

## **2000 Conference Presentations**

**Aliphatic Polyurea Coatings Based on Polyaspartic Ester Resin**  
Edward Squiller, Bayer Corporation

**Performance Enhancement of Aromatic Polyurea Spray Coatings by the Use of Conventional Primer Systems**  
Al Perez, Huntsman Corporation; and Calvin Shen, Huntsman Polyurethanes

**In-Field Quality Control Testing for Polyurea Spray Elastomer Systems**  
Craig Kowalski, In-Spec Instruments LLC

**New Reactive Chain Extenders and MDI Prepolymers for Tailor-Made Polyurea Elastomers**  
Matthias Sikorski, Nitroil Performance Chemicals; and Holger Cordelair, INPUT

**Primer Systems for Concrete and Steel: Polyurea Spray Elastomers in Deck Coating Applications**  
Art Weiss, VersaFlex, Inc.

**New Incheon International Airport**  
This is the largest airport project in the world and this presentation will examine the steps utilized in using polyurea technology.  
K.M. Moon, Kangnam Ltd.

**Importance of Properly Training the Applicator**  
PCE & Gusmer

**Direct Impingement Mixing for the Spray of Polyurea**  
Gusmer

**Static-Mixing Laboratory Techniques For Aliphatic Polyurea Coatings**  
David House, Dejan Iijevski, Ray Scott and John Leon

## **2001 Conference Presentations**

**Earliest & Largest Applications of POLYUREA**  
Paul Grubs  
More than 30 million square feet has been coated without any failures. The finished product can be used for ground support of tanks, helicopters, trucks and aircraft landing strips. Learn about using polyurea for a non-slip coating applied to an epoxy laminate.

**Effects of Secondary Diamine Content in Spray POLYUREA Coating Systems**  
Ray Scott  
This presentation outlines the effect of secondary diamine (Unilink 4200) content on both the physical properties, and the spray performance of spray polyurea coating

systems. It also highlights the cost contribution of the secondary diamine compared to the total project costs.

#### **Equipment & Organization for Application of POLYUREA Elastomer Systems**

**Dudley Primeaux II and John P. Courier**

What is the equipment needed to have a successful polyurea application? Gain insight on application equipment, typical trailer setup, accessory equipment and organization.

#### **Factors Affecting Performance of POLYUREA in the Field**

**Dudley Primeaux II and Lee Bower**

Raw material suppliers and manufacturers typically include typical performance properties on their data sheets. How these values are affected on the jobsite and conditions to watch for will be presented.

#### **Health & Safety Presentation**

**Greg Livingston and Barbara Cummings**

Safety is everybody's business. What are the risks associated with polyurea spray applications? This talk will include isocyanate based chemicals, amine based chemicals and personal protective gear. The presentation will also give the basic equipment necessary for crew safety according to OSHA.

#### **Low Cost Housing-Poverty Eradication**

**Grahame Wease**

Is it possible that polyurea can play a role in saving the world? The Kalayaan project will utilize the unique POLYPANEL (Patent Pending) Low Cost building system, a specially formulated rigid SPI Polyurea and Polyurethane Foam Sandwich panel. The use of this material will provide the core material for the construction of 30,000 low-cost home units for the Filipino poor. The project will be the world's largest use of Polyurea in a single project this century.

#### **Polyurea Industry Market Review**

**Ken Bowman, PDA Executive Director**

This presentation will discuss the results of a PDA survey on the market for polyurea. It will touch on size and scope of the Polyurea market, including volume, raw materials sold and industry employment potential and other pertinent information.

#### **POLYUREA & Metal Coating**

**Art Weiss**

The basic metal coating process will be reviewed, including field preparation and coating installation. Listen to cautions about preparation, as well as lessons learned, and hear the most current information on correctly applying polyurea to metal coating in the field.

#### **POLYUREA Coating on Highly Reinforced Concrete Structures**

**Greg Livingston**

What are the difficulties associated with coating on highly reinforced, mass cast concrete structures? How to deal with "bugholes", "gouges" and other surface imperfections. A primer on primers.

### **POLYUREA Joint Sealants**

**Charles Idowu and Rob Loomis**

Some of the most notable advantages of polyurea sealants will be presented. It will include uniform cure time under extreme conditions of temperature and humidity, zero volatile organic compounds, no catalysts, high movement capabilities, and good color retention. Polyurea sealant properties are compared to more commonly known technologies.

### **POLYUREA Manhole Rehabilitation**

**Greg Livingston**

Learn how polyurea manhole rehabilitation can be tailored to fit different customers needs. Benefits to customers and applicators can be maximized if the correct application is found.

### **POLYUREA Systems for Casting & Adhesives**

**Dr. Sven Uwe Keimling, Holger Cordelair and Richard Milian**

The influence of secondary amines and blocked amines formulated as DAX 10 and DAX 12 on polyurea castings and adhesives and other applications.

### **Recent Developments-POLYUREA Caulks**

**Jerry Reddinger and Kenneth Hillman**

This talk will discuss and highlight certain key relationships that can ultimately evolve based upon prepolymer, polyetheramine, chain extender and additive selection.

### **Safe Control of Microbiological Organisms**

**Lee Hanson, David McRobbie and Stephen Falder**

A revolutionary technology is being used to sanitize and protect areas from bacteria, fungi and mold growth with a safe and very effective biocide.

### **Transition from Single Component to Plural Component Equipment**

**Kris Gilbreath**

As the polyurea industry grows we begin to see a new market develop in which heavy industry, a long-time single component applications industry, desires to adapt their manufacturing processes to plural component, fast-set, high-performance Polyureas.

### **Unique POLYUREA Adhesive Systems Offer New Opportunities**

**Al Perez**

This study will examine the concept of two-component polyurea adhesives and will serve to offer comparative data of such products versus commercially available adhesives that are comprised of different chemistries.

## **2002 Conference Presentations**

### **The Influence of Processing Pressure Differential and Mixing Module Configuration on Volumetric Ratio and Physical Properties**

**Robert M. Loomis, Willamette Valley Company**

**Physical properties for a fast-set spray polyurea were measured under various processing pressure and temperature conditions. Low and high-pressure differential conditions were created to study how the volumetric ratio and physical properties were influenced under these conditions.**

#### **Automatic Internal Lining System**

**Takaharu Izumo and Takao Kakiba Nippon Paint Co., Ltd.**

**A sewage system's shield is conventionally applied with a secondary concrete coverage. A new technique called the "internal lining method" that replaces the second concrete covering with an anti-corrosion lining segment is attracting interest and its application is increasing.**

#### **Unique Application Profile —Polyurea Benefits Airports**

**John Pardi, Gusmer Corporation**

**At the Newark Airport polyurea was used for markings of terminal gates, cross walks and work areas because of its longevity and faster drying time. This presentation will highlight some of the R&D design techniques to achieve the accurate and tight spray patterns, methods of application and special equipment used.**

#### **The Massachusetts Bay Transitway Tunnels Waterproofed with a Balanced Primer and Polyurea System.**

**Gregory J. Livingston, Polyurea Coating Systems Inc.**

**This tunnel will form the critical underwater link on Boston's new Silver line subway link. The transit way tunnels were constructed of high density concrete. To fill the voids the coatings contractor used a cement-based system that was troweled on the walls and a low viscosity 100% solids penetrating primer was then applied. The unique property of this primer is it is chemically balanced with the polyurea topcoat. Due to the balanced formulations, the primer chemically bonds to the polyurea.**

#### **The European Market**

**Dr. Umile Gianluca, Chemval SRL**

**This will be an overview of the European market of coatings in general and which target market trend for polyurea coatings can be reached in the next years. He will also describe some particular applications of polyurea in Italy.**

#### **Today's Application of Polyurea in Europe**

**Kai Klockemann, Nitroil Performance Chemicals**

**Polyurea took a slightly different approach in Europe. Today many niche applications are dominant where a high heat resistance or chemicals resistance are necessary, e.g. in industrial combustion systems or valves, or high physical impact, e.g. as a bed for rail-tracks.**

#### **The Role of Independent Testing Labs for Development, Analysis and Product Qualifications.**

**Al Perez, TRI/Austin**

**One of the most rapid, cost-effective resources available to industry is the independent testing laboratory. These organizations function to provide expertise and consultation in areas such as performance testing, certifications, formulation**

analysis, reliability engineering and novel test development. This presentation will serve to highlight some of the benefits and services they offer.

#### **The Softer Side of Polyurea Elastomer Coatings**

**Jay A. Johnston and Samantha Smith, Huntsman Polyurethanes**

Spray polyurea elastomer systems are rapid curing coatings that can be applied in adverse climates where other coating types may immediately fail. This presentation will discuss the preparation of several low hardness polyurea coatings.

#### **Silicone Modified Polyurea: The Next Evolution in Polyureas**

**Stuart B. Smith, Engineered Polymers, Inc.**

Silicone Modified Polymers show better chemical, water and UV resistance in aliphatic and aromatic formulations than standard polyureas.

#### **Polyaspartics: A New Generation of High-Performance Polyurea Coatings**

**Carl Angeloff, P.E., Edward Squiller, Ph.D., Kurt Best, Associate Scientist**

Describes the development of a new class of polyurea polymer system. Describes the use of polyaspartic ester compounds, which are secondary aliphatic diamines, in combination with aliphatic polyisocyanates to form aliphatic polyurea coatings. Polyaspartic ester-based polyurea topcoats are non-yellowing, exhibit good outdoor weathering and long potlife. The moderately fast reactivity, combined with the relatively low viscosity of the polyaspartic ester compounds allows for a broader range of application in two-component coatings.

#### **The Use of UV Stabilizers in Aliphatic Polyurea Coatings**

**David W. House, Consultum, Ray V. Scott, PolyTechnologies and John F. Leon, UOP, LLC**

End-users are willing to pay a premium for aliphatic polyurea coatings because of the need for clear, colorless materials in some applications and for color stability and color reproducibility in other applications. However, color stability does not guarantee physical property stability. We have found that the retention of the physical properties of the polyurea coatings can be dramatically extended when certain stabilizer packages are added to the formulation.

## **2003 Conference Presentations**

#### **Polyurea Around the World**

**Dr. Gianluca Umile, Elastopol; Toji Nagai, Active In Co. Ltd.; and Antony Hurst, Huntsman Corp.**

Curious about how polyurea is being used abroad? What is the state of this industry outside of the United States? Join us for this exciting opportunity to hear presentations from representatives from five countries who will share their successes, lessons learned and thoughts about the future of this evolving industry.

#### **Health & Safety, Industrial Hygiene**

**Ed Conrad, Bayer Corp.**

### **A Specifier's Eye Toward Specifying Coatings**

**Jon B. Ardahl, Black & Veatch**

How well are your protection systems doing their job? This session will address evaluation processes of various protection systems and their manufacturers. Specification criteria will be discussed; looking at service conditions, establishing minimum criteria and manufacturer responsibilities. Stages and types of evaluations and compliance also will be presented regarding potential material manufacturers and contractor submittals.

### **Cost Effective Chemical Removal of Corrosion Inducing Surface Salts**

**Hap Peters, CHLOR Rid**

It is well documented that the single largest contributor to premature coating failures is non-visible surface contaminating soluble salts, which go undetected prior to the coating application. Essentially, surface preparation standards are generally not compatible with applied coating systems. Improved methods of detection and monitoring of surface soluble salts and an innovative surface treatment step using environmentally friendly, cost-effective chemicals have proven to achieve salt limit specifications.

### **Surface Preparation for Successful Coating of Concrete**

**Robert Johnson, The Sherwin Williams Company**

This presentation will provide information on the requirements and methods of surface preparation of concrete for the successful application of plural component hot spray polyurea systems as an aide to owners, design professionals, specifiers and contractors. All concrete surfaces to receive polyurea must be structurally sound, clean, dry and have a surface profile to assure long-term successful performance of applied polyurea system.

### **Specifications and Polyurea Elastomeric Coating/Lining Systems**

**Dudley Primeaux, Primeaux Associates**

Before a contractor/applicator can start the necessary work of applying a polyurea elastomeric coating/lining system, some guidance or direction must be provided for the project. Equally important, this information must be correct and understood, as well as applicable to the current scope of work. While it seems that much of the information being provided in the polyurea industry is verbal or short written direction, this is not the norm for the general coating/lining industry. Each coating/lining application project is accompanied by a detailed coating/lining specification. A coating/lining specification is a written, legal document that details mandatory technical requirements of application work involving the use of these protective coating/lining systems, including polyurea systems. This document is crucial to the success of that coating/lining work. This paper will take a look at the major components of a coating/lining specification, show how polyurea technology fits and why it is important to follow that specification.

### **The Positive Effects of Certain Aromatic Diamines on the Sprayability and Processing of Polyureas**

**John Leon, Ray Scott, Dudley Primeaux, Lee Hanson, The Hanson Group LLC  
Keith Wilkerson, Aceto Corporation**

Certain aromatic diamines improve the spray pattern, surface quality, substrate adhesion, polymer properties and overall equipment processing when used as a formulated processing aid. This paper explores the effect of varying the level of certain aromatic diamines on the physical polymer properties, the cured coating, and the processability, of spray polyurea coatings.

**Time is of the Essence-Rapid Deployment on Bridges in CTDot**

**Bernard R. Appleman, PhD  
and Eric Kline, KTA-TATOR, INC.**

The presentation will feature projects painted using this novel approach during the 2003 construction season.

**New Secondary Amine Chain Extenders For Aliphatic Polyurea Materials**

**Mark Posey, Kenneth Hillman & Howard Klein, Huntsman Corp.**

Huntsman has recently commercialized a new secondary cycloaliphatic chain extender, JEFFLINK™ 754. Spray data has been generated comparing this new product to the existing chain extender. Similar physical properties can be obtained with each product and the slight reformulation needed to achieve equivalent coatings will be discussed.

**Polyurea Flooring Application Profiles - Specification to Coating**

**Murph Mahaffey, Glas-Craft, Inc.**

Two polyurea flooring jobs will be profiled. One is an a training center for handicapped workers, and the other is a lab-testing facility that has two rooms - a refrigerated room and an ambient-temperature room. Presentation will include material selection process (specifying Polyurea), surface preparation work, application of materials and finishing methods (termination edges of coatings). Data on thickness and job requirements will be included.

**New In-roads into Weather Stable Spray Elastomers**

**Dave Zielinski, Bayer Polymers LLC; John Perry, Bayer Polymers LLC and James Rosthauser, Spray & Reinforcement Group**

We will review the chemistry, formulation approaches, application equipment and physical properties of traditional systems and compare these to the new composite system. Special emphasis will be on the topcoat, which consists of polyesters, polyaspartic esters and adducts based on hexamethylene diisocyanate.

## **2004 Conference Presentations**

**Use of Polyurea by the U. S. Navy**

**E. Dail Thomas (insert picture)**

**Naval Sea Systems Command (NAVSEA)**

The U. S. Navy has numerous unique and challenging environments where corrosion control is essential in order to meet Fleet readiness requirements. NAVSEA manages the development and application of technologies for shipboard preservation. Although historically an epoxy market, the Navy has been intrigued and watchful of the developing family of Isocyanate coating systems. This presentation will discuss the performance requirements, laboratory and field tests, and Qualified Products Lists (QPL) used to introduce and qualify coatings systems. Examples of recent experiences with Polyureas will be discussed.

### **Polyurea, Polyurethanes and PUR /Polyurea – What’s the Difference?**

**Dudley J. Primeaux II, Primeaux Associates, LLC**

The polyurea elastomer coating and lining technology has made very significant inroads since its introduction in the late 1980s. However, over the years there has been a melding of polyurea and other coating technologies. There is now a class of polyurea systems that have different processing characteristics and some feel that these are not polyurea systems at all. This presentation will take a look at the polyurea technology and formulation basics. A comparison to what a polyurethane and polyurethane/polyurea system is and performance issues will also be explored.

### **SSPC Aliphatic Polyurea Specification – The Need for a Joint Industry Standard**

**Michael J. Masciale, SSPC: The Society for Protective Coatings**

In the past, SSPC has issued polyurethane weatherable topcoat specifications in compliance with an industry need of identifying benchmarks of quality and satisfactory performance. More recent polyurea technology advances have allowed for the development of value-added topcoats that are proving to be valuable alternatives to many polyurethane applications. The development of an SSPC specification for a weatherable polyurea topcoat will be discussed with intentions of providing a standard that will be acceptable throughout the industry.

### **Lifetime of Corrosion Protection in a Single Coat**

**Robert Kogler, Federal Highway Administration**

This presentation will introduce the new strategic direction of the Federal Highway Administration as it relates to long-term durability of highway bridges. Corrosion protection has long been a focus issue of highway agencies in terms of maintenance; however, recent emphasis has shifted toward optimizing the use of corrosion protection strategies with the design stage of structures to produce bridges that last longer, are faster and easier to fabricate and construct, and have a higher level of quality. New aggressive goals have been set for coating materials that provide both durability and production advantages.

### **An American in Asia and Polyurea in China**

**Craig Kowalski, Shanghai Citic-Sumber International Distribution Co., LTD**

The presentation will be featured in two parts. The first will discuss doing business as an American in Asia. Examples of marketing, technical (?), language barriers, cultural concerns and personnel stories for multiple countries, including China, will be presented. The second portion of the program will further examine doing business in China and the obstacles and triumphs for Polyurea in China. The session will also address the efforts of the two PDA members working together in China to establish a chapter of PDA. Efforts to establish and maintain national polyurea standards will also be presented.

### **The Application of Aliphatic Polyurea Waterproofing on the Disney World Baseball Stadium**

**William “Tripp” Ishmael, Jr., Elastomer Specialties, Inc.**

The case study will provide a detailed description of the recent application of new polyurea technology on Disney’s All Star Sports Stadium. The stadium required complete waterproofing because of leaking that occurred after concrete installation six years ago. The concrete all displayed severe cracking and fracturing that

necessitates repair. This presentation will provide a pictorial history, outline the procedures used and the challenges faced while installing this new polyurea technology.

#### **Large Concrete Flooring Project**

**Robert Johnson, The Sherwin-Williams Company**

This case study will provide information on the evaluation of existing conditions and the preparation of prime contract documents for the application of a polyurea floor system to meet stringent owner requirements of both durability and rapid return to service. Discussion will include methods of surface preparation for multiple substrates, equipment requirements, moisture vapor emissions testing, crack and joint detailing and overcoming various job conditions.

#### **Waterproofing Large Parking Deck at Baltimore Mall**

**Bruce Hall, B & H Coatings, Inc.**

This case study will provide information on the coating of a 100,000-square-foot parking deck at a shopping mall. This project was completed between Thanksgiving and Christmas – the busiest shopping time of the year – in an area enjoying at least one snow storm a week. Project included surface preparation, joint replacement, concrete repair and 70mils of polyurea coating.

#### **Shea and Yankee Stadiums Flooring Projects**

**Charles Idowu, Degussa Building Systems**

This case study will provide information regarding the project background, including time and weather constraints, low temperature surface preparation and concrete repair, in addition to the choice of polyurea technology employed and application method. The session will also include problem areas, how they were addressed and lessons learned for the future.

#### **Evaluation of Moisture-cure Resins as Primers Under Aromatic Polyurea Elastomer Systems**

**Jay Johnston, Huntsman Corporation**

Due to the productivity gains of rapid curing coatings, polyurea coatings are now being used in more aggressive environments. This session summarizes the use of moisture-cured primers to improve the adhesion of polyurea coatings to metal and concrete surfaces. An evaluation of one-component moisture-cure resins with different reactivities as primers will be presented. Adhesion values of primer and polyurea coating systems, substrate preparation, cure rates and final physical properties will also be addressed during this technical presentation.

#### **Viscoelastic Polyurea Foam**

**Kai Klockemann, Nitroil Performance Chemical**

This presentation will describe the application of pure polyurea foam without additives like blowing agents, catalysts or stabilizers. The new foam can be flexible or specifically adjusted like visco-elastic properties and opens new fields of application combining polyurea foam and polyurea spray(e.g. in the field of sound and impact absorption). It is easy to process on standard equipment.

#### **A 40-year Case Study of Polymeric Waterproofing Systems in Civil Engineering Projects**

**Adrian Pike, Pitchmastic PmB Ltd.**

This session will provide the rationale behind why structures must be coated with an effective waterproofing product and the potential consequences of not taking these preventative actions. Pike will illustrate the history of waterproofing products in the United Kingdom, leading up to present day. Topical areas will include the wide range of international standards, project case studies, installation methods and application techniques.

**Fastcure Polyurea for Corrosion Protection**

**Ed Squiller, Ph.D., Bayer Polymers, LLC**

The paint industry, like all industries, is looking for efficiencies that will improve productivity. Painters are looking for ways to speed up the painting process and/or reduce the number of steps required in the painting operation. This session will describe polyaspartics coating technology and how it can be used to formulate relatively fast drying one- and two-coat corrosion resistant paints for use on steel substrates. The polyaspartics technology offers several advantages over conventional two- and three-coat paints, including faster production and lower costs. The coating chemistry will be presented in basic terms and the results of accelerated exposure tests will demonstrate the good corrosion resistance achieved with this technology.

**Field and Shop Inspection of Thick Film Coatings**

**Eric Kline, KTA-Tator, Inc.**

This session will focus on the inspection needs of thick film coatings. The unique characteristics of proper surface preparation, cleanliness, profile (angularity), coating thickness and coating continuity will be explored. Various differences between inspection problems encountered in the shop versus the field will also be highlighted during this presentation.

**A New Application Method of Coatings and Foam Using RIM Technology**

**Michael Bartenstein, Gusmer Corporation**

This presentation will discuss a unique spray method of applying polyurea and polyurethane coatings or foams to mold or substrate surfaces. This method covers large areas of mold or substrate surfaces by dispersing the media into wide, consistent patterns, directly related to tip orifice configuration and height off the work surface. This method has applications throughout the industry from mold coating and filling to reinforced substrate composition.

## **2005 Conference Presentations**

**The Polyurea Market a Look Forward**

**John Durig, The Sherwin-Williams Company**

Durig will address issues that will affect the market's growth and the opportunities he believes will arise from the technology growth. He will also address the technological needs that the raw material suppliers should be working towards.

**Polymer Science at Southern Mississippi University – Pressing the Frontiers of Formulation, Synthesis and Applications**

**Dr. Douglas Wicks, University of Southern Mississippi  
Dr. Doug Wicks, Chair of the Polymer Sciences Department at University of  
Southern Mississippi.**

**Dr. Wicks will present the latest academic information on polymer coating  
formulation, synthesis and applications.**

**Spanning the Gulf Between Primary Amine and Hydroxyl Reactivity, New Secondary  
Aliphatic Amines for the Formulator's Toolbox**

**Mark Posey, Huntsman Corporation**

**Co-Author: Kenneth Hillman, Huntsman Corporation**

**Primary amines can cure so quick that coatings have an "orange peel" texture and  
adhesion problems. Primary amines also have two active hydrogen sites, which can  
both undergo reaction with an isocyanate to form cross-linking bonds. In some  
formulations this leads to favorable properties, in other cases, the additional cross-  
linking is undesirable. To help bridge this gap, Huntsman has developed a new line  
of secondary amines. Huntsman's patent pending process allows the generation of  
high levels of secondary amine groups while achieving low primary and tertiary  
amine content. These new products will be introduced along with examples of use.  
Although polyurea uses will be emphasized, these products will have application in  
a number of polymer chemistries, including epoxy, polyurethane, polyurethane/urea  
hybrids and polyamides, just to name a few.**

**Polyurea Used as Joint Sealant and Filler**

**Art Weiss, VersaFlex Incorporated**

**This presentation will explore the use of polyurea as a joint filling material. It will  
demonstrate the effectiveness of polyurea as contrasted to the historical semi-rigid  
epoxy materials.**

**International Spotlight – Polyurea Meets European Parking Decks**

**Kai Klockemann, Nitroil Performance Chemical**

**Polyurea chemistry has developed rapidly in the past three years. As a result, the  
latest materials can be tailored to meet a wide range of performance requirements,  
including those outlined in European construction legislation. As such, polyurea is  
now applied to such structures as parking decks, bridges and other civil  
engineering constructions, which are all subjected to a wide range of conditions. To  
illustrate the success of such applications, this presentation will recount a recent  
350,000-square-foot parking deck project.**

**Basic Joint Installation**

**Brian Bowers, ASTC**

**The purpose of this presentation is to give the contractor a quick overview of joint  
installation, including helpful hints and direction to help keep them out of trouble.**

**Progress and Prospect of Spray Polyurea Elastomer Technology in CHINA -**

**Weibo Huang, MCRI**

**This paper will focus on the development of spray polyurea elastomer technology in  
China. Much progress has been made in formulation and application by MCRI's  
pioneer work.**

**An Introduction to an Apparatus and Method for Nondestructive Testing of Dielectric Materials**

**John Courier, Equipment & Coating Technologies**

This presentation includes a method description and principles of operation, a discussion of detectable defect types, the inspectable materials and product forms, the merits of absolute versus differential inspection and basic equipment setup. John Courier of Equipment & Coatings Technologies and certified Gusmer and Graco instructor will show you how to save money by not putting excess material on concrete or geotextile materials. He will share tips on never-before-released DI 4 hole modules, and recommend the best Graco fusion mixing chamber series and how to improve your spraying with the gap and probler guns. If you want new tips on equipment and coatings technologies, this is the seminar to attend.

**Higher Performance Materials for Improved Polyurea Properties: High Chemical Resistance, High Temperature Resistance, High Tensile Strength**

**Ray Scott, The Hanson Group**

**Co-Authors: Kevin Light and Jim Facello, The Dow Chemical Co & Lee Hanson, The Hanson Group**

In today's market Polyureas are being accepted and used in many applications. The everyday polyurea is great for many applications, but there are certain specialty areas where Higher Chemical Resistance, High Heat Resistance and Higher Physical Properties are needed. In order to obtain these performance characteristics, higher-grade raw materials specifically designed for polyureas are needed. This presentation will show that certain raw materials are available, and you can formulate polyureas that handle high acid environments, high heat and provide you tensile and tear properties that far exceed standard polyureas while still giving you the fast cure and back-to-service times.

**Industrial Flooring Project**

**Mark Hudson, The Sherwin-Williams Co.**

**Co-Author: Bob Johnson, The Sherwin-Williams Co.**

This presentation will provide information on the evaluation of existing conditions and the preparation of prime contract documents for the application of a polyurea floor system to meet stringent owner requirements of durability and rapid return to service. The discussion will include methods of surface preparation for multiple substrates, equipment requirements and job conditions to overcome. Project scope includes inspection of the substrate, removal and replacement of non-durable substrate, decontamination of the surface, creation of surface profile, testing for moisture vapor emissions, repair of surface irregularities, crack and joint detailing and application of polyurea.

**USDA Veterinary Services Building in Miami, Fla**

**Tom Wunderlin, Fox Industries**

**Co-Author: Dave Preston, PCCS**

The topic to be presented shall focus on the repair and corrective measures needed to remove existing protective coatings and polyurea from CMU walls and concrete floors to recoat with a designed system to enhance performance. The entire slab was to be resloped and recoated to promote improved drainage and assist in

creating a bio-secure area. More than 5,000 gallons of FX-640 Spray-applied Aromatic Polyurea were applied to this one-of-a-kind 84-stall facility.

#### **Failure Analysis of Polyurea Coatings**

**Cindy O'Malley, KTA-Tator**

Lack of proper surface preparation has accounted for a majority of the exhibited polyurea failures followed by installation in an inappropriate service environment. The technology doesn't fail and generally, the inappropriate installation is the culprit leading to failure. Properly installed, polyurea coatings offer a variety of performance characteristics, including rapid cure, VOC compliance and ease of coating thickness build. These characteristics make them attractive to facility owners representing many different industries. However, even a perfectly formulated coating will fail if incorrectly specified or improperly applied. This presentation covers consistent modes of coating failure not related to formulation or product variance. An overview of analytical techniques used to identify the mode of failure specific to polyurea coatings will also be presented.

#### **Waterproofing of Highway Concrete Bridge Structures**

**Robert Kogler, FHWA**

Corrosion and deterioration of concrete bridge structural elements is a growing problem throughout the country. Significant advances in the durability of concrete structures have been made over the past decade through the use of High Performance Concrete (HPC), inhibitive admixtures, epoxy-coated rebar, durable overlays, membranes, and increased concrete cover designs. There is a large inventory of pre-stressed concrete bridges that are beginning to reach an advanced age in their lifecycle. The use of pre-stressed designs is also increasing within the system. FHWA has targeted the "Bridge of the Future" as a primary goal for its research program. This bridge must be constructed and erected in a fraction of the current time necessary to build a bridge and must also be designed with a significant increase in durability. A component of this research program will examine the potential durability benefits from the use of thick film waterproofing membranes on bridge structures. The subject paper will report on an initial application to an experimental full-scale concrete bridge built at the research center.

#### **The Perfect Surface for Polyurea Applications for Roof and Secondary Containment Applications**

**Jim Popp, Crown Fluid**

This presentation focuses on a unique recovery pad system reinforced with polyester that provides a fully adhered and ventable substrate for polyurea in order to build roofing and/or secondary containment membranes. When applying coatings over existing substrates, the surface of the substrates usually are not smooth, whether concrete, asphalt, metal, etc. These substrates require a lot of surface preparation work before applying polyurea, can have embedded moisture, and the polyurea installation may lack reinforcement. Topics discussed will include applying a seamless membrane, achieving specified mil thickness, reducing material waste, and competing with non-polyurea roofing systems including EPDM, CPVC and TPO.

**Utilization of Programmable Logic Controls in Proportioning Equipment for Spray Applied Pure Polyurea Applications**

**Robert Zimel, Gusmer**

**Spray applications of pure polyurea materials can require formal documentation to ensure the integrity of the application and assure the application specifier the materials were applied in conformance with the material suppliers requirements. Programmable Logic Controls when designed and programmed as a integral part the spray proportioner, offers the applicator, project contractor, material supplier and application specifier hard documentation of the material parameters while sprayed during application.**