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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Authored by:
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Stan Johnson, Rotational Engineer

APRIL 2009
DISCLAIMER

The authors alone are responsible for the preparation and accuracy of the information, data, analysis, discussions, recommendations, and conclusions presented herein. The contents do not necessarily reflect the views, opinions, endorsements, or policies of the Utah Department of Transportation or the US Department of Transportation. The Utah Department of Transportation makes no representation or warranty of any kind, and assumes no liability therefore.
ACKNOWLEDGEMENTS

The authors would like to acknowledge the following individuals and parties who participated in the study:

Tim Ularich, Assistant District Engineer
Jack Mason—Area Supervisor
Crew of Maintenance Station #2424 (Kevon Ogden, former Supervisor)
Robert Beebe Construction
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.
### Table 1  Literature Search Results For Specific Application As Concrete Spall Repair Products

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

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](image)
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).

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.

![Installation of the Sta-Crete 3003 product in one of the spalled areas.](image)

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

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

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

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
Polyurethane Elastomeric Coating
Technical Data Sheet: 3/20/06

Description
Nitrocoat 1575 is a state-of-the-art, high-performance, sprayed polyurethane elasto-coated membrane. 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 resists tear-off and negative water fronts and withstands movement from contraction and expansion. These characteristics make Nitrocoat 1575 ideal for an impact resistant (ball and foot traffic) protective coating over polyurethane foam in roofing applications. The high-quality on form is created an ideal liner for decorative ponds, aquaculture tanks, and industrial storage.

Unique Properties
Nitrocoat 1575 is a seamless membrane that can be handled or walked on within 60 minutes after spraying. Nitrocoat 1575's unique polyurethane formula provides excellent resistance to chemicals and hydrolysis while offering superior sprayability and ease of processing. Due to its fast set 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 can be used to coat both sides of the material. As color stable inks are not color stable, for color stable coatings ask your technical representative about inkjet materials.

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

Applicator Requirements
For spray application, use spray guns that are designed specifically for use with polyurethane elastics. Airless spray guns are preferred for the best spray atomization and to reduce the risk of premature dry out of the material.

Recommended Uses
- Roofing systems
- Metal roofing and corrosion ponds
- Earthquake containment lining used with geotextiles
- Concrete tanks, ponds, water reservoirs, oil storage, irrigation ditches, tunnels
- Membrane covering used with geotextiles to encapsulate contaminates in landfill applications
- Replace or repair existing sheet metal membrane liners
- Cold storage and feeders
- Primary and secondary containment

Typical Physical Properties

<table>
<thead>
<tr>
<th>Application</th>
<th>Physical Characteristics</th>
<th>Dry Physical Properties</th>
<th>Wet Physical Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effective Dry Time: 20-25 seconds</td>
<td>Appearance: A: Clear Amber Liquid B: Clear Amber or Pigmented Liquid</td>
<td>Tan/Light Brown</td>
<td>At 77°F (25°C)</td>
</tr>
<tr>
<td>Tear Free 98-120 seconds</td>
<td>Softness: Silky, lightweight uncoated</td>
<td>7000 psi (49 MPa)</td>
<td>Solids by Volume: 100%</td>
</tr>
<tr>
<td>Final Cure 72 hours</td>
<td>Odor: Odorless</td>
<td>100%</td>
<td>Solids by Weight: 100%</td>
</tr>
<tr>
<td>Clean-up Solvent: NMP Polyurethane</td>
<td>Sheen: Gloss at time of use</td>
<td>Barometer: ASTM D-412, 1500 psi (10 MPa)</td>
<td>Solubility: Non-soluble</td>
</tr>
<tr>
<td>Thinner: Butyl</td>
<td>ISO 7174</td>
<td>Drying Time: ASTM D-412, 720 K: 72%</td>
<td>Solubility: 100%</td>
</tr>
<tr>
<td>Flash Point: 300°F</td>
<td>Water Resistance: Excellent</td>
<td>Die C</td>
<td>Viscosity (p.d): V 895 bps</td>
</tr>
</tbody>
</table>

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

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 sandblasting. A primer may be required, subject to the type and 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 calling material/primer.

Nitrocoat 1575 can be sprayed over a broad range of ambient and substrate temperatures. Contact UCSC personnel for applications outside of standard ambient/substrate temperature range between 60°F to 100°F or for specific recommendations. Prior to the availability of spray equipment, an air spray application, at 60°F to 100°F (16°C to 38°C), is recommended. Nitrocoat 1575 should be sprayed in a cross hatch pattern to ensure uniform coverage.

Solvents such as MEK (Methyl Ethyl Ketone), NC-100 (N,N-dimethyl-1,3-propylenthepane) or NMF may be used for cleaning of liquid components with adequate provision for thorough ventilation and fume removal. The use of protective gloves and eye wear is strongly urged.

Storage above 60°F is recommended to prevent separation. While infrequent separation does occur below 50°F, heating above 60°F for several days will remove Nitrocoat 1575 to its original condition.

General Safety, Toxicity, Health Data

Material Safety Data Sheets (MSDS) are available on the carrying material. Any individual who may come in contact with these products should read and understand the MSDS. In case of emergency call CHEMTREC at 1-800-424-9300.

WARNING: Contact with skin or inhalation of products may cause an allergic reaction. Avoid contact with the liquid or spray mist.

Protective garments should be protective glasses, gloves, and protective clothing. If contact occurs, wash off with soap and water and flush eyes with water for at least 15 minutes. See the warning label on the product packing.

CLEAN UP: Use NMF

CONTAMINATION: Avoid moisture contamination in container.

Container should not be sealed if contamination is suspected. Carbon dioxide can develop pressure can develop. Do not attempt to use contaminated material.

EXPOSURE PROTECTION: Safety glasses, gloves, or a face shield are recommended.

SKIN PROTECTION: Chemical resistant gloves are recommended. Cover any exposed skin area with clothes or protective clothing.

RESPIRATORY PROTECTION: Use N95 or dust mask with a P-10 respirator. Respirate protective equipment, protective foot wear and protective clothing are required at all times during spray application. Contact UCSC for a copy of the Material Respiratory Protection Program developed by NIOSH or the UCSC website at www.buyucsc.com and click material/safety documents.

INGESTION: Do not take internally. This belief is dangerous if swallowed, this ingestion of polymers or plasticizer may not be fatal to humans, but may cause irritation of the mouth and stomach tissues.

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

Warranty and Disclaimer

This date presented herein is not intended as professional application for persons who do not purchase or utilize the product in the normal course of their business.

The potential user must proceed in such a manner as to determine the product's performance and suitability in the intended application. This date constitutes general information on times for any particular job. The responsibility for the user. The application of the date on the product is to be used at the user's risk and is subject to change without notice.

The date given above of a product, which is to have UCSC's label on the product, means that the product is not to be used for any purpose other than the use for which it is intended.

The user is responsible for any and all incidental or consequential damages resulting from any breach of warranty.

UCSC Ltd. has no control in the manufacture of the finished polymer membrane other than its components. It is the responsibility of the user to determine the quality and the safety of the product used. The user is responsible for selecting and operating the equipment used in the application of the polymer. There is no warranty that is extended beyond the description on the label of this equipment. The user is responsible for any operation or misuse of the equipment.

UCSC Ltd. is not responsible for the quality of any product used in connection with this product. UCSC Ltd. does not warrant that the product is suitable for use in any application.

The liability of UCSC Ltd. for any nondelivery of the product to the user as well as the liability of UCSC Ltd. for any other negligence or breach of warranty between the parties is limited to the purchase price of the product.

The protection herein is intended to be a guide in the use of the product and to prevent the damage of the product. The information herein is intended to be a guide and is not intended to be the sole or only basis for the use of the product. UCSC Ltd. makes no warranties, express or implied, including any warranty of merchantability or fitness for a particular purpose, with respect to this product or information set forth herein. Nothing contained in this publication or any previous or subsequent written or oral document is intended to replace the advice of the user/potential user or any other professional or person.

Accordingly, the buyer assumes all risk whatsoever as to the use of these materials and agrees to indemnify and hold UCSC Ltd. harmless from any breach of warranty, negligence, or other claims that may arise from the use of the product.

UCSC
P.O. Box 8400
Phoenix,AZ 85060

Call 800-843-UCSC (1-800-289-8272) toll-free
602-269-3777 for ext
602-269-3776 for fax

info@buyucsc.com
corporate.ucsc.com
APPENDIX B

PRELIMINARY INFORMATION FOR PRODUCT EVALUATION

1. Product Trade Name: Star-Grete 3003
   Date: Jul 10, 06
   Manufacturer/Co: SPMAR
   Patented? ☐ Yes ☐ No ☐ Applied For
   Company Contact: SPMAR CORP
   Ph#: ( ) Fax#: ( )
   Street Address: 13210 Barton Circle
   City: Sante Fe Springs State: CA Zip Code: 90670
2. Local Contact: ALTA PAINTS
   Ph#: (861) 464-9492 Fax#: (414) 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
   Product Identification: POLYUREA
4. Recommended use of product: Airport Runways, Bridge Heads Parking Decks
5. Outstanding Features or Advantages Claimed: FLEXIBILITY, STRENGTH
6. General Composition of Material: (Attach laboratory report when applicable)
7. When Introduced on Market? Alternate for what existing product(s)?
8. Approx. cost: $35-55 per gallon (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.
6. 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)

12. Who recommended that the Department be contacted? DAVE FOLEY

13. Has another office of UDOT been contacted? 

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

(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.
Development & Implementation Program Manager
(801) 965-3890

Robert Stewart
Development Engineer
(801) 965-4333

R. Barry Sharp
Research Specialist
(801) 965-4314
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/°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
Flash Point: >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 foot/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 acoustical 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 breathing 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

PRELIMINARY INFORMATION FOR PRODUCT EVALUATION

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

1. Product Trade Name: STA-GRETE 3003 Date: JUL 10, 06
   Manufacturer/Co.: EMPAR
   Patented? Yes No Applied For
   Company Contact: EMPAR CORP Ph#: (____) - Fax #: (____)
   Street Address: 1321 O BARTON CIRCLE
   City: SANTA FE SPRINGS State: CA Zip Code: 90660

2. Local Contact: ALTA PAINTS Ph#: (301) 466-9695 Fax #: 466-4930
   Local Address (Distributor): 136 W 3300 S
   City: SLC State: UT Zip Code: 84115

3. Background description of Company and its product: BOTH 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 (64oz). 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.

I.D. FILE #267/22
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? $ 

mature

(Department of Transportation
(801) 841-3426
(Needed for follow up correspondence.)

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

Use submit this form to:

UDOT -- Research Division
to: Barry Sharp
01 South 2700 West - Box 148410
Utah Lake City, UT 84114-8410

fax to: (801) 965-4796

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

Dan Avila, P.E.
Development & Implementation Program Manager
(801) 965-3890

Robert Stewart
Development Engineer
(801) 965-4333

R. Barry Sharp
Research Specialist
(801) 965-4314

E/West Web Design/Product Listings Dec 00 ASPS 02.jpg
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 facilities.

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
- Water Storage
- Mining Tailings
- Ponds
- Water Treatment
- Pipelines
- Show Aquaria Tanks
- Chemical Containment

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 constant 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-GALL & 55-GAL. KITS
Flash Point: >200°F
Gloss: Medium
Mix Ratio: 1:1 (A:B) By Volume
Pot Life @70°F, 50% RH: 5-seconds to 10-seconds depending on formulation
Dry Time: @70°F, 50% RH, 5 seconds to 10-minutes to touch, cure time 3-minutes to 2-
3 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 Epmare #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 accordance 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 acousticient flow through the
mechanical pumping system. System 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 breathing 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.