Stimulus Bill: $27 Billion Released for Roads, Bridges

President Obama and U.S. Transportation Secretary Ray LaHood released $26.6 billion from the American Recovery and Reinvestment Act (ARRA) to states and local transportation authorities on March 3, 2009—eight days earlier than required by law, according to www.recovery.gov, the Obama Administration's web site for the ARRA. Parts of each allocation are set aside for urban, suburban, and rural road projects, but many of the decisions about how the construction money will be spent are left to the states. There's just one catch—if a state does not assign its funds to specific projects within 120 days, some of the money will be withdrawn and allocated to other states.

The high rollers on the list are CA, TX, FL, NY, and PA, totaling approximately $8.3 billion combined, or 30% of the funds allocated. Five other states, OH, IL, GA, MI, and NC, share another $4.4 billion of the money.

On the same day the money was released, Secretary LaHood announced that some of it would be used immediately in Montgomery County, MD, where road crews had started work on a one-mile stretch of Route 650. Another 100 transportation projects across the country, totaling $750 million, have been identified to start within a month.

The Federal Highway Administration must approve each proposed project, and the state's governor must certify that the state will use ARRA funds in addition to state funding.

The list below shows distribution by state. To see more about where the money will be spent, visit www.recovery.gov.

- **Alabama: $513,692,083**
- **Alaska: $175,461,487**
- **Arizona: $521,958,401**
- **Arkansas: $351,544,468**
- **California: $2,569,568,320**
- **Colorado: $403,924,130**
- **Connecticut: $302,053,956**
- **Delaware: $121,828,650**
- **Florida: $1,346,735,003**
- **Georgia: $931,585,680**
- **Hawaii: $125,746,380**
- **Idaho: $181,934,631**
- **Illinois: $935,592,704**
- **Indiana: $657,967,707**
- **Iowa: $358,162,431**
- **Kansas: $347,817,167**
- **Kentucky: $421,094,991**
- **Louisiana: $429,859,472**
- **Maine: $130,752,032**
- **Maryland: $4431,034,777**
- **Massachusetts: $437,865,255**
- **Michigan: $847,204,834**
- **Minnesota: $502,284,177**
- **Mississippi: $354,564,343**
- **Missouri: $637,121,984**
- **Montana: $211,793,391**
- **Nebraska: $235,589,279**
- **Nevada: $201,352,460**
- **New Hampshire: $129,440,556**
- **New Jersey: $651,774,480**
- **New Mexico: $252,644,377**
- **New York: $1,120,684,723**
- **North Carolina: $735,526,684**
- **North Dakota: $170,126,497**
- **Ohio: $935,677,030**
- **Oklahoma: $464,655,225**
- **Oregon: $333,902,389**
- **Pennsylvania: $1,026,429,012**
- **Rhode Island: $137,095,725**
- **South Carolina: $463,081,483**
- **South Dakota: $183,027,359**
- **Tennessee: $572,701,043**
- **Texas: $2,250,015,146**
- **Utah: $213,545,653**
- **Vermont: $125,791,291**
- **Virginia: $694,460,823**
- **Washington: $492,242,337**
- **West Virginia: $210,852,204**
- **Wisconsin: $529,111,915**
- **Wyoming: $157,616,088**

Americlean Earns Safety Award

Americlean, an industrial cleaning and painting contractor in South Glens Falls, NY, became the first contractor in the state to earn OSHA's SHARP (Safety & Health Achievement Recognition Program) safety designation. Companies with SHARP certification represent the top 1% of businesses in employee safety, based on safety records and prevention programs.

Americlean has 25 employees who perform painting, abrasive blasting, cleaning, and equipment refurbishing. According to the company, work often involves small spaces and heights. Some of the steps the company took in order to become SHARP certified were instituting mandatory safety training every month, requiring site-specific safety training, and establishing an accident investigation system.

Hartman Walsh Names Business Director

Hartman Walsh Corporation, headquartered in St. Louis, MO, has hired Jim Brinkman as the national director of business development. He will use his experience to expand the company's conventional and specialty coating business, UHP waterjetting division, and evergreen maintenance account relationship.

Jim Brinkman

Brinkman has over 30 years of business development experience, with 12 years in industrial coatings. He will be based in St. Louis, MO, with support offices in Fort Collins, CO; Calvert City, KY; Columbus, OH; and Williamsburg, VA.

Insituform Acquires Bayou Companies

The Bayou Companies (TBC), located in New Iberia, LA, has announced that it agreed to be acquired by Insituform Technologies, Inc. (Chesterfield, MO). TBC has been a family-owned business for 65 years; the acquisition includes Commercial Coating Services International, Ltd (CCSI), Bayou Welding Works (BWW), and the minority ownership in Bayou Coating LLC.

The acquisition of TBC will complement Insituform's pipe protection capabilities, create cross-selling opportunities, and enhance global market opportunities for Insituform's energy and mining business, according to TBC.

Transactions for the acquisition will be completed by February 28, 2009, said TBC.

EPA Seeks Small Business Research Proposals

In March 2009, the U.S. Environmental Protection Agency (EPA) will begin soliciting applications for research grants from small businesses involved with science and technology, including coatings and related technology.

Solicitations beginning in March represent the first of the program's two phases. In the first phase, EPA awards up to $70,000 based on technical feasibility and scientific merit. After six months, if the EPA determines that sufficient progress has been made, a company may receive a Phase II contract of up to $225,000 for two years to develop and commercialize the Phase I technology.

To qualify for the SBIR program, a small business must be an independently owned for-profit with no more than 500 employees. At least 51% of the business must be owned by a U.S. citizen, or lawful resident alien, and must have its main place of business in the U.S.

As part of the SBIR program, the EPA recently awarded $1.6 million in research contracts to 23 small companies in January 2009. For a list of all recent awardees, visit www.es.epa.gov/ncer/sbir/09awards.

For information about the program, including how to apply, visit www.epa.gov/ncer/sbir.

RPR Honored for Clean Paint Removal Method

RPR Technologies A/S (Porsgrunn, Norway) has announced that its paint stripping process earned the firm the 2008 "Best Cleantech Company" award in the Eurecan European Venture Awards contest. Receiving the award in Barcelona, Spain, RPR won the honor for its patented induction heat process for removing paint and corrosion byproducts from steel surfaces. According to the company, the method has no harmful byproducts and is cleaner, safer, and faster than traditional methods of paint removal.

RPR also manufactures an industrial machine that uses the induction heat process. The company says the equipment is suitable for a number of heavy-duty applications, including ships, offshore oil platforms, land-based oil and gas pipelines, and storage tanks.

The Eurecan European Venture Award is a multi-stage contest aimed to identify, promote, and reward innovative, early-stage companies in Europe. The contest evaluates companies based on its business potential, team experience, technology merit, competitive position, investment interest, growth potential, and entrepreneur.

More information about RPR can be found at www.rprtech.com, and information about the contest can be found at www.e-unlimited.com.

ARS Adds to Sales Department

Advanced Recycling Systems, Inc., located in Lowellville, OH, has announced the addition of Dale Campbell to its sales department.

Dale Campbell

Campbell has been working in the abrasive blasting industry since 1984 and has eight years of experience selling dust collection and containment equipment, according to ARS. He will be working with clients in the bridge, water tank, and marine industries.

ARS designs and manufactures industrial surface preparation and dust control equipment.

Controlling Surface Profile

What are the causes of surface profile exceeding specified ranges, and how can surface profile be controlled so that it meets the spec?

Hugh Roper

The most likely causes of excessive surface profile are improper abrasive selection for the equipment used, incorrect operation of the equipment, or improper blasting techniques. Here's a good rule of thumb: if the existing profile is less than or equal to the specified profile, then the specified profile on both new steel and previously blasted and coated steel can be achieved by properly selecting and controlling the pertinent variables. Please note that existing profiles exceeding the specified profile are beyond the scope of this article and must be handled differently.

The rules for creating specific surface profiles with any abrasive blast procedure are derived from basic physics. Reference 1 details the variables involved in abrasive blasting, the interaction of those variables, and how to control each variable to consistently achieve the desired results.

To design an abrasive blasting process to meet a specification, you must know the condition of the surfaces to be prepared and the capabilities of the equipment to be used. To select a suitable abrasive and technique, it is prudent to run a profile test by a qualified blaster, using the project equipment to blast a surface with the same hardness as the project substrate.

Blasting techniques largely influence the productivity and profiles for any blast process. The equipment and blast techniques must be compatible with the selected abrasive. When using non-recyclable abrasive, blast at 90 degrees to the surface to hold the explosive energy at the surface and get the most work from the disintegrating abrasive. On the other hand, use recyclable abrasives at angles of 55–70 degrees to avoid the adverse effects of the vigorous rebound of recyclable abrasive. To improve the consistency of the profile, good blasting technique also includes a sweeping action (keeping the nozzle in constant motion) rather than focused blasting on a spot.

To remove an existing coating without increasing the surface profile requires adjustments to abrasive size and blasting technique. By using the smallest, hardest abrasive and by reducing the blast angle, there will be less indentation (decreased profile depth) while increasing scouring action to remove coating and corrosion products. The result of this scouring action will be increased peak count, which will improve coating adhesion.

The abrasive operating mix accomplishes the cleaning and profiling. If the mix is not clean, (free of dust and fines) or of the right type, mass (weight), hardness, shape, and friability for the project, then good results cannot be expected from the equipment or the blaster.

The particle size distribution of the operating mix is critical to achieving the proper surface cleanliness, profile uniformity, and peak count. It is important to establish the parameters for the proper operating mix and then maintain this consistency by an appropriate abrasive control process.

To illustrate the variation of operating mixes using steel abrasives, a properly controlled operating mix of a G 40 Grit produces over 475,000 impacts in a pound, while a pound of a G 25 Grit may only produce 180,000 impacts. It is the number of impacts that chiefly determines the quality of the cleaning

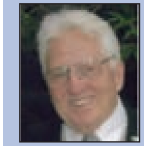
Continued

or profiling of the surface. Therefore, the smaller the abrasive size, the faster the cleaning and the lower the profile—provided that the abrasive has sufficient mass and velocity to break the scale or contamination and remove it.

The equipment, either air blast or mechanical, should have the ability to continuously ensure the proper velocity of the particles. Variation of particle velocity will have significant impact on both profile and cleanliness of the surface.

In summary, profile can be controlled to conform to a wide range of specifications, even when there is existing profile under a coating.

1. Hugh Roper, Raymond Weaver, and Joseph Brandon, "Peak Performance from Abrasives," JPCL/PCE June 2006, p. 24



Hugh Roper is retired from Wheelabrator Abrasives, where he was responsible for technical services for all of North America and special assignments in South and Central America. He is a certified SSPC Coatings Specialist and a NACE Level 3 Coating Inspector technician.

David Dorrow

Because a surface profile that exceeds the specification may contribute to premature coating failure, controlling the profile during abrasive blasting is critical to the success of a coating project.

Many variables in the abrasive blasting process, both controllable and uncontrollable, affect profile. Controllable variables include the selection of the abrasive (particle size, particle shape, hardness, density, friability) and the blasting technique (nozzle pressure, nozzle wear, distance from the nozzle to the surface, angle of particle impact). Uncontrollable variables include surface composition, hardness of surface, mill scale versus coated surface, and existing profile.

Achieving the desired surface profile requires the expertise of a reputable abrasive supplier, an experienced contractor, and a knowledgeable specifying engineer. The involved parties must communicate effectively, from the development of the specification through the completion of the surface preparation.

A reputable abrasive supplier should control its manufacturing process to supply an abrasive with repeatable results. The supplier should be able to discuss all the parameters of the product and know what profile range to expect with a

Continued

selected product gradation under standard blasting conditions. Abrasive gradation is one variable over which the abrasives manufacturer has control.

Many other abrasive product characteristics are inherent in the type or class of the abrasive. The abrasive supplier cannot change the particle shape, hardness, chemical content, or friability.

It is important to select an abrasive type that can create the specified profile. The contractor must overlook buying the abrasive based on the lowest price per ton, and instead, look at the characteristics of the abrasive in light of the desired results.

The contractor has several controllable variables with which to keep the profile in the desired range. The pressure at the nozzle is a key controllable variable. Higher nozzle pressure equates to increased particle velocity and faster production rates for finishing the job, which results in greater profitability.

Over the past decade, a trend for higher nozzle pressure has also affected the profiles typically achieved with standard sized abrasives. Profiles exceeding the specified ranges became the norm when applying higher nozzle pressure, resulting in an increased demand for finer grade abrasives.

On maintenance and repair blasting, some contractors still prefer a coarser grade abrasive, expecting to exceed the desired profile range because they believe a coarser abrasive achieves faster productivity. If they are challenged by an inspector, they re-blast with a finer grade abrasive to try to reduce the profile.

It has always been an industry assumption that this re-blast with a finer abrasive will bring the profile back down into the desired profile range. At best, you may be able to bring the profile down by a ½ mil by knocking off the high profile peaks, but it is almost impossible to change a 4-mil profile to a 2-mil profile with this technique.

This same potential problem exists if

there is an excessive pre-existing profile under the existing coating being removed. The specifying engineer/ inspector and the contractor must all be aware of the pre-blast surface conditions (rust pitting) and existing profile before a desired profile range is specified.

With so many controllable and uncontrollable variables, creating the desired profile is not an exact science. However, an acceptable result is obtainable through an understanding of all the variables and implementing proper controls.

David Dorrow has worked in sales & marketing for several leading abrasive manufacturing companies over the past 27 years. He has participated in the SSPC Abrasive Steering Committee and the SSPC Surface Preparation Steering Committee, as well as the Development Committees for SSPC AB1 Mineral Abrasive Specification and SSPC VIS 1-89 Visual Standard for Abrasive Blast Cleaned Steel.

Jeroen Keswiel, EUROGRIT BV, The Netherlands

An excessive surface profile is usually caused by using an abrasive that is too coarse. Selecting an appropriate abrasive size is the most important issue here. In doing so, you have to find a balance between cleaning power and surface profile. For a heavily corroded surface or a thick coating, you may need a coarse abrasive, but it will also give you a coarse profile. Sometimes it may be necessary to do a second (sweep) blast with a smaller grain size to reduce the surface profile to what is specified.

Another way to avoid excessive surface profile is to reduce the air pressure at the nozzle, thus reducing the impact of the abrasive on the surface (which reduces productivity).

Simply measuring the surface profile depth is not enough—it should be clearly indicated what type of surface profile is to be measured (Rt, Rz, Ry5, Ra, etc.) and how it is to be measured. Three methods for measuring the depth of the profile are described in ASTM D4417, Field Measurement of Surface Profile of Blast Cleaned Steel. Method A is a visual comparator; Method B is a depth micrometer; and Method C is a replica tape. All three methods are, in effect, differently defined, so the key is to reach agreement between the parties involved on which approach is to be used before beginning work.

Jeroen Keswiel has been an Area Export Manager for Eurogrit BV (Papendrecht, The Netherlands) since November 1996.

Introducing a Series on Analyzing Coating Failures

Welcome to the inaugural column in a series on analyzing failures of protective and marine coatings. Each month, we will describe a thought-provoking, challenging coating failure with twists and turns not unlike a good mystery novel. However, these case studies are not fiction; they are actual coating and lining failures affecting a wide variety of structures, while also representing a cross section of industries and parties to blame. The coating failures were diagnosed and resolved by professionals in the industry. They tell the stories, from the background to the site investigation, the forensic laboratory investigation, the cause of the failure, and the recommendations for repair. We hope you enjoy reading these case histories over the next nine months, and, more importantly, we hope that you will gain knowledge from the experiences of others so that you don't contribute to similar problems in the future.

Richard A. Burgess, KTA-Tator, Inc., Series Editor

All industrial protective coating systems have a finite service life. They will eventually fail because they will give way to the cumulative effects of the service environment in which they were installed. When we consider coating failure, it is important to understand how long a coating system should last in order to determine if the failure is expected due to age in service or if the failure can be categorized as "premature" or unexpected.

Obviously, the service life of a coating or lining system varies with the prevailing service environment. While some linings may last only 5–7 years before needing repairs, other coating and lining systems may last 10–15 years before needing maintenance painting. Some environments are so benign that a coating system can perform for 20–25 years without any significant deterioration (other than perhaps changes in appearance because of color and/or gloss differences).

Varying widely, service environments include mild, moderate, and severe atmospheric exposures; immersion (partial or full) in a variety of solutions; temperatures and pH levels; chemical exposure; physical damage (e.g., impact, abrasion); and other conditions. The type and intensity of the various service environments are too numerous to list. However, once the prevailing service environment is identified and a coating or lining system is properly selected and installed, the length of service life can be anticipated. When a failure occurs well before the expected service life is reached, then the failure is considered premature and typically warrants investigation (Figs. 1 and 2).

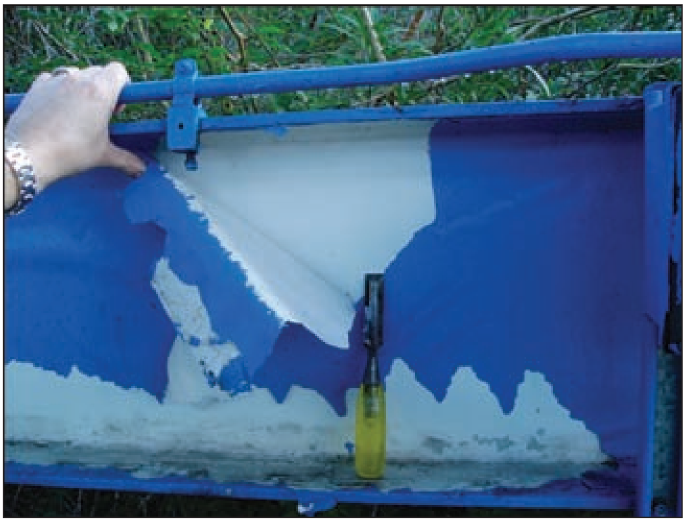


Fig. 1: Catastrophic disbonding of newly applied coating
Photos courtesy of KTA-Tator, Inc.

Why Do Coatings Fail Prematurely?

There are hundreds of causes of premature coating failures. Just when you think you've seen them all, another failure occurs with a new twist—or at least one that's new to you. But if we set aside the minutiae and look at the big picture, premature coating failure can typically be attributed to design, materials, or installation. Among these three categories, there are seven basic causes. Note that coating failure can be caused by multiple contributing factors and may not fit cleanly into one of the seven causes below.

Design

Three major causes of coating failure relate to design.

- Lack of proper or complete identification of the prevailing service environment
- Incorrect coating system selection for the prevailing service environment

Continued

• An improperly prepared specification

Materials

Two basic causes of coating failure relate to the materials themselves.

• Defective raw materials used to formulate the coating

• An improperly formulated coating

Installation

Two basic causes of coating failure relate to the installation of the system. Note that surface preparation is considered part of the system installation. In addition, quality control (inspection on behalf of the contractor) and quality assurance (inspection on behalf of the owner) are part of the installation phase, and errors in either QC or QA may contribute to the following causes of premature coating failure.

• Poor surface preparation

• Incorrect mixing, thinning, application and/or cure of the coating

Who Gets Blamed for Coating Failures Before the Investigation?

When a coating or lining system fails prematurely, the facility owner may be quick to point the blame, rather than first investigating the cause of the failure that occurred and then assessing responsibility. If you consider how our justice system is designed to work, if one is accused of a crime, the party is innocent until proven guilty in a court of law. Unfortunately,

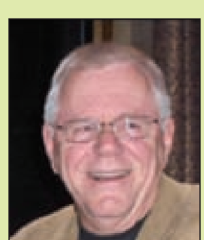
Fig. 2: Premature rusting of lining system

because the majority of coating failures are reportedly related to installation, the coating industry does not always operate like our court system. When a coating failure occurs, often the painting contractor is presumed guilty of causing the failure until the contractor can prove the company's innocence. While this presumption is not fair, it is often made, which is why quality control and documentation of surface preparation and coating installation operations (an alibi) are so critical to the contractor. But other parties must be considered "suspects" as well. Considering that only two of the seven causes listed above can be the fault of the contractor, it is important to separate the people from the problem, have an independent investigation performed, and then assign responsibility based on the outcome of the investigation, rather than on incomplete information or past experiences. Coating manufacturers, raw material suppliers, facility owners, QC and QA personnel, and project engineers (specifiers) can all be responsible for premature coating failure.

What Happens When a Coating System Fails?

When a coating or lining system is compromised due to premature failure, the underlying substrate (that the coating system was installed to protect) may become exposed to the service environment, and accelerated degradation may occur, particularly if the coating failure is unnoticed or unreported for any period of time. Therefore, it is important to remedy the failure as soon as possible to

Richard A. Burgess



Mr. Burgess is a senior coatings consultant with KTA-Tator, Inc. (Pittsburgh, PA), with over 16 years of experience in coating condition assessments; failure analysis; specification preparation; expert witness; and environmental, health, and safety consulting. He holds a BS in environmental science from Rutgers University and an MS in operations management from the University of Arkansas. He also conducted post-graduate work in environmental health at the University of Pittsburgh Graduate School of Public Health, where his research focused on the influence of environmental lead on blood lead levels of children.

Mr. Burgess is an SSPC-Certified Protective Coatings Specialist and a NACE-Certified Coatings Inspector Level 3 (Peer Review). He is a published author in multiple trade journals and SSPC Conference Proceedings, an active member of both SSPC and NACE International, and the Vice Chairman of the Waterjetting and Wet Abrasive Blast Cleaning Task groups. He is also a principal instructor for KTA's Basic Level Coatings Inspection Course, SSPC's Initial and Refresher Lead Paint Removal Courses (C3 and C5), SSPC's Fundamentals of Protective Coatings Course (C1), and SSPC's Planning and Specifying Industrial Coatings Projects (C2). Prior to joining KTA, Mr. Burgess was a manager in the Analytical Services Division of Professional Service Industries/Pittsburgh Testing Laboratory from 1981-1991. He can be contacted at rburgess@kta.com.

minimize the effect of the service environment on the unprotected surfaces.

Once the failure is identified, an investigation into the cause and extent of failure is typically undertaken. Without a formal investigation into the cause, the failure may recur after the repairs are made or be repeated elsewhere. An independent investigation will often reveal the cause(s) of the failure, so that the responsible parties can be identified and repair procedures can be established. These steps help prevent the failure from recurring once the repair procedures are completed and the coated or lined structure is returned to service.

Coating failure can be costly. The loss of production or operating time, the cost of the investigation, and the labor and materials associated with the rework can be quite high, perhaps more than the initial project cost, depending on the structure, the complexity of the failure, and the rework. As a result, lawsuits are sometimes filed naming any and all of the various parties remotely associated with the failure. Legal costs can be disproportionate and high for the innocent parties. The outcome of lawsuits can be a negotiated settlement, binding or non-binding arbitration, or a trial. When a case goes to a jury trial, the assignment of blame may rest in the hands of laymen who may not truly comprehend the technical nature of industrial coatings and the mechanisms of failure.

Who Can Investigate a Coating Failure?

No licenses, degrees, or certifications qualify an individual to become a coating failure investigator. While a degree in chemistry, chemical engineering, or similar field can be a distinct advantage to the investigator, there are no prerequisites. Certifications like the SSPC Protective Coating Specialist (or the NACE-equivalent) are often recognized as industry certifications for failure ana-

Continued

lysts. While certifications may demonstrate knowledge and experience, they do not necessarily identify a good investigator.

Good investigators need experience and the ability to look at the bigger picture. An inexperienced investigator or an investigator who gets consumed by the small details may uncover a fact or facts that may be identified as the cause, yet other facts dispute the cause. The ability to consider all of the facts, look at patterns of failure, consider areas of failing and non-failing coating, and apply the results of the forensic investigation to the failure can help to eliminate possible causes and identify others. For example, excessive coating thickness or voids in the cross section of coating layers can be the cause of failure; however, if the coating is just as thick, or if the layers also contain voids in areas that are not showing failure, then coating thickness (or voids) may be a contributing factor in the failure but not the exclusive reason for it.

Fig. 3: High-performance liquid chromatography

What Steps Are Involved in a Coating Failure Investigation?

When a coating failure occurs and an investigation is initiated, an investigator should consider six basic questions:

- What was supposed to be done?
- Does it make sense?
- What was done?
- What happened?
- Who's responsible?
- How will the failure be repaired?

Each of these six steps is briefly explained.

What was supposed to be done?
This question is answered by reviewing the project specification, product data sheets, and other contract documents that describe what was supposed to occur related to coating system installation. This step is the first in a failure investigation.

Does "it" make sense?
Here's the second step. Based on the prevailing service environment and the structure itself, does what was specified make sense, or was the coating doomed from the start because of the degree of surface preparation specified or coating system selected by the specifier?

What was done?
The third step includes the site investigation and the laboratory analysis, which often reveal what was actually done versus what was supposed to be done. Additionally, project documents like inspection forms and logbooks often shed light on project activities that may have contributed to the problem.

What happened?
Once steps 1 and 2 are answered and the site investigation and forensic analysis of step 3 are completed, the investigator takes the fourth step of considering all of the facts of the case (not just the ones that fit the hypothesis) and rendering an expert opinion about the probable cause and mechanism of failure.

Who's responsible?
After the cause of failure has been identified, it's time for step 5, bringing the people back into the problem. There often needs to be assignment of responsibility, since repair or replacement of the failed coating system will cost money; and the facility owner is typically not willing to pay for installation twice (unless the owner was at fault). Shared responsibility can occur. That is, there may be more than one party at fault and the cost of rework may be divided among the various entities.

How will the failure be repaired?
Step 6, the repair recommendation, is perhaps one of the most difficult decisions that an investigator will need to make. The knee-jerk reaction is to remove and replace the entire coating system (failing and non-failing) so that the facility is "whole again," and to eliminate any possibility that the portion of the coating system that is intact will eventually fail via the same mechanism. But an investigator must steer clear of the emotional side of a failure. While removal and replacement may be the conservative approach, the added downtime and the fact that not all of the coating is deficient must weigh into the decision. If litigation ensues, the court may not uphold such a conservative repair procedure.

The Role of the Laboratory in a Failure Investigation

Similar to a laboratory in a homicide investigation, the coating laboratory plays a key role in identifying what "killed" the coating system. The types of equipment and the techniques employed by the analyst are not unlike those used by a forensic crime lab. The investigator and the analyst must consider the background information on the failure, clues from the field investigation, and the nature of samples collected. All information gathered helps chart a course of analysis. The laboratory investigation typically begins with a microscopic examination of the samples, then may lead to any number of analyses that will help identify the cause of failure. Analysis may include the use of techniques such as infrared spectroscopy, high-performance liquid chromatography, gas chromatography-mass spectroscopy, scanning electron microscopy, or differential scanning calorimetry (Fig. 3). These techniques and their use to diagnose failures will be described in upcoming columns.

The Roles of QA and QC Inspection Personnel in a Failure Investigation

Quality assurance (QA) and quality control (QC) coatings inspection personnel can play a key role in helping to determine the cause of the failure. They can also play a role in preventing the failure from recurring. Thorough, complete inspection records will likely be scrutinized during the failure investigation and may become a key component in litigation. Conversely, incomplete or inaccurate records can harm the investigation and can reflect poorly on the coating inspector. For example, if the failure is related to incorrectly manufactured batches of coating and the inspector's records do not indicate batch numbers, or do not reflect where each batch was used on the structure, the failure investigation may become increasingly difficult. Or simply recording that ambient conditions "met" the specification requirements without actually recording the temperatures, conditions, date, and time will be useless in the failure investigation.

The failure investigator may interview the QA and/or QC coatings inspector and request copies of inspec-

Continued

tion records, photographs, and other project documents to aid in the investigation. The value of these documents is directly related to their inherent completeness and accuracy.

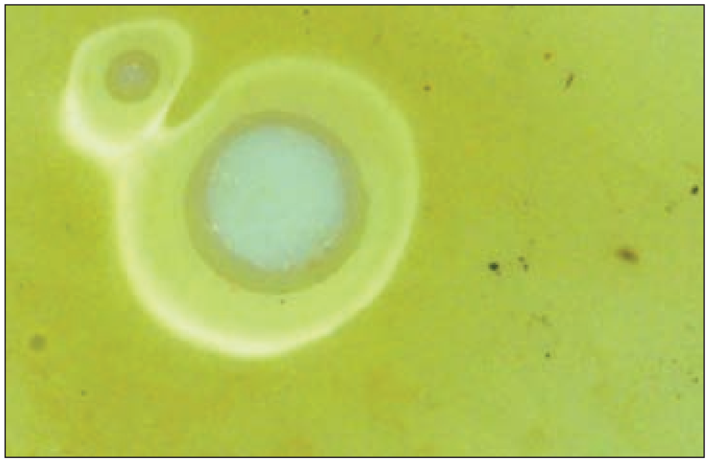


Fig. 4: "The Case of the Yellowed Lining"

A coatings inspector must realize that inspection records, photographs, and written correspondence with the contractor, owner, and material supplier are all "discoverable" in the legal process. The inspector may be required to give a deposition and may need to testify and be cross-examined in court if a coating failure is litigated. Proper records serve better than memory.

A Taste of What's to Come

Here are a few teasers of the types of coating failure case histories you can anticipate reading about in the coming months.

- "The Case of the Yellowed Lining"—Relining a ten-million-gallon potable water storage tank is no simple undertaking. However, because of the ingenuity and experience of a reputable painting contractor, the project was proceeding very smoothly...until the lining turned multiple shades of yellow (Fig. 4).
- "The Case of the Disappearing Blisters"—A coating contractor applied an epoxy primer and a urethane finish coat to the exterior of a new water storage tank in the Midwest. Shortly after completion of the project, someone noticed that the coating detached from the sidewalls in several areas as large, irregularly shaped blisters. Oddly, the blisters often shrank and disappeared during the afternoon hours, just to reappear the next morning.
- "The Case of the Perplexing Paint Shop"—We discover how certain "building improvements" made by the lessee resulted in a continual loss of interior roof coatings over his occupancy. It was only after the space conditioning system was closely examined that the reason for the deterioration and loss of epoxy mastic coatings was discovered.
- "The Case of Three Rights Make a Wrong"—We describe three different failure investigations on aluminum that exhibited the same corrosion mechanism. Aluminum, like steel, is coated for corrosion protection and aesthetics, and like coatings on steel, coatings on aluminum are subject to premature failure. Yet, as you will see, the three case histories on coated aluminum suggest the project outcomes should have been quite different. Why would failure occur when it appeared that everything was done correctly?

So stay tuned as we solve these and other cases.

Applicator Specialist Training: Workforce Development for the 21st Century

Like many trades, the industrial painting sector is comprised mainly of an aging workforce with knowledge and skills that cannot be easily replicated. According to data presented by contractors at the SSPC- and *JPCL*-organized Workforce Summit held in November 2006 in Pittsburgh, PA, the average painter is now over 50 years old, and not enough new workers are entering the field to replace the older painters as they retire or move into administrative positions. Thus, continued training of the existing workforce and recruitment of future workers through a variety of programs and delivery methods is crucial for the industry.

Current training includes that provided by organizations such as the International Union of Painters and Allied Trades (IUPAT), SSPC, the National Center for Construction Education and Research (NCCER), NACE, the Williamson Free School, and the Institute of Corrosion in the UK.

Along with the various other industry groups, SSPC recognizes that the industrial painting trade has become a highly technical profession, and the need to successfully transfer knowledge to the next generation of qualified craft workers is greater than ever. In 2008, SSPC and NACE jointly published SSPC ACS-1/NACE 13, a consensus standard that spells out the criteria for programs that certify individual industrial painters to the highest standard of craftsmanship. Based on this standard, SSPC created the new "Industrial Coating and Lining Application Specialist Qualification and Certification Program" (CAS) in August 2008. The program is meant to jump-start the lengthy process toward certification of the painter workforce by addressing the education, training, experience, and knowledge required to prepare and apply protective coatings to steel and concrete surfaces.

This article describes SSPC's new Applicator Specialist Training Curriculum, designed to meet SSPC ACS-1/NACE 13; established training programs, primarily those from SSPC; and SSPC's interim and full certification program for CAS.

SSPC Applicator Specialist Training Curriculum

The applicator specialist training curriculum SSPC has developed over the past two years is designed to meet the immediate need for training craft workers while also providing a career path toward eventual CAS certification (detailed later in this article) for those workers who wish to pursue it. The curriculum covers both the core Body of Knowledge topics and all of the specialty areas identified within SSPC ACS-1/NACE 13. Currently, Level I, Level II, and Specialty training are available, with Level III training under development.

The standard itself defines these various qualification levels for training as

- Level I—basic knowledge of industrial coatings and linings;
- Level II—detailed knowledge of, and skills for applying, industrial coatings and linings;
- Specialty—Level II plus detailed knowledge and skills for specialty areas defined in the Body of Knowledge; and
- Level III/Level II plus—basic supervisory knowledge and skills, basic training knowledge and skills, and basic communication knowledge and skills.

Level I qualification is intended for entry-level Application Specialists; Level II qualification is for experienced Application Specialists able to work independently; and Level III qualification is for Application Specialists responsible for planning, oversight, evaluation, and supervision of industrial coating and lining work on complex structures.

The standard's requirements associated with each qualification level include prerequisites, experience, and an appropriate degree of knowledge and skills as they relate to the Body of Knowledge contained in Appendix A. This Body of Knowledge forms the basis for the core SSPC applicator specialist training curriculum in terms of

- environmental, safety, and health;
- process control;
- materials;

By Pamela Groff, SSPC Technical Materials Development Specialist

Photos courtesy of SSPC

- corrosion basics;
- surface preparation; and
- liquid coating application.

The following additional specialty training as defined in the standard's Body of Knowledge is also available through SSPC.

- Application of Polymer Coating to Concrete
- Electrostatic Spray Application
- Plural-Component Spray Application
- Powder Coatings Application
- Thermal Spray Application
- Coating application to Specialty Pipelines

Current SSPC Programs for Training Contractors to Teach Their Workforce

Currently, applicator specialist training is delivered through SSPC's Applicator Train-the-Trainer in-person program and its e-learning center.

Coatings Applicator Training Program

By the* JPCL *Staff

A new tool, the Corrodere Applicator Training Program, has been developed to train coatings applicators in best practices. Developed by the Surrey, UK-based MPI Group in conjunction with industry experts, the program consists of three DVDs that guide an applicator through all aspects of surface preparation and coatings application.

The material covered in the DVDs includes the following.

Industrial Coatings Applicator

- Health and Safety
- Access, Plant and Equipment
- Surface Preparation
- Paint Types
- Paint Application
- Quality Control

Abrasive Blast Cleaning Operative

- Introduction to Abrasive Blast Cleaning
- Health and Safety
- Blast Media
- Standards and Quality Control
- Operational Procedures
- Process Control

Spray Painting Operative

- Introduction to Spray Painting
- Health and Safety
- Paint Materials
- Airless Spray Equipment
- Conventional Spray Equipment

The training materials feature a built-in narration that can be turned off if desired; video, still images, and animation; and handout and instructor notes that can be viewed on-screen or printed out. Some of the course units also include theoretical and practical knowledge assessments. In addition to the training materials, each DVD features an introduction/overview, a technical glossary of corrosion terms, and a link to online help.

The DVD series is compatible with PCs that run either Windows XP or Vista applications. The set of three DVDs is available in the U.S. from SSPC. Visit www.sspc.org for more information.

Applicator Train-the-Trainer

The SSPC Train-the-Trainer program, established in 2007, provides contractors with a mechanism for bringing worker training to the contractor's own facility so it can be conducted at the convenience and need of the contractor. Training in the core topics of corrosion, surface preparation, abrasive materials, coating materials, application methods, process control, and safety is available. Designed to teach contractor personnel how to train their own workers, the two-day program reviews the SSPC Level I and Level II applicator curriculum through lectures; team exercises; and a hands-on component that covers hand- and power-tool cleaning, dry abrasive blast cleaning, and spray application. The trainer course concludes with two short Level II exams, one on surface preparation and one on coating application. Trainers completing Train-the-Trainer are then qualified by SSPC to return to their facilities to teach the SSPC applicator curriculum to their workers and to document the training.

Level II specialty training modules on high- and ultra-high-pressure waterjetting, plural-component spray, coating concrete, thermal spray, pipeline coatings, electrostatic spray, and powder coatings are also available as supplements to the Train-the-Trainer program.

While the SSPC curriculum described here features classroom lectures and demonstrations, it also focuses heavily on hands-on training so that workers get an immediate feel for how to use the tools of the trade properly. The hands-on training reinforces the theoretical knowledge gained in the classroom.

On-line Training

This past January, SSPC introduced an alternative method for workers to gain the Level II "classroom theory" portion of applicator specialist training—the Applicator Training Basics e-course. This on-line learning program covers the core Body of Knowledge of ACS-1/NACE 13 requirements for surface preparation and application, as well as safety in painting. The program was designed to allow applicators who do not have the opportunity to get classroom training at a facility to close this training gap. However, they must also complete hands-on and other training elsewhere if they intend to seek SSPC certification in the future.

Established Training for Applicators

SSPC's existing workforce training and qualification programs, including Abrasive Blasting (C-7), Water Jetting (C-13), Airless Spray Basics and Paint Simulator (C-12), Floor Coating Basics (C-10), Marine Plural Component (MPCAC, C-14), and Plural Component Basics (C-15) were created before the release of SSPC ACS-1/NACE 13 and meet a portion of the formal training pre-requisites established in it. Once SSPC ACS-1/NACE 13 was published in 2008, SSPC began offering a more comprehensive curriculum tied directly to the standard, with the goal of providing training that can play a key part in preparing the industrial painting workforce to become certified in the future.

Applicator specialist training from IUPAT and NCCER also covers training topics specified in ACS-1/NACE 13. IUPAT has trained its staff to deliver an updated industrial painter curriculum, with District Councils implementing industrial painter apprenticeship programs nationwide. The IUPAT apprenticeship program is three or four years long, with 432 hours of instruction.

NACE has partnered with NCCER to produce an industrial coating and lining application specialist written assessment. NCCER also has an existing painting curriculum that includes more than 150 hours of industrial painting training in addition to 72 hours of core curriculum. The total number of paint training hours provided by the NCCER program exceeds 600.

In Canada, the Industry Training Authority offers three levels of training, with a practical assessment and a written exam at each level. It requires 450 hours of classroom training and 5,400 hours of work experience. Those with 8,100 hours of work experience can challenge their need to take the training requirements and instead take the practical assessment and written exam.

Interim and Full Certification from SSPC's CAS Program

SSPC's CAS program represents a transition plan that will prepare the protective coatings industry for the day in which the national infrastructure is in place for standardized apprenticeships and training programs. The plan is in line with SSPC's conservative estimate that it will take the industry 10 years to develop a significant group of trained and qualified industrial painters meeting the criteria of ACS-1/NACE 13 and the needs of owners.

CAS serves as a mechanism for national and third-party professional recognition of certified applicators. The two-part approach involves an interim program that began in 2008 and will be fully implemented in 8–12 years. The "Interim Certification Program" allows those in the current workforce the opportunity to realistically achieve certification within the next several years. Craft workers who have fewer hours of formal training and experience than specified in the SSPC/NACE standard can test out for certification. Those craft workers meeting the eligibility requirements for "interim" certification (minimum of 150 hours of formal training and at least 2,000 hours of work experience) will still be required to pass a rigorous written examination and undergo a thorough hands-on skills assessment in industrial painting and blast cleaning to assess competency.

SSPC Interim Application Specialist Certification is valid for a maximum of two three-year terms, or six years. Those wishing to renew their application specialist certification after completing the second term must take a "Full Status" written exam to transfer certification status from "interim" to "full."

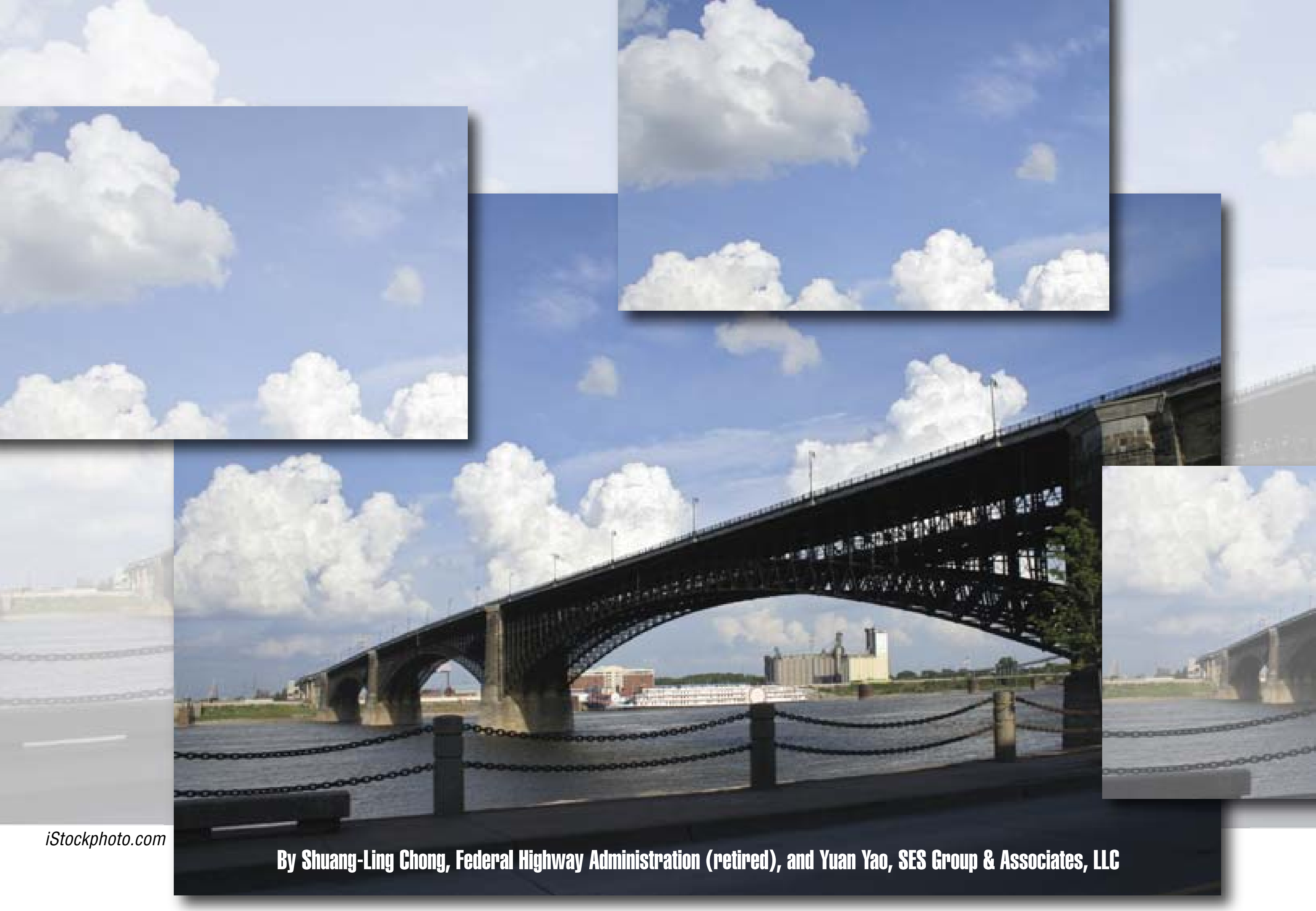
"Full" status certification to SSPC ACS-1/NACE 13 under CAS is also available now for those who request it and qualify. Achieving this status requires passing a closed-book written exam drawn from the core areas of the SSPC ACS-1/NACE 13 Body of Knowledge and hands-on testing that certifies proficiency in dry abrasive blast cleaning and coating application using conventional or airless spray. Those eligible for the full status certification typically have more than 3,000 hours of work experience and a minimum of 450 hours of formal training.

SSPC believes that its qualification and certification program is a viable means of helping to develop a highly qualified workforce sooner rather than later. This will improve quality on the job in the present by giving contractors access to more qualified workers. Applicator training delivered through the SSPC Applicator Train-the-Trainer and the Applicator Training Basics e-course, as well as through IUPAT and NCCER, meets the immediate need for workforce development while working toward the long-term certification goal.

Further Information

For more information on SSPC's initiative, contact Michael Damiano, SSPC director of product development, at 877-281-7772, ext. 2203.

JPCL


iStockphoto.com

By Shuang-Ling Chong, Federal Highway Administration (retired), and Yuan Yao, SES Group & Associates, LLC

A Methodology to Evaluate the Relative Performance of Various Coating Systems

Editor's Note: The full report, including all data, on which this article is based appears in the on-line edition of the January 2009 JPCL, *found at www.paintsquare.com.*

In the U.S., bridge maintenance and rehabilitation costs billions of dollars annually, and corrosion is a major cause of bridge deterioration. Therefore, reducing corrosion is critical for bridge owners to save money as well as prevent bridge failures. Accelerated information on coating degradation rates during the early stages of testing would be highly beneficial for making a bridge maintenance plan. A number of papers have been published to estimate the rate of coating degradation in terms of weight loss, film thickness reduction, surface blistering, surface rusting, and similar factors. However, no sensitive methods have been established for systematically comparing coating performance.

In particular, a sensitive method is needed to test the numerous new bridge coatings that have been formulated recently to meet the U.S. Environmental Protection Agency's restrictions on volatile-organic-compound (VOC) content in architectural and industrial maintenance (AIM) coatings. Even though a significant number of studies have been conducted to investigate the performance of these new coatings, the performance of some systems is not thoroughly understood through accelerated testing, and verification in the field takes a long time.

Nevertheless, various accelerated laboratory test methods have been developed to predict a coating's field performance in a relatively short time. Currently, the most popular program for coating evaluation is the AASHTO/National Transportation Product Evaluation Program (NTPEP). In the program, each coating system is tested in a certified laboratory, and then its performance is judged by several criteria in the standard AASHTO R31 method, "Standard Practice for Evaluation of Coating Systems with Zinc-Rich Primers." R31 includes an accelerated laboratory test.

The Federal Highway Administration/Turner-Fairbank Highway Research Center (FHWA/TFHRC) has developed a fairly reliable methodology to determine the relative coating performance for various coating types. Most of the new coating systems are well formulated; they do not generally exhibit significant surface failures at early stages of accelerated laboratory testing. The only failure observed at early test time is rust creepage at an intentionally made scribe. Making a scribe is a necessity to evaluate coatings within a reasonable amount of time. In several published papers,[1,2,3,4] rust creepage at the scribe was plotted against test time to observe the growth rate of the creepage, i.e., corrosion rate.

In 1990, to obtain rust creepage values that generally increase with test time, the FHWA/TFHRC followed ASTM D1654, "Standard Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments." But the plot of rust creepage as a function of test time showed no particular mathematical pattern.[1] However, the measurement technique was refined to take rust creepage measurements along a scribe line at intervals of equal distance. Creepage values were then averaged,[5] and a linear relationship between mean accumulative creepage and test time was observed. Although the refinements in measurement are valuable, the method is tedious and time consuming.

Later, repeatability of creepage measurement and the linear relationship were improved further when the FHWA/TFHRC developed ASTM D7087-05a to measure rust creepage. Titled, "Standard Test Method for An Imaging Technique to Measure Rust Creepage at Scribe on Coated Test Panels Subjected to Corrosive Environments," ASTM D7087-05a is more quantitative and faster than the methods discussed above. It includes tracing the rust creepage area along a scribe, scanning the trace, and saving the scanned image on a computer. The creepage area is then integrated by computer software and divided by twice the scribe length to obtain the mean rust creepage.[6] A linear correlation has been found between scribe creepage and test time for all the previously conducted tests, showing that ASTM D7087-05a is a highly powerful method for comparing coating performance.

In this article, some representative test results of different coating systems are collected to show the consistency and advantage of this plotting using ASTM D7087-05a for determining corrosion rate and for determining how soon corrosion starts to develop at the scribe for each coating system tested. Ultimately, it is easy to identify a coating type that performs better than others from the plot. Based on this plot, either the slope or the incubation time (or both) can be used to compare the differences in coating degradation rates at the scribe among the coating systems tested under the same conditions.

Table 1: 500-Hour Laboratory Test Cycle[a]

Test Cycle	Test A	Test B
Freeze: 68 hour Temperature: -23 C	X	X
UV-condensation: 216 hours Test cycle: 4-h UV/4-h condensation UV lamp: USA-340 UV temperature: 60 C Condensation temperature: 40 C Condensation humidity: 100% RH	X	X
Salt fog-dry air: 216 hours Test cycle: 1-h wet/1-h dry air Wet cycle: 0.35 wt% $(NH_4)_2SO_4$ 0.05 wt% NaCl at ambient temperature Dry air cycle: at 35 C	X	
Salt fog-dry air: 216 hours Test cycle: 1-h wet/1-h dry air Wet cycle: 5% NaCl at 35 C Dry air cycle: at ambient temperature		X

a: All Test A and Test B results are shown in the complete article on www.paintsquare.com.

Table 2: Typical Outdoor Annual Characteristics of Sea Isle Exposure Site in New Jersey

Sunshine: 2,840 hour Relative humidity: 51% Rainfall: 150 cm pH of rain water: 4.2 Conductivity of rain water: 163 microsiemens/cm Composition of rain water: 27 ppm Cl^-, 25 ppm SO_4^{-2} Water temperature: 9.1 C (48.4 F)	
Spray seawater: pH = 7.5 Salt content: 2.7 wt%	

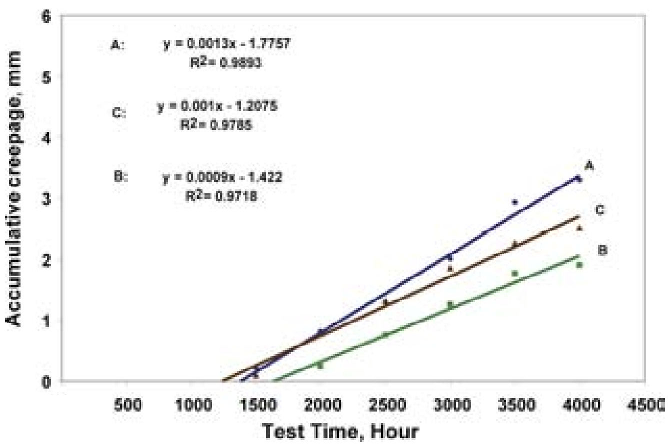


Fig. 1: Plot of scribe creepage of moisture-cured urethane coating systems A, B, and C over SSPC-SP 10 surfaces versus laboratory test time in Test A.

Procedure to Obtain the Plot

Plotting the data requires several steps.

1. A straight scribe is made on a coated steel panel vertically or diagonally in accordance with ASTM D1654.

2. At equal test time intervals of any laboratory accelerated test method (such as 500 hours used in this article) or outdoor exposure (such as 6 months) throughout the test period, a mean rust creepage distance is measured. Two measuring methods are the most popular:

(a) taking measurements at equal distances on both sides of the scribe, and then averaging all the measurements,[5] and

(b) tracing and integrating the creepage area around the scribe, and then dividing the result by two lengths of the scribe line (ASTM D7087-05a).

Usually, a minimum of three replicate test panels is needed for each coating system to obtain statistically meaningful data. As creepage increases, measuring error decreases.

3. Rust creepage should be measured at least at six test time intervals, or the test should be conducted longer than originally planned if no significant failures can be observed.

4. The mean accumulative rust creepage is then plotted against test time intervals.

5. A straight line is plotted by applying linear regression analysis of the data points for each coating system. (A linear regression analysis is a mathematical model that determines the relationship between one or more independent variables and a dependent variable by the least squares method.) The slope of the line and the intercept (incubation time) at zero rust creepage are then obtained from the linear regression equation.

Results

Some of the plots are shown in Figs. 1–4. The laboratory and outdoor test conditions are described in Tables 1 and 2 (p. 27). The coating systems in the plots are listed in Table 3 (p. 30). These results are part of previously published research data.[2] A freeze cycle was added to both laboratory tests (the so called "Chong Cycle" by Aragon and Frizzi[7]) to make tests more realistically simulate the outdoor conditions of northern climates.

All the time series data generated a linear regression equation as shown in Figs. 1–4. A generic form of the equation is shown below.

$$y = ax - b \text{ (Equation 1)}$$

where slope = a, and

incubation time = x = b/a when y = 0

R^2 is the Coefficient of Regression. The closer this number is to 1.0, the better the data points fit a straight line. (In a perfect straight line, $R^2 = 1$.)

We can define the coating durability as (D), which is proportional to the incubation time (T). That is, the extrapolated test time when creepage equals zero and is inversely proportional to the line slope (S) as shown below;

then $D \propto T/S$ or $D = k\,T/S$ where k is a constant (Equation 2)

Thus, the relative coating performance after testing can be distinguished by the ratio of incubation time (T, hour) to slope (S, mm/hour). The ratio (T/S) is here considered the "durability index" and has been calculated for the various coating systems above and is listed in Table 4 (p. 32).

The higher the T/S ratio is, the better the coating performance becomes in terms of corrosion creep. For example, the coating performance over an SSPC-SP 10 surface is in the decreasing order of B > C > A, where the durability index is 17.6, 12.1, and 10.5 respectively. Similarly, over chloride-doped surfaces, System B (13.5) performs better than System A (7.0), which is better than System C (4.4) with durability index included in parenthesis.

Further demonstrations of the usefulness of the technique can be found in the complete article on www.paintsquare.com (January 2009 *JPCL* On-line Exclusive), where the performance of many different coating types previously tested in two different laboratory tests (Test A and Test B) have been plotted.

It should be stated here that scribe creepage is only one parameter for predicting coating performance; however, its early development under most test conditions makes coating evaluation possible in a relatively short time.

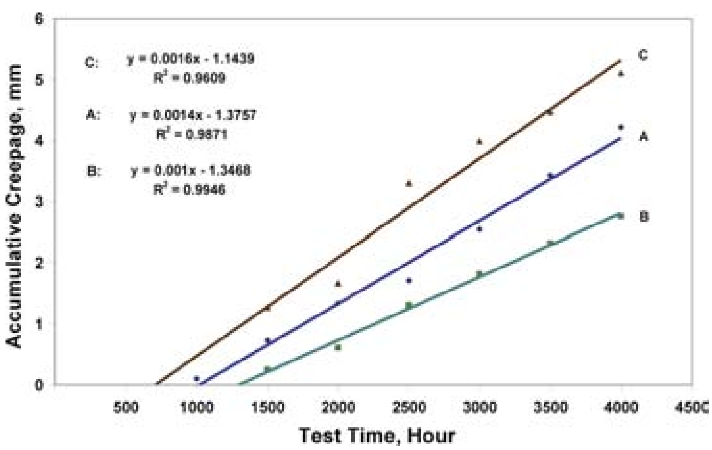


Fig. 2: Plot of scribe creepage of moisture-cured urethane coating systems A, B, and C over 20 µg/cm² chloride-doped SSPC-SP 10 surfaces versus laboratory test time in Test A.

Summary and Conclusions

Several research studies on coating performance published previously by FHWA showed an excellent linear relationship between mean accumulative creepage at scribe and test time, for both laboratory tests and outdoor exposure within the predetermined test periods. By looking at the incubation time and slope value of the linear line, coating performances can be compared if they are tested under the identical test conditions and preferably at the same test time. This plot technique obviously has a big advantage over the other evaluation methods; it is mathematically based and gives more quantitative results. Unlike most of the other methods that measure only the final rust creepage after the test is completed, this plot provides much more information on coating performance. It can differentiate between the performance of various coating systems, and it can be used to distinguish the performance of the same generic coating materials made by different vendors. For example, from the above plots, the performance of moisture-cured urethanes formulated by different vendors can be distinguished in terms of rust creepage growth rate at the scribe and incubation time.

The new plot method discussed in this article generated a linear relationship between rust creepage at scribe and test time. The scribe creepage should be measured by tracing, and the creepage area should be integrated by computer software or by averaging the creepage distance at equal distances along the scribe. This method is a highly useful ranking tool for evaluating the performance of coatings that have been tested under the same test conditions (either accelerated laboratory tests or natural weathering tests)

Table 3: Description of Moisture-Cured Urethane Coating Systems

System	Coating materials Dry	Film Thickness, mil (µm)	VOC, g/L
A	Zn[a]-rich urethane/MIO[b]-filled urethane/urethane	3/3/3 (75/75/75)	314/315/314
B	Zn-rich urethane/MIO-filled urethane /MIO-urethane	3/3/3 (75/75/75)	336/336/336
C	Zn-rich urethane/MIO- & Al[c]-filled urethane/MIO-filled urethane	3/3/3 (75/75/75)	337/340/336
A1	MIO- & Al-filled urethane/MIO-filled urethane/urethane	3/3/3 (75/75/75)	315/315/314
B1	Zn- & MIO-filled urethane/MIO-filled urethane/MIO-filled urethane	3/3/3 (75/75/75)	336/336/336
C1	MIO- & Al-filled urethane/MIO- & Al-filled urethane/MIO-filled urethane	3/3/3 (75/75/75)	340/340/336

a: Zinc b: Micaceous iron oxide c: Aluminum

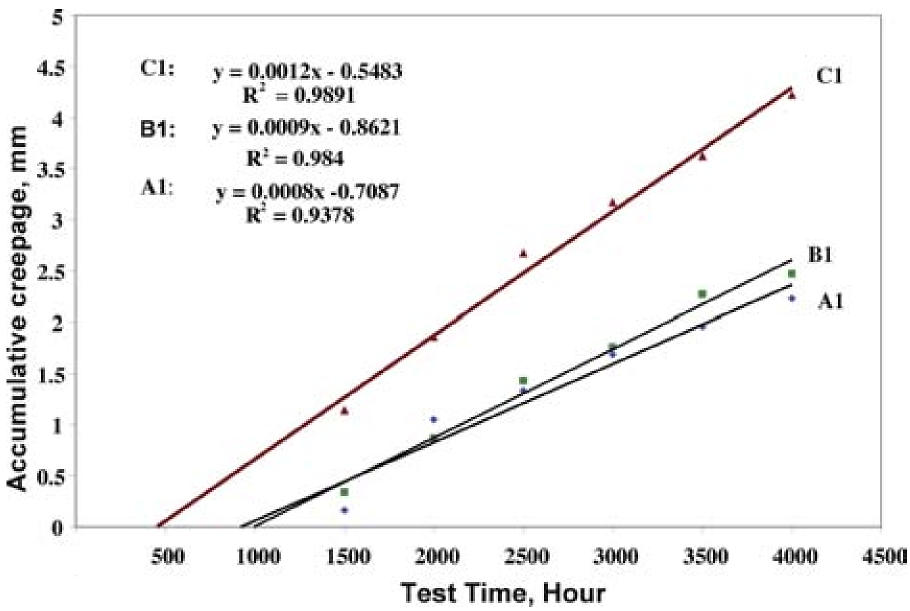


Fig. 3: Plot of scribe creepage of moisture-cured urethanes over SSPC-SP 3 surfaces versus laboratory test time in Test A.

and preferably at the same test time. Performance can be evaluated in terms of the following variables.

• Different coating formulations within same coating type

• Different coating types (More than one test is needed to obtain more reliable performance results because the systems' performance may vary depending on the test conditions.)

• Different degrees of cleanliness of steel including Near-White (SSPC-SP 10), chloride contaminated (SSPC-SP 10), and rusted and then power-cleaned (SSPC-SP 3) surfaces.

Rust creepage growth rate at the scribe or coating durability can be calculated from the line slope in the plot. Based on the slope and incubation time, the relative performance of different systems (durability index) can be estimated with reasonable reliability under the same test conditions. But the readers should note that these values are used for comparison purposes; they are not absolute values for corrosion protection.

There are three major advantages for this plot method.

• More information such as coating degradation rate at the scribe and incubation time can be obtained.

• Laboratory test time can be shortened because the scribe creepage at longer times is obtainable from extrapolation.

• Relative coating performance can be observed on the plot.

In conclusion, this method is highly useful for determining relative coating performance in the laboratory within a short time.

References

1. Shuang-Ling Chong and John Peart, *Evaluation of Volatile Organic Compound (VOC)—Compatible High Solids Coating Systems for Steel Bridges*, FHWA Publication No. FHWA-RD-91-054, 34 pp., August 1991.
2. Shuang-Ling Chong and Yuan Yao, *Laboratory and Test-Site Testing of Moisture-cured Urethanes on Steel in Salt-Rich Environment*, FHWA Publication No. FHWA-RD-00-156, 75 pp., December 2000.
3. Shuang-Ling Chong and Yuan Yao, *Laboratory Evaluation of Waterborne Coatings on Steel*, FHWA Publication No. FHWA-RD-03-032, 44 pp., April 2003.
4. Shuang-Ling Chong and Yuan Yao, "Performance of Two-coat Zinc-rich Rapid Deployment Systems on Steel Surfaces," *Proceedings of PACE 2005*, 12 pp., Las Vegas, NV, January 2005.
5. Raymond E. F. Weaver, "Interpreting Scribe Undercutting Data in Cyclic Tests," *JPCL*, September 1999, pp. 17–25.

continued

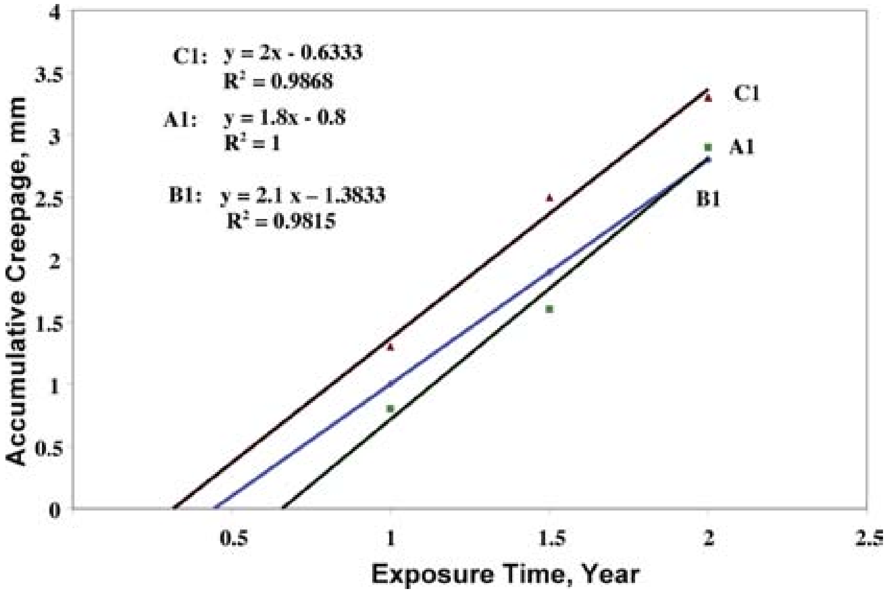


Fig. 4: Plot of scribe creepage of moisture-cured urethanes over SSPC-SP 3 surfaces versus outdoor exposure time

Table 4: Relative Performance of Different Moisture-Cured Urethane Coating Systems in Test A

System No.	Surface Condition	Slope (S), mm/hour	Incubation Time (T), hour	Durability Index (T/S) X 10^{-5}, $(hour)^2$/mm x 10^{-5}
A	SSPC-SP 10	0.0013	1,366	10.5
B	SSPC-SP 10	0.0009	1,580	17.6
C	SSPC-SP 10	0.001	1,208	12.1
A	Chloride-Doped SSPC-SP 10	0.0014	982	7.0
B	Chloride-Doped SSPC-SP 10	0.001	1,347	13.5
C	Chloride-Doped SSPC-SP 10	0.0016	714	4.4
A1	SSPC-SP 3	0.0008	886	11.0
B1	SSPC-SP 3	0.0009	958	10.6
C1	SSPC-SP 3	0.0012	457	3.8

6. Yuan Yao and Shuang-Ling Chong, "An Imaging Technique to Measure Rust Creepage at Scribe on Coated Test Panels," *JPCL*, January 2002 pp. 67–78.
7. M. A. Aragon and E. Frizzi, "Correlation Between Natural and Artificial Weathering of Anticorrosion Paints: Analysis of Some Artificial Weathering Cycles," *Protective Coatings Europe*, January 2002, pp. 8–13, and *JPCL*, September 2002, pp. 58–62.

Dr. Shuang-Ling Chong retired in 2007 from the Federal Highway Administration, where she had worked since 1989. She has worked on all generic types of bridge coatings; leaching of blasted paint residues; chloride testing; and failure analysis. A research chemist as well as manager of TFHRC Coatings and Corrosion Laboratory, she has more than 30 years of experience in chemical research. She is a member of numerous industry organizations, including SSPC, ASTM, TRB, and ACS.

Ms.Yuan Yao joined SaLUT, Inc. in 1994, working on performance evaluations of various coating types and a wide range of testings. She also has worked on analytical techniques in the TFHRC Coatings and Corrosion Laboratory as an on-site contractor. She is a senior chemist and has worked on many chemistry and coating projects in the past 15 years.

JPCL

Evaluating Techniques for Measuring Applied Film Thickness of Polyurea Elastomeric Systems

By Dudley J. Primeaux II, Primeaux Associates LLC, Elgin, TX and Kelin Bower, PolyVers International, Houston, TX

In any coating or lining work, obtaining the specified minimum film thickness or the minimum average film thickness is essential. In addition, the applied coating or lining must be uniform and void free to prevent premature failures related to uniformity and coverage that otherwise can and will occur. Specifications call for a required minimum film build, not to verify material use, but because the requirement relates to the overall performance of the project. Knowing the applied film thickness of the coating or lining system as the job proceeds also helps determine if one has obtained sufficient material to successfully complete the application work as specified.

Film thickness can also affect the color, gloss, surface finish, adhesion, flexibility, impact resistance, and hardness of a coating. The effects of film thickness are especially critical for fast-set, plural-component polyurea spray coating and lining systems;[1] however, wet film thickness measurements used in traditional coating and lining work may not readily apply to the polyurea technology due to its unique characteristics.

Failures due to low film thickness could be avoided with proper application training and attention paid to the specification requirements and minimal applied film thickness requirements.[2]

This article will discuss various applied film thickness measurement techniques and how they relate to polyurea elastomer coating and lining technology, specifically for concrete structures, a major use of polyurea coatings. The article will focus on ASTM D6132, "Standard Test Method for Nondestructive Measurement of Dry Film Thickness of Applied Organic Coatings Using an Ultrasonic Gage," and the new SSPC Paint Application Specification No. 9, Measurement of Dry Coating Thickness on Cementitious Substrates Using Ultrasonic Gages.

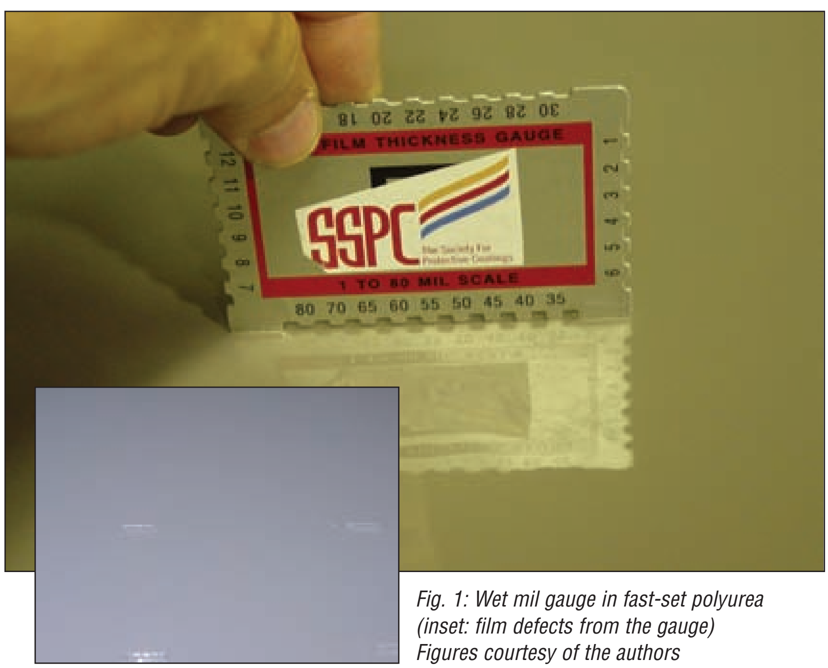


Fig. 1: Wet mil gauge in fast-set polyurea (inset: film defects from the gauge) Figures courtesy of the authors

Thickness Measurement Methods

So just how does one measure the applied film thickness of fast-set, plural-component polyureas on concrete? The traditional and easiest method recognized by the industry is the use of notched gauges on the applied wet film (wet film thickness gauge).[3,4] Although this method is fast and economical, the applied coating systems must remain in a liquid state for a period of time to properly use the gauge. With fast-set systems, like polyurea, a wet film gauge is woefully inadequate.

Because the polyurea spray elastomer gels or sets very rapidly, usually within 15 seconds, there is no time to place the gauge in the "wet" material, remove the gauge, and achieve an accurate reading. Also, the gauge can become stuck or glued into the polymer system, or it can otherwise damage the material, leaving visible defects (Fig. 1). Dry film thickness (dft) measurements can also be taken to monitor application. The most common method is measuring film thickness on metallic substrates using magnetic thickness gauges. Because the major use of polyurea is for protecting concrete or cementitious substrates, magnetic gauges are not directly suitable. However, contractors can use magnetic gauges with some creativity.[5] By either driving large head metal nails in the concrete substrate, or by placing small metal panels on the surface, followed by application of the coating system, contractors can measure coating dft using magnetic thickness gauges.

Figure 2 is a simple illustration of that procedure.

While the procedure in Fig. 2 may seem simple and ideal, it has some problems. For example, the human factor comes into play. If the coating applicator knows the purpose of the nails or metal panels, he or she may tend to pay more attention during application to areas designated for dft measurement. This tendency may lead to the designated areas being within the average minimum thickness requirements while leaving other areas thinner than required.

The use of the nails or panels can also result in raised or higher levels of the applied coating. Aesthetic issues and performance concerns can result if traffic or mechanical movement is present in a raised area. For instance, if metal panels are not permanently bonded to the substrate, large areas of de-bonding could occur, especially if multiple locations are used for overall thickness measurements, such as in SSPC-PA 2 or SSPC-PA 9.[6,7] So the use of magnetic gauges on coatings over nails or metal on concrete is not always a good approach.

Although destructive, other methods suitable for concrete substrates can include the P.I.G. or Tooke gauge for dft.[8] While these methods are typically used on thinner film coating systems (< 10 mils or 254 μm), they can be used on the thicker film coating systems. However, it has been shown in some cases that when using this technique on the thicker applied polyurea elastomeric systems, the resilient qualities of the film build do not allow for a clean cut, and inconsistent readings can occur. Moreover, some may actually not be cuttable because they are soft, and reading of the cut angle is useless for evaluation. Another disadvantage to using destructive measurements is that the test area must be repaired.

Relatively new to the arsenal of the coatings applicator and inspector is the ultrasonic gauges for use on concrete and cementitious substrates.[9] These gauges work by sending a signal (ultrasound) pulse through the applied coating system and measuring the time required for the signal to bounce back from the substrate. Using data gathered through ultrasound, the gauge then calculates the coating thickness.

Some writers have discussed why ultrasonic gauges do not work well for applied fast-set polyurea spray elastomer systems.[10] One limitation, as is claimed, results from the microcellular makeup of the applied polyurea. The high-pressure impingement mixing needed to apply the coating can cause the coating's microcellular characteristic, which interferes with the ultrasound signal. The coating also may be deformable under the load of the test probe.

While some of the objections to using ultrasound techniques might be true to a minor degree, some other characteristics of polymers in polyurea systems can help overcome the objections. For example, one characteristic of polyurea spray technology, aside from the possible microcellular nature, is that its polymerisation produces higher molecular weights at the outer surfaces of the cross section of the polymer film[11,12] compared to outer surfaces of polyurethanes and epoxy systems that possess relative uniform polymer molecular weight distribution throughout a cross section of the polymer film. Because ultrasonic units work by changes in density, the unit "sees" the applied layers (or spray passes), often causing confusion on thickness evaluations of applied polyurea spray systems.

Continued

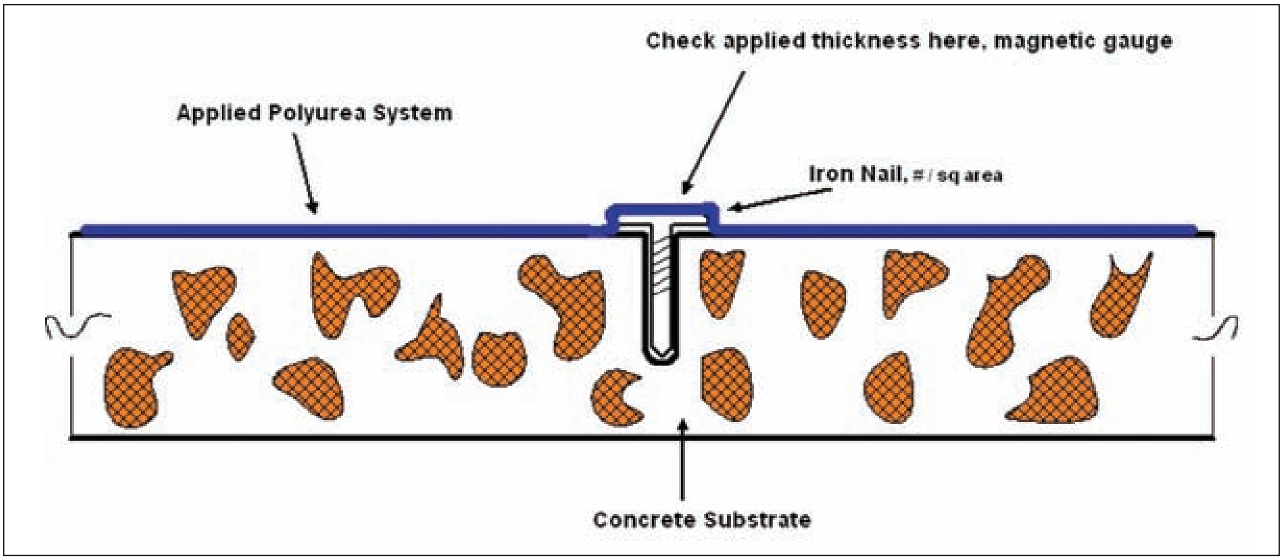


Fig. 2: Polyurea applied over nail or metal plate

To avoid confusion, it is very important to calibrate the ultrasound instrument and to verify its calibration before using the unit on the project. Calibration must be reaffirmed throughout the measurement process. Initial spot measurements should be made to give one an idea of the applied coating thickness range. Once the range is confirmed, the gain can be adjusted on the unit to evaluate the thickness range, thus overcoming confusion relating to changes in density. Furthermore, one can get an idea of how many passes or layers have been applied. ASTM D6132, Section 3.3.3, notes that non-uniform coating density can influence accuracy.

The proper transducer probe use is essential for polyurea systems. It has been found that the "D" probe is the optimum and suggested probe to use when evaluating applied film thickness for fast-set polyurea spray elastomer systems.

Concrete Coating and Lining Measurement Testing

As mentioned, one of the largest uses for the polyurea spray elastomer technology is in the coating or lining of concrete substrates.[13] With that in mind, it is very important that proper applied film thickness be observed to insure performance in these application areas. To illustrate the usefulness of the ultrasonic gauges, a series of experimental test panels was prepared.

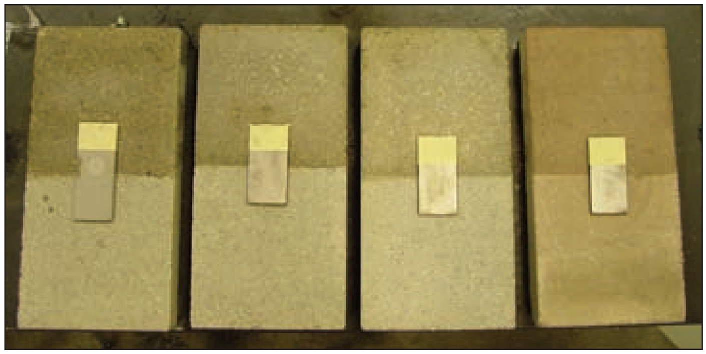


Fig. 3: Concrete test samples

Fig. 4: (L to R) Coated concrete test samples, one coat to four coats

A series of concrete blocks, 8 in. x 16 in. (20 cm x 40.6 cm) was prepared with a profile of CSP 2 to CSP 3.[14] The top half of each block was primed with an epoxy primer system. In the center of each block, a metal coupon 3 in. x 5 in. (7.6 cm x 12.7 cm) was used for thickness measurement using magnetic gauges. The top portion of the coupon was taped off to allow for conventional micrometer testing of applied dft (Fig. 3). The metal coupons had a surface profile of 3 to 4 mils (76 to 101 μm), as illustrated in Fig. 3.

The four blocks were coated with one coat, two coats, three coats, and four coats respectively, of a fast-set spray polyurea elastomer system, with a gel time of about 10 seconds and tack free time of about 30 seconds. The polyurea system was applied with a plural-component, high-temperature/high-pressure proportioning unit, fitted with a mechanical purge impingement mix spray gun. After one hour of application of the polyurea system, each sample was evaluated for system uniformity and applied film thickness.

A visual observation of the coated concrete panels revealed that the one-coat application gave poor, incomplete coverage over the unprimed and primed concrete area, while the two-coat application showed incomplete coverage over only the unprimed concrete area. For each of the four metal samples, complete coverage was noted for the one- to four-coat applications (Fig. 4).

Results

Micrometers, Type 2 magnetic gauges, and an ultrasonic gauge, were used to measure the applied dft of the polyurea spray elastomer system. Table 1 shows the results.

Very good consistency in the measured dft was obtained from the different test methods, including the ultrasonic gauge. However, the results are not exact between methods used. Discrepancies can be explained by the characteristics of the applied polyurea system and the surface profile of the

Continued

Table 1: Applied Dry Film Thickness Results*

Sample	Micrometer	Type 2, #1		Type 2, #2		Ultrasonic, Concrete	
	Tape area	Metal	Tape area	Metal	Tape area	Primed	Unprimed
#1, 1 coat	13	10	11	10	12	13	13
#2, 2 coats	20	18	19	21	19	25	25
#3, 3 coats	34	29	30	28	31	28	28
#4, 4 coats	55	43	47	44	50	52	51

*values reported are in mils (thousands of an inch) substrate.

Fast-set polyurea systems are not paint materials. Applied polyureas have surfaces that are level but with an orange-peel finish, and the orange peel can cause some measurement issues.[15] Depending on where one places the gauge probe, varying thicknesses can be measured, and averaging will "smooth out" the results, though the numbers will not be exact. (See ASTM D6132, Section 3.3.2.)

Compared to metals, concrete substrates have a higher profile and porosity, which can account for large spreads in dft evaluations. Use of a primer system is mainly for improved adhesion and other minor issues, but can also prevent penetration of the coating system into the substrate.

Application and Field Use of Ultrasonic Techniques

The successful field use of ultrasonic thickness measurements for an applied polyurea system to concrete was confirmed in the following examples.

The concrete floor of a decommissioned facility, once used for manufacture and repair of large electrical transformers but then scheduled for demolition, was contaminated with polychlorinated biphenyls (PCBs), a known health hazard. To protect the demolition crew and minimize the transfer of contaminants, a polyurea spray technology was specified as a floor/capping system. The specification called for a minimum average coating thickness of 60 mils (1.5 mm) in light areas and a minimum average of 120 mils (3.0 mm) in heavy construction equipment areas on the 28,000 ft^2 (2,600 m^2) facility.

To confirm that the specified film thickness was achieved, an ultrasonic gauge was used to verify the coating thickness and measurements were taken, using the SSPC-PA 2 procedure for frequency characterization (because SSPC-PA 9 had not yet been published). Measurements taken throughout the project were found to meet the minimum specified film thickness in the noted areas. However, the specifier expressed some doubt about the validity of the results, so to confirm the readings, micrometer measurements of the thickness of removed blisters were taken. The micrometer measurements correlated with the results of the ultrasonic gauge.[16]

Polyurea was specified as the lining for a concrete secondary containment area in the diesel, jet fuel, and MOGAS storage area of a major Air Force Facility. The specification called for a minimum average thickness of 80 mils (2.0 mm), applied over a failing epoxy lining system. Ultrasonic thickness testing was again used to monitor the applied film build. To confirm the thickness measurement of the ultrasonic gauge, caliper measurements were taken from samples obtained from destructive pull-off adhesion testing, as was specified for certain areas of the project.[17] In this work, the adhesion testing afforded the ability to confirm the applied film thickness noted with the ultrasonic gauge by use of micrometers. Of course, these test areas required repair of the lining system before the customer would accept the project.

Conclusion

In order to insure performance of an installed coating or lining system, monitoring of applied film thickness is crucial to success. Many physical and appearance properties of the finished coating or lining are affected by applied film thickness. These include color, gloss, surface finish, adhesion, flexibility, impact resistance, hardness, and "fit" of coated pieces. The coating and lining applicator and inspector have a variety of tools to monitor applied coating thickness. While tools are readily available and easy to use for film thickness measurements on metallic substrates, measurement on concrete or other cementitious substrates is more difficult. However, work described in the article has shown that ultrasonic gauges and the related industry test procedures are in fact effective measuring tools, even for the fast-set polyurea spray elastomer technology.

References

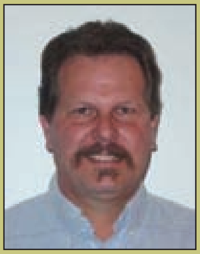
1. Primeaux II, D.J., "Specifications and Polyurea Elastomeric Coating /Lining Systems," "Bet on Success" 2003 PDA Annual Conference, Reno, NV, August 19–21, 2003, pp. 1–16.
2. Polyurea Applicator Spray Course, Polyurea Development Association, Kansas City, MO.
3. ASTM D4414 (latest version), "Standard Practice for Measurement of Wet Film Thickness by Notch Gages," ASTM International, West Conshohocken, PA.
4. ASTM D1212 (latest version), "Standard Test Methods for Measurement of Wet Film Thickness of Organic Coatings," ASTM International, West Conshohocken, PA.
5. ASTM D7091 (latest version), "Standard Practice for Nondestructive Measurement of Dry Film Thickness of Nonmagnetic Coatings Applied to Ferrous Metals and Nonmagnetic, Nonconductive Coatings Applied to Non-Ferrous Metals," ASTM International, West Conshohocken, PA.
6. SSPC Paint Application Specification No. 2, "Measurement of Dry Coating Thickness with Magnetic Gauges," SSPC: The Society for Protective Coatings, Pittsburgh, PA, 2004.
7. SSPC Paint Application Specification No. 9, "Measurement of Dry Coating Thickness on Cementitious Substrates Using Ultrasonic Gages," SSPC: The Society for Protective Coatings, Pittsburgh, PA, 2008.

Continued

8. ASTM D4138 (latest version), "Standard Practices for Measurement of Dry Film Thickness of Protective Coating Systems by Destructive, Cross-Sectioning Means," ASTM International, West Conshohocken, PA.
9. ASTM D6132 (latest version), "Standard Test Method for Nondestructive Measurement of Dry Film Thickness of Applied Organic Coatings Using an Ultrasonic Gage," ASTM International, West Conshohocken, PA.
10. Reader Response: "DFT of Coatings on Concrete," Problem Solving Forum, *JPCL*, Vol 24, Number 9, September 2007, pp. 28–29.
11. Dominguez, R.J.G., "The Effect of Annealing on the Thermal Properties of Reaction Injection Molded Urethane Elastomers," *Polymer Engineering and Science*, Volume 21, No. 18, December, 1981, pp. 1210 – 1217; discussions and work with author.
12. Ryan, Anthony J., et. al., "Thermal, Mechanical and Fracture Properties of Reaction Injection-Moulded Poly(urethane-urea)s," *Polymer*, Volume 32, No. 8, 1991, pp. 1426–1439; discussions with author.
13. "Study of the Global Polyurea Industry 2008," Duker Worldwide, The Polyurea Development Association, Kansas City, MO.
14. "Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, and Polymer Overlays," Guideline No. 03732, International Concrete Repair Institute, Sterling, VA, 1997.
15. Berger, D.M. and D.J. Primeaux II, "Thick-Film Elastomeric Polyurethanes and Polyureas," *The Inspection of Coatings and Linings*, 2nd Edition, SSPC: The Society for Protective Coatings, 2003, Chapter 5.3, pp. 115–121.
16. ASTM D1005 (latest version), "Standard Test Method for Measurement of Dry-Film Thickness of Organic Coatings Using Micrometers," ASTM International, West Conshohocken, PA.
17. ASTM D7234 (latest version), "Standard Test Method for Pull-Off Adhesion Strength of Coatings on Concrete Using Portable Pull-Off Adhesion Testers," ASTM International, West Conshohocken, PA.

Editor's Note: This article is based on a paper the authors gave at PACE 2009, the joint conference of SSPC: The Society for Protective Coatings and the Painting and Decorating Contractors of America, held February 15-18, 2009, in New Orleans, LA.

Dudley J Primeaux II, PCS, CCI



Dudley J. Primeaux II

Dudley J. Primeaux II is a consultant and the owner of Primeaux Associates LLC (Elgin, TX), which specializes in the polyurea industry, equipment, application, training, and inspection. He is part of The Polyurea Training Group, which provides various training programs relating to all aspects of polyurea technology, and he is the instructor for the Polyurea Development Association (PDA) Spray Applicator Course. Mr. Primeaux has an M.S. degree in organic chemistry from Lamar University in Beaumont, TX, and was employed by Texaco Chemical Company, Huntsman Corporation, and EnviroChem Technologies, LLC, as a partner before forming Primeaux Associates LLC.

Mr. Primeaux is active in SSPC, NACE, and PDA, where he is a past-president and a member of the Board of Directors. He has also completed the SSPC PCS Protective Coatings Specialist and SSPC CCI Concrete Coatings Inspector certifications. He is an inventor of 26 U.S. patents and 8 European patents on polyurethane and polyurea foam applications, as well as polyurea spray elastomer systems and applications. He has authored over 40 technical papers on polyurea elastomeric coating and lining technology, as well as several chapters in SSPC book publications.

Kelin Bower

Kelin Bower

Kelin Bower is the marketing director for PolyVers International (Houston, TX), a polyurea technology company that formulates, manufacturers, and supplies polyurea elastomeric coating and lining systems globally.

Mr. Bower received his degree in international business with minors in political science and economics from Texas Lutheran University. He then began his work with PolyVers in technical support and development and has since transitioned into his current role. Mr. Bower is active in SSPC, NACE, and PDA, where he is a member of the Board of Directors. He has authored and co-authored numerous technical presentations on polyurea elastomer technology.

SSPC Honors Five Projects at PACE 2009

SSPC President Bruce Henley presented the following five 2009 Structure Awards for outstanding coating projects at the 2009 SSPC Annual Meeting and Awards Program, held at PACE 2009 in New Orleans, LA. The winning projects will be featured in an upcoming issue of *JPCL*.

William Johnson Award

The William Johnson Award recognizes an outstanding achievement demonstrating aesthetic merit in industrial or commercial coatings work. Nominated projects must have been completed within the past three years.

The qualities that may be considered for aesthetic merit include color, gloss or texture, and the impact the coating has on the appearance of the environment or the structure itself. The coating may represent a theme, an object, or a specific graphic design.

This year's winner of the Johnson Award is the Georgia Dome, owned by the Georgia World Congress Center Authority. Specialty Finishes, Inc. (Atlanta, GA) performed the coatings work with materials supplied by the Tnemec Company, Inc. (North Kansas City, MO).

E. Crone Knoy Award

The E. Crone Knoy Award recognizes an outstanding achievement in industrial or commercial coatings work that demonstrates innovation, durability, or utility. Nominated projects must have been completed within the past three years.

The qualities that may represent outstanding achievement in this area include excellence in craftsmanship or execution of the work, and use of state-of-the-art techniques or products to creatively solve problems or provide long-term service.

Continued

Individual Member Update

- Ron Allen, Caldwell, ID
- Len Andre, Whitehorse, YT, Canada
- Andres Aquino, Lima, Peru
- Jimmie Baham, Folsom, LA
- Jerry Bakke, Duluth, MN
- Mark Borne, Kenner, LA
- Giuseppe Borsellino, Varennes, QC, Canada
- Jeremy Bristow, El Paso, TX
- Paul Calfat, Onoway, AB, Canada
- James Campbell, Buford, GA
- Miguel R. Castillo, Caracas, Venezuela
- Carlton A. Catalani, San Antonio, TX
- James Caveney, Roslindale, MA
- Juan Pablo Cazares, Naucalpan, Mexico
- Peter Cholos, Munster, IN
- Jorge Costa, Tequesta, FL
- Joseph Cox, Reading, PA
- Jim Cutler, Phoenix, AZ
- Marty DiSabatino, Wilmington, DE
- Chris Doppke, Providence, RI
- Brian Dutilly, Jacksonville, FL
- Robert B. Eley P.E., Cleveland, MS
- Joel Emery, Santee, CA
- Noman K. Faridi, Calgary, AB, Canada
- Larry Frazier, Norfolk, VA
- Wendy Gomez, Sarasota, FL
- Jesse Gomez, Providence, RI
- Warren Graves, Dollard-Des-Ormeaux, QC, Canada
- Ivan Hernandez, Hayward, CA
- Christopher Hooter, Winnipeg, MB, Canada
- Shian Hu, Richardson TX
- Isaac A. (Tony) Huval, Beaumont, TX
- Martin Jansons, Christiansburg, VA
- Jimmie L. Johnson, Sarasota, FL
- Randy Korthals Augusta, KS
- Anthony Lelli, Quakertown PA
- Matthew Lossos, Saint Louis, MO
- Peter Madonna, Federal Way, WA
- John Mainieri, Columbus, OH
- Vasel Malaj, Farmington, MI
- Louis Manta, Valparaiso, IN
- John Mathias, Pearl City, HI
- Joseph McCarthy, Swansea, SC
- Darren C. Melhuish P.E., Yorktown, VA
- Ryan Monchamp, Lincoln, CA
- Dian Nasarudin, South Jakarta, Indonesia
- Patrick Nix, Louisville, KY
- Daniel J. Nolan, North Charleston, SC
- Ramon Pelaez, Southbridge, MA
- Elizabeth Quarm, Cleveland, OH
- Scott Quesenberry, Springfield, OH
- Martin Sabatino, New Castle, DE
- Tim Sanderson, Wagoner, OK
- Bert D. Savage, Portland, OR
- David Selinsky, Coon Rapids, MN
- John Steven Sharpe, Grovetown, GA
- Brad Shaw, Fairfax VA
- John Smart, Valdosta, GA
- Dwight A. Smith, Biggar, SK, Canada
- Neil Stanley, Dayville, CT
- Jeff Stephens, Goldsboro, NC
- Gina Summers, Amphur Sriracha Chonburi, Thailand
- Brigham Timpson, Fredonia, AZ
- Jaroslav Vala, Usti nad Labem, Czech Republic
- Pieter Van Rensburg, Mpumalanga, South Africa
- Roy E. Voltmer, Columbia, MD
- James Walt, Christiansted, Virgin Islands (USA)
- Bob Weiskerger, Pittston, PA
- Christopher Westlund, Gilroy, CA
- Carlos YBarra, Commerce, OK
- Kees Zaal, Rotterdam, Netherlands
- Hui Zhou, Houston, TX

This year's Knoy Award winner is the Cardinal Unit 3 Cooling Tower (Brilliant, OH), which is owned by the Buckeye Power Company and managed by American Electric Power. Coatings supplied by The Sherwin-Williams Co. (Cleveland, OH) were applied by New Castle, DE-based Cannon Sline.

Charles G. Munger Award

The Charles G. Munger Award recognizes an outstanding industrial or commercial coatings project demonstrating longevity of the original coating. The structure may have had spot repairs or been overcoated (with the original coating still intact).

"Hats Off"(Calgary Airport Tanks) won this year's Munger Award. Petker Coatings Ltd. (Calgary, AB) used materials supplied by Devoe Coatings (Strongsville, OH) for work on the tanks, which are owned by The Devonian Foundation. NWS Inspection (Calgary, AB) inspected the coating work.

George Campbell Award

The George Campbell Award recognizes outstanding achievement in the completion of a difficult or complex industrial or commercial coatings project. Nominated projects must have been completed in the past three years.

The qualities that may represent achievement in a difficult or complex structure include work occurring in harsh or extreme environmental conditions; work completed under strict time constraints, limited access, or in high traffic areas; a structure with complex structural components; or work coordinated with multiple trades or sub-contractors.

Two projects received the George Campbell Award this year.

Coatings work on the Liard River Bridge (Alaska Highway, BC) received one of this year's Campbell Awards. The structure's owner, Public Works and Government Services, Canada, hired

Instructor Greg Richards, KTA-Tator, leads students in the Bridge Coating Inspection Program course held in November 2008 in St. Petersburg, FL.

Students of the Protective Coatings Inspector course held in November 2008 in Batam, Indonesia

Certified Coating Specialists, Inc. (Castlegar, BC) for the coatings work. Stoncor Group Canada/Carboline/Plasite Coatings Group supplied the coatings materials.

The second George Campbell Award was given for work performed on the Berth 2 East and West Potash Ship Loaders (North Vancouver, BC), a structure owned by Neptune Bulk Terminals Canada Ltd. Certified Coating Specialists (Castlegar, BC) were the applicators, and Camcoat Industries, Ltd. (Burnaby, BC) supplied the coating materials for the job. Camcoat is a distributor for International Paint.

Training Roundup

SSPC training is important to many companies, both in the U.S. and abroad. The following is a summary of two recently offered training courses.

KTA-Tator was the host for twenty-three students who attended the SSPC Bridge Coating Inspection Program (BCI) that was held in St. Petersburg, FL, the week of November 3, 2008. Greg Richardson of KTA-Tator, Inc. and Kevin Schweikert of Protective Coating Solutions, Inc. were the instructors. Florida, Connecticut, and Kentucky require bridge inspectors to have the BCI certification in order to perform inspection work on state bridge projects.

A Protective Coatings Inspector (PCI) Course was held on November 10–15, 2008, in Batam, Indonesia. Instructors Alex Wijaya and Abdul Quim led the course, which had 11 students.

associations

Thermal Spray Show Focuses on Expanding Uses

The International Thermal Spray Conference Exposition (ITSC) 2009 will cover a wide variety of topics under this year's theme, "Expanding Thermal Spray Performance to New Markets and Applications." The conference will be held May 4–7 at the Flamingo Las Vegas Hotel in Las Vegas, NV. ITSC is organized by ASM Thermal Spray Society (TSS), an affiliate society of ASM International; the German Welding Society (DVS); and the International Institute of Welding (IIW).

Presentations will focus on the advantages of using thermal spray technology for new applications. High velocity flame spraying requirements for land gear applications, thermal spray coating applications, and the state of job shops in Japan will be some of the topics discussed. Several presenters will cover trends, markets, and opportunities in countries such as China, Korea, India, and Europe.

Short courses are scheduled to provide an in-depth educational experience to those new to thermal spray. The courses start as early as April 30. Details are available on the ITSC registration site.

The ITSC Exposition will be held May 4–6. A large gathering of companies will display their equipment, materials, products, and services for the thermal spray community. Those interested in exhibiting should contact Kelly Thomas at Kelly.Thomas@asminternational.org.

To register for ITSC 2009, or for any additional information, visit www.asminternational.org/itsc, or call 800-336-5152 ext. 0.

New Association Aims to Preserve Bridges

The Bridge Preservation Association (BPA), formed in 2008, aims to bring together those in the industry and the government who are actively involved with bridge preservation. It is comprised of bridge stakeholders, including industry representatives, consultants, academics, agencies, contractors, and other experts involved in bridge preservation.

The BPA's mission is to advance preservation and maintenance practices, procedures, products, and technologies that help enhance bridge performance, extend service life, and increase public safety. Bridge preservation includes activities intended to prevent, delay, or reduce deterioration. The association says that structural or operational improvements of an existing bridge are not preservation activities.

Until June 30, 2009, the BPA is offering a discounted membership fee. For more information on the association, visit www.bridgepreservationassociation.org.

ASTM Has New Standard for Galvanizing

ASTM International, based in West Conshohocken, PA, has developed a new standard, A1057/A1057M, Specification for Steel, Structural Tubing, Cold Formed, Welded, Carbon,

Continued

Corps to Use ECI for West Closure Complex

The New Orleans District of the U.S. Army Corps Engineers plans to use Early Contractor Involvement (ECI) to expedite construction of the proposed $500 million Gulf Intracoastal Waterway West Closure Complex project.

The West Closure Complex will reduce the risk of storm surge from an event that has as low as a 1% chance of happening in any given year for a majority of the west bank area, according to the Corps. The project will require a 20,000 cubic feet per second storm water drainage pumping station, the largest of its type in the nation; two navigable floodgates; and levee and flood wall construction. The project is adjacent to an Environmental Protection Agency (EPA) wetland area of national significance, so construction impacts must be kept to a minimum, the Corps says.

ECI allows members of the construction industry to participate in the early stages of planning and enables the Corps to use innovative construction sequencing techniques into the proposed plan.

The Corps is working with the EPA, federal and state resource agencies, non-federal partners, the Louisiana Coastal Protection and Restoration Authority, and the Southeast Louisiana Flood Protection Authority-West Bank.

More information can be found at www.fedbizopps.gov, under solicitation number W912P809R0004.

Zinc-Coated (Galvanized) by the Hot-Dip Process, that addresses the galvanizing process as it is used in several industries, including construction, automotive, and transportation.

ASTM 1057 classifies the coating weights and mechanical requirements for the galvanizing process. The new standard is under the jurisdiction of Subcommittee A05.11 on Sheet Specifications, part of the ASTM International Committee A05 on Metallic-Coated Iron and Steel Products.

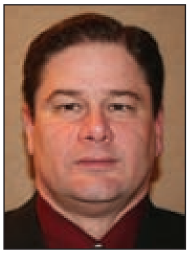
Giulio Scartozzi, a member of Committee A05 and the metallurgical manager for Allied Tube and Conduit, said, "The primary users of the standard will be new and existing customers of continuously galvanized steel products, including but not limited to structural and mechanical engineers, federal and state agencies, and industry associations."

For more information on the standard, visit www.astm.org.

companies

Spider Creates New Sales Position

Spider (Seattle, WA), a division of Safeworks, LLC, promoted Steve Cabral to the newly created position of industrial sales representative for the Eastern region. He will be responsible for driving suspended access and safety solutions to facility owners, general contractors, and specialty subcontractors on infrastructure, energy, and industrial plant structures.



Steve Cabral

Cabral has been with Spider for 13 years, starting as a field service technician, and then advancing to an outside sales specialist.

Spider manufactures and distributes access and safety solutions in North America.

Evonik Names Product Line Head

Dr. Martin Welp

Evonik Industries (Essen, Germany) named Dr. Martin Welp as the new head of the polyesters and adhesive resins product line, as of January 1, 2009. He replaced Dr. Thomas Wildt.

Dr. Welp joined the company in 1999. He was previously the managing director with operational responsibility for Evonik Colortrend B.V. in Maastricht, Netherlands, and managed the global marketing in the colorants product line and the polytrend business. Dr. Welp holds a doctorate degree in chemistry.

Evonik offers raw materials for the coatings and adhesives industry.

E.T. Horn Promotes Two

Bob Ahn

Vince Anderson

The E.T. Horn Company (La Mirada, CA) recently promoted Bob Ahn to president of the industrial groups and Vince Anderson to vice president of the coatings and building materials group. Both Ahn and Anderson have been with the company since 1996.

E.T. Horn manufactures specialty chemicals and ingredients used in coatings and other products.

Ashtead Appoints New Board Member

Ashtead Technology in Aberdeen, Scotland, has appointed Derek Shepherd to the Board as a non-executive director.

Shepherd is the main board director of Aggreko plc, headquartered in Glasgow, UK, and has been the managing

Zinc-Coated (Galvanized) by the Hot-Dip Process, that addresses the galvanizing process as it is used in several industries, including construction, automotive, and transportation.

ASTM 1057 classifies the coating weights and mechanical requirements for the galvanizing process. The new standard is under the jurisdiction of Subcommittee A05.11 on Sheet Specifications, part of the ASTM International Committee A05 on Metallic-Coated Iron and Steel Products.

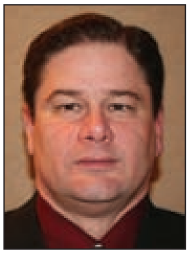
Giulio Scartozzi, a member of Committee A05 and the metallurgical manager for Allied Tube and Conduit, said, "The primary users of the standard will be new and existing customers of continuously galvanized steel products, including but not limited to structural and mechanical engineers, federal and state agencies, and industry associations."

For more information on the standard, visit www.astm.org.

companies

Spider Creates New Sales Position

Spider (Seattle, WA), a division of Safeworks, LLC, promoted Steve Cabral to the newly created position of industrial sales representative for the Eastern region. He will be responsible for driving suspended access and safety solutions to facility owners, general contractors, and specialty subcontractors on infrastructure, energy, and industrial plant structures.



Steve Cabral

Cabral has been with Spider for 13 years, starting as a field service technician, and then advancing to an outside sales specialist.

Spider manufactures and distributes access and safety solutions in North America.

Evonik Names Product Line Head

Dr. Martin Welp

Evonik Industries (Essen, Germany) named Dr. Martin Welp as the new head of the polyesters and adhesive resins product line, as of January 1, 2009. He replaced Dr. Thomas Wildt.

Dr. Welp joined the company in 1999. He was previously the managing director with operational responsibility for Evonik Colortrend B.V. in Maastricht, Netherlands, and managed the global marketing in the colorants product line and the polytrend business. Dr. Welp holds a doctorate degree in chemistry.

Evonik offers raw materials for the coatings and adhesives industry.

E.T. Horn Promotes Two

Bob Ahn

Vince Anderson

The E.T. Horn Company (La Mirada, CA) recently promoted Bob Ahn to president of the industrial groups and Vince Anderson to vice president of the coatings and building materials group. Both Ahn and Anderson have been with the company since 1996.

E.T. Horn manufactures specialty chemicals and ingredients used in coatings and other products.

Ashtead Appoints New Board Member

Ashtead Technology in Aberdeen, Scotland, has appointed Derek Shepherd to the Board as a non-executive director.

Shepherd is the main board director of Aggreko plc, headquartered in Glasgow, UK, and has been the managing director of Aggreko International for the last ten years.

Derek Shepherd

Ashtead rents specialist equipment to the offshore oil and gas sector and the environmental monitoring and test industry. It operates from the UK, North America, and Singapore.

In June 2008, Phoenix Equity Partners acquired the company.

Altana Reports Business Decline

Altana AG, a specialty chemicals groups based in Wesel, Germany, reported a fourth quarter sales decrease of 3% compared to the previous year and a decrease of 2% after adjusting the negative exchange rate.

Effects of the worldwide economic crisis caused sales to decline by 1% in Asia, 2% in Europe, and 7% in North and South America, according to the company.

Altana's BYK Additives and Instruments division had a slight increase in sales, achieving €450 million, €5 million more than what was reported the previous year. The ECKART Effect Pigments division reached sales of €351 million, down 3% from 2007. The ACTEGA Coatings and Sealants reported sales of €214 million, also down 3% from 2007.

Dr. Matthias L. Wolfgruber, CEO of Altana AG, stated, "Altana has not been able to remain untouched by the worldwide economic crisis....For 2009, we expect a very difficult market environment, for which we have prepared ourselves with a set of measures to reduce costs and to further increase efficiency."

products

New UV Coating Protects Concrete

Cytec Industries Inc. (Woodland Park, NJ) recently launched the Ebecryl® 891 resin. It is a UV-curable acrylate developed for on-site or field-applied applications on concrete flooring.

The acrylate is a modified polyester that provides a balance of viscosity, abrasion resistance, and cure speed to protect concrete flooring, according to the company.

Continued

director of Aggreko International for the last ten years.

Derek Shepherd

Ashtead rents specialist equipment to the offshore oil and gas sector and the environmental monitoring and test industry. It operates from the UK, North America, and Singapore.

In June 2008, Phoenix Equity Partners acquired the company.

Altana Reports Business Decline

Altana AG, a specialty chemicals groups based in Wesel, Germany, reported a fourth quarter sales decrease of 3% compared to the previous year and a decrease of 2% after adjusting the negative exchange rate.

Effects of the worldwide economic crisis caused sales to decline by 1% in Asia, 2% in Europe, and 7% in North and South America, according to the company.

Altana's BYK Additives and Instruments division had a slight increase in sales, achieving €450 million, €5 million more than what was reported the previous year. The ECKART Effect Pigments division reached sales of €351 million, down 3% from 2007. The ACTEGA Coatings and Sealants reported sales of €214 million, also down 3% from 2007.

Dr. Matthias L. Wolfgruber, CEO of Altana AG, stated, "Altana has not been able to remain untouched by the worldwide economic crisis....For 2009, we expect a very difficult market environment, for which we have prepared ourselves with a set of measures to reduce costs and to further increase efficiency."

products

New UV Coating Protects Concrete

Cytec Industries Inc. (Woodland Park, NJ) recently launched the Ebecryl® 891 resin. It is a UV-curable acrylate developed for on-site or field-applied applications on concrete flooring.

The acrylate is a modified polyester that provides a balance of viscosity, abrasion resistance, and cure speed to protect concrete flooring, according to the company.

Continued

Cytec is a global specialty chemicals and materials company that makes products for several markets, including industrial coatings and adhesives.

More information can be found at www.cytec.com.

NLB Unit Removes Pavement Stripes

NLB Corp. (Wixom, MI) has introduced its new Starjet-Plus™, a waterjet system for removing pavement markings and runway rubber. It is an ultra-high-pressure (UHP) waterjet system with 40,000 psi rotating waterjets on a robotic arm, the company says. It also has on-board filtration so that the water tank does not need to be refilled throughout the day. Proportional controls help with control, and in-cab video allows the user to monitor progess and traffic.

More information on the product can be found at www.nlbcorp.com.

Elcometer Offers Marine Inspection Kits

Elcometer Instruments Limited (Manchester, England) has introduced Marine Inspection Kits to cover all inspection requirements needed under IMO (International Marine Organization) regulations.

The kit contains everything necessary to be in compliance with IMO MSC.215 (82) and IMO MSC.216 (82), as well as ElcoMaster™ software to generate reports.

For more details, visit www.elcometer.com.

Empire Has Blast Cabinets for Fine Media

Empire Abrasive Equipment Company (Langhorne, PA) has introduced a full line of blast cabinets specifically designed to handle fine media used to clean and strip paint from delicate substrates.

According to the company, the cabinets assure an even flow of abrasives by creating a differential between vessel pressure and blast pressure that can

be adjusted. The line is available in five sizes with over 70 factory options and a three-year warranty.

Visit www.empire-airblast.com for more information.

Kit Tests for Lead in Soil

Industrial Test Systems, Inc. (ITS), in Rock Hill, SC, has introduced LeadQuick™ Lead in Soil Test Kit.

The kit uses the Lead in Water Test Kit and measures lead in soil by a 5-minute extract solution of 0.15 grams of soil. The kit can detect 0.03 μg, according to the company. A Hach® LeadTrak™ Pocket Colorimeter™ II and 25 tests are included.

ITS is a manufacturer of instruments and chemistries designed to test water quality parameters.

For more information, visit www.sensafe.com.

Rhino Launches New Epoxies

Rhino Industrial™ (San Diego, CA), a business unit of Rhino Linings Corporation, recently introduced a new line of epoxy products for floor coatings and linings. Each product can be applied by spray, roller, brush, squeegee, or trowel, according to the company.

The floor coating products include Rhino™ 450, a structural epoxy gel; Primer 1500, a clear, waterborne, two-part epoxy primer; Rhino™ 1501, a pigmented two-part epoxy coating; Rhino™ 2300, a clear or pigmented 100% solids epoxy coating; Rhino™ 9300, a novolac, self-leveling, tightly cross-linked epoxy coating; and Rhino™ 9700, a novolac, thixotropic, tightly cross-linked epoxy coating and lining.

For more information on the products, visit www.rhinolinings.com.

DeVilbiss Introduces HD Spray Guns

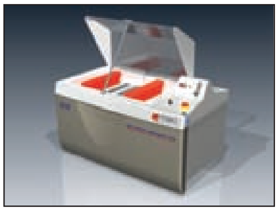
DeVilbiss, part of ITW Industrial Finishing in Bournemouth, England, has launched Advance HD (High Demand) spray guns. The guns are lightweight with light trigger action and high capacity air passages, the company says. The product is available with three choices of types of atomization technologies, and it comes equipped with stainless steel fluid passageways, tips, and needles.

Visit www.itwifeuro.com for more information.

Continued

TQC to Introduce 3 Testing Products

Thermimport Quality Control (TQC), headquartered in Zevenhuizen, Netherlands, plans to introduce several new products at the end of March.



Salt spray corrosion cabinet

A new salt spray corrosion cabinet will perform corrosion tests on a variety of materials, such as paints and metals. It will be offered in capacities of 500 or 1,000 liters and is based on glass-reinforced plastic, the company says. The size of the cabinet complies with popular international standards for salt fog testing, including ASTM B117, ISO 9227, DIN 50 021, and JIS Z 2371.

Super-pig camera adapter

Also to be introduced is a washability, wear, and abrasion tester. This machine will test the abrasion, washability, brushability, and resistance of a wide range of materials, including paint and coatings. It is available with two or four test stations, and all stations can be tested wet or dry, according to the company. The unit has adjustable speed cycles and stroke length, the ability to test flat or curved samples, and a multi-language digital display.

Abrasion tester

Also coming from TQC is the Super-Pig camera adapter. It allows digital pictures to be made through the microscope of the SP1000 Super-Pig coating thickness gauge. It fits the top of the microscope and has a specially designed, conical-shaped inner part made of non-glare plastic.

For more information on any of these products, visit www.tqc.eu.

COMING UP

Meetings

March 19-21 Power-Gen India & Central Asia, New Delhi, India, www.power-gen.com

March 22-24 NPRA Annual Meeting, San Antonio, TX, U.S., www.npradc.org

March 22-26 ACS Spring Meeting, Salt Lake City, UT, U.S., www.acs.org

March 22-26 NACE Corrosion 2009, Atlanta, GA, U.S., www.nace.org

March 29-31 NPRA International Petrochemical Conference, San Antonio, TX, U.S., www.npradc.org

March 30-April 1 European Coatings Congress, Nuremberg, Germany

March 31-April 2 European Coatings Show, Nuremberg, Germany

March 31-April 2 UTECH Europe, Maastricht, The Netherlands, www.utecheurope2009conference.com

April 1-4 AISC NASCC: The Steel Conference, Phoenix, AZ, U.S., www.aisc.org

April 17 Houston Coating Society Trade Show, Pasadena, TX, U.S., www.houstoncoatingsociety.org

April 17-18 SSPC Hampton Rds. Chapter Meeting and C12 Airless Spray, Norfolk, VA, U.S., www.sspc.org

May 4 SSPC 3rd Annual Golf Outing, Midway, PA, U.S., www.sspc.org

Courses

March 19-21 NACE Corrosion in Water Facilities, Atlanta, GA, U.S., www.nace.org

March 20 SSPC C5 Lead Paint Removal Refresher, Vallejo, CA, U.S., www.sspc.org

March 20 SSPC Coating Application Specialist, Seattle, WA, U.S., www.sspc.org

March 21 NACE CIP One-Day Bridge Course, Atlanta, GA, U.S., www.nace.org

March 23-26 KTA-Tator, Inc. SSPC C.3 Deleading Supervisor/Comp Person, Pittsburgh, PA, U.S., www.sspc.org

March 23-27 MS&T Basic Comp. Of Coatings, Rolla, MO, U.S., www.coatings.mst.edu

March 23-27 SSPC C1 Fundamentals of Coatings, St. John's, NL, Canada, www.sspc.org

March 23-27 SSPC NBPI NAVSEA Basic Paint Inspector, Seattle, WA, U.S., www.sspc.org

March 23-28 SSPC PCI Protective Coatings Inspector, Houston, TX, U.S., www.sspc.org

March 27 KTA-Tator, Inc. SSPC C.5 Lead Paint Removal Supervisor/Comp Person Refresher, Pittsburgh, PA, U.S., www.sspc.org

March 30-April 3 SSPC Marine Coatings, St. John's, NL, Canada, www.sspc.org

March 30-April 1 KTA-Tator, Inc. Basic Coatings Inspector, Pittsburgh, PA, U.S., www.kta.com

April 6-10 NACE Basic Corrosion; Internal Corrosion for Pipelines, Tulsa, OK, U.S., www.nace.org

April 6-10 SSPC C1 Fundamentals of Coatings, Media, PA, U.S., www.sspc.org

April 6 KTA-Tator, Inc. Coatings Inspection Instrument Workshop, Pittsburgh, PA, U.S., www.kta.com

Certified Coatings Awarded Lewis and Clark Bridge Painting Project

By Brian Churray, PaintSquare

Photos courtesy of Washington State DOT

Certified Coatings (Concord, CA) was awarded a contract of $5,148,109 by the Washington State Department of Transportation to perform coatings application on substructure components of the Lewis and Clark Bridge, an 8,288-foot-long cantilever structure over the Columbia River between Longview, WA, and Rainier, OR. The bridge, which was designed by Joseph Strauss of Golden Gate Bridge fame and features a 1,200-foot-long main span, was erected in 1929. The contract is jointly funded by the Washington and Oregon Departments of Transportation. It is the second phase of a three-part effort to replace the coatings that were applied in 1984.

The project, which required SSPC-QP 1 and QP 2 certification and quality control by a NACE CIP Level 3 inspector, involves pressure-flushing, abrasive blast-cleaning, and recoating steel piers and bents. The project entails applying a rust-penetrating sealer to pack rust and coating the steel with a moisture-cured urethane system. The contract includes erecting containment to control the emission of the existing red-lead-based alkyd system.

American Recovery and Reinvestment Act of 2009

The $787 billion American Recovery and Reinvestment Act of 2009, which was signed into law by President Obama on February 17th, 2009, includes an estimated $130 billion for public works infrastructure spending. The distribution of this funding has begun in earnest, with a focus on "shovel-ready" projects. In many cases, state departments of transportation have already let the contracts that the funding will support, and Paint BidTracker can help you, the contractors, design professionals, and material suppliers, secure a portion of this funding with our ongoing commitment to comprehensive coverage of public works contracting that includes industrial protective coatings application. To learn more, visit www.PaintSquare.com/BidTracker.
(See related story on p. 4.)

New York State Thruway Authority Lets Bridge Painting Bid

The New York State Thruway Authority awarded a contract of $6,700,000 to Atlas Painting & Sheeting Corporation (Amherst, NY) to abrasive blast-clean and recoat approximately 285,000 square feet of structural steel surfaces on eleven bridges in Erie, Genesee, Monroe, and Ontario Counties. The contract, which includes containment of the existing lead-bearing coatings, involves blasting the steel to a Near-White finish (SSPC-SP 10) and applying an organic zinc-rich coating system.

Continued

Quick Hits

Tank Pro, Inc. (Northport, AL) was awarded a contract of $446,175 by the City of Wichita Falls, TX, to abrasive blast-clean and recoat the interior and exterior surfaces of an existing 1 MG elevated water storage tank.

Mongan Painting Company, Inc. (Cherokee, IA) won a contract of $35,230 from the City of Grand Island, NE, to abrasive blast-clean, repair, and recoat 4,326 square feet of concrete surfaces associated with an odorous air scrubbing filter at a wastewater treatment plant; the concrete will be coated with a moisture-cured aromatic polyurethane system.

Worth Contracting, Inc. (Jacksonville, FL) was awarded a contract of $1,429,414 by the Florida Department of Transportation to apply protective coatings to steel and concrete surfaces on three bridges in Collier, Lee, and Manatee Counties.

Metroplex Service, Inc. (Knoxville, TN) secured a contract of $16,615 from the City of Bristol, TN, to apply a high-solids amine epoxy system to ferrous metal components of an existing bar screen structure at a wastewater treatment plant.

Era Valdivia to Recoat Illinois River Bridge

Era Valdivia Contractors, Inc. (Chicago, IL) secured a contract from the Illinois Department of Transportation to perform surface preparation and coatings application on an existing 2,290-foot-long cantilevered through truss bridge over the Illinois River and adjacent roadway and railway. The contract, which requires lead-based paint abatement and containment, is valued at $2,725,783.

Kinsmen Corporation Secures Tank Rehabilitation

Kinsmen Corporation (Hooksett, NH) won a contract of $257,752 from the Town of Sturbridge, MA, for the rehabilitation of an existing 1.5 MG concrete water storage tank. The project includes applying an elastomeric polyurethane liner to the interior surfaces of the tank, as well as waterproofing exterior surfaces of the tank with an acrylic coating.

Coblaco Services Wins Clariflocculator Coating Contract

Photo courtesy of The Town of Superior

The Town of Superior, CO, awarded a contract of $38,895 to Coblaco Services, Inc. (Aurora, CO) to abrasive blast-clean and recoat existing steel surfaces associated with a water treatment plant clariflocculator including drum surfaces, rake arms, overflow piping, weirs, and bridge surfaces. The project involves applying an epoxy system to immersed surfaces and an epoxy-urethane system to exposed surfaces.

Plant Equipment & Services to Reline Power Plant Piping

Plant Equipment & Services, Inc. (Bryan, TX) was awarded a contract by the City of Garland, TX, to reline the interior surfaces of 4-foot-diameter circulating water inlet piping at a power plant. The piping will be abrasive blast-cleaned to a White Metal finish (SSPC-SP 5), patched with metal putty, and lined with three 30-mil-thick coats of

100%-solids epoxy. The contract, which required NACE certification, is valued at $65,279.

West Florida Maintenance Wins Tank Painting Bid

The Key West Utility Board awarded a contract of $63,561 to West Florida Maintenance, Inc. (Apollo Beach, FL) to perform surface preparation and coatings application on a 506,626-gallon fuel tank, a 506,909-gallon fuel tank, a 1.9 MG fuel tank, a 500,000-gallon water tank, and two 168,000-gallon demineralized water tanks at the Stock Island Generating Facility. The tanks will be pressure-washed at 3,000 psi, spot-power-tool cleaned (SSPC-SP 3), and coated with a rust-converting primer, a waterborne epoxy intermediate, and a waterborne urethane finish.

Maine DOT Lets Bridge Painting Project

The Maine Department of Transportation awarded a contract of $968,000 to Royal Bridge, Inc. (Tarpon Springs, FL) to perform surface preparation and coatings application on three four-span steel bridges in Cumberland County. The contract, which requires SSPC-QP 1 and QP 2 certification, involves recoating a total of approximately 696,000 pounds of structural steel. The steel will be abrasive blast-cleaned to a Near-White finish (SSPC-SP 10) and coated with an organic zinc primer, an epoxy intermediate, and an aliphatic urethane finish selected from the NEPCOAT Qualified Products List B. The contract includes erecting a Class 1A containment structure (SSPC-Guide 6), as the existing coatings may contain lead.

L.C. United Painting Wins Reservoir Reconditioning Bid

L.C. United Painting Company (Sterling Heights, MI) secured a contract of $306,000 from the City of Eau Claire, WI, to recondition the coatings on a 165-foot-diameter by 24-foot-high, 4 MG water storage reservoir. The project involves performing lead abatement and coatings application on the exterior surfaces of the tank, as well as performing touch-up coating of interior tank and valve vault surfaces. The exterior surfaces will be abrasive blast-cleaned to a Commercial finish (SSPC-SP 6) and coated with a zinc primer, an acrylic polyurethane intermediate, and a fluoropolymer polyurethane finish. The interior tank and vault surfaces will be spot-blast-cleaned and coated with an epoxy system. The contract includes abatement of the existing lead-bearing coatings within a Class 1A containment structure (SSPC-Guide 6).