Report No. UT-08.23

THREE POLYUREA CONCRETE SPALL REPAIR PRODUCTS ON SR-201 IN REGION 2

Experimental Feature X(06)04

FINAL REPORT

Prepared For:

Utah Department of Transportation Research Division

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APRIL 2009

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Tim Ularich, Assistant District Engineer

Jack Mason—Area Supervisor

Crew of Maintenance Station #2424 (Kevon Ogden, former Supervisor)

Robert Beebe Construction

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16. Abstract

Tests of three different polyurea products: Nitrocoat™ 1575, Sta-Crete 3003 and Sta-Crete 3200 were applied and evaluated as experimental concrete spall repair materials. All three resulted in failure. Tests of Sta-Crete 3200 in longitudinal cracks on an exit ramp were successful.

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EXECUTIVE SUMMARY

In August 2006 the Utah Department of Transportation (UDOT) installed and evaluated three polyurea products as concrete spall repair products. The products were Nitrocoat™ 1575 (UCSC Ltd.), a sprayed plural component polyurea elastomer, Sta-Crete 3003 (Epmar Corp.), a two component MDI cured polyurea and Sta-Crete 3200 (Epmar Corp.), a two component MDI base prepolymer and polyether amine. The Sta-Crete 3200 product was also installed in longitudinal cracks on an exit ramp.

An interim evaluation in January of 2007 revealed that all three products had failed in the spall repair areas. The Sta-Crete 3200 product that was installed on the ramp was still intact.

The UDOT Research Division does not recommend the use of these three products for concrete pavement spall repair applications.

1.0 INTRODUCTION

The Utah Department of Transportation (UDOT) recognizes the need for cost-effective and reliable quick set concrete spall repair products, and tests new products to determine whether those products represent an improvement over materials already in use.

In the summer of 2006, Tim Ularich, Region 2 Assistant District Engineer, after being approached by Robert Beebe, of Robert Beebe Construction, Willard, UT, agreed to test the following products as potential spall repair solutions:

Nitrocoat™ 1575 (UCSC Ltd.), a sprayed plural component polyurea elastomer (Appendix A)

Sta-Crete 3003™ (Epmar Corp.), a two component MDI cured polyurea (Appendix B)

Sta-Crete 3200™ (Epmar Corp.), a two component MDI base prepolymer and polyether amine (Appendix C)

These products are generally used for sealing concrete and steel substrates that are exposed to moisture, such as roofing systems, water tanks, tunnels, irrigation ditches, airport runways, parking decks, water treatment facilities, chemical containment facilities, cold storage facilities, and warehouse floors. Refer to the above listed appendices for more detailed product information and manufacturer's recommendations.

Robert Beebe, of Robert Beebe Construction, Willard, UT, was a certified installer of the Nitrocoat™product in pond liner applications. He was also certified by the Epmar Corporation to install the two Sta-Crete products.

The Research Division conducted a literature search to investigate the documented history of these products being used for this particular type of application. The databases searched and the results of the search are shown in Table 1.

DESCRIPTION	URL	RESULT
AASHTO Product Evaluation Listing (APEL)	http://apel.transportation.org/	No hits
Federal Highway Works Administration (FHWA)	http://www.fhwa.dot.gov/	No hits
Research in Progress (RIP)	http://rip.trb.org/	No hits
Texas Transportation Institute (TTI)	http://tti.tamu.edu/	No hits
Transportation Research Information Service (TRIS)	http://ntlsearch.bts.gov/tris/index.do	No hits
State DOT Search Engine	http://www.google.com/coop/cse?cx=006511338351663161139:cnk1qdck0dc	No hits

Table 1 Literature Search Results For Specific Application As Concrete Spall Repair Products

2.0 OBJECTIVES

The objectives of the test were to document the installation of the products and to observe the durability of the products over a 3 year time period.

3.0 INSTALLATION

The outside lane on westbound SR-201 between mile markers 10.8 and 12.9 was chosen by Tim as the test site (Fig. 1)

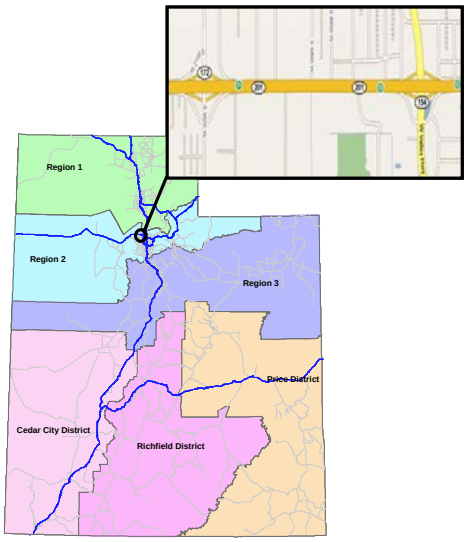


Figure 1 Location Map

Robert Beebe, of Robert Beebe Construction, Willard, UT, was selected by the product vendors because of his experience in applying similar materials as pond liners or corrosion protection for steel tanks. He was also certified as an installer by the Epmar Corporation for the two Sta-Crete products

On Aug. 12, 2006, from 9:00 PM to 9:00 AM, the lane was closed and the materials were installed sequentially from east to west (Figure 2).

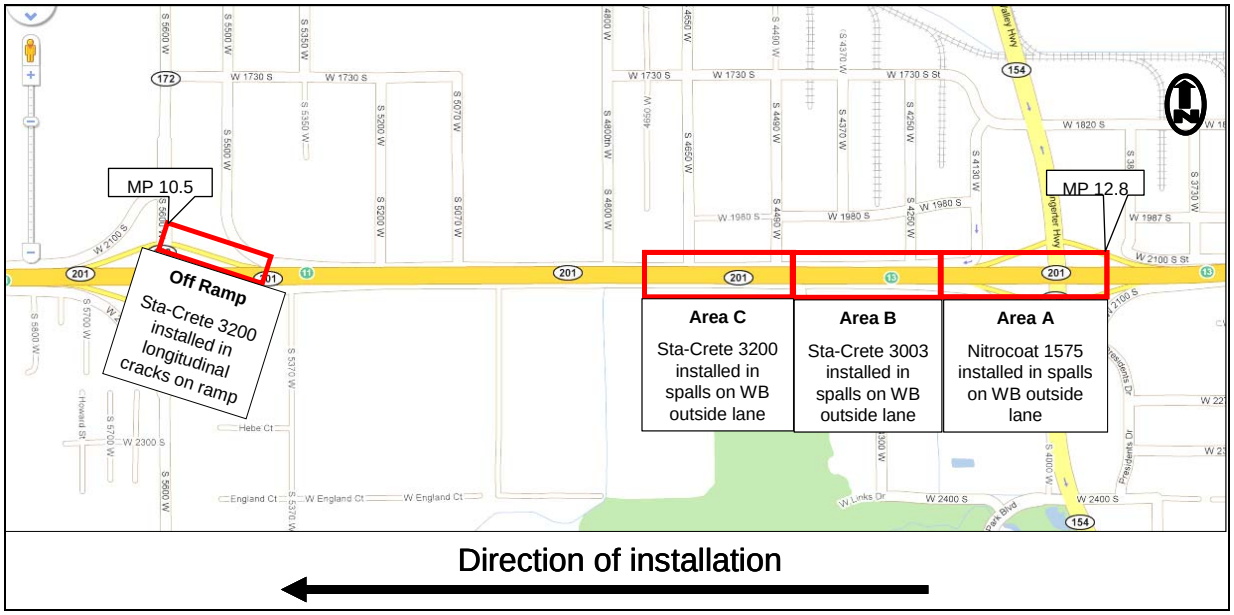


Figure 2 Installation Sequence

The cost of the installation included the cost of the traffic control, the contractor's installation cost, and the hourly of the UDOT maintenance personnel who participated in the study. The materials and equipment were furnished by the contractor.

The spalled areas were prepared by jack hammering and de-bonding and sand blasting. No saw cutting of the surfaces was done. The spalled areas were then pre-wet, and the material was applied using a spray gun dispenser that featured a pressure mixer on its nozzle.

Each product was installed in at least two different holes. The Nitrocoat™ 1575 was installed first, followed by Sta-Crete 3003, and finally the Sta-Crete 3200.

Figure 3 Installation of the Sta-Crete 3003 product in one of the spalled areas.

Tim Ularich expressed some concerns about the installation process. It seemed to him that the whole installation process was unorganized. He also observed that all three materials were applied using the same equipment and wondered if there could have been contamination problems. All three products were exothermic materials, and concern was also expressed by Tim over the amount of heat that the products generated after installation. Additionally, the inability of the materials to be brought up to grade or to be shaped to grade resulted in several uneven patches.

4.0 FIELD REVIEW

The test site was reviewed in January 2007 by Tim Ularich and the Barry Sharp, of the Research Division. Tim determined, at that time, that all the patches had failed and needed to be repaired with cold mix asphalt

A follow-up site visit was made by the Ken Berg of the Research Division in January of 2009. The following photographs were taken and document the condition of the patches during that site visit.

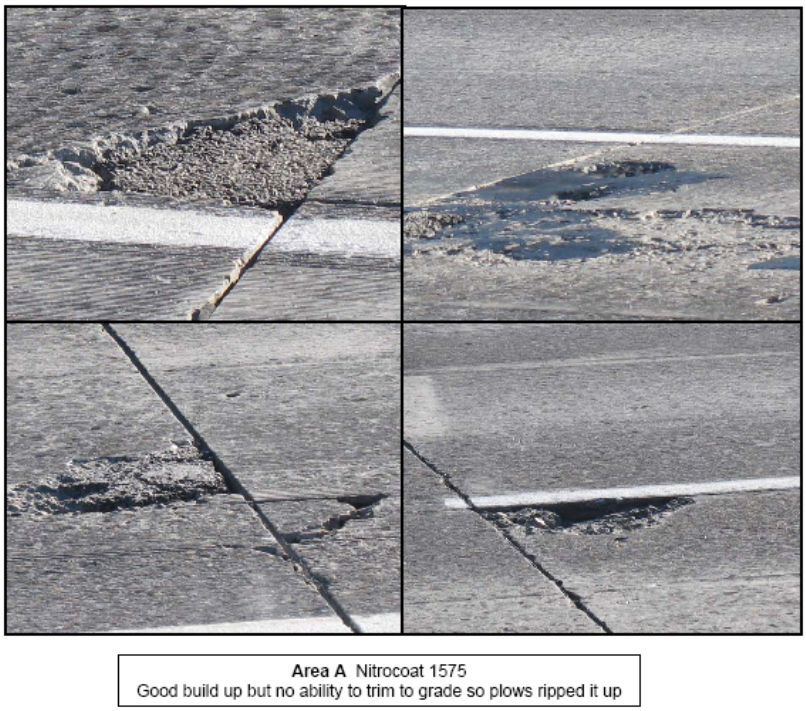


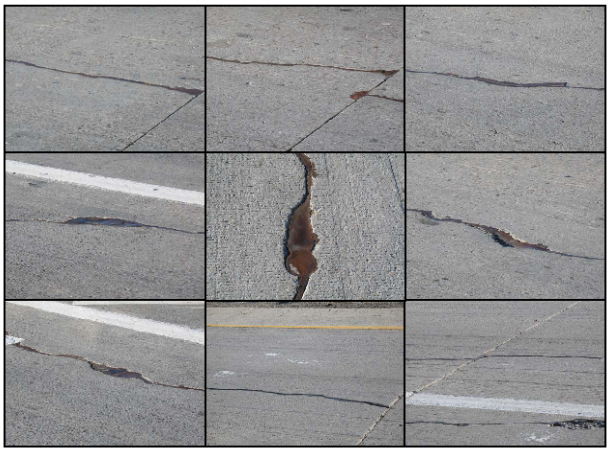
Figure 4 Typical failure of patches in Area A. Note the cold mix patches installed by Maintenance forces.

Area B Sta-Crete 3003
Too runny-wouldn't hold grade in the cross slope and needed aggregate for a friction course.

Figure 5 Typical failure of patches in Area B. Note the cold mix patches installed by Maintenance forces.

Area C Sta-Crete 3200. Better build-up than Sta-Crete 3003.

Figure 6 Typical failure of patches in Area C. Note the cold mix patches installed by Maintenance forces.



Off Ramp Sta-Crete 3200 installed in longitudinal cracks on 5600 W. off ramp.

Figure 7 Sta-Crete 3200 still intact in longitudinal cracks

5.0 ANALYSIS

Because all three products were exothermic, Tim speculates that the heat output could possibly be a factor that contributed to their failure. When the Nitrocoat product was applied on a surface with a “crown,” it could not be trimmed to grade, resulting in exposure to damage from snow plow blades. The Sta-Crete 3003 was too runny to hold grade in the cross slope and had to be topped of, in some areas, with the Sta-Crete 3200 product. Any of the resulting patches that were uneven were subjected to differential pressures from passing traffic which could have contributed to their failure. The relative performance properties of each product are summarized in Table 2.

PRODUCT	BUILD-UP	GRADABLE	EXOTHERMIC	COMMENTS
Nitrocoat™ 1500	Best	No	Yes	Could not be trimmed to grade so plows tore it up.
Sta-Crete 3003	Worst	No	Yes	Too runny--wouldn't hold cross slope. Some applications needed Sta-Crete 3200 on top to bring to grade.
Sta-Crete 3200	Better	No	Yes	Better build up. Needed aggregate for friction. Held up better in longitudinal cracks than in spalls.

Table 2 Performance Summary

6.0 CONCLUSIONS/RECOMMENDATIONS

The consensus of those involved in the study was that all the products failed early in the spalled areas. The products are not recommended for continued use in concrete repair applications in holes larger than 6” in diameter, if at all. However, the Sta-Crete 3200 product performed adequately in the longitudinal cracks on the exit ramp.

APPENDIX A

Nitrocoat™ 1575

7/9 Waterproof Protective Membrane
Polyurea Elastomeric Coating
Technical Datasheet: 3/28/05

Description

Nitrocoat 1575 is a state-of-the-art, high-performance, sprayed plural-component polyurea elastomer. Nitrocoat 1575's combination of high elongation and tensile strength creates a membrane with excellent impact resistance. When used in large span areas, this product creates a liner free of seams that won't shrink and withstands movement from contraction and expansion. These characteristics make Nitrocoat 1575 ideal for an impact resistant (hail and foot traffic) protective coating over polyurethane foam in roofing applications. The high-elongation formula creates an ideal liner for decorative ponds, aquaculture farms and industrial tanks.

Unique Properties

Nitrocoat 1575 is a seamless membrane that can be handled or walked on within five (5) minutes after spraying. Nitrocoat 1575's unique polyurea formula provides excellent resistance to chemicals and hydrolysis while offering superior sprayability and ease of processing. Due to a fast gel time, Nitrocoat 1575 can be built up to any thickness in one pass. However, for even coating coverage, multiple applications in a crisscross pattern is recommended.

Nitrocoat 1575 standard colors are black, tan, gray, green, red, blue and yellow. Custom colors will be quoted upon request. Nitrocoat 1575 is an aromatic coating. Aromatic coatings are not color stable. For color stable coatings ask your technical representative about aliphatic materials.

100% Solids. No solvents. No VOCs. USDA Approved.

Recommended Uses

- Roofing systems
- Marine tanks and sanitation ponds
- Earthen containment lining used with geotextile
- Concrete tanks, ponds, lagoons, reservoirs, dikes, irrigation ditches, tunnels.
- Membrane covering used with geotextile fabrics to encapsulate contaminates in landfill applications
- Replace or repair failed existing sheet membrane liners
- Cold storage and freezers
- Primary and secondary containment

General Application Instructions

The polyol "B" component must be thoroughly power mixed each day, prior to use.

Follow instructions attached to "A" and "B" containers.

Recommended Equipment and Settings:
Standard 1:1 ratio, heated, plural component equipment developing a minimum of 2000 psi (69 bar) dynamic pressure will adequately spray Nitrocoat 1575. Contact UCSC for equipment and gun recommendations.

Pre-heater temperature settings: 160-170°F (71-76°C)
Hose temperature settings: 160-170° F (71-76°C) a hose thermometer inserted under the insulation near the gun should read a minimum of of 145-155°F (63-68°C).

Physical properties will be enhanced when sprayed at higher pressure (2000 psi or more) (13.9 mpa), utilizing an impingement mix gun.

Typical Physical Properties

Application

Effective Gel Time: 20-25 seconds
Tack Free: 98-120 seconds
Final Cure: 72 hours
Clean-up Solvent: NMP, Polyclean
Thinner: Not used
Mixing Ratio by Volume: 1:1
Flash Point: 500° F

*Complete polymerization to achieve final strength can take up to several weeks, depending on a variety of conditions.

Physical Characteristics

Appearance:
A: Clear Amber Liquid
B: Clear Amber or Pigmented Liquid

Shelf Life:
Six (6) months in unopened containers.
Stored between 60°F and 100°F

Water and Oil Resistance:
Excellent

Service Temperature:
-60°F to +300°F

Dry Physical Properties

Tensile Strength: ASTM D-412, 1500 psi ± 50
Elongation: ASTM D-412, 700% ± 25%
Hardness: ASTM D-2240, Shore A 70 ± 5
Tear Resistance: ASTM D-624 300 pli, ± 10
Die "C"

Wet Physical Properties

At 77°F (25°C)
Solids by Volume: 100%
Solids by Weight: 100%
Volatile Organic Compounds: 0 lbs/gal (0g/l)
Theoretical Coverage DFT: at 16 mils (0.4mm)
100 s.f. (9.1m²/ga)
Weight per gallon (approx): A: 9.2 lbs.
B: 8.55 lbs.
Viscosity (cps): A: 600-800
B: 400-600

Test values may vary depending on type of equipment, equipment settings and environmental conditions.

Note: The material supplied is two components (Component A / Component B) used to formulate Nitrocoat 1575. The quality and characteristics of the finished polymer is determined by the mixture and application of the two components.

Substrate surfaces to which Nitrocoat 1575 may be applied must be clean, dry, free of oil and other surface contaminants. The surface should be broken by grinding, sanding, or sand blasting. A primer may be required, subject to type and/or condition of substrate. Consult technical service personnel for specific primer recommendations and substrate preparation procedures or reference the primer/substrate chart on the UCSC website at www.buyucsc.com by clicking materials/primers.

Nitrocoat 1575 can be sprayed over a broad range of ambient and substrate temperatures. Contact UCSC personnel for applications outside of standard ambient/substrate temperatures between 40°- 100°F or for specific recommendations, pricing, and availability of spray and auxiliary equipment. Minimum material/container temperature for spray application is 80°F ±10° F(27°C). It is recommended that Nitrocoat 1575 be sprayed in a crisscross pattern to ensure uniform thickness.

Solvents such as MEK (Methyl Ethyl Ketone), trichloroethane or NMP may be used for cleanup of liquid components with adequate provision for thorough ventilation and flammability. The use of protective gloves and hand creams is strongly urged.

Storage above 60°F is recommended to prevent separation. While infrequent separation does occur below 50°F, heating above 140° F with occasional slow stirring will restore the Nitrocoat 1575 to its original condition.

General Safety, Toxicity, Health Data

Material Safety Data Sheets are available on this coating material. Any individual who may come in contact with these products should read and understand the M.S.D.S. In case of emergency contact CHEMTREC EMERGENCY NUMBER at 800-424-9300.

WARNING: Contact with skin or inhalation of vapors may cause an allergic reaction. Avoid eye contact with the liquid or spray mist. Hypersensitive persons should wear protective clothes, gloves and use protective cream on face, hands and other exposed areas.

CLEAN UP: Use NMP

CONTAMINATION: Avoid moisture contamination in containers. Containers should not be resealed if contamination is suspected, carbon dioxide created pressure can develop. Do not attempt to use contaminated material.

EYE PROTECTION: Safety glasses, goggles, or a face shield are recommended.

SKIN PROTECTION: Chemical resistant gloves are recommended. Cover as much of the exposed skin area as possible with appropriate clothing.

RESPIRATORY PROTECTION is MANDATORY! Respiratory protective equipment, impervious foot wear and protective clothing are required at all times during spray application. Contact UCSC for a copy of the Model Respiratory Protection Program developed by API or visit the UCSC website at www.buyucsc.com and click materials/safety documents.

INGESTION: Do not take internally. It is believed that ingestion of polymeric isocyanates would not be fatal to humans, but may cause inflammation of mouth and stomach tissue.

Consider the application and environmental concentrations in deciding if additional protective measures are necessary.

Warranty and Disclaimer

The data presented herein is not intended for non-professional applicators or those persons who do not purchase or utilize this product in the normal course of their business.

The potential user must perform any pertinent tests in order to determine the product's performance and suitability in the intended application, since final determination of fitness of the product for any particular use is the responsibility of the buyer. The aforementioned data on this product is to be used as a guide and is subject to change without notice.

The sole exclusive remedy of buyer, which is to have UCSC Ltd. replace any nonconforming product at no cost to buyer is conditioned upon buyer notifying UCSC Ltd. or its distributor in writing of such defect within thirty days of the discovery of such defect. UCSC Ltd. shall not be liable for any direct, incidental or consequential damages resulting from any breach of warranty.

UCSC Ltd. has no role in the manufacture of the finished polymer membrane other than to supply its two components. It is vital that the person applying this product understands the product and is fully trained and certified in the use of plural component equipment. The quality and fitness of the product is dependent upon the proper mixture and application of the components by the applicator. There are no warranties that extend beyond the description on the face of this instrument. UCSC Ltd. warrants only that the two components of this product shall conform to the technical specifications published in the product literature.

UCSC Ltd. makes no warranty as to the quality of any product modified, supplemented, tinted, or altered in any way after it leaves the manufacturing plant. UCSC Ltd. does not warrant that this product is suitable for use as a liner for potable water containers. Use of this product in a potable water container could be hazardous to health if it is improperly processed or applied.

The liability of UCSC Ltd. for any nonconformity of this product to its technical specifications shall be limited to replacement of the product.

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APPENDIX B

Utah Department of Transportation
Research and Development Division

I.D. FILE # 06-122

PRELIMINARY INFORMATION FOR PRODUCT EVALUATION

orm R-52 (Rev. 2/03)

ee Instruction block at bottom before starting to fill out form.

1. *Product Trade Name:* STA-CRETE 3003 Date: July 10, 06
   Manufacturer/Co.: EPMAR Patented? ☐Yes ☐No ☐Applied For
   Company Contact: EPMAR CORP Ph#: (____)____-____ Fax #:____-____
   Street Address: 13210 BARTON CIRCLE
   City: SANTE FE SPRINGS State: CAL Zip Code: 90605
2. Local Contact: ALTA PAINTS Ph#: (801) 466-9625 Fax #: 486-4930
   Local Address *(Distributor)*: 136 W. 3300 SO
   City: SLC State: UT Zip Code: 84115
3. Background description of Company and its product: B&H INDUSTRIAL COATS 801-814-3426
4. Product Identification: POLYUREA
5. Recommended use of product: AIRPORT RUNWAYS, BRIDGE HEADERS PARKING DECKS
6. Outstanding Features or Advantages Claimed: FLEXIBILITY, STRENGTH,
7. General Composition of Material: (Attach laboratory report when applicable)
8. When Introduced on Market?_____ Alternate for what existing product(s)?_____
9. Approx. cost: $35-55 per GAL (unit). Delivery at site 10 days after receipt of order.
   If cost is "job-by-job" give typical price range to expect....$_____ TO $_____.

INSTRUCTIONS -- Answer ALL Questions. Use "X" to indicate choices.
Where a Question is Not Applicable, enter N/A.
Attach additional paper if needed and refer to Item No.

0. Does your product meet requirements of the following specifications? Please write the specification number, classification and type or subgroup when appropriate (i.e. AASHTO M 148, Type I D, Class A)

AASHTO _____ _____ _____ _____ _____

ASTM _____ _____ _____ _____ _____

FEDERAL _____ _____ _____ _____ _____

UDOT _____ _____ _____ _____ _____

1. Is product approved for use by other highway authorities or agencies?
(Indicate by whom used and whether use is routine or experimental only)_____

_____

2. Who recommended that the Department be contacted? DAVE FOLEY / JACK MASON

3. Has another office of UDOT been contacted ☐ Y ☑ N If YES, Whom?_____

Please answer the following questions by placing an X in the appropriate box:

YES	NO	
☑	☐	Can a demonstration be provided?
☑	☐	Are ☐ videos or ☐ educational training courses available?
☑	☐	Can ☐ plans, ☐ drawings, or ☐ pictures be furnished by manufacturer?
		If Yes, ☐ Copy attached ☐ To be mailed.
☑	☐	Are instructions or directions for installation, application or use available?
☑	☐	Is availability seasonal?
☐	☐	Can samples be provided ☐ free or ☑ at cost for laboratory/field testing?

Approximate cost for samples? $_____

Signature ROBERT BEEBE 801-814-3426
(Needed for follow up correspondence.)

• •Please attach trade literature, test results, testimonials, specifications, MSDS sheets, instructions, warranty, samples, etc. • •

Please submit this form to:

UDOT -- Research Division
Attn: Barry Sharp
4501 South 2700 West - Box 148410
Salt Lake City, UT 84114-8410

or fax to : (801) 965-4796

For your questions or comments our engineering staff is available M-F from 7am to 5pm (MST),

Dan Avila, P.E.	Robert Stewart	R. Barry Sharp
Development & Implementation	Development Engineer	Research Specialist
Program Manager	(801) 965-4333	(801) 965-4314
(801) 965-3890		

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STA-CRETE 3003

POLYUREA CAULKING

Description

STA-CRETE 3003 Polyurea Caulking, also marketed as PENATRON 3003, is a 100% solids two component MDI cured polyurea material that has excellent flexibility, tensile strength and rapid setting properties. STA-CRETE 3003 is typically specified for filling interior and exterior horizontal concrete control joints, cracks, and other repair areas where down time is an issue. STA-CRETE 3003 has over 15-years successful case history and is USDA acceptable.

Applications

STA-CRETE 3003 Polyurea Caulking is applied to properly prepared concrete. **STA-CRETE 3003 has been used successfully in the following applications:**

- Food Processing Plants
- Water Treatment Facilities
- Warehouse & Showroom Floors
- Airport Runways
- Parking Deck Garages
- Bridge Headers
- Cold Storage
- Chemical Containment

As well as many other service areas which require a resilient, flexible, quick curing joint compound. STA-CRETE 3003 is applied with plural dispensing equipment capable of maintaining a consistant 1:1 mix ratio or an approved dispensing gun. STA-CRETE 3003 will change color (except black) when exposed to UV.

Performance

VOC – 0 g/l *Meets Final SCAQMD Rule 1113 (2008)*
ASTM D412 Tensile Strength = 750 psi
ASTM D142 Elongation = 300%
ASTM D624 Tear Strength = 180 psi
ASTM D790 Compressive Strength = 675 psi
ASTM D695 Modulus of Elasticity = 20,080 psi
ASTM D2240 Hardness = 85 Shore A
ASTM D1674 Coefficient of Linear Expansion
(in/in/^{o}C) –10°C to 60°C = 13.8 x 10^{-5}
FED. SPEC MMM-A-001993 – Meets or Exceeds Guideline Performance

EPMAR CORPORATION
13210 Barton Circle – Santa Fe Springs, California 90605
Tel: (562) 946-8781 Fax: (562) 944-9958
www.Epmarcorp.com

Physical Characteristics

Volume Solids:	100%
Weight Per Gallon:	8.6. lbs.
Packaging:	2-GAL. & 10-GAL. KITS
FlashPoint:	>200°F.
Gloss:	Medium
Mix Ratio:	1:1 (A:B) By Volume
Pot Life @70°F., 50% RH:	2-MINUTES
Dry Time:	@70°F. 50% RH, 12-minutes to touch, foot traffic 1-hour. Heavy traffic in 2-hours, Full cure in 72-hours (chemical resist.)
Film Thickness:	¼"-1'
Coverage:	77 linear foot/gal @1/4"Width x 1" Depth 18 linear foor/gal @1"Width x 1" Depth
Colors:	Gray and Black.
Thinning:	None. Use Epmar #1 or #2 Solvent for clean up.
Primers (Steel):	Self-priming or Sta-Crete 1207, Sta-Crete 2900 or Sta-Crete 3700.
Topcoats:	Sta-Crete 1202, Sta-Crete 1600, Sta-Crete 2700, Sta-Crete 2900, and Sta-Crete 3700

Surface Preparation

Concrete – Allow concrete to cure a minimum of 28-days. All visible oil, grease, sludge, and any other contaminants shall be removed prior to any product application. Vacuum dust and debris from joints, cracks and crevices.

Application Methods

Mechanical Application - Sta-Crete 3003 is designed to be applied with mechanical plural component, proportioned application equipment or spray applied using Graco's "Reactor" E-Series plural component proportioner with the "Fusion" spray gun or approved equal. Material temperature should be maintained at 70°F. – 80°F. to produce an acconsistant flow through the mechanical pumping system**. See Section 4 – Polyurea Floor Application for complete instructions.**

Hand Mixing - Sta-Crete 3003 may be hand mixed from premeasured kits. The product temperature must be at least 60°F. Part B must be poured into part A while part A is being mixed. Use proper mixing technique moving the mixer up and down and scraping the sides to insure complete mixing of all the material. Mixer speed should be at least 700 rpm and mixed for 1 minute, quickly checking for lines of unmixed material prior to application. Avoid overmixing and inducing air into material. Immediately pour onto prepared surface without delay to avoid viscosity increase and subsequent loss of bond strength.

Cartridge – Dispensing Sta-Crete 3003 requires a 300 x 300 ml. dual application gun or equal.

Environment – Sta-Crete 3003 can be applied at substrate and environmental temperatures as low as 0°F. – and as high as 100°F. and 5°F. above dewpoint providing the material temperature is maintained between 70°F – 80°F.

Safety – CONTAINS POLYUREA AND ISOCYANATE RESINS! DO NOT USE IF YOU HAVE AN ADVERSE REACTION TO THESE CHEMICALS! See product safety data sheet. Wear appropriate protective clothing, gloves, eye protection, and beathing apparatus. **Contact EPMAR for any additional application information.**

WARRANTY

The following warranty is made in lieu of all other warranties, either expressed or implied. This product is manufactured of selected raw materials by skilled technicians. Neither seller nor manufacturer has any knowledge or control concerning the purchaser's use of this product and no warranty is made as to the results of any use. The only obligation of either seller or manufacturer shall be to replace any quantity of this product, which is proved to be defective. Any claim of defective product must be received in writing within one (1) year from date of shipment. Neither seller nor manufacturer assumes any liability for injury, loss, or damage resulting from use of this product.

APPENDIX C

Utah Department of Transportation
Research and Development Division

I.D. FILE # 06-122

PRELIMINARY INFORMATION FOR PRODUCT EVALUATION

orm R-52 (Rev. 2/03)

ee Instruction block at bottom before starting to fill out form.

1. *Product Trade Name:* STA-CRETE 3003 Date: July 10, 06
   Manufacturer/Co.: EPMAR Patented? ☐Yes ☐No ☐Applied For
   Company Contact: EPMAR CORP Ph#: (____)____-____ Fax #:____-____
   Street Address: 13210 BARTON CIRCLE
   City: SANTE FE SPRINGS State: CAL Zip Code: 90605
2. Local Contact: ALTA PAINTS Ph#: (801) 466-9625 Fax #: 486-4930
   Local Address *(Distributor)*: 136 W. 3300 SO
   City: SLC State: UT Zip Code: 84115
3. Background description of Company and its product: B&H INDUSTRIAL COATS 801-814-3426
4. Product Identification: POLYUREA
5. Recommended use of product: AIRPORT RUNWAYS, BRIDGE HEADERS PARKING DECKS
6. Outstanding Features or Advantages Claimed: FLEXIBILITY, STRENGTH,
7. General Composition of Material: (Attach laboratory report when applicable)
8. When Introduced on Market?____ Alternate for what existing product(s)?____
9. Approx. cost: $35-55 per GAL (unit). Delivery at site 10 days after receipt of order.
   If cost is "job-by-job" give typical price range to expect....$____ TO $____.

INSTRUCTIONS -- Answer ALL Questions. Use "X" to indicate choices.
Where a Question is Not Applicable, enter N/A.
Attach additional paper if needed and refer to Item No.

Does your product meet requirements of the following specifications? Please write the specification number, classification and type or subgroup when appropriate (i.e. AASHTO M 148, Type I D, Class A)

AASHTO _____ _____ _____ _____ _____

ASTM _____ _____ _____ _____ _____

FEDERAL _____ _____ _____ _____ _____

UDOT _____ _____ _____ _____ _____

Is product approved for use by other highway authorities or agencies?
(Indicate by whom used and whether use is routine or experimental only)_____

_____

Who recommended that the Department be contacted? DAVE FOLEY / JACK MASON

Has another office of UDOT been contacted ☐Y ☑N If YES, Whom?_____

Please answer the following questions by placing an X in the appropriate box:

YES	NO	
☑	☐	Can a demonstration be provided?
☑	☐	Are ☐ videos or ☐ educational training courses available?
☐	☐	Can ☐ plans, ☐ drawings, or ☐ pictures be furnished by manufacturer? If Yes, ☐ Copy attached ☐ To be mailed.
☑	☐	Are instructions or directions for installation, application or use available?
☐	☐	Is availability seasonal?
☐	☐	Can samples be provided ☐ free or ☑ at cost for laboratory/field testing?

Approximate cost for samples? $_____

gnature ROBERT BEGBE 801-814-3426
(Needed for follow up correspondence.)

• •Please attach trade literature, test results, testimonials, specifications, MSDS sheets, instructions, warranty, samples, etc. • •

ease submit this form to:

OT -- Research Division
tn: Barry Sharp
01 South 2700 West - Box 148410
lt Lake City, UT 84114-8410

fax to : (801) 965-4796

r your questions or comments our engineering staff is available M-F from 7am to 5pm (MST),

Dan Avila, P.E.	Robert Stewart	R. Barry Sharp
Development & Implementation Program Manager	Development Engineer	Research Specialist
(801) 965-3890	(801) 965-4333	(801) 965-4314

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EPMAR

STA-CRETE 3200

SPRAYABLE 100% SOLIDS POLYUREA

Description

STA-CRETE 3200 Series Polyurea are 100% solids sprayable two component polyurea elastomeric systems. Sta-Crete 3200 Series Polyurea is a MDI base prepolymer and polyether amine. This product line is developed for the protection of ferrous metals and concrete substrates subject to constant immersion service or chemical secondary containment. tensile strength and rapid setting properties. STA-CRETE 3200 Series Polyurea is typically specified for the interior of concrete and steel substrates subject to constant water or chemical immersion service conditions where down time is an issue. STA-CRETE 3200 is USDA acceptable for continuous or intermittent contact in food processing facilties.

Applications

STA-CRETE 3200 Series Polyurea is applied to properly prepared steel and concrete. **STA-CRETE 3200 is suitable for the following applications:**

- Food Processing Plants
- Water Treatment Facilities
- Water Storage Reservoirs & Pipelines
- Chemical Containment
- Mining Tailing Ponds
- Show Aquaria Tanks

As well as many other service areas which require a resilient, flexible, quick curing joint compound. STA-CRETE 3200 Series Polyurea is applied with plural dispensing equipment capable of maintaining a consistant 1:1 mix ratio or an approved dispensing gun. STA-CRETE 3200 will change color when exposed to UV.

Performance

VOC – 0 g/l *Meets Final SCAQMD Rule 1113 (2008)*
ASTM D412 Tensile Strength = 1800 psi
ASTM D142 Elongation = 130%
ASTM D624 Tear Strength = 75 pli (Die C)
= 114 pli (split tear)
ASTM D790 Compressive Strength = 675 psi
ASTM D695 Modulus of Elasticity = 35,000 psi
ASTM D2240 Hardness = 55-60 Shore D

EPMAR CORPORATION
13210 Barton Circle – Santa Fe Springs, California 90605
Tel: (562) 946-8781 Fax: (562) 944-9958
www.Epmarcorp.com

Physical Characteristics

Volume Solids:	100%
Weight Per Gallon:	9.5. lbs. (A&B Averaged)
Packaging:	20-GAL. & 55-GAL. KITS
FlashPoint:	>200°F.
Gloss:	Medium
Mix Ratio:	1:1 (A:B) By Volume
Pot Life @70°F., 50% RH:	5-seconds to 30-seconds depending on formulation.
Dry Time:	@70°F. 50% RH, 5 seconds to 10-minutes to touch, cure time 3-minutes to 2-hours for immersion (depending on formulation).
Film Thickness:	20-100 mils
Coverage:	15-75 square feet per gallon depending on mil thickness requirements.
Colors:	Gray and Tan.
Viscosity, CPS @75°F:	600 (Comp. A), 560 (Comp. B)
Specific Gravity @75°F:	1.18 (Comp. A), 1.11 (Comp. B)
Thinning:	None. Use Epmar #1 or #2 Solvent for clean up.
Primers (Steel):	Self-priming or Sta-Crete 1500 Series Epoxy.
Topcoats:	Sta-Crete 2700 or Sta-Crete 3300 (for UV resistance)

Surface Preparation

Concrete – Allow concrete to cure a minimum of 28-days. All visible oil, grease, sludge, and any other contaminants shall be removed prior to any product application. Vacuum dust and debris from joints, cracks and crevices.

Steel – Prepare surface in sccordance with SSPC-SP10 (Near White Metal Cleanliness) and produce a 3-5 mil surface profile. Grind off all weld spatter and smooth all rough welds.

Application Methods

Mechanical Application - Sta-Crete 3200 is designed to be applied with mechanical plural component, proportioned application equipment or spray applied using Graco's "Reactor" E-Series plural component proportioner with the "Fusion" spray gun or approved equal. Material temperature should be maintained at 145°F. ~ 160°F. to produce an acconsistant flow through the mechanical pumping system. Sytem pressure should be maintained between 2,000-3,000 psi with hydraulic pressure set between 400-500 psi. See Section 4 – Polyurea Floor Application for complete instructions.

Environment – Sta-Crete 3200 can be applied at substrate and environmental temperatures as low as 0°F. – and as high as 100°F. and 5°F. above dewpoint providing the material temperature is maintained between 145°F – 160°F.

Safety – CONTAINS POLYUREA AND ISOCYANATE RESINS! DO NOT USE IF YOU HAVE AN ADVERSE REACTION TO THESE CHEMICALS! See product safety data sheet. Wear appropriate protective clothing, gloves, eye protection, and beathing apparatus. **Contact EPMAR for any additional application information.**

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