System

Distri has introduced a new pail and parts cleaning system, which can be used with water/detergent, caustics, or solvents as washing media. The Type 100, designed to be environmentally friendly, can be ordered with a solvent recovery system to accomplish a closed loop setup. The system is available in three sizes, with the largest able to clean up to 12 five-gallon pails per washing cycle.

Circle No. 36 on Reader Service Card



Software

Chromatography

Shimadzu Scientific Instruments, Inc.'s Class-VP software (chromatography laboratory automated system software, with VP standing for validation and productivity) was designed using USDA and US EPA guidelines. The software meets regulatory agency software validation requirements. Advanced log file and system suitability tools help prove method validity and meet GLP or GMP requirements.

Circle No. 37 on Reader Service Card

Factor Analysis

ESCA Tools software trajectory projection factor analysis (TPFA) transforms raw XPS or AES depth profile data into chemically meaningful spectra for identifying components of overlapping peaks. This Surface/Interface Inc. product uses rotation matrix transformations and spatial projections to transform original depth profile data into meaningful spectra. This enables a more exact analysis of peak components than does the approach of linear test squares peak fitting to standard chemical line shapes.

Circle No. 38 on Reader Service Card



Laboratory Apparatus

Moisture Analyzer

Analite, Inc. has developed a new moisture analyzer that provides multi moisture parameters in analog and computer format. Designed to accept inputs from all relative humidity instruments on the market today, the Analite A2000 provides such data as RH, temperature, dew point, wet bulb, absolute humidity, humidity ratio, enthalpy, and vapor pressure.

Circle No. 39 on Reader Service Card

Gloss Checkers

Kernco Instruments Co., Inc. has introduced two new gloss checkers, 14A10 and 14A11. They may be used for quality control of paint and ink, outdoor exposure testing, hue adjustment, or luster testing. Other uses include checking coated surfaces such as external coatings, cleaning or waxing condition of vehicles, stops, aircraft, bridges, iron/steel frames, or to diagnose deterioration.

Circle No. 40 on Reader Service Card

Pressure Washers

A.R. North America, Inc. has introduced a line of portable compact pressure washers available in four models from 1,200 to 1,500 psi. Designed for surface preparation prior to painting, the washers remove dust, grime, and flaking particles. They are also applicable for cleaning of equipment.

Circle No. 41 on Reader Service Card

Vapor Condensing

A new system is designed for reducing emissions of volatile organic compounds from chemical compounding mixers and reaction vessels. The head space vapor condensing system (HSVCS) is engineered to reduce VOC emissions by lowering reaction vessel head space temperature with liquid nitrogen, causing solvent vapors to condense and return to the product as a liquid. This apparatus is available from Liquid Carbonic.

Circle No. 42 on Reader Service Card

Gas Detector

The Autostep® Plus is a "paper tape" toxic gas detector with UL approval as an intrinsically safe instrument capable of measuring down to ppb range. This GMD Systems, Inc. product is available for isocyanates, phosgene, chlorine, acid gases, hydrides, and hydrazines. Features include 15-second quick response, datalog memory capability to 4,000 points, adjustability, gas specificity, flexibility, and emergency response.

Circle No. 43 on Reader Service Card

Misc. Miscellaneous

Drum Inserts

CDF Corp. offers a line of smooth-wall, thin lip plastic inserts for 55-gallon drums. The Profit 55 is blow molded from FDA-approved LDPE in a wall thickness of 18 or 24 mils. A thin contoured lip snaps onto the top of the chime to prevent leakage between the insert and the drum wall.

Circle No. 44 on Reader Service Card

Fastener Adhesives

Water-based acrylic microencapsulated fastener adhesives are engineered to provide environmentally friendly thread locking materials. ND Industries, Inc., has designated these adhesives ND Microspheres™ AA0695, AA0795, AA 0895, AA0995, and AA1095. These are room temperature curing adhesives designed to be preapplied to threaded fasteners.

Circle No. 45 on Reader Service Card

Warning Labels

Physically and chemically rugged labels, placed permanently around floor drains to prevent misuse, are available from Intelli-

gent Labeling Technologies, Inc. P100 Floor Drain Warning Labels are produced in a variety of two-color combinations in rectangular, oval, circular, and doughnut shapes to accommodate standard drain configurations. They are designed for lasting installation in a range of environments.

Circle No. 46 on Reader Service Card

Case Packer

The Model 3100 automatic case packer operates at speeds up to 30 cases per minute, and any number of layers can be accommodated. The Schroeder Machines apparatus, which employs a hot melt adhesive system for case sealing, has a PLC control and is completely adjustable for a range of sizes. A unitizing feature enables this machine to layer unstable products in forming pack patterns.

Circle No. 47 on Reader Service Card

Pressure Washer Tips

Titan, Inc. has introduced two styles of pressure washer tips, both of which consist of a one-piece body constructed of stainless steel. Q-Meg tips offer extended wings, for easy installation and quick disconnect, which indicate the spray pattern's fan path and make it possible to direct the spray. The 1/4" Meg tips are available for similar high-pressure cleaning applications.

Circle No. 48 on Reader Service Card

Slide Gates

Air-operated dust tight slide gates provide automatic interim flow control in powder/bulk handling systems. The slide gates, supplied by Wm. W. Meyer & Sons, Inc., are designed for use in systems moving free-flowing solids, granules, or powders. Standard in heavy gauge mild steel, they are also available in special materials, such as stainless steel or aluminum, or with special coatings.

Circle No. 49 on Reader Service Card



New Materials

Instron Corp. has introduced eight new additions to its 4400 and 5500 series of materials testing systems. The new systems are designed to provide comprehensive solutions for a variety of material testing requirements including tensile, shear, compression, peel, tear, friction, and flexure in R&D, quality control, and production applications. The new systems include models 4481 and 5581, 4482 and 5582, 4484 and 5584, and 4485 and 5585.

Circle No. 50 on Reader Service Card

High Shear, Low Cost Cone and Plate Viscometer

NEW

Budget priced Brookfield CAP 1000 provides high shear rate in a cone and plate viscometer that delivers these user advantages:

- Shear rate: 12,000 sec⁻¹
- Viscosity range 0.25 to 100 Poise
- Sample temperature control
- Digital settings and display in CGS or SI units
- Tests mini-samples (<1 ml)
- Typical Brookfield quality and reliability
- Fast and easy to set up and clean
- Variable speed model available

ISO 9002 Certified

Call or send for brochure

BROOKFIELD BROOKFIELD ENGINEERING LABS, INC.
Dept. CAP-1 240 Cushing Street,
Stoughton, MA 02072-2398 USA

617-344-4310 • FAX 617-344-7141 • 800-628-8139 (US ex MA)

Circle No. 258 on the Reader Service Card

The Most Advanced, Easiest-To-Use PC-Based Formulation Software

Formu-Tools™

Your complete solution to:

- Information Management
- Analysis Calculations
- Formulation Design - A unique feature of Formu-Tools™

For product information:
Tel: (610) 642 0380
Fax: (610) 642 2599

DTW DTW Associates, Inc.
Dawn of New Ideas in Scientific Software

Circle No. 281 on the Reader Service Card



Raw Materials

Preservative

ANGUS Chemical Co. has introduced a new in-can preservative for latex paint and emulsion systems. Canguard® 442 is an EPA-approved biocide which can be used at low levels to control microbial degradation. Reported benefits of this product, which can be used in combination with other preservatives, include low odor, no contribution to VOC, and handling characteristics.

Circle No. 51 on Reader Service Card

VAE Technology

Two new products based on advanced vinylacetate ethylene technology are designed to help formulators manufacture low VOC/low odor water-based paints and coatings. The products, Airflex® 808EXP and 809EXP emulsions, are intended for use in interior architectural paint formulations. These Air Products and Chemicals, Inc. products reportedly provide scrub resistance, freeze-thaw stability, and low temperature coalescence.

Circle No. 52 on Reader Service Card

Paint Additives

A series of silicone-based paint additives designed for surface modification, foam control, adhesion promotion, and blocking resistance in paint, coating, and ink formulations is highlighted. Addid® 100 and 200 series products are engineered for consistent surface modification; 700 and 800 series products feature foam control properties; 500 series products are high-viscosity silicone oils for a textured surface finish; and 900 series products are adhesion promoters.

Circle No. 53 on Reader Service Card

Red Pigment

Meteor® Plus 9384 pigment, a new red buff, provides a new color space in complex inorganic color pigments. Its high infrared reflectance reportedly has heat reducing benefits for buildings using coil coated roofing and siding. The Engelhard Corp. product was developed to have 70 to 80 percent greater color strength compared to the next closest CICI with a red value.

Circle No. 54 on Reader Service Card

Reactive Diluent

Information is available on Cardolite® NC-513, a reactive diluent and flexibilizer. Cardolite Corp. reports that minimal migration levels and water resistance make this product applicable for use in high-solids and 100% solids epoxy coatings used on tanks and pipes that come in contact with potable water.

Circle No. 55 on Reader Service Card

Light Stabilizer

Clariant Corp. has released a new light stabilizer for plastics and various coatings. The ultraviolet light stabilizer is recommended for the stabilization of pigmented and unpigmented polyolefins, as well as for selected engineering resins like thermoplastic polyesters, acrylics, and styrenics. Sanduvor® PR-31 is also suited for polypropylene.

Circle No. 56 on Reader Service Card

Resin System

A new experimental weatherable resin system for ambient-cure, high-solids coatings formulations has been introduced. The new system was developed to meet the durability requirements of a polyurethane without the use of isocyanates. Dow Plastics may be contacted for more information on XUS 19044.01 developmental acrylic polymer and XUS 19024.01 developmental anhydride curing agent.

Circle No. 57 on Reader Service Card



Paints/ Coatings

Rust Prevention

Birchwood Casey has introduced Dri Touch IRP1, a rust preventative and penetrant coating for iron and steel parts which forms a protective coating that reportedly will not run off the surface or wick off into packaging materials. The product, which can be applied by dipping, brushing, or low-pressure spraying, can be applied directly over wet surfaces. The light-bodied liquid is recommended for powder metal (freshly sintered) parts.

Circle No. 58 on Reader Service Card

Protective Film

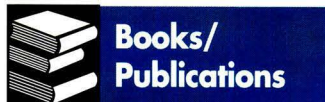
Challenge, Inc. has introduced a maintenance product for companies which spray-apply liquid coatings or need to protect equipment and fixtures from chemicals or paint overspray. The coating is water-based, 40% solids, solvent-resistant, and solvent-free, and can be detached from a surface using common tools. It can be applied using conventional air spray guns or airless spray systems.

Circle No. 59 on Reader Service Card

Bonding Primer

A DTM bonding primer includes an adhesion-promoting acrylic resin which is designed for adhesion to metal siding and other hard, slick, glossy surfaces with minimal surface preparation. This primer reportedly works on new or old, weathered substrates as well as previously painted surfaces. The Sherwin-Williams Co. reports such benefits as low VOC level, low odor, no heavy metal hazards, and easy clean up.

Circle No. 60 on Reader Service Card



Books/ Publications

PVT Data

Technomic Publishing Co., Inc. has published a compilation of pressure-volume-temperature (PVT) data for more than 180 polymers. The reference volume provides PVT data on each polymer in table and graph form. *Standard Pressure-Volume-Temperature Data for Polymers* is intended to be an aid in polymer research and engineering.

Circle No. 61 on Reader Service Card

Industry Study

Paint and Coatings 2000: Review and Forecast is a new and revised study of the industry. The report provides market data, industry trends, forecasts for each coatings segment up to the year 2000, and other key facts that impact the coatings market in the United States. This National Paint and Coatings Association study includes tables and graphs.

Circle No. 62 on Reader Service Card

Coatings Additives

Use levels and performance of antiskinning agents, defoamers, flocculating agents, fungicides, loss-of-dry inhibitors, preservatives, thickening agents, and wetting/dispersing agents are described in a new brochure. "Metal Soaps, Specialty Additives and Biocides for the Coatings Industries" also includes a table suggesting solutions to coatings problems common in solvent-based, high-solids, and waterborne coatings. This publication is available from Huls America Inc.

Circle No. 63 on Reader Service Card

Capabilities Brochure

"Cleaning Air Worldwide," a product and services brochure, provides information on a range of thermal and catalytic oxidation approaches for the elimination of carbon monoxide, nitrogen oxide, and volatile organic compounds produced in manufacturing processes. This full-color, 16-page brochure can be obtained from CSM Environmental Systems, Inc.

Circle No. 64 on Reader Service Card

Testing Instruments

The "Gardco Mini Catalog #16 of New Testing Instruments and Equipment" has been printed. This Paul N. Gardner Co., Inc. publication includes 95 pages of new product descriptions, instructions, specification references, and prices. Featured are precision wet film thickness gauges, UV curemeter, UV lamps and accessories, the Positector 6000 series, minitest gages, Elcometer 355 digital coating thickness system, T-mike wall thickness gages, and new color instruments.

Circle No. 65 on Reader Service Card

FEDERATION MEETINGS



For information on FSCT meetings, contact Federation of Societies for Coatings Technology, 492 Norristown Rd., Blue Bell, PA 19422 (610) 940-0777, FAX: (610) 940-0292.

1996

(May 3-5)—FSCT Spring Week. Held in conjunction with the Pacific Northwest Society's Annual Spring Symposium. Seminar on the 3rd and 4th. Incoming Society Officers Meeting on the 4th. Board of Directors Meeting on the 5th. Doubletree Suites Hotel, Seattle, WA.

(Aug. 15-17)—Pan-American Coatings Expo. Co-sponsored by Federation of Societies for Coatings Technology, ANAFAPYT, and Instituto Mexicano de Técnicos en Pinturas y Tintas. Sheraton Maria Isabel Hotel, Mexico City, Mexico.

(Oct. 23-25)—International Coatings Technology Conference and Expo (Formerly Annual Meeting and Paint Industries' Show). McCormick Place North, Chicago, IL.

1997

(Nov. 5-7)—International Coatings Technology Conference and Expo (Formerly Annual Meeting and Paint Industries' Show). Georgia World Congress Center, Atlanta, GA.

SPECIAL SOCIETY MEETINGS

1996

(Feb. 14-16)—23rd Annual International Waterborne, High-Solids, and Powder Coatings Symposium. Sponsored by the Southern Society and The University of Southern Mississippi (USM). New Orleans, LA. (Robson F. Storey or Shelby Thames, Co-Organizers, WBHS&PC Symposium, Dept. of Polymer Science, USM, P.O. Box 10076, Hattiesburg, MS 39406-0076).

(Mar. 20-22)—Southwestern Paint Convention. Sponsored by Houston and Dallas Societies. Del Lago Resort, Conroe, TX. (Thomas Fitzgerald, Monarch Paint Co., P.O. Box 55604, Houston, TX 77255; (713) 462-5313).

(Apr. 16)—FOCUS '96—"Driving Technology to Meet New Challenges." Sponsored by the Detroit Society. Michigan State University Management Center, Troy, MI. (Rosemary Brady, Akzo Nobel Coatings, Inc., 1845 Maxwell St., P.O. Box 7062, Troy, MI 48007-7062; (810) 637-8565).

(May 3-4)—49th Annual Spring Symposium. Sponsored by the Pacific Northwest Society. Doubletree Suites Hotel, Seattle, WA. (Richard C. Tomczak, Specialty Polymers, Inc., 8531 Juanita Dr., Kirkland, WA 98034; (206) 979-3875).

(May 8-9)—Eastern Training Conference and Show. Sponsored by the Philadelphia Society for Coatings Technology. Valley Forge Convention Center, Valley Forge, PA. (Wayne Kraus, Hercules Incorporated, Research Center, 500 Hercules Rd., Wilmington, DE 19808; (302) 995-3435. Booth reservations: Sam Firestone, S.E. Firestone Associates, Inc., 101 Surrey Rd., Melrose Park, PA 19207-2931).

(May 8-10)—Southern Society Annual Meeting. Hyatt Regency-West Shore, Tampa, FL. (Walter R. Naughton Jr., Scott Paint Corp., P.O. Box 10218, Sarasota, FL 34278-0218; (813) 371-0015).

(June 14-15)—Joint Meeting of the St. Louis and Kansas City Societies. Holiday Inn, Lake of the Ozarks, MO. (Randall Ehmer, Walsh & Associates, Inc., 500 Railroad Ave., N. Kansas City, MO 64116; (816) 842-3014).

1997

(Feb. 18-20)—Western Coatings Societies' 23rd Biennial Symposium and Show. Sponsored by the Golden Gate, Los Angeles, Pacific Northwest, and Rocky Mountain Societies. Disneyland Hotel and Convention Center, Anaheim, CA. (Bruce Cotton, Pliess-Staufner (California), Inc., P.O. Box 825, Lucerne Valley, CA 92356; (619) 248-7306; or Ron Elliott, J.R. Elliott Enterprises, Inc., 300 Thor Pl., Brea, CA 92621; (714) 529-0711).

OTHER ORGANIZATIONS

1996—North America



(Jan. 14-17)—1996 RCMA Annual Conference. Sponsored by the Roof Coatings Manufacturers Association (RCMA). Westin Caesar Park Cancun Beach & Golf Resort, Cancun, Mexico. (Joe Hobson, RCMA, 6000 Executive Blvd., Ste. 201, Rockville, MD 20852-3803).

(Jan. 17)—The Society of the Plastics Industry (SPI), Inc.'s Michigan Chapter Mini-Conference. Kellogg Center, East Lansing, MI. (SPI, 1275 K Street, N.W., Ste. 400, Washington, D.C. 20005).

(Jan. 22-24)—Composites '96. Sponsored by The Composites Manufacturing Association of the Society of Manufacturing Engineers (CMA/SME). Anaheim Marriott, Anaheim, CA. (SME Customer Service, One SME Dr., P.O. Box 930, Dearborn, MI 48121-0930).

(Jan. 23-24)—ASTM Symposium on Durability Testing of Nonmetallic Materials. Sponsored by the American Society for Testing and Materials. Crown Sterling Suites, Fort Lauderdale, FL. (Robert J. Herling, Atlas Electric Devices Co., 4114 N. Ravenswood Ave., Chicago, IL 60613).

(Jan. 23-24)—"Science and Technology of Pigment Dispersion." Vitnzau (Luzern), Switzerland. (Angelos V. Patsis, Director, Institute for Materials Science, State University of New York, New Paltz, NY 12651).

(Feb. 2-4)—"Spring Decor '96." Sponsored by the National Decorating Products Association (NDPA). The Opryland Hotel, Nashville, TN. (Teri Flotron, NDPA, 1050 N. Lindbergh Blvd., St. Louis, MO 63132-2994).

(Feb. 5-7)—SPI Composites Institute's 51st Annual Conference and Exhibition. Cincinnati Convention Center, Cincinnati, OH. (Peggy Stabach, SPI Composites Institute, 355 Lexington Ave., New York, NY 10017).

(Feb. 6-8)—"Color Pigments 1996: Trade, Technology, and Regulation in the Americas." Sponsored by the Color Pigments Manufacturers Association, Inc. (CPMA). Hotel Presidente Inter-Continental Mexico, Mexico City, Mexico. (CPMA, P.O. Box 20839, Alexandria, VA 22320-1839).

(Feb. 15-16)—"Coatings Application Training Seminar." Sponsored by Madison Chemical Industries Inc. Milton, Ont. (Madison Chemical Industries Inc., 490 McGeachie Dr., Milton, Ont. L9T 3Y5).

(Feb. 24-26)—"Interiors Decor Showcase '96." Sponsored by the National Decorating Products Association (NDPA). Toronto Congress Center, Toronto, Ontario. (Teri Flotron, NDPA, 1050 N. Lindbergh Blvd., St. Louis, MO 63132-2994).

(Feb. 25-28)—Fifth Annual International Zinc Conference. Sponsored by the American Zinc Association. Palm Springs, CA. (Cricket Forster, American Zinc Association, 1112 Sixteenth St., N.W., Ste. 240, Washington, D.C. 20036).

(Feb. 28-Mar. 1)—"Inherently Conductive Polymers: An Emerging Technology." Short course sponsored by Advanced Polymer Courses. Ocean Resort Hotel & Conference Center, Deerfield Beach, FL. (Matt Aldissi, Advanced Polymer Courses, 536 Main St., Unit #1, Falmouth, MA 02540).

(Mar. 4-6)—"Toughening of Polymers." Sponsored by The American Chemical Society: Division of Polymeric Materials: Science and Engineering. Hilton Head, SC. (Angelos V. Patsis, Director, Institute for Materials Science, State University of New York, New Paltz, NY 12651).

(Mar. 11-13)—Ninth Annual Industrial Lead Paint Abatement and Removal Conference. Sponsored by Steel Structures Painting Council (SSPC). Pittsburgh Hilton and Towers, Pittsburgh, PA. (Dee Boyle, SSPC, 40 24th St., Pittsburgh, PA 15222).

(Mar. 11-14)—24th Annual Symposium and Equipment Exhibition. Sponsored by American Vacuum Society (AVS). Orlando, FL. (Margaret Stringer, AVS, 120 Wall St., 32nd Floor, New York, NY 10005).

(Mar. 11-15)—27th Annual Spring Program in Polymers. Sponsored by the Institute of Materials Science. The Grosvenor Resort Hotel-Disney World Village, Lake Buena Vista, FL. (Angelos V. Patsis, Institute of Materials Science, State University of New York, New Paltz, NY 12651).

(Mar. 13-14)—17th Annual Equipment Exhibition. Sponsored by American Vacuum Society (AVS). San Jose, CA. (Margaret Stringer, AVS, 120 Wall St., 32nd Floor, New York, NY 10005).

(Mar. 18-22)—"The Basic Composition of Coatings." Short Course sponsored by University of Missouri-Rolla (UMR), Rolla, MO. (UMR Coatings Institute, 1870 Miner Circle, Rolla, MO 65409-0010).

(Mar. 20-22)—"Electrocoat '96." Conference sponsored by Products Finishing. Clarion Plaza Hotel, Orlando, FL. (Cindy Goodridge, Gardner Management Services, 6600 Clough Pike, Cincinnati, OH 45244).

SYNTHOPOL ACRYLIC RESINS



In addition to our versatile types **SYNTHALAT A[®]**, **SYNTHALAN[®]**, **LIOPTAL A[®]** and **SYNTHOLUX[®]** we can also supply every other kind of binders individually designed to your requirements by our R&D department.

To obtain more detail of our product ranges, have you considered an informal talk with our chemists or our sales team?

Our range of products comprises of



Polyester resins
Dispersions
Alkyd resins

and also the **specialities** developed for you.

Under **Tel. ++49-4161-7071-44**

we are at your disposal for any further information and for your catalog requests.

Meet SYNTHOPOL and its philosophy



Always at your disposal

Synthopol Chemie Dr. rer. pol. Koch GmbH & Co. KG
Alter Postweg 35 · 21614 Buxtehude · GERMANY
☎: ++49-4161/7071-0 · Fax: ++49-4161/80130

(Mar. 25-28)—ARMA Spring Committee Meetings. Sponsored by Asphalt Roofing Manufacturers Association (ARMA). Atlanta, GA. (ARMA, 6000 Executive Blvd., Ste. 201, Rockville, MD 20852-3803).

(Apr. 13-14)—"Eastern Education & Trade Fair." Sponsored by the National Decorating Products Association (NDPA). Sturbridge Host Hotel, Sturbridge, MA. (Teri Flotron, NDPA, 1050 N. Lindbergh Blvd., St. Louis, MO 63132-2994).

(Apr. 16-18)—1996 Annual Forum. Sponsored by The Conference on Safe Transportation of Hazardous Articles (COSTHA). Atlanta Airport Hilton and Towers, Atlanta, GA. (COSTHA, 9053 Shady Grove Ct., Gaithersburg, MD 20877).

(Apr. 16-19)—"Introduction to Coatings Science." Short course sponsored by The University of Southern Mississippi (USM), Hattiesburg, MS. (Shelby F. Thames, Director, USM, Box 10037, Hattiesburg, MS 39406).

(Apr. 22-23)—"Practical Chemistry of Polyurethanes and Diisocyanates." Seminar sponsored by Technomic Publishing Co., Program Division. Sheraton Colony Square Hotel, Atlanta, GA. (Program Division, Technomic Publishing Co., Inc., 851 New Holland Ave., Box 3535, Lancaster, PA 17604).

(Apr. 22-26)—"Introduction to Paint Formulation." Short Course sponsored by University of Missouri-Rolla (UMR), Rolla, MO. (UMR Coatings Institute, 1870 Miner Circle, Rolla, MO 65409-0010).

(Apr. 24-25)—"Advances in Polyurethane Foam Formulation." Seminar sponsored by Technomic Publishing Co., Program Division. Sheraton Colony Square Hotel, Atlanta, GA. (Program Division, Technomic Publishing Co., Inc., 851 New Holland Ave., Box 3535, Lancaster, PA 17604).

(Apr. 28-May 1)—American Oil Chemists' Society (AOCS) Meeting. Indiana Convention Center and RCA Dome, Indianapolis, IN. (AOCS Education/Meetings Dept., P.O. Box 3489, Champaign, IL 61826-3489).

(Apr. 28-May 2)—Radtech North America. Exhibition and Conference sponsored by RadTech International North America. Nashville, TN. (Christine Dionne, RadTech International North America, 60 Revere Dr., Ste. 500, Northbrook, IL 60062).

(Apr. 30-May 1)—"Thermoplastic Foams." Seminar sponsored by Technomic Publishing Co., Program Division. Sheraton Colony Square Hotel, Atlanta, GA. (Program Division, Technomic Publishing Co., Inc., 851 New Holland Ave., Box 3535, Lancaster, PA 17604).

(May 1-2)—"Paint Volatile Organic Compounds (VOC)." Training course sponsored by the American Society for Testing and Materials (ASTM). Cleveland, OH. (Tina Falkenstein, ASTM, 100 Barr Harbor Dr., West Conshohocken, PA 19428-2959).

(May 5-7)—1996 ISCC Annual Meeting and Joint Symposium. Sponsored by the Inter-Society Color Council. Doubletree Guest Suites Resort at Walt Disney World Village, Lake Buena Vista, FL. (Robert T. Marcus, ISCC Publicity Chairman, c/o Pantone, Inc., 590 Commerce Blvd., Carlstadt, NJ 07072-3098).

(May 6-10)—"Dispersion of Pigments and Resins in Fluid Media." Short course sponsored by Kent State University, Kent, OH. (Carl J. Knauss, Director, Professional Development Institute, P.O. Box 1792, Kent, OH 44240).

(May 8-9)—ARMA Executive Committee Meeting and Board of Directors Meeting. Sponsored by Asphalt Roofing Manufacturers Association (ARMA). Baltimore, MD. (ARMA, 6000 Executive Blvd., Ste. 201, Rockville, MD 20852-3803).

(May 8-9)—"Surgical Tissue Adhesives." Seminar sponsored by Technomic Publishing Co., Program Division. Westin Hotel, San Francisco, CA. (Program Division, Technomic Publishing Co., Inc., 851 New Holland Ave., Box 3535, Lancaster, PA 17604).

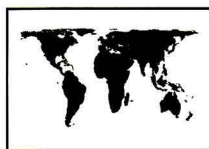
(May 12-17)—42nd Annual Technical Meeting and Exposition of the Institute of Environmental Sciences. Radisson Twin Towers Hotel, Orlando, FL. (Institute of Environmental Sciences, 940 E. Northwest Hwy., Mt. Prospect, IL 60056).

(May 13-17)—"Physical Testing of Paints and Coatings." Short course sponsored by University of Missouri-Rolla (UMR), Rolla, MO. (UMR Coatings Institute, 1870 Miner Circle, Rolla, MO 65409-0010).

1996—Africa



(Mar. 25-29)—"Coatings for Africa '96." Sponsored by Oil & Colour Chemist's Association (OCCA). Cape Town Civic Centre, Cape Town, South Africa. (Chris Pacey-Day, SURFEX Ltd., Priory House, 967 Harrow Rd., Wembley HA0 2SF, England).



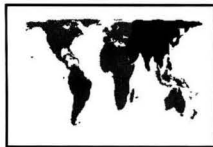
1996—Asia

(Mar. 12-13)—Middle East Coatings Show. Exhibition and conference sponsored by FMJ International. Hyatt Regency Hotel, Dubai, United Arab Emirates. (Mike Tarrant, FMJ International Publications Ltd., Queensway House, 2 Queensway, Redhill, Surrey RH1 1QS).

(May 28-31)—China Coat. Exhibition sponsored by Sinostar International Ltd. Guangzhou, China. (Sinostar International Ltd., 1001 Shiu Lam Bldg., 23 Luard Rd., Wanchai, Hong Kong).

(June 5-6)—Asia-Pacific Coatings Show. Exhibition and Conference sponsored by FMJ International. Hong Kong Convention and Exhibition Centre, Hong Kong. (Mike Tarrant, FMJ International Publications Ltd., Queensway House, 2 Queensway, Redhill, Surrey RH1 1QS, England).

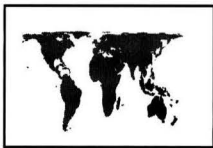
(June 5-8)—The International Exposition for Coatings & Paints. Sponsored by Chinese Chemical Society (CCS) and Chemical Industry and Engineering Society of China (CIESC). Shanghai Exhibition Center, Shanghai, P.R. China. (Worldwide Exhibitions Service Co., Ltd. (WES), 4/F, Bldg. 2, 1486 Nanjing Rd. (W), Shanghai 200040, P.R. China).



1996—Australia

(Jan. 18-25)—International Schools and Conference on X-ray Analytical Methods—AXAA '96. Sponsored by the Australian X-ray Analytical Association (AXAA), Inc. Sydney, Australia. (The Secretariat, AXAA '96, GPO Box 128, Sydney, NSW 2001, Australia).

(Aug. 11-16)—Third International Hydrocolloids Conference. Cosponsored by the CSIRO and the Cooperative Research Centre for Industrial Plant Biopolymers. Landmark Park Royal Hotel, Potts Point, Sydney, Australia. (Gail Hawke, Third International Hydrocolloids Conference, P.O. Box N399, Grosvenor Place, Sydney, NSW 2000, Australia).



1996—Europe

(Jan. 29-31)—"Silicones in Coatings." Sponsored by The Paint Research Association (PRA). Hotel Palace, Brussels, Belgium. (Dip Dasgupta, PRA, 8 Waldegrave Rd., Teddington, Middlesex TW11 8LD, England).

(Mar. 18-22)—"Globec '96." Sponsored by Maack Business Services. Davos, Switzerland. (Maack Business Services, Moosacherstrasse 14, CH-8804 AU/Zürich, Switzerland).

(Mar. 26-28)—"Pressure Sensitive Adhesives: Materials, Testing, and Applications." Seminar sponsored by Technomic Publishing AG. Hotel International, Basel, Switzerland. (Program Division, Technomic Publishing Co., Inc., 851 New Holland Ave., Box 3535, Lancaster, PA 17604).

(Mar. 27-28)—"Practical Chemistry of Polyurethanes and Diisocyanates." Seminar sponsored by Technomic Publishing AG. Hotel International, Basel, Switzerland. (Program Division, Technomic Publishing Co., Inc., 851 New Holland Ave., Box 3535, Lancaster, PA 17604).

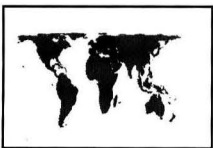
(Apr. 11-12)—"Polymer Structure and Practical Properties." Seminar sponsored by Technomic Publishing AG. Hotel International, Basel, Switzerland. (Program Division, Technomic Publishing Co., Inc., 851 New Holland Ave., Box 3535, Lancaster, PA 17604).

(May 7-8)—"Hydrogels: Specialty Plastics for Biomedical and Pharmaceutical Applications." Seminar sponsored by Technomic Publishing AG. Basel Hilton Hotel, Basel, Switzerland. (Program Division, Technomic Publishing Co., Inc., 851 New Holland Ave., Box 3535, Lancaster, PA 17604).

(May 8-10)—"Medical Packaging Technology and Validation of the Packaging Process." Seminar sponsored by Technomic Publishing AG. Zurich Hilton Hotel, Zurich, Switzerland. (Program Division, Technomic Publishing Co., Inc., 851 New Holland Ave., Box 3535, Lancaster, PA 17604).

(May 21-22)—"Thermoforming: Process and Design." Seminar sponsored by Technomic Publishing AG. Hotel International, Basel, Switzerland. (Program Division, Technomic Publishing Co., Inc., 851 New Holland Ave., Box 3535, Lancaster, PA 17604).

(May 23-24)—"Thermoplastic Foams." Seminar sponsored by Technomic Publishing AG. Hotel International, Basel, Switzerland. (Program Division,



Technomic Publishing Co., Inc., 851 New Holland Ave., Box 3535, Lancaster, PA 17604).

(May 30-31)—"Nanomaterials: Design, Preparation, Characterization, and Applications." Seminar sponsored by Technomic Publishing AG. Hotel International, Basel, Switzerland. (Program Division, Technomic Publishing Co., Inc., 851 New Holland Ave., Box 3535, Lancaster, PA 17604).

(June 3-5)—"Styrenics '96." Sponsored by Maack Business Services. Zürich, Switzerland. (Maack Business Services, Moosacherstrasse 14, CH-8804 AU/Zürich, Switzerland).

(June 4-5)—"Sealing Technology: Materials, Design, and Applications." Seminar sponsored by Technomic Publishing AG. Hotel International, Basel, Switzerland. (Program Division, Technomic Publishing Co., Inc., 851 New Holland Ave., Box 3535, Lancaster, PA 17604).

(June 10-14)—FATIPEC. Conference sponsored by the Belgian Association of Coatings Technicians. Brussels, Belgium. (Michael Kuhn, Vincentz Verlag, Postfach 6247, 30062 Hannover, Germany).

(June 11-13)—European Coatings Show '96. Exhibition and conference sponsored by Vincentz Verlag. Brussels, Belgium. (Michael Kuhn, Vincentz Verlag, Postfach 6247, 30062 Hannover, Germany).

(June 10-13)—"Science and Technology of Pigment Dispersion." Vitznau (Luzern), Switzerland. (Angelos V. Patsis, Director, Institute for Materials Science, State University of New York, New Paltz, NY 12561).

(June 17-19)—18th International Conference in Stabilization and Controlled Degradation of Polymers. Luzern, Switzerland. (Angelos V. Patsis, Director, Institute for Materials Science, State University of New York, New Paltz, NY 12561).

(July 1-3)—Ninth International Symposium on Polymer Analysis and Characterization. Keeble College, Oxford University, United Kingdom. (John Dawkins, Dept. of chemistry, Loughborough University of Technology, Loughborough, Leicestershire, LE11 3TU, United Kingdom).

Advertisers' Index

BASF Corp.	95
Brookfield Engineering	99
Degussa Corp.	31
DTW Associates, Inc.	99
DuPont Ti-Pure	Cover 2
Federation of Societies for Coatings Technology	1, 32, 70
Flex Products	96
The Haartz Corp.	10
Hanley Paints	96
Hüls America Inc.	Cover 3,2
ICI Polyurethanes	5
Kerr-McGee Chemical Corp.	8
Shamrock Technologies	Cover 4
Synthopol Chemie	103
Western Equipment Co.	9,96

NOTE: The Advertisers' Index is published for the convenience of our readers and as an additional service to our advertisers. The publisher assumes no liability for errors or omissions.

From the confessions of Dick Stewart:

F I woke up this morning feeling a bit down. It was my birthday—a year older!! I shaved, showered, and knew that when I got downstairs my wife would greet me with a big kiss and say, "Happy Birthday, dear."

I went downstairs. She didn't say a word. Obviously she had forgotten. Well, my kids won't forget. Pretty soon they came down screaming, "Where's my lunch?" "Hurry, I'll be late for school."

Feeling even more depressed, I left for the office. My secretary greeted me with a cup of hot coffee and a "Happy Birthday, boss." This made me feel a lot better. By the time lunchtime came around, I suggested we should go out for a bite to eat, since there wasn't much going on at the office anyway.

When we were seated in the car she said, "Why don't we go for a drive in the country instead of eating in the usual place?" Since it was my birthday, I thought it was a good idea. So we went for a nice drive, had a nice lunch and a couple of drinks.

On the way back to the office my secretary said, "Why don't we go to my place and I'll pour you another drink?" Since it was my birthday after all, and since there wasn't much going on at the office, I agreed. So, we drove to her place.

After we had a couple of drinks my secretary said, "Why don't you sit and relax while I go into the bedroom and slip into something more comfortable." Then she left the room.

After a few minutes she returned carrying a big birthday cake, followed by my wife and three kids. There I sat with nothing on but my socks.

Dick writes from the doghouse:

At our society's golf tournament this year, Yvon Poitras (our Society Rep) was seen by the secretary of the club striking the ball from two feet in front of the markers on the first tee.

The secretary came storming out of the club house yelling at Yvon. "You can't do that! You are supposed to tee off in line with the markers or behind them. You are disqualified!"

"Get back in the club where you belong," Yvon shouted back. "This is my third shot."

* * * * *

Anonymous from Milwaukee sent me a clip from the *Mequon Courier*:

A police officer saw a car accelerate rapidly from the intersection of Mequon Road and Interstate 43 when the light turned green and then made a sharp turn on San Marino Drive at 7:43 a.m. on February 19. The officer stopped the car and found a large black dog in the driver's seat and a 27-year-old Milwaukee man in the passenger's seat. The officer asked the man if he knew where he was, where he had been, and who was driving. The man said he didn't know who was driving, where he was, or where he had been. There was no one else in the car but the man and the dog. The man was subsequently arrested for drunk driving, driving after his license was revoked, and altering a registration sticker.

A clip from *Reader's Digest* fell out of one of my files that may have been forwarded by Bob Athey. If it wasn't Bob, my apologies to the kind person whoever it was.

A wealthy man lay critically ill. "There's only one thing that will save you," his doctor said. "A brain transplant. It's experimental and very expensive."

"Money is no object," said the man. "Can you get a brain?"

"There are three available. The first was from a college professor, but it'll cost you \$10,000."

"Don't worry, I can pay. What about the second?"

"It was from a rocket scientist. It'll cost \$100,000."

"I have the money. What about the third?"

"The third was from a Washington bureaucrat. It will set you back \$500,000."

"Why so much for the bureaucrat's brain?"

"Never been used."

However, I do not know that it was Bob who asked:

Do Chemophobics use perfume? . . . Bob also quoted Malcolm Refrew who was quoted in the September 11 *C&EN News*, which a few of you might have missed, with:

—Why are there interstate highways in Hawaii?

—If nothing sticks to Teflon, how do they make Teflon stick to the pan?

—What does Geronimo yell when he parachutes out of a plane?

There were a few others not quite as hysterically funny.

The optimist—This is the best of all possible worlds.

The pessimist—is afraid this is true.

—Milt Glaser

And after all his many years, what has Dave Platt learned?:

—I've learned that I shouldn't go grocery shopping when hungry.

—I've learned never to praise my mother's cooking when eating something fixed by my wife.

—I've learned that nothing really happens when you tear off those "do not remove" tags from your pillow.

—I've learned that if you talk to your friends more than to your wife about problems in your marriage, you're really in serious trouble.

—I've learned that even when you schedule an appointment with your doctor at 8 a.m., you'll have to wait an hour.

* * * * *

Causes of death listed on old death certificates:

1. Died suddenly, nothing seriously wrong.

2. Went to bed feeling well, woke up dead.

3. Worn out.

4. Don't know, never was fatally ill before.

5. Don't know, died without the aid of a physician.

6. Blow to the head with an axe—contributory cause, another man's wife.

—*Augusta Genealogical Society Newsletter*, submitted by Robert F. Link.

—Herb Hillman, *Humbug's Nest*, P.O. Box 135, Whitingham, VT 05361.

Our Commitment Shines Through.

Hüls America's new IPDI (isophorone diisocyanate) plant in Mobile, Alabama, is a state-of-the-art manufacturing facility with a capacity of **over 20 million pounds per year**, to meet market demands well into the 21st century.

Due to its unique properties, **VESTANAT® IPDI has long been a preferred raw material** for the manufacture of light-stable and weather-resistant polyurethanes by imparting resistance to the environmental effects of UV light, humidity, acid rain, and heat while providing good mechanical properties.

The Hüls America Inc. plant produces the only isophorone derivatives in the U.S. that are **fully integrated back to the basic raw materials**. This gives us the ability to control quality at every stage and gives our customers confidence in our ability to deliver, day in and day out.

For more information, contact:

HÜLS AMERICA INC.

Coatings Raw Materials

220 Davidson Ave.

Somerset, NJ 08873

Phone: (908) 560-6800

Toll-Free (800) 631-5275

(800) 352-4920 (NJ)

In Canada: (905) 451-3810

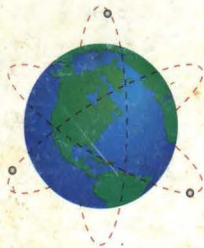


Mobile, Al

IPDI

ISOPHORONE CHEMISTRY

hüls



Worldclass Experience, Quality & Service

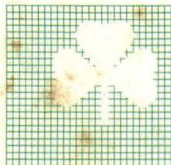
For Wax and PTFE powders, dispersions, or emulsions, nobody beats Shamrock's record of innovation, service and leadership.

We originated the use of stir-in wax and PTFE for abrasion resistance. Today, as a **worldwide** provider of more than 250 products, we are able to **ship** most orders the day they are received.

Shamrock is the world's only fully integrated producer of micronized PTFE for inks and coatings. We are the only one who actually certifies total **quality**, because we control every facet of production—from raw material to finished product—in house. And we are the world's largest electron beam processor of PTFE.

For fifty years, Shamrock Technologies has provided industry with natural and synthetic raw materials. For the last thirty years, we have offered **real** solutions to the **real-world** challenges ink and coating formulators face: slip, abrasion, mar, hydrophobicity, matting, wet scuff, non-skid and lower slide angle.

No one can match our quality, service and worldwide experience. Depend on Shamrock for every application challenge. Call us today.



Shamrock Technologies, Inc.
Foot of Pacific Street
Newark, New Jersey 07114
Phone: (201) 242-2999
Telefax: (201) 242-8074

Shamrock

SETTING THE STANDARD... SINCE 1945

