EVERSTRONG®

NANO-POXY

SELF-PRIMING NANO-ENGINEERED EPOXY

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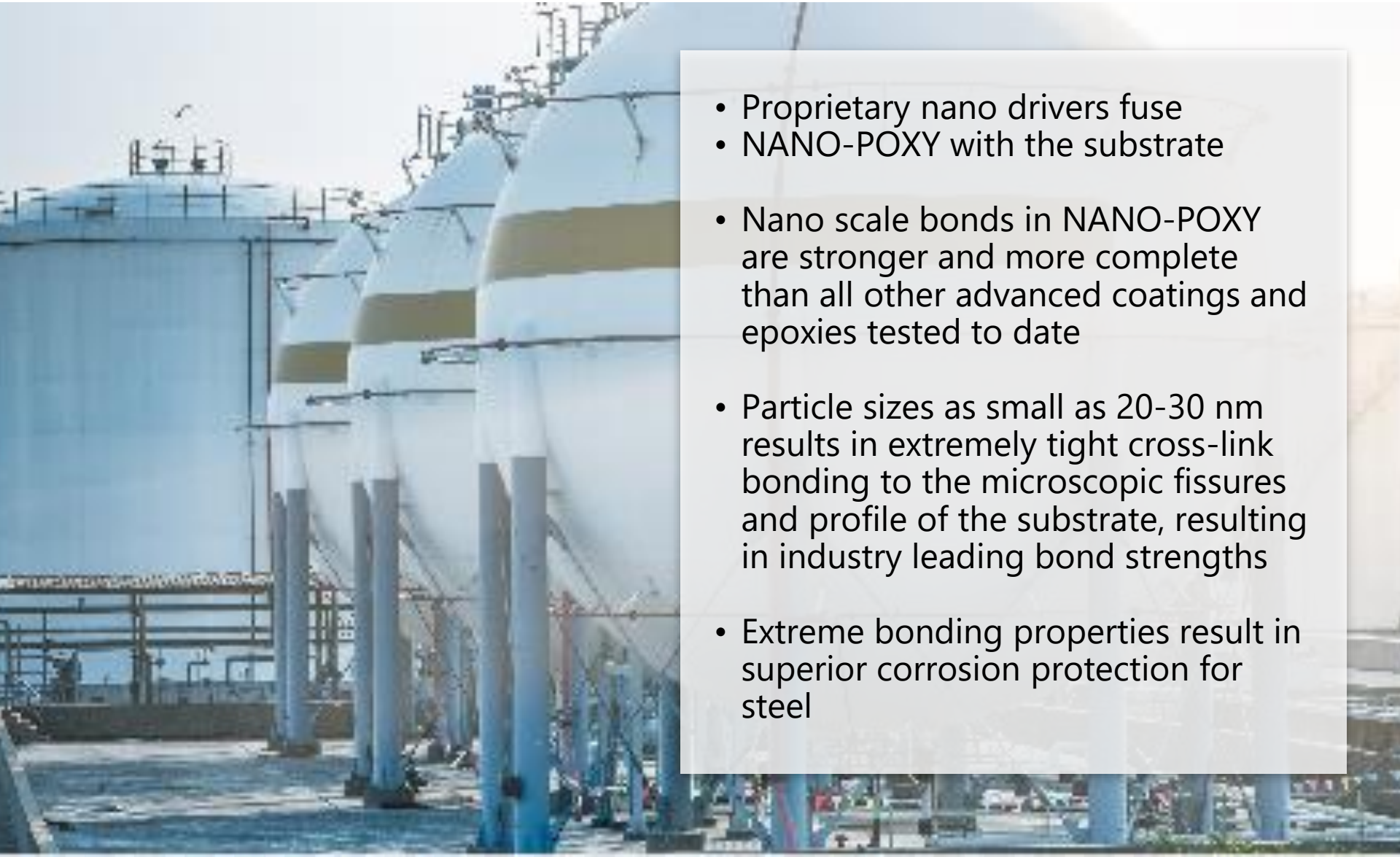
5011 E. 5th , Katy, Texas 77493 USA

Producing next generation coating products to fully protect industrial surfaces from corrosion and environmental assaults

PROPRIETARY NANOTECHNOLOGY



- Proprietary nano drivers fuse
- NANO-POXY with the substrate

- Nano scale bonds in NANO-POXY are stronger and more complete than all other advanced coatings and epoxies tested to date

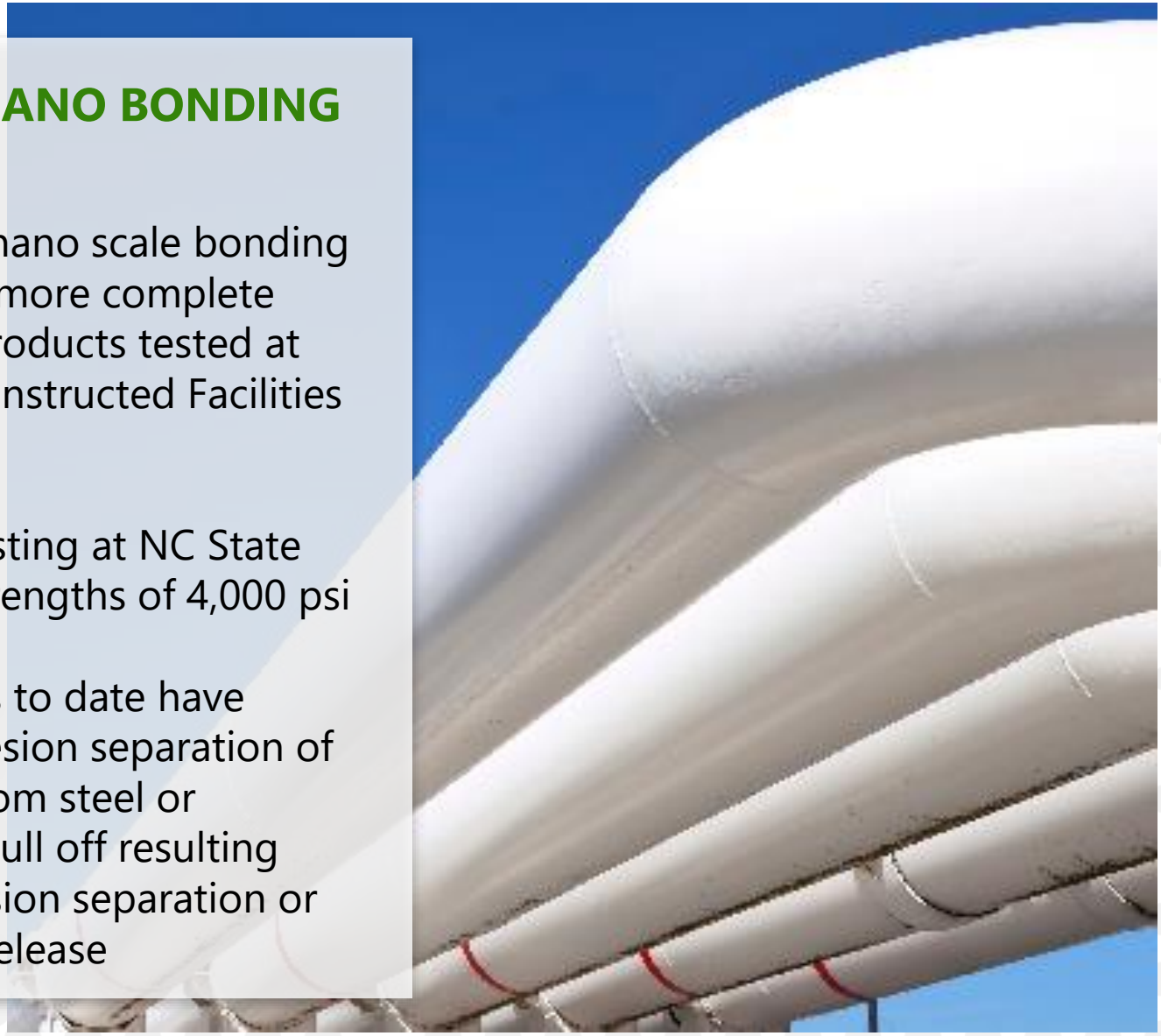
- Particle sizes as small as 20-30 nm results in extremely tight cross-link bonding to the microscopic fissures and profile of the substrate, resulting in industry leading bond strengths

- Extreme bonding properties result in superior corrosion protection for steel

NANO-ADHESION

PROPRIETARY NANO BONDING TECHNOLOGY

- NANO-POXY's nano scale bonding is stronger and more complete than all other products tested at the NC State Constructed Facilities Lab (CFL)
- Independent testing at NC State CFL - pull off strengths of 4,000 psi
- No test samples to date have resulted in adhesion separation of NANO-POXY from steel or concrete, with pull off resulting only from cohesion separation or from adhesive release



NANO-POXY ADVANTAGES

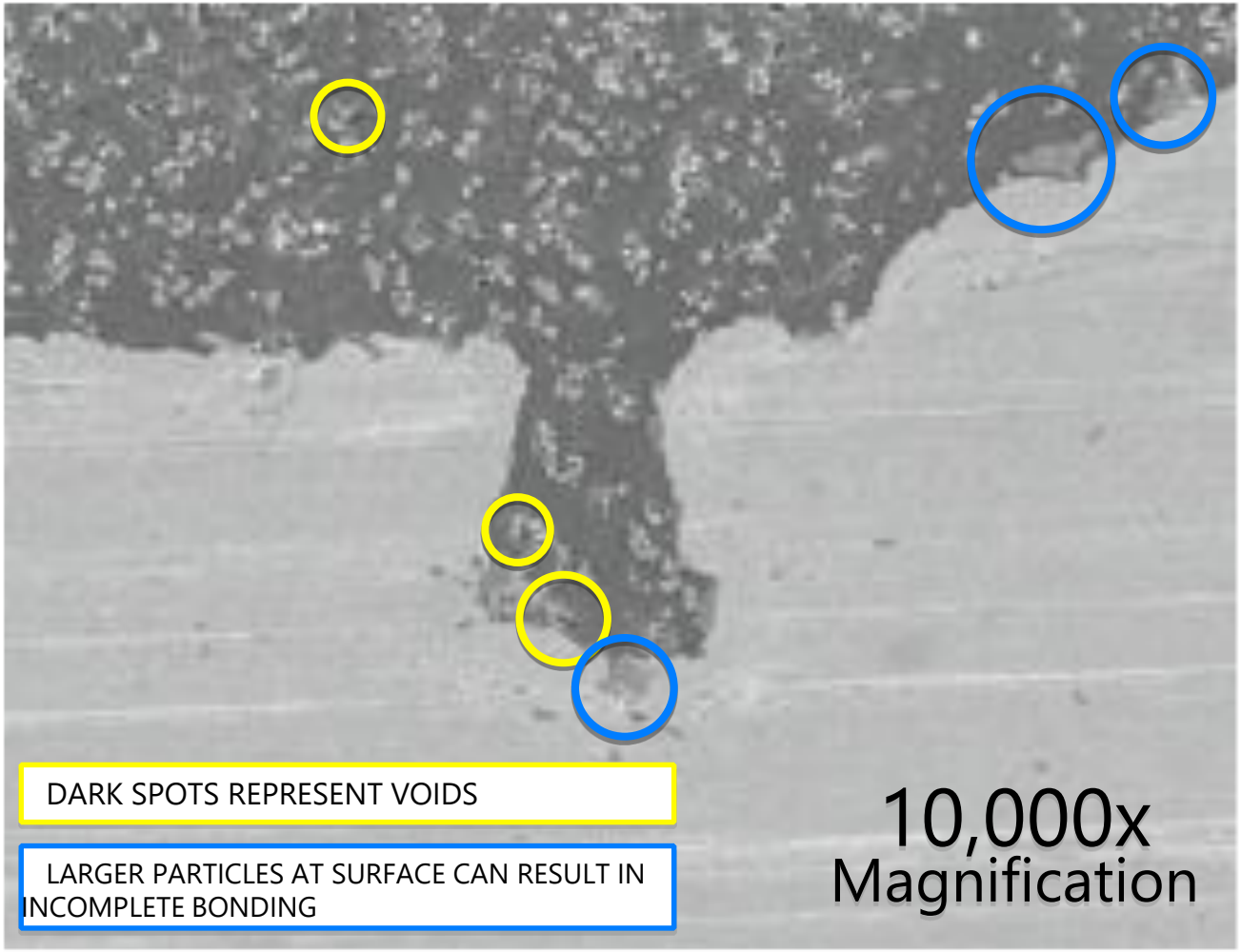
- Extremely Small Particles - true nano scale particles provide superior bonding with substrate, improving corrosion and chemical resistance
- Extreme Surface Tolerance - nano scale bonding significantly improves adherence to poorly prepared substrates - damp, tight rust and salt spray
- Extremely Fast - Less prep, no primer, single coat for most applications
- Extremely Easy to Mix - 1:1 mixing ratio with Part A and Part B simplifies mixing, and easily mixed with a power drill in 5 gallon pails
- Extremely Easy to Apply - brush or roll applied or sprayed with a pot life up to 1-1/2 hour, easy to mix, superior spraying properties with less odor
- Extremely Complete Curing - cures more completely than other advanced coatings allowing quicker recoating times and much faster return to service
- Extremely Low VOC - up to 1/6th the level of other leading epoxies

COMPETITOR A

MICROSCOPY IMAGE

COATING

STEEL SURFACE

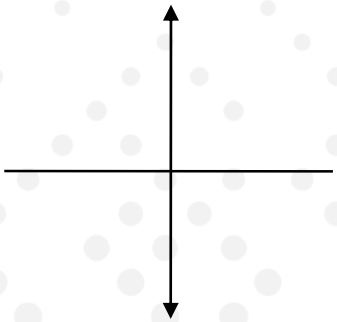


Microscopic Evaluation and analysis performed May 9, 2014 by the Analytical Instrumentation Facility at NC State University

COMPETITOR B

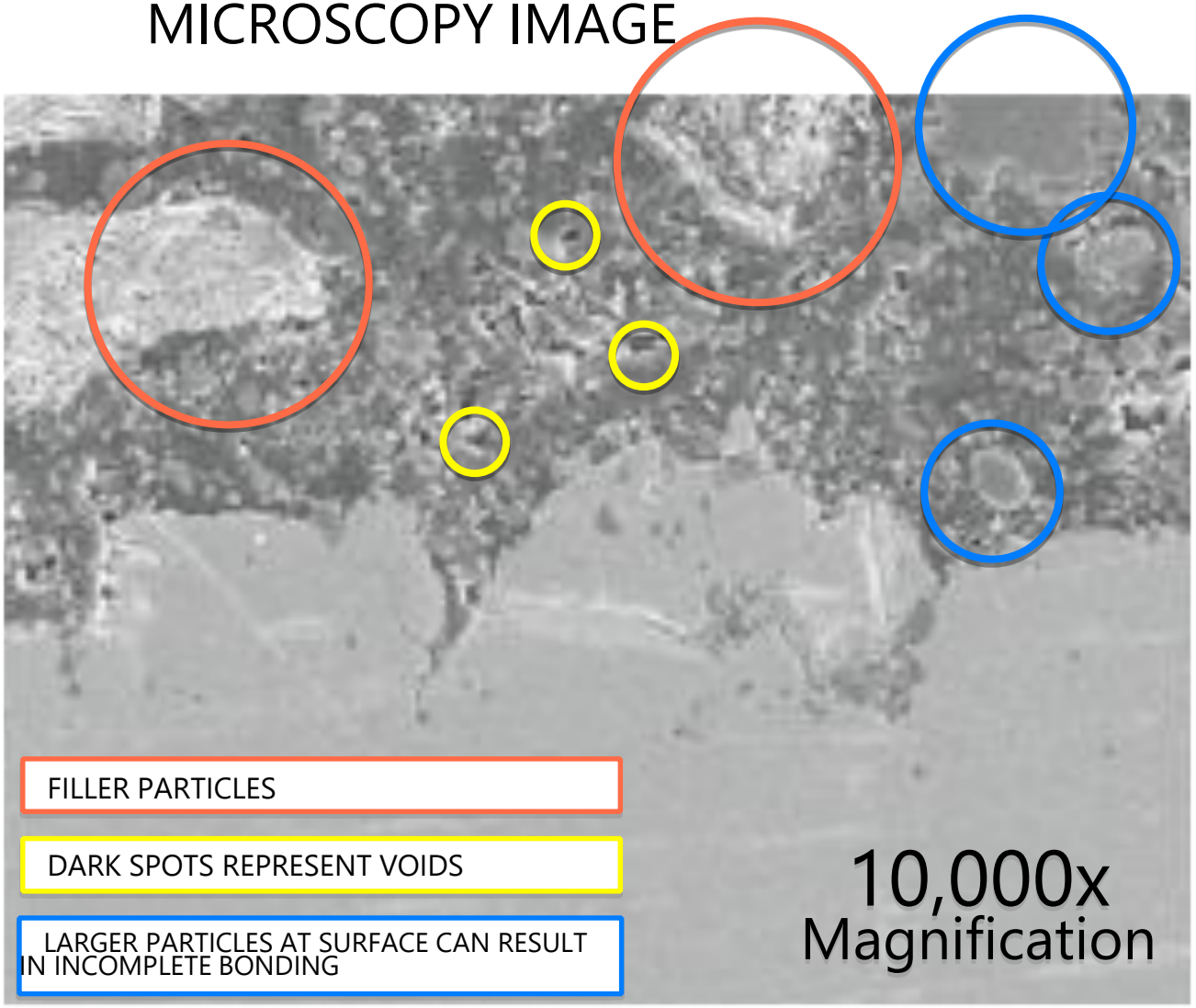
MICROSCOPY IMAGE

COATING



STEEL SURFACE

Microscopic Evaluation and analysis performed May 9, 2014 by the Analytical Instrumentation Facility at NC State University

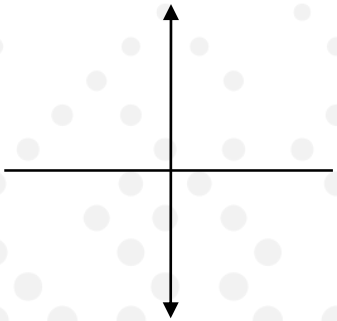


NANO-POXY

MICROSCOPY IMAGE

Image shown at 15 times greater magnification than Competitors A & B

COATING



STEEL SURFACE

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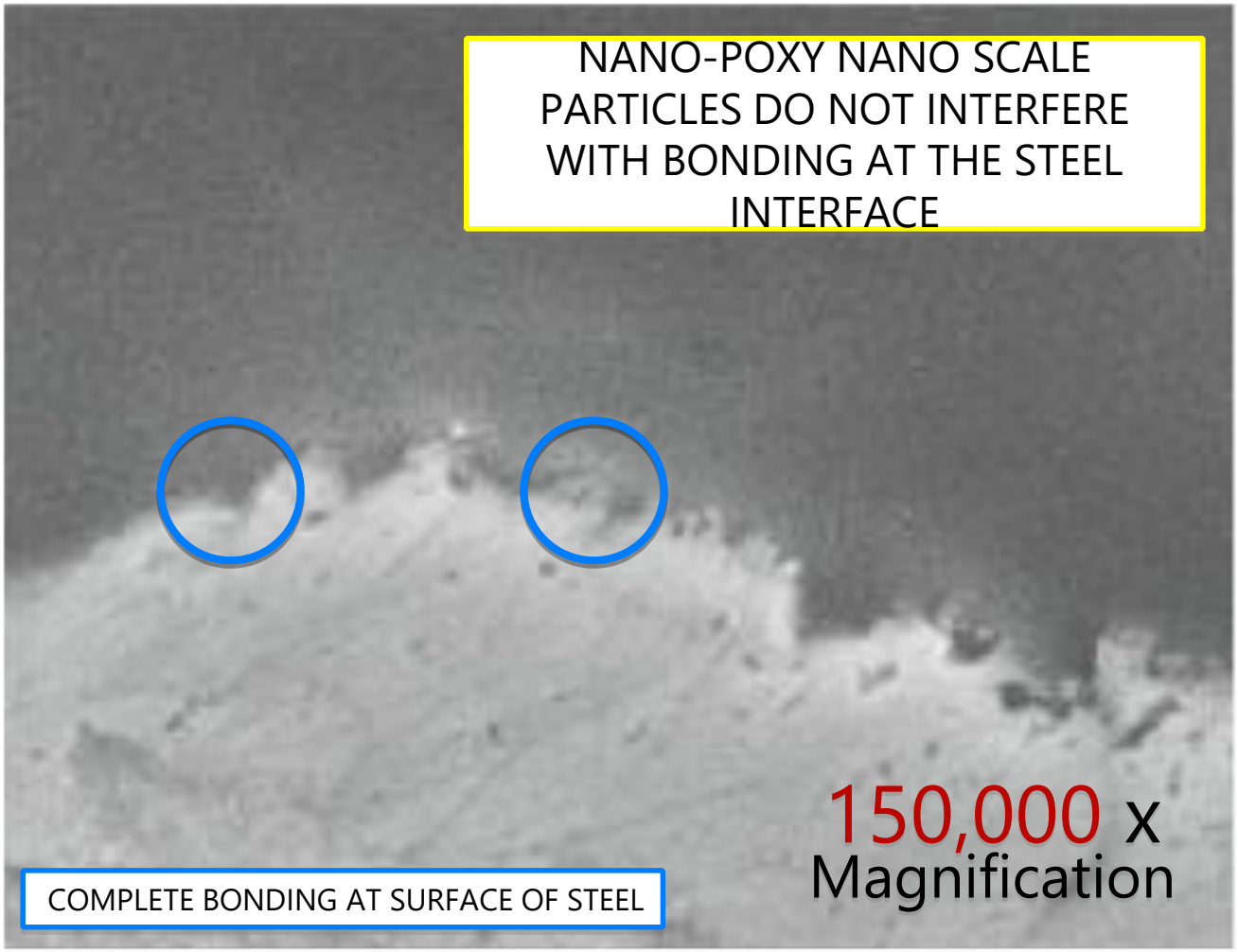
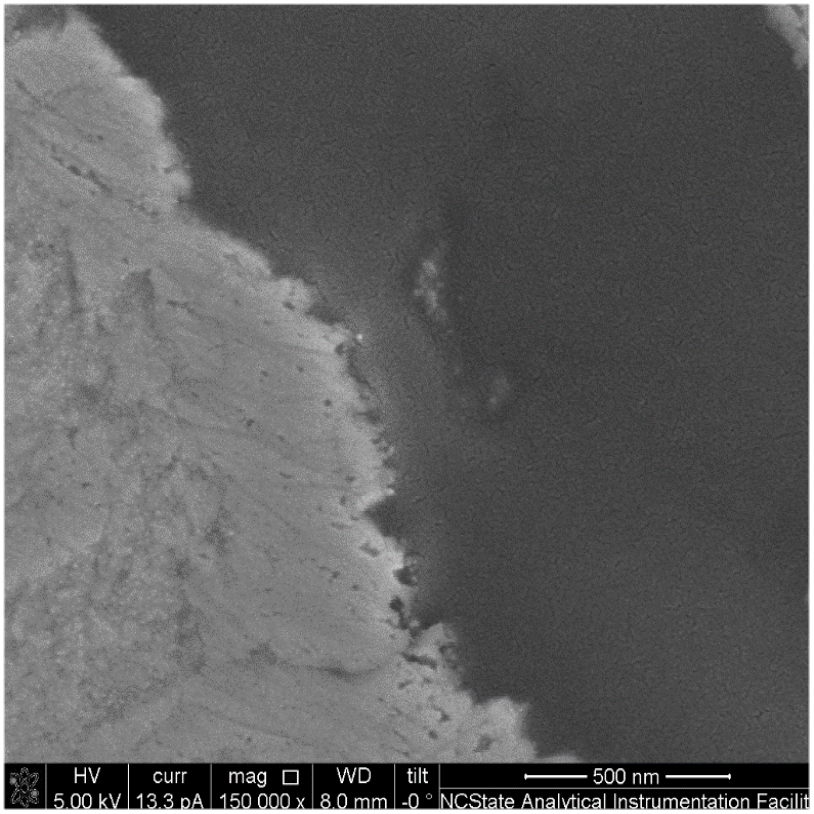
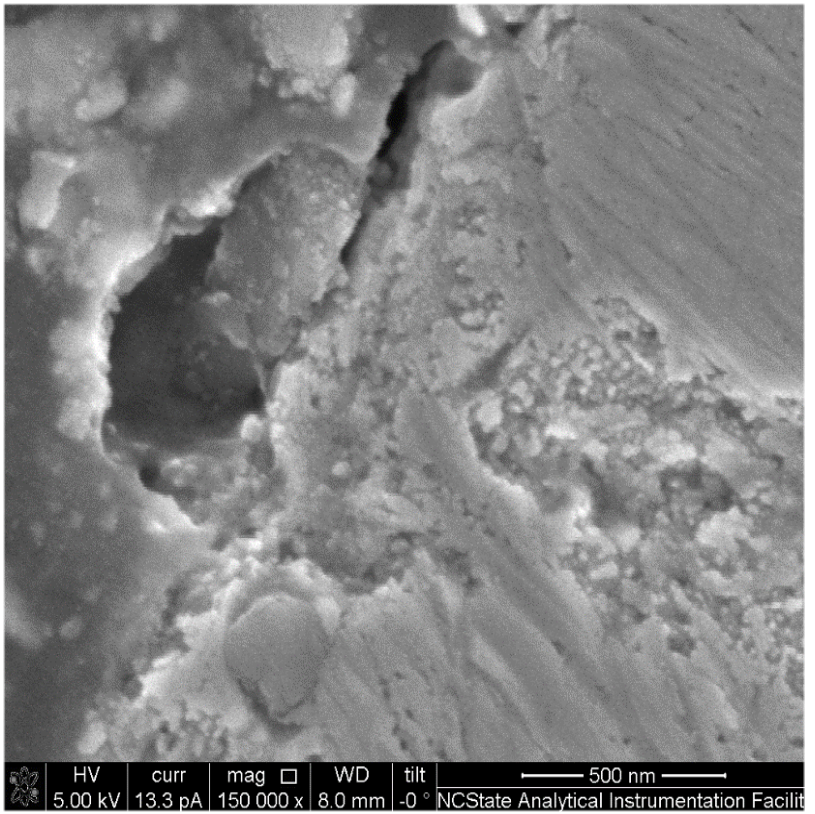


NANO-POXY VS. COMPETITOR

MICROSCOPY IMAGE (150,000 x)



Magnification Showing NANO-POXY Steel-Coating Bond Line as Continuous and Completely Free of Voids



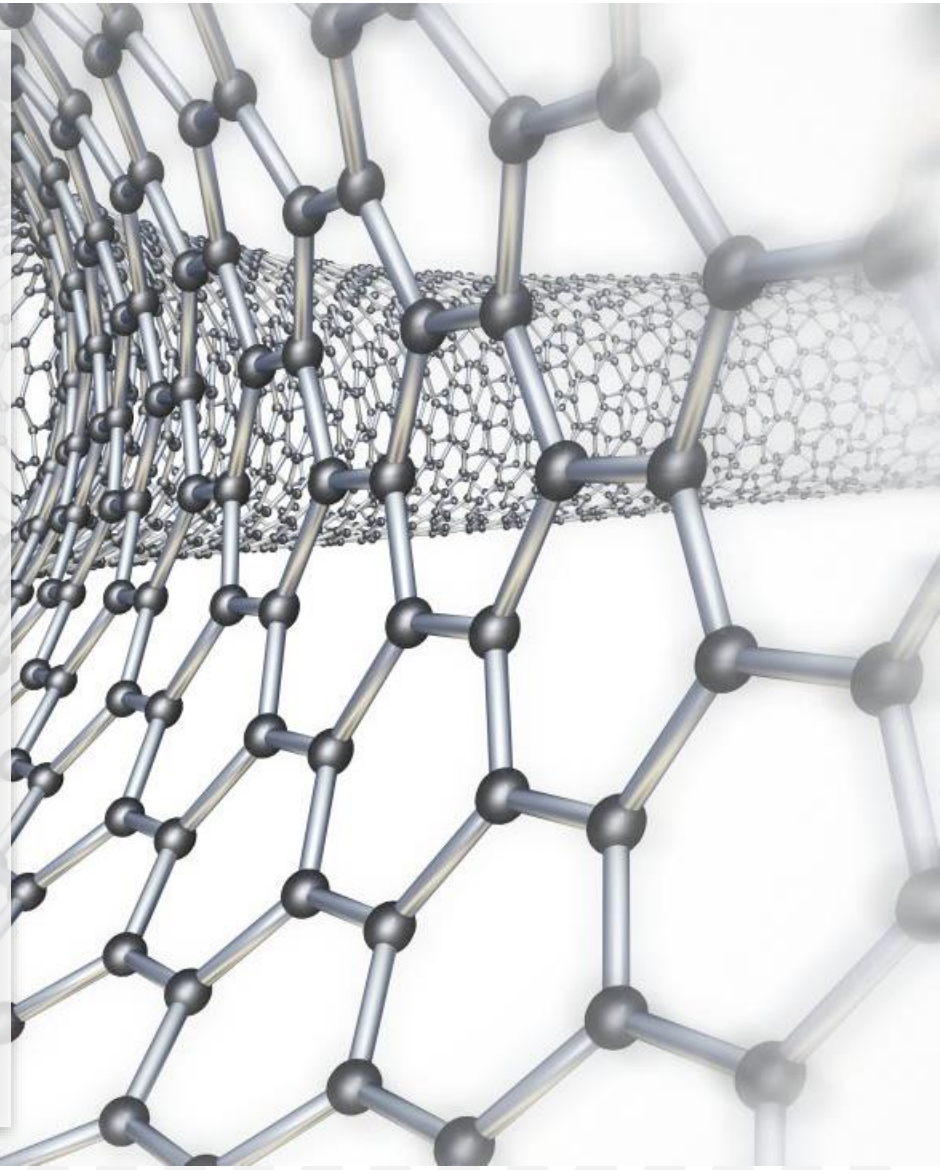
Magnification Showing Steel-Coating Bond Line with Voids and Large Particles (voids are dark areas)

NANO-POXY NANO-COMPONENTS

The exact nano structure (size and shape) and mixing sequence used to produce XTREME is proprietary and protected by patent. Some of the nano components in NANO-POXY include:

- Cobalt
- Graphite
- Pigments
- Titanium dioxide
- Zinc

Carbon nanotubes provide both liquification and mixing enhancements which improve bonding and particle cross linking

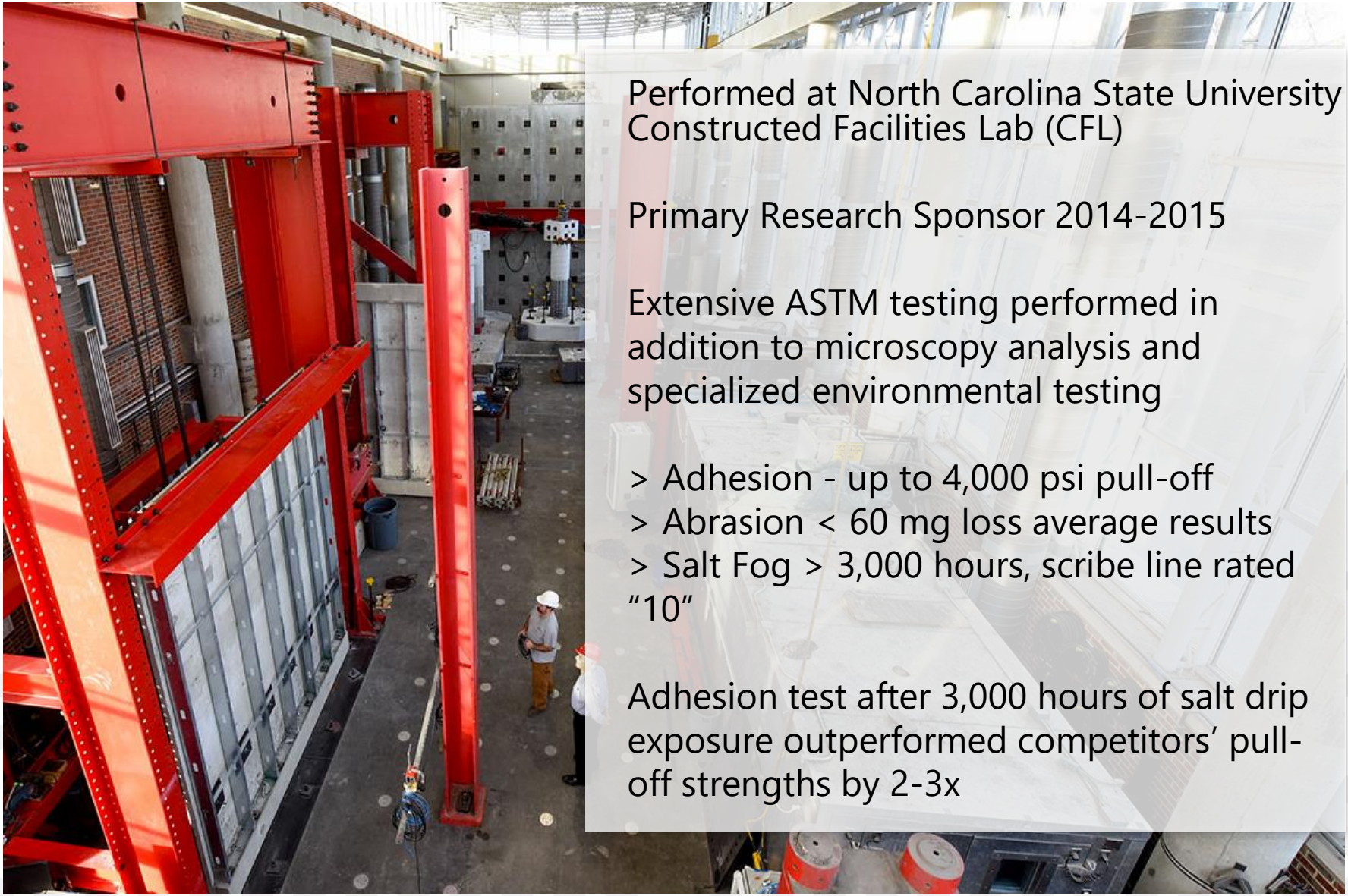


NANO-POXY BONDING STRENGTH

Nano scale bonding is superior to conventional coatings.
NANO-POXY penetrates and bonds to surfaces on a nano scale, resulting in a minimum of 1.6 TRILLION anchors points per sq. in.

- Nano drivers fuse NANO-POXY to the substrate resulting in a coating bond that is more resistant to peeling, blistering or disbondment
- The bond between NANO-POXY and steel and concrete is stronger than any competing coating, epoxy, or paint tested to date at the NCSU's CFL
- NANO-POXY's bond strength to smooth glass exceeds that of leading competitor's bond strength to near white metal steel surfaces

ADVANCED RESEARCH AND TESTING



Performed at North Carolina State University Constructed Facilities Lab (CFL)

Primary Research Sponsor 2014-2015

Extensive ASTM testing performed in addition to microscopy analysis and specialized environmental testing

> Adhesion - up to 4,000 psi pull-off
> Abrasion < 60 mg loss average results
> Salt Fog > 3,000 hours, scribe line rated "10"

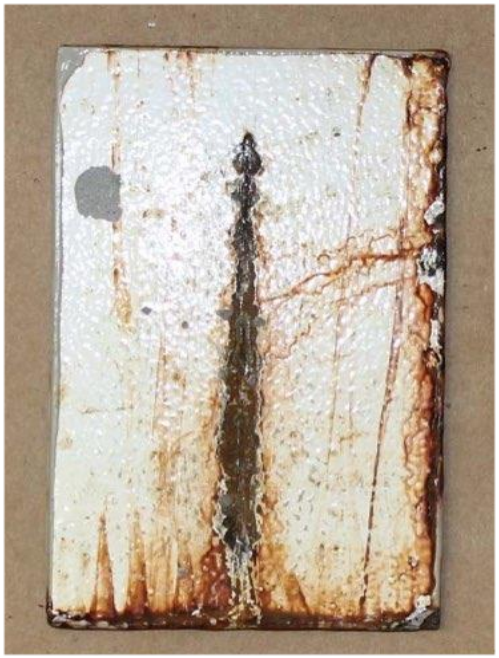
Adhesion test after 3,000 hours of salt drip exposure outperformed competitors' pull-off strengths by 2-3x

NANO-POXY ASTM TESTING CERTIFICATION

- ASTM B117 Salt Fog - “10” rated scribe line after 3,000 hrs in chamber
- ASTM D552 Impact - greater than 150 in-lb impact resistance
- ASTM D2794 Mandrel - certified “Flexible Coating” (video)
- ASTM D4060 Abrasion - less than 60 mg loss
- ASTM D4541 Adhesion Steel - bond exceeds 3,000 psi (image and video)
- ASTM D7234 Adhesion - bond exceeds concrete strength (video)
- ASTM G8 Cathodic Disbondment - no disbonding after 30 days
- ASTM D870 Immersion - no cracking, rusting, or delamination after 12 months continuous immersion in 200°F deionized water

COMPETITORS A, B, AND C

After 3,000 hours in salt fog chamber – ASTM B117 Test



Leading Polysiloxane
- scribe line undercutting
- bare metal upper left

Leading High Solids Epoxy
- significant coating failure

Leading Mid Grade Epoxy
complete failure

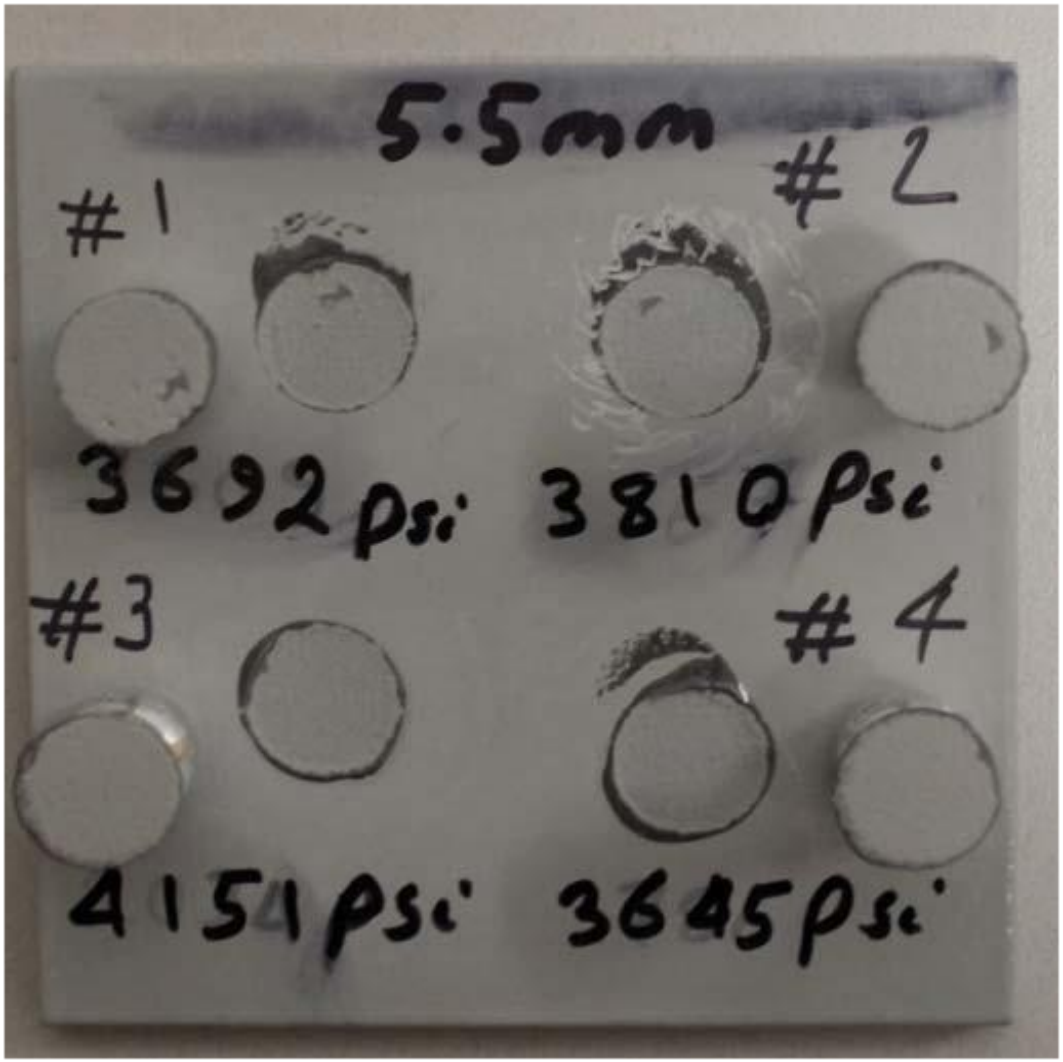
NANO-POXY ASTM B117 SALT FOG TEST

After 3,000 hours, with pull test results after 3,000 hours

Tight scribe line, no undercutting

2,142, 2,460, 3,780 = 2,794 psi avg.

NANO-POXY PULL STRENGTH TEST RESULTS

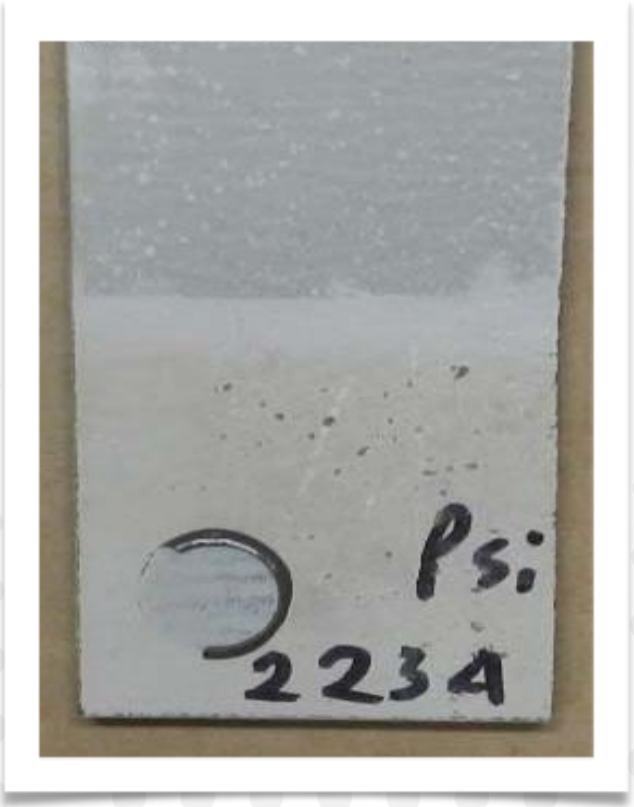


NANO-POXY SPECIALIZED TESTING RESULTS

- Sulfuric Acid Immersion - NANO-POXY and four competitive coatings were immersed in 70% H_2SO_4 for 30 days, bare metal was exposed on three of the competitive coatings after 5 days, pull test were performed on the two remaining coatings, NANO-POXY and Competitor D (images and results follow)
- Chemical Splash - 30% Sodium Hydroxide, 38% Hydrochloric Acid, 67% Sulfuric Acid, 80% Citric Acid, 10% and 60% Boric Acid, 85% Phosphoric Acid, Sodium Hydroxide and 100% Xylene were applied to bare steel samples coated with 5 mil NANO-POXY (no primer) for 24 hours then pull tests performed (image and results follow)
- Steel Angle Edge Retention - 5 mil single coat NANO-POXY applied to fabricated shape (mill scale with no primer) then placed in salt chamber for 1,000 hours, with complete edge retention, test was to qualify NANO-POXY for as an alternative to galvanized drainage components for the LAX airport expansion project (images follow)
- Impact Test – Steel ball drop and deflection and integrity test with hammer blows with no damage to coating surface (video and image)
- Fuel/Solvent Immersion Test - 5 mil NANO-POXY coated on near white metal sample and immersed in Gasoline, Diesel, VMP Naptha, Denatured Alcohol, Turpentine, Linseed Oil and Paint Thinner for 7 days, no damage to coating

NANO-POXY ACID IMMERSION RESULTS

Pull test results after 30 days continuous immersion in 70% Sulfuric Acid

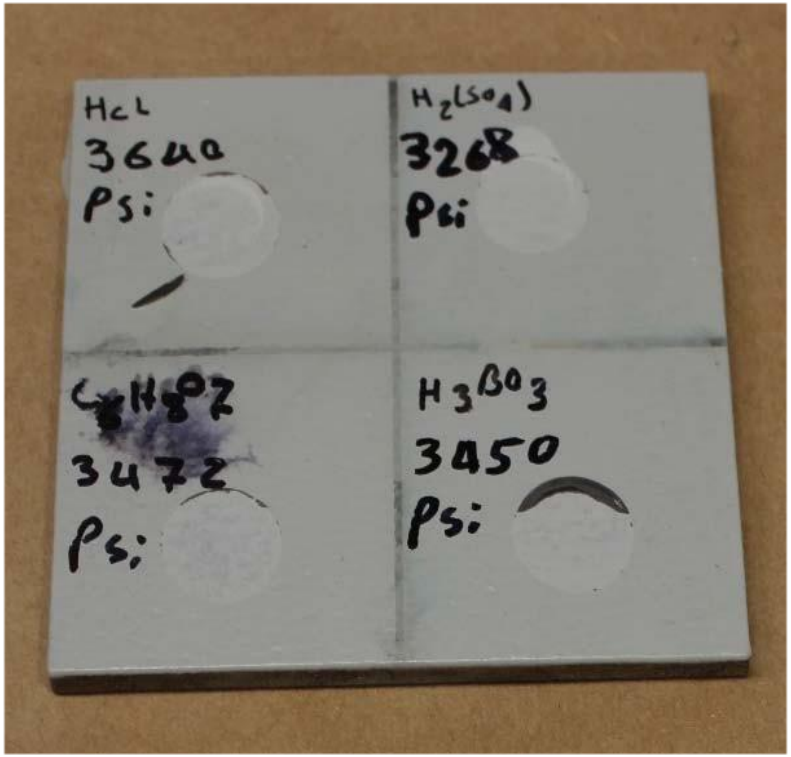


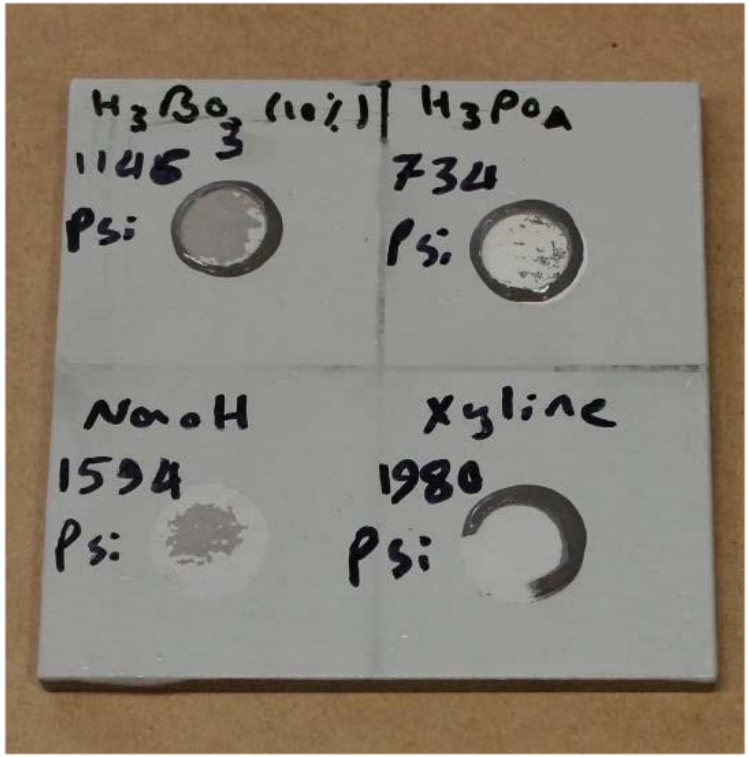
NANO-POXY

Competitor D

NANO-POXY CHEMICAL SPLASH TEST PULL RESULTS

8 concentrations soaked on steel samples for 24 hours then adhesion pull test were conducted, only phosphoric acid was less than 1,000 psi. Four acids, including 38% hydrochloric acid, tested over 3,000 psi in pull strength



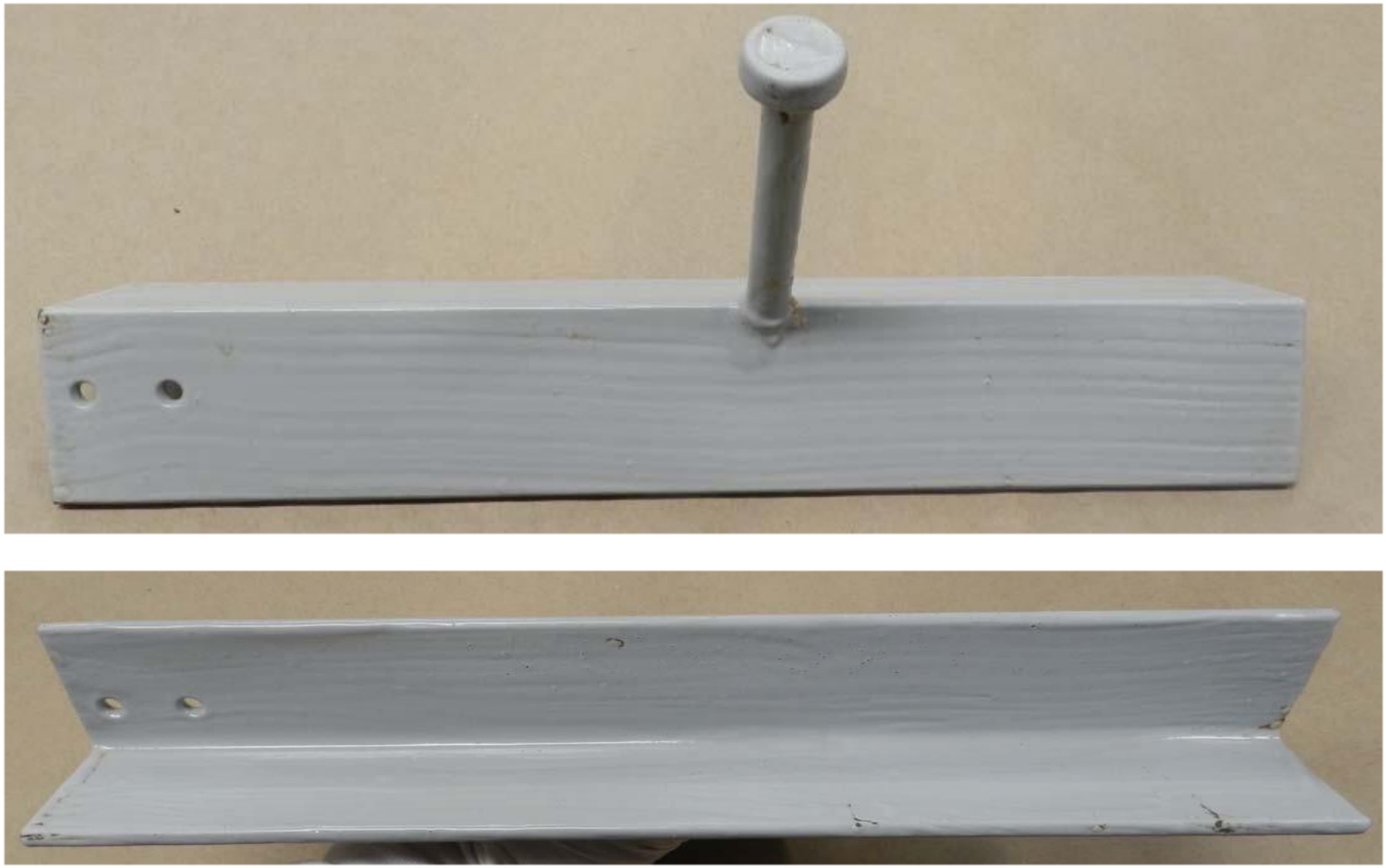


NANO-POXY EDGE RETENTION TEST

Fabricated steel angles with a single coat of NANO-POXY brushed directly over mill scale while angles were hanging in place

NANO-POXY SALT CHAMBER TEST

> 1,000 hours in Salt Chamber



NANO-POXY IMPACT TEST

The plate was struck with the hammer then flipped over and struck again with the hammer until it was yielded in the opposite direction. This was repeated again, yielding the plate back to the original deformed thickness. Even though the steel plate was impacted from both faces with sufficient force to repeatedly yield the steel in both directions at the same location, no cracks, chips, or pop-outs of any kind were observed on either surface.

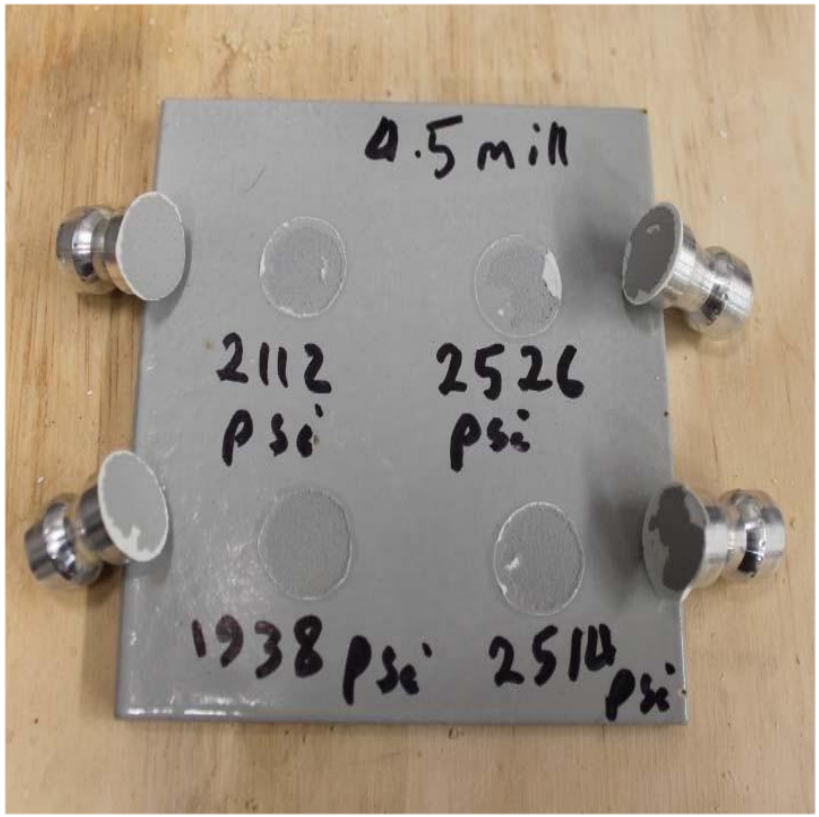
NANO-POXY SPECIALIZED TESTING RESULTS

- Heat and Cold Resistance - 5 mil of NANO-POXY applied to two unprimed metal samples and heated to 250°F and frozen at 0°F for 100 days. Color change occurred with the heated sample but with no damage to either sample (image)
- Freeze/Thaw Exposure - 100 cycles consisted of freezing the sample to -25°C, holding the sample at that temperature for 1 hour, lowering the temperature further to -35°C, holding that temperature for 1 hour, and then immersing the frozen sample in a bath of water at 10°C for approximately 2 hours (image)
- Environment Exposure - Two samples located on the roof of the lab in Raleigh, NC and exposed to full sun for 18 months, loss of gloss but no chalking or breakdown of the coating surface (image)
- Immersion in High pH Solutions - a thin film of NANO-POXY was immersed in sealed containers with 5 molar NaOH and saturated CaOH for 4 months. Films were not degraded after exposure and were visibly the same color as control samples. In addition, the mass of the solution (sealed in each container) did not change over time, indicating that the films were not dissolving into the solution. The mass of each film sample over time also did not change, indicating the films were not absorbing solution, nor were they breaking down (image)

NANO-POXY HEAT AND COLD RESISTANCE

100 days heated at 250° F and frozen at 0° F - no degradation

Color change only at 250°F



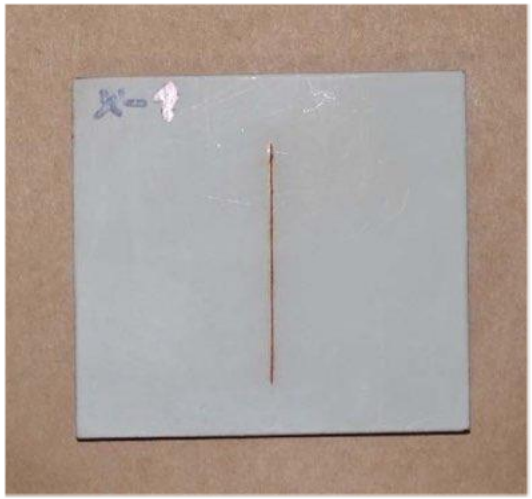
Pull Tests Results on 0°F sample

NANO-POXY FREEZE/THAW CYCLE TEST

100 cycles to -25°C for 1 hour, then -35°C for 1 hour, then thawed at 10°C for 2 hours. No color change or damage to coating surface

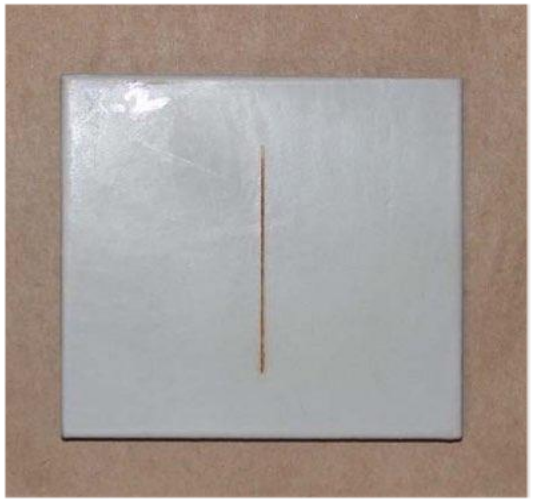
NANO-POXY ENVIRONMENT EXPOSURE TEST

Two samples exposed to full sun for 24 months in Raleigh, NC.



NANO-POXY

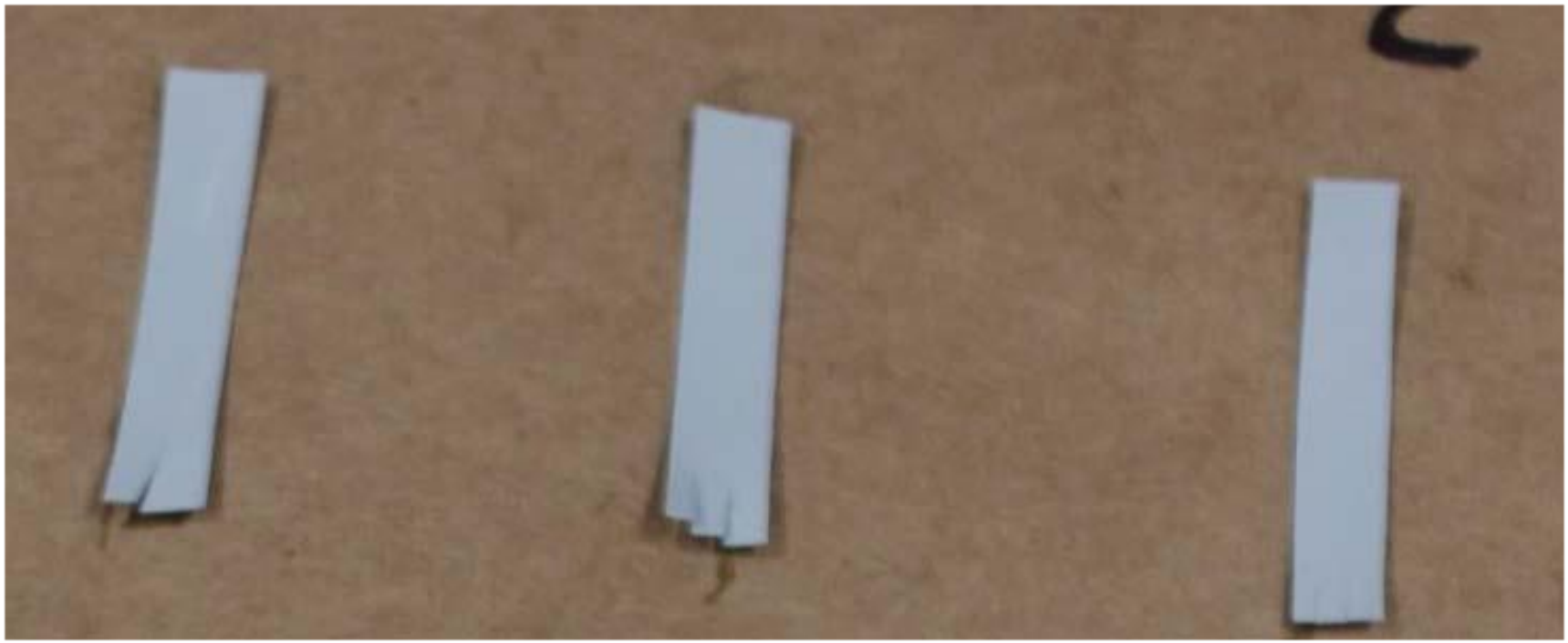
CONTROL



NANO-POXY

Both aged specimens have gloss retention loss (as is typical for epoxies exposed to UV), however, neither has chalked (which is unusual for an unprotected epoxy). Both specimens show a tight scribe line with no rust creepage or undercutting of any kind. No pinholes, blistering, or peeling of any kind is observed anywhere on either aged NANO-POXY specimens.

NANO-POXY IMMERSED IN HIGH PH SOLUTIONS



Thin film strips of NANO-POXY were immersed in sealed containers with 5 molar NaOH and saturated CaOH for 4 months. Film samples were not degraded after exposure and were visibly the same color as control samples. The mass of the solution (sealed in containers) did not change over time, indicating that the films were not dissolving into the solution. The mass of each film sample over time also did not change, indicating the films were not absorbing solution, nor were they breaking down.

NANO-POXY TESTING REPORT SUMMARY

Summary of Results for NANO-POXY Coating

Prepared by:
Gregory Lucier, Ph.D.
Laboratory Manager

Technical Report
IS -14-18Constructed Facilities Laboratory

2414 Campus Shore Drive
North Carolina State University
Raleigh, NC 27695-7533

AMERICAN BUREAU OF SHIPPING CERTIFICATION

ABS

CERTIFICATE NUMBER
15-HS1306675-PDA

DATE
21 Jan 2015

ABS TECHNICAL OFFICE
Houston Materials

CERTIFICATE OF

Design Assessment

This is to certify that a representative of this Bureau did, at the request of

PROENTEK LLC

assess design plans and data for the below listed product. This assessment is a representation by the Bureau as to the degree of compliance the design exhibits with applicable sections of the Rules. This assessment does not waive unit certification or classification procedures required by ABS Rules for products to be installed in ABS classed vessels or facilities. This certificate, by itself, does not reflect that the product is Type Approved. The scope and limitations of this assessment are detailed on the pages attached to this certificate.

Product: Coating
Model: Everstrong NANO POXY

This Product Design Assessment (PDA) Certificate 15-HS1306675-PDA, dated 21/Jan/2015 remains valid until 20/Jan/2020 or until the Rules or specifications used in the assessment are revised (whichever occurs first).

This PDA is intended for a product to be installed on an ABS classed vessel, MODU or facility which is in existence or under contract for construction on the date of the ABS Rules or specifications used to evaluate the Product.

Use of the Product on an ABS classed vessel, MODU or facility which is contracted after the validity date of the ABS Rules and specifications used to evaluate the Product, will require re-evaluation of the PDA.

Use of the Product for non ABS classed vessels, MODUs or facilities is to be to an agreement between the manufacturer and intended client.

AMERICAN BUREAU OF SHIPPING
Daniel Hyun SON For
Mohamed C Boukamcha
Engineer/Consultant

Extensive testing on NANO-POXY performed at North Carolina State University's Constructed Facilities Lab beginning in January 2014, with summary report submitted to ABS in October 2014.

NANO-POXY INDUSTRIAL USERS

- AB Brown - Power plant in Ohio using NANO-POXY in highly corrosive environment to coat exterior of flocculate tanks
- WestRock - Largest global paper/pulp/packaging company, coating stainless steel tanks at Virginia pulp mill, where no coating has been able to bond
- Bangor International Airport - 17,000 SF concrete floor coating project over 60 year old concrete floor for Life Flight Operations of Maine
- Asheville Distilling Company - Floor, wall, pit and tank coating for 93% alcohol and containment for 75% phosphoric acid and 50% sodium hydroxide
- ABT - Leading surface drainage company in the US, proposing NANO-POXY
  as a galvanizing alternative for underground steel frames for LAX airport expansion
- Timmons Oil – Fuel & lubricant distributor, exterior & interior fuel tank coating
- NYLE Systems - Wood kiln and food dehumidification system manufacturer, OEM metal coating and concrete coating for wood kiln

FIELD TESTS

Extremely Corrosive Flocculate Environment at AB Brown Power Plant in Ohio

FIELD TESTS

Corrosion on AB Brown Power Plant flocculate tank base

FIELD TESTS

Severe corrosion at base of the flocculate tank on concrete pad

FIELD TESTS

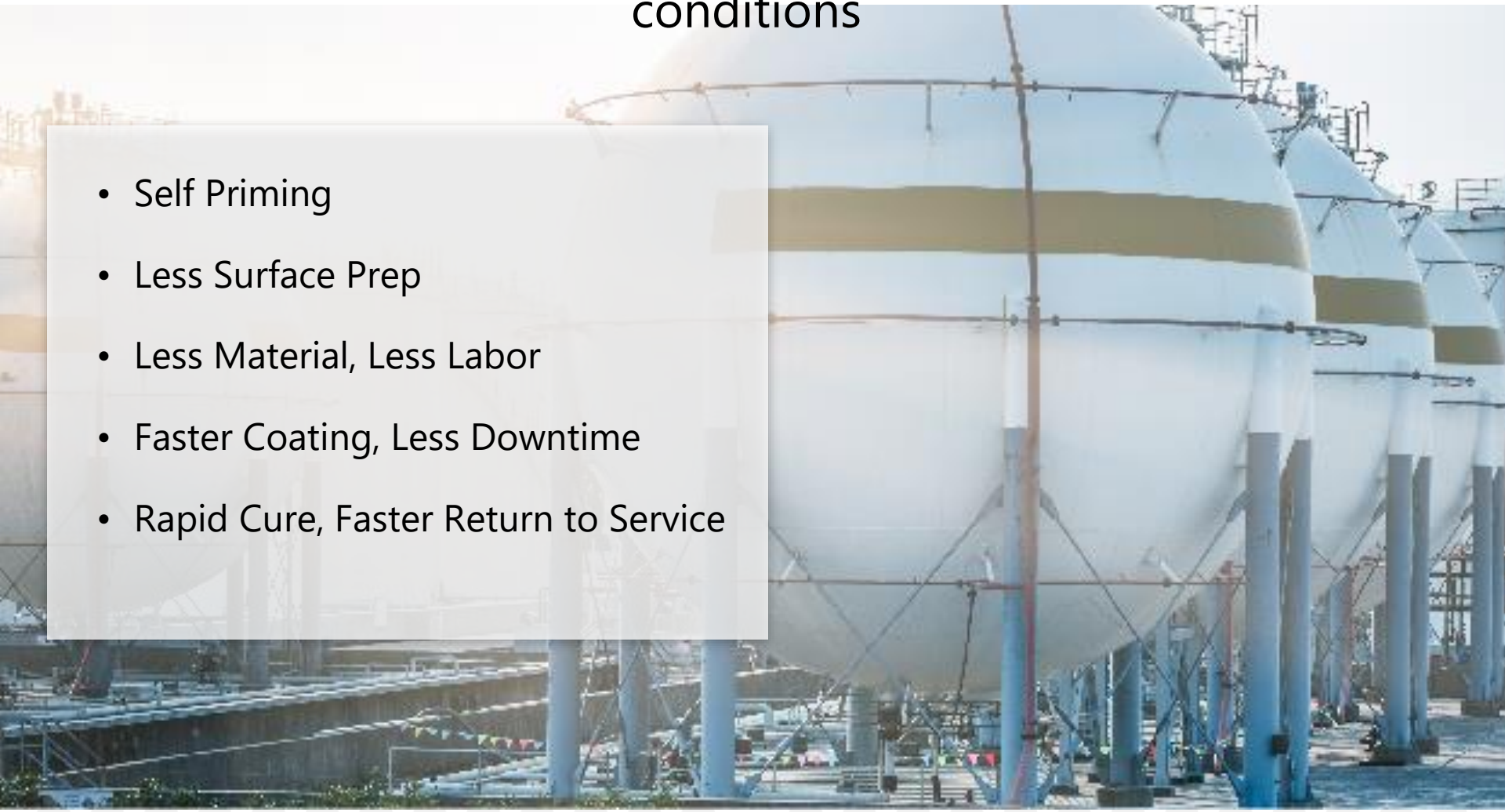
Test Section on AB Brown Tank with single coat of XO.XTREME with no

FIELD TESTS

AB Brown tank coated as well as concrete pad

NANO-POXY SAVINGS

Single coat application for general atmospheric conditions



- Self Priming
- Less Surface Prep
- Less Material, Less Labor
- Faster Coating, Less Downtime
- Rapid Cure, Faster Return to Service

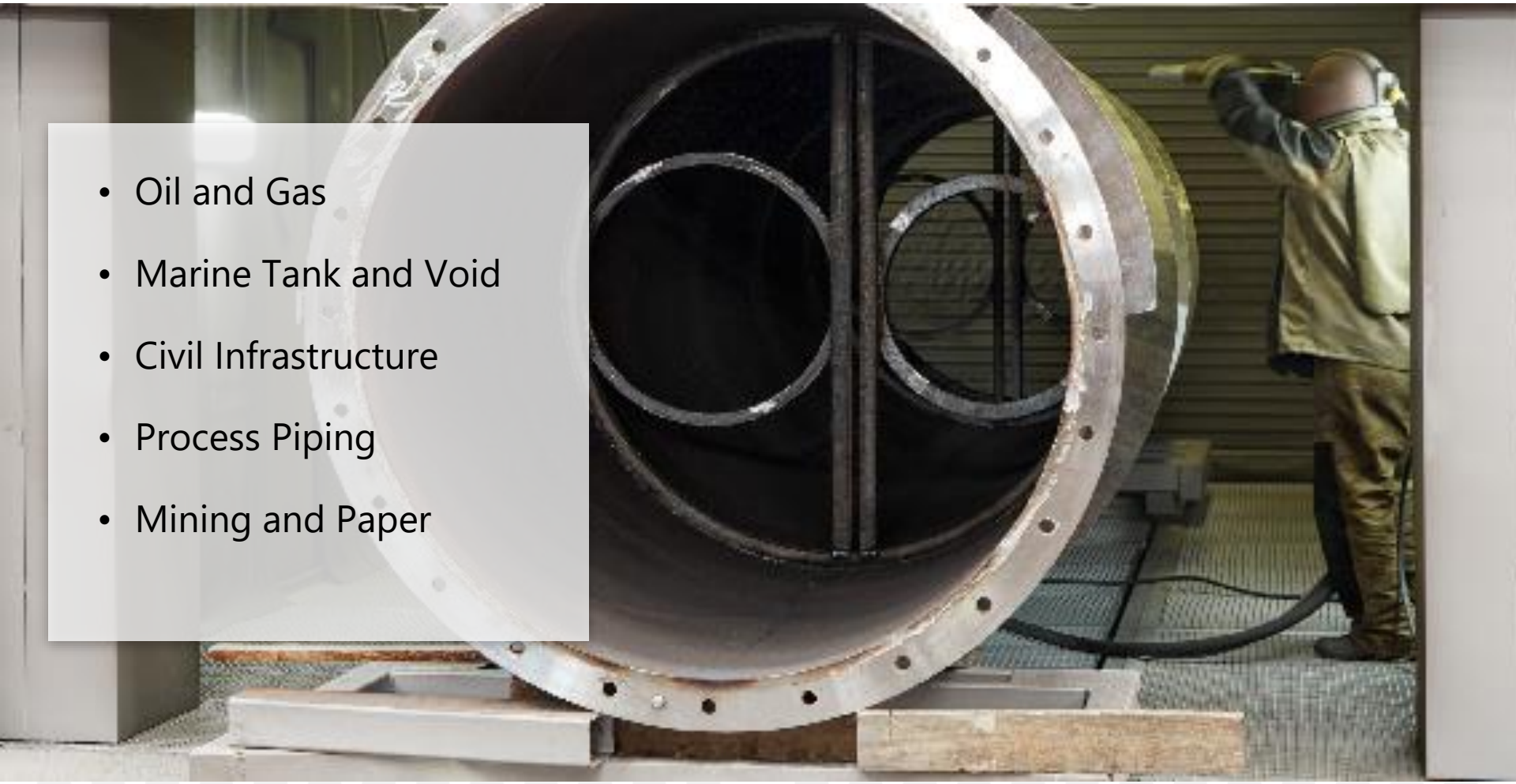
NANO-POXY COST VS. COMPETITORS

	NANO-POXY	CARBOLINE Carboguard 635	TNEMEC Pota-Pox
Volume Solids	82%	65%	67%
Theoretical coverage 1 mil	1,315 ft^2	1,042 ft^2	1,070 ft^2
Recommended Coating Thickness (Immersion)	8 mil	10-12 mil	10-12 mil
System Requirements	2 Coats	3 Coats	3 Coats
VOCs	0.36 lbs/gal	2.47 lbs/gal	2.40 lbs/gal
HAPs	1.59 lbs/gal	Not Published	2.40 lbs/gal
Material Cost per sq. ft.	$1.37*	$2.30	$2.47

*Does not include savings resulting from less surface prep, primer elimination, less downtime and faster return to service

NANO-POXY APPLICATIONS

Engineered for a broad range of extreme atmospheric and immersion applications



- Oil and Gas
- Marine Tank and Void
- Civil Infrastructure
- Process Piping
- Mining and Paper

NANO-POXY APPLICATIONS

Our trained engineers are available to design custom applications for specialized projects

NANO-POXY 2 year warranty is 2x industry standard

EVERSTRONG®

NANO-POXY

Made in the USA to exacting standards for our Global Partners

Proentek LLC