UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JUL 14 1999

OFFICE OF
PREVENTION, PESTICIDES AND
TOXIC SUBSTANCES

Ms. Donna Hicks
TSCA Technical Specialist
EH&S Regulatory Management Expertise Center
The Dow Chemical Company
2301 Brazosport Blvd. OC-703
Freeport, Texas 77541-3257

Dear Ms. Hicks:

I am responding to your January 19,1999 inquiry about considering epoxy coated concrete as a non-porous surface. In your letter you provided test results on the resistance of an epoxy coating to degradation by chlorinated solvents. My staff has reviewed your letter and the test results and our response follows.

The reference to high density plastics in the definition of non-porous surfaces was intended to cover rigid plastic items. It was not intended to include epoxy coated concrete that may be located in heavily trafficked areas such as floors and walls. EPA cannot make a general statement or amend the regulations to include epoxy coated concrete in the definition of non-porous surfaces based only on the data you submitted.

As interpretive policy, EPA provides the following test to evaluate whether PCBs spilled onto an epoxy coated surface penetrated through to the underlying surface. You may conduct this test as research and development for PCB Disposal, following the requirements of §761.60(j). Prior to conducting disposal or decontamination of a contaminated surface based on the test you must obtain a risk-based approval under either §761.61(c) or §761.79(h). These risk-based approvals are granted through your Regional Administrator and are done on a case-by-case basis.

Determining Whether a Painted* Surface Meets the Definition of Non-Porous Surface in 40 CFR 761.3: Demonstrating a "Validated Non-Porous Surface"

1. Collect a representative sample of the dried applied epoxy coating (or other surface coating) prior to applying PCBs to the surface. Collect samples from the entire depth of the epoxy coating. Measure the "bulk" (as opposed to surface) PCB concentration in the sample in accordance with the chemical extraction and analysis procedures in 40 CFR 761.358.

2. Contaminate the remaining dried epoxy coated surfaces with a known concentration of liquid PCBs and allow it to remain on the surface for a designated amount of time prior to removal.

§761.123. Dispose of the cleanup wastes in accordance with §761.79(g).

4. Collect a representative sample of the cleaned epoxy coating (or other surface coating). Collect samples from the entire depth of the epoxy coating. Measure the "bulk" (as opposed to surface) PCB concentration in the sample in accordance with the chemical extraction and analysis procedures in 40 CFR 761.358. If the bulk concentration is less than or equal to the concentration in step 1, the surface is non-porous to PCBs.

5. The test conditions used above in step 2 provide the maximum PCB concentration and clean up response time. If either or both of these conditions are exceeded then the epoxy coating must be considered compromised and can no longer be considered non-porous.

*There is no use authorization for paint or any other coating containing PCBs at concentrations greater than 50 ppm.

If you have any questions please refer them to Laura Casey at (202)260-1346 or Sara McGurk at (202)260-1107.

Sincerely,

Tony Baney, Chief
Fibers and Organics Branch

cc: Kim Tisa, EPA Region 1
Dave Greenlaw, EPA Region 2
Ed Cohen, EPA Region 3
Stuart Perry, EPA Region 4
Tony Martig, EPA Region 5
Lou Roberts, EPA Region 6
Dave Phillippi, EPA Region 7
Dan Bench, EPA Region 8
Max Weintraub, Region 9
Dan Duncan, Region 10

The Dow Chemical Company
2301 N. Brazosport Blvd.
Freeport, Texas 77541-3257

January 19, 1999

CERTIFIED MAIL Z 440 879 709

Dr. John H. Smith (7404)
Fibers and Organics Branch
National Program Chemicals Division
Office of Pollution Prevention and Toxics
U.S. EPA Headquarters
401 M St. S.W.
Washington, D.C. 20460

SUBMISSION OF TESTING DATA TO SUPPORT THE LISTING OF EPOXY COATINGS AS "NON-POROUS SURFACES"

In the PCB Amendments effective August 28, 1998, the definition of "Non-porous surface" was added. This definition includes examples of non-porous surfaces, "smooth uncorroded metal, natural gas pipe with a thin porous coating.....**and high density plastics, such as polycarbonates and melamines, that do not absorb organic solvents**".

An epoxy coating is not listed specifically as a type of high density plastic that does not absorb organic solvents. However, since epoxy coatings **are** high density plastics and manufacturer's provide data to show it does not absorb organic solvents, The Dow Chemical Company requests the EPA to include epoxy coatings over concrete as a "non-porous surface". A technical bulletin and test data from Sentry Polymers, Inc. for Semstone 245 is included for your review.

If you have any questions about this request contact me at 409-238-5036. Please send the results of your review and your decision to my attention.

Sincerely,

Donna Hicks

Donna Hicks, Technical Specialist
EH&S Regulatory Management Expertise Center - TSCA

Attachments

PCB epoxy coating -EPA ltr.doc
ddh

TECHNICAL BULLETIN
January 1997

SEMSTONE® 245

Solvent Resistant Novolac Concrete Protection System

DESCRIPTION AND USES

SEMSTONE 245 is a high performance specialty coating for concrete. Its unique formulation makes it suitable for service in chlorinated solvents, such as:

- Methylene chloride
- Ethylene dichloride
- Trichloroethylene

In addition, SEMSTONE 245 offers excellent resistance to a very broad range of other hazardous and corrosive chemicals including benzene, phenol, ketones, alcohols. This makes it the preferred choice for protecting hazardous waste handling facilities and other areas that will regularly see exposure to a wide variety of difficult chemicals.

Other features include:

- Very rapid cure, providing quick turnaround of projects.
- Can be applied at temperatures as low as 35°F.

PACKAGING/COVERAGE

SEMSTONE 245 is available in 1-gallon, 3-gallon and 25-gallon units. Each unit consists of premeasured Part A and Part B components. A bagged Part C thixotropic agent is added for work on vertical surfaces.

* Application thickness may vary depending on expected service conditions (i.e., chemical exposure, temperature, traffic load and other mechanical abuse, immersion service vs. splash-spill, etc.). Consult Sentry Polymers for specific thickness recommendations. In addition, coverage rates will be effected by the condition of surface being coated (degraded vs. smooth, steel vs. concrete, etc.). To figure THEORETICAL coverage per gallon, divide desired mil thickness into 1,604. (For example, theoretical coverage for a 60-mil thickness is: 1,604 divided by 60 = 26.73 square feet per gallon.)

DOES THIS effect the POROSITY?

For practical coverage, make necessary allowances for condition of the substrate, working conditions, waste, spillage, etc.

SENTRY POLYMERS, INC.
P.O. BOX 2076
5500 E. HWY 332
FREEPORT, TEXAS 77542
409-233-0312
800-231-2544

TYPICAL PROPERTIES - WET

Solids by Volume: 100%
Weight per Mixed Gallon: 10.6 lbs
Pot Life @ 75°F: 15 min

Cure Time (approximate):	Temperature	Firm	Chemical Service**
	35°F	24 hrs	7 days
	55°F	8 hrs	48 hrs
	80°F	4 hrs	24 hrs

**For immersion service in chlorinated solvents, the coating must be post cured at 150°F for 12 hours

TYPICAL PROPERTIES - CURED

Color: Buff
Hardness - ASTM D-2240 Shore D: Neat: 80
Compressive Strength - ASTM C-579: Aggregate Filled: 18,000 psi
Tensile Strength - ASTM D-638: Reinforced: 8,000 psi
Flexural Strength: Neat: 11,000 psi
ASTM D-790: Reinforced: 14,000 psi
(ASTM C-580) Aggregate Filled: 6,000 psi
Flexural Modulus of Elasticity: Neat: 8.1 psi x 10^5
ASTM D-790: Reinforced: 9.4 psi x 10^5
(ASTM C-580): Aggregate Filled: 14.9 psi x 10^5
Bond Strength - ASTM D-4541: Concrete: Failure in Concrete
Steel: 1,700 psi
Water Vapor Transmission - ASTM E-96: WVT: 0.0120 grain per hr ft²
Permeability: 0.0042 perm. -in.

STORAGE AND SHELF LIFE

Keep SEMSTONE 245 components tightly sealed in their original containers until ready for use. Store unopened at 50-to-90°F, out of direct sunlight. At least 24 hours immediately prior to use, store all components (A, B, C, and aggregate) at 80-to-90°F, to facilitate handling.

Properly stored, SEMSTONE 245 has a minimum shelf life of one year. Refer to batch number on label for date of manufacture.

APPLICATION GUIDELINES

IMPORTANT NOTES

1. Work on vertical surfaces requires the addition of Part C thixotrope.

2. For manual applications, use only 1-gallon and 3-gallon units. The mixed material has a very short pot life, so plan your work accordingly.

TEMPERATURE CONSIDERATIONS

1. Throughout the application process, the temperature of the surface to be coated should be 35-to-95°F.

2. Below 55°F, the components will thicken noticeably, making manual applications difficult.

3. When coating steel, halt application if the temperature falls within 5°F of the dew point. (This is not necessary when coating concrete.)

4. Bubbles may appear in the SEMSTONE 245 coating if it is applied over concrete in direct sunlight, or when temperatures are rising. This is due to the expansion of air and/or moisture trapped in the concrete. It is especially true of air entrained concrete.

- For best results, shade the work area and apply SEMSTONE 245 when temperatures are falling.

5. Store all materials (components A, B, C and aggregate) at 65-to-75°F for at least 24 hours before use, to facilitate handling.

SURFACE PREPARATION - GENERAL

1. Surfaces must be free of dirt, dust, oil, grease, chemicals and other contaminants immediately prior to applying each coat of SEMSTONE 245.

2. For the initial coat, concrete surfaces can be damp. However, for recoats, all surfaces must be dry.

SURFACE PREPARATION OF CONCRETE

1. Immediately prior to application of coating, concrete substrate must be:
   - Adequately cured (generally, at least 28 days; check with Sentry Polymers if concrete has cured less than 28 days).
   - Structurally sound.
   - Free of all dirt, dust, debris, oil, grease, fats, chemical contamination, salts, solvents, surface hardeners, incompatible curing compounds and form release agents, laitance and efflorescence.
   - Concrete surfaces must be dry.

   and must have:
   - Tensile strength of at least 300 psi.
   - pH in the range of 7-to-11.
   - All fins, projections and splatter removed.
   - All defects repaired using patching as described herein.
   - Failed or otherwise incompatible old coatings removed.

- A surface texture similar to medium sandpaper (40-to-60 grit).

Refer to Sentry Polymers' separate document "Surface Preparation - Concrete" for further instruction in the preparation of concrete surfaces.

2. Locate all expansion joints, control joints, floor drains, equipment base plates, and mid-floor termination points. Handle them as per Sentry Polymers separate document "Construction Details."

3. Degraded concrete on horizontal surfaces should be restored using SEMCRETE 610 Concrete Repair Mortar.

4. Honeycombs or any form voids in vertical surfaces must be filled. Use a mortar made with SEMCRETE 610 Concrete Repair Mortar.

5. Priming may be required in situations where outgassing could be a problem. Consult Sentry Polymers for primer recommendations.

SURFACE PREPARATION OF STEEL (Non-Immersion Service Only)

1. Abrasive blast steel surfaces to a near white metal finish with 1-to-2 mil anchor profile. (Ref. SSPC-SP-10)

2. All outside corners must be ground smooth and rounded.

3. Round all inside corners to a minimum 1/2" radius using a putty made of SEMSTONE 110 Damp Proof Primer with Part C thixotrope added. (See guidelines in separate technical bulletin for SEMSTONE 110 Damp Proof Primer)

MASKING

Mask surfaces that are not to be coated. This material is difficult to remove, once applied.

PRIMING

1. Concrete

   a. Concrete surfaces should be primed using SEMSTONE 110 Damp Proof Epoxy Primer.

      - Mix and apply SEMSTONE 110 Damp Proof Epoxy Primer in accordance with instructions found in the SEMSTONE 110 Damp Proof Epoxy Primer Technical Bulletin.

   b. Wait for the primer to cure before topping with SEMSTONE 245.

   c. Take precautions to prevent the primed surface from becoming contaminated.

   d. Should the primed surface become contaminated, you will need to wash the surface with soap and water, rinse it and dry it before proceeding.

   e. If primer cures beyond the allowable recoat window, consult SEMSTONE 110 Damp Proof Epoxy Primer Technical Bulletin for proper instructions.

2. Steel - priming not required.

APPLICATION EQUIPMENT

SEMSTONE 245 may be applied using a spray rig, notched trowel, brush or roller.

1. Spraying Material Without Aggregate

   - DO NOT use a single component airless rig.
   - Use a plural component airless rig. See Equipment Specification - 397-250, Graco

2. Spraying Aggregate Filled Material

   - DO NOT use a plural component or a single component airless rig with aggregate filled material.

     a. Use a peristaltic spray rig, such as the Carrousel Pump by Quik Spray, Port Clinton, Ohio.

        - Set up the peristaltic rig with a 1" ID, 15' long material line and a 3' pole spray gun.

   - Pre-wet the hoses by pumping a small amount of mixed SEMSTONE 245 without aggregate through the lines and pole gun; about 1/2-gallon should be sufficient.

3. Always use spray equipment in accordance with manufacturer's instructions.

4. Care of Spray Rig Hoses

   - Take care to prevent the mixed material from setting up in your hoses. For best results, keep your hoses as short as possible, purge them immediately if work is interrupted, keep them out of direct sunlight and insulated from hot surfaces.

5. For manual applications:

   a. Floors - preferred method is to spread with serrated squeegee, then backroll. As a second choice, trowel or brush could be used.

   b. Walls - use roller or brush.

MIXING AND APPLICATION

Important Note: This material has a very short pot life at temperatures above 72°F. Keep Part A, B, and aggregate components in a climate controlled storage (65-to-72°F) 24-hours before use. Mix only that amount of material which can be used in 20-to-30 minutes.

1. The components must be individually agitated immediately prior to use:

   Part A - Blend each Part A component to a uniform consistency in its individual container, using a Jiffy type mixer.

   Part B - Stir each Part B component to a uniform color in its individual container.

2. For work on vertical surfaces, add Part C.

   - Part C comes in premeasured bags.
   - For a 1-gallon unit, add a .6 lb premeasured bag of Part C. For a 3-gallon unit, add a 1 lb premeasured bag of Part C.
   - For 25-gallon units, add one premeasured bag to each bucket of Part A and each bucket of Part B. (NOTE - There are 4 buckets of Part A and one bucket of Part B in a 25-gallon unit.)

     a. Using a Jiffy type mixer, blend the Part C in until it is evenly dispersed, (about 1-to-2 minutes).

Note: Adding Part C darkens the color of SEMSTONE 245 somewhat.

   - The above levels of Part C will enable the product to be applied at up to 30-mils on a vertical surface. If greater mil build is desired or if a putty consistence is desired, you can add more Part C as required for your particular project.

3. Skip this step if you are spraying with plural component spray equipment.

   - If mixing for application by hand:

     a. Pour Part A into a clean mixing container of adequate capacity.

     b. Add Part B.

     c. Mix thoroughly for two minutes using a Jiffy type mixer.

     > The pot life of the mixed material will be about 15 minutes at 80°F. Use immediately. For work on floors, etc., we suggest that you immediately dump the mixed material onto the surface and spread it.

Note: The premeasured quantities of each component have been carefully set. Any variation in these premeasured ratios will adversely effect performance. Mix only complete units. If any of the components are spilled, discard the batch.

4. Material should be applied in even coats.

   - If spraying, use multidirectional passes to insure positive coverage and a proper film build.
   - If you notice a marbling or streaking effect while spraying, stop immediately. The spray equipment is not mixing the material properly or the mix ratios are incorrect. Check your equipment.
   - This marbled or streaked material will not cure properly and must be removed. Scrape the material off and then solvent wash the area with MEK or toluene. Alternately, abrasive blasting may be used to remove the material. In either case the end result is to have a non-sticky surface to recoat.

5. Adding aggregate:

   a. Horizontal surfaces

      - To obtain a thicker coating and/or a nonskid finish, aggregate may be broadcast into the coating before it begins to set.
      - Since SEMSTONE 245 sets quickly, you must plan the work carefully. One worker should apply the coating, and another should follow immediately, broadcasting the aggregate. However, keep the work separated. Do not allow aggregate to be broadcast ahead of the applicator.

      1. Broadcast aggregate until a dry layer is achieved.

      2. Allow the coating to cure.

      3. Remove the excess aggregate.

- Use only clean, dry, bagged and well graded 20/40 mesh silica or quartz sand containing not less than 97.5% silicon dioxide. Aggregate may be either round or angular.
- When broadcasting aggregate in a large or congested area, it may be desirable for workers to wear golf shoes to enable them to walk out onto the coating without disturbing it.
- An optional topcoat of SEMSTONE 245 must be applied to protect the aggregate and obtain a more cleanable surface. The topcoat should be of neat material applied at a coverage rate of 150-to-160 sq. ft. per gallon. The surface must be kept dry and free of contaminates prior to applying this topcoat.

b. Spraying material blended with aggregate.

1. Pour half the mixed SEMSTONE 245 into a clean 5-gallon bucket.

2. Slowly add sand to each bucket while blending with a Jiffy type mixer. Do both buckets immediately.

3. You may add up to 3-parts, by weight, of sand to 1-part, by weight, of SEMSTONE 245.

> At a 3-to-1 ratio you will get a mixture of grout-like consistency.

> At a 2-to-1 ratio you will obtain a still fluid mixture and extend coverage by 100%. (optimal for spray applications)

6. Prepare surfaces for intercoat adhesion as follows:

a. Allow SEMSTONE 245 to cure.

b. If the surface has cured firm to the touch, but less than 24 hours, it must be washed with soap and water, rinsed and dried before recoating.

c. Surfaces cured beyond 24 hours must be washed with soap and water, rinsed, dried and lightly sanded or abrasive blasted.

d. Important: While SEMSTONE 245 can be applied over damp concrete, for recoating, the surface must be dry.

7. Post-curing for immersion service in chlorinated solvents:

- The coating must be postcured if it will be used for continuous immersion service in chlorinated solvents.
- Tarp the coated area and heat it at 150°F for at least 12 hours.

8. Spark Testing Steel

- Spark testing is recommended for coated steel in immersion service. Test at 110 volts per mil.

9. If work is interrupted, and at the end of the day, terminate the coating in a straight line.

CLEANUP

Clean all tools and equipment with xylene, MEK or toluene.

SAFETY PRECAUTIONS

FOR INDUSTRIAL USE ONLY.

Both the mixed product and its separate A and B components can be extremely irritating to skin, eyes and the respiratory system.

Avoid contact with eyes and skin; do not ingest or inhale.

When spraying in a confined area, wear a fresh air hood and make provision for forced ventilation.

At all other times, wear a NIOSH approved respirator suitable for organic vapors when working with this product or its components.

When working with SEMSTONE 245, always wear chemical goggles, rubber gloves, and appropriate work clothing.

Prolonged or repeated exposure to the unreacted Part A and Part B components of SEMSTONE 245 may cause skin irritation or allergic reactions.

Refer to material safety data sheets regarding individual components.

Sentry POLYMERS, INC.

SEMSTONE 245

ASTM E-96, Procedure E

Conditions: 100 deg. F, desiccant, 90% relative humidity

Permeance result: 0.0457 grains/(hr. X ft^2 X in. Hg)

Vapor pressure at 100 deg. F, 90% RH = 0.9 X 1.932 in. Hg

Water vapor transmission:

$$0.120 \frac{\text{grains}}{(ft^2)(\text{hr})(\text{in. Hg})} \times (0.9 \times 1.932 \text{ in Hg}) = .0209 \frac{\text{grains}}{(ft^2)(\text{hr})}$$

Hydraulic conductivity:

$$.0209 \frac{\text{grains}}{(ft^2)(\text{hr})} \times 0.0648 \frac{\text{grams}}{\text{grain}} \times \frac{cm^3}{\text{gram}} \times \frac{ft^2}{30.48^2 cm^2} \times \frac{\text{hr}}{3600 \text{ sec}}$$

$$= 4.0 \times 10^{-10} \frac{cm}{\text{sec}}$$

P.O. BOX 2076-A / FREEPORT, TEXAS 77541 / (409) 233-0312

Sentry POLYMERS

RESISTANCE OF SEMSTONE™ 245 (formerly SPX-2011) TO ETHYLENE DICHLORIDE

OBJECTIVE: To determine the resistance of SEMSTONE™ 245 to ethylene dichloride (EDC) through long term immersion testing.

METHOD: Test coupons of SEMSTONE™ 245 were manufactured in accordance with published literature. Both sides and all edges were exposed to EDC under total immersion conditions. Weight changes and appearance changes were noted.

DATA:

DATE	SAMPLE WEIGHT	APPEARANCE CHANGE
9-12-88 (Start)	16.28 gr.	---
9-13-88	16.32 gr.	None
9-15-88	16.39 gr.	None
9-19-89	16.39 gr.	None
10-14-88	16.40 gr.	None
12-02-88	16.41 gr.	None
1-12-89	16.44 gr.	None
6-07-89	16.46 gr.	None
10-02-89	16.46 gr.	None

RESULTS: The sample initially gained a small amount of weight and ultimately the weight leveled out. There was no physical appearance change at all. Based on the severity of the test and the accumulative data, SEMSTONE™ 245 should perform well in EDC service.

Ray Stavinoha
Technical Director

P.O. BOX 2076-A / FREEPORT, TEXAS 77541 / (409) 233-0312

Sentry POLYMERS, INC.

Resistance of SEMSTONE™ 245 to Methylene Chloride

BACKGROUND

Extensive immersion testing has been carried out with SEMSTONE™ 245 in chlorinated solvents and over a year of history in chlorinated solvent service has been concluded. It has proven to be far superior to any other product on the market. This test program was carried out to more simulate field exposure conditions so that more of the parameters of its usage would be understood. Methylene chloride was used as the test media because of its aggressiveness and wide use in the market.

TEST METHOD

The following SEMSTONE™ 245 systems were applied to sandblasted concrete blocks.

I. 30 mils SEMSTONE™ 245, 20/40 silica broadcast,
10 mils SEMSTONE™ 245 top coat.

II. 60 mils SEMSTONE™ 245, 20/40 mesh silica broadcast,
15 mils SEMSTONE™ 245 top coat.

III. 30 mils SEMSTONE™ 245 - no aggregate.

Two plastic containers were placed on each block and sealed with a SEMSTONE™ 245 putty. Each block was cured overnight at 75°F and then cut in half with each half possessing one of the plastic containers. One half was cured at 75°F for a total of 3 days and the other half was cured at 140°F for 8 hours after the initial cure at 75°F overnight. Methylene chloride was placed into the containers and a lid placed on them. Outside of the containers on the remainder of the samples, splash and spill and intermittent exposure testing was conducted.

TEST DATA

Intermittent Exposure: In the splash and spill, dripping, and intermittent exposure testing, all of the samples, both room temperature cured and post-cured, showed no signs of attack. This test was concluded after one month.

Continuous Immersion Testing:

System I Room temp. cure - failed in 3 days.
Post-cured - top coat lifted in 2 weeks, but the remainder of lining stayed firm until the test was concluded in 2 months.

P.O. BOX 2076-A / FREEPORT, TEXAS 77541 / (409) 233-0312

System II Same results as System I.

System III Room temp. cure - failed in one week.
Post-cured - look good after 2 months.

CONCLUSIONS

This test program correlates with what we have experienced before. In splash and spill conditions, SEMSTONE™ 245 holds up well to methylene chloride if it has achieved a reasonable room temperature cure.

For constant immersion service such as in a sump, our published literature calls for a 12 hour post-cure at 150°F. This appears to be more than sufficient.

There is an interesting phenomenon present in dealing with methylene chloride. It is recognized that its method of attack is through migrating into the coating and then causing it to swell, crack, flake and peel. Studies have shown that even SEMSTONE™ 245 post-cured will absorb a small amount of methylene chloride. The addition of aggregate to the system reduces its amount of organics that will absorb the solvent and this is evident in weight gain studies. This is only true for polymers that are resistent to methylene chloride. Those that are not will loose integrity quickly with or without aggregate.

In constant immersion service, our earlier studies have shown that the best system is SEMSTONE™ 245 pre-blended with the aggregate, with Part "C" for verticals, and then applied to the substrate. The thin top coats lifted in the broadcast method in continuous immersion, probably because there was only a very thin layer of coating over the exposed aggregate from the broadcast. The failure begins in a localized area right around each aggregate peak. It appears that the methylene chloride migrates through the thin top coat until it reaches the more impervious aggregate/coating layer, thus causing the top coat to peel.

We have been able to draw the following conclusions over the last two years of testing:

(1) In intermittent service, all the constructions work well with or without the post-cure. The construction is dependent upon other characteristics of the project.

(2) For short term constant exposure conditions when thinner coatings are used (30-35 mils), the non-aggregate system is the best.

(3) For long term continuous exposure, blending the aggregate with the coating, and Part "C" if necessary, produces the best results.

The one problem area that is not totally defined at this point is the following condition. The product is applied at lower temperatures (<60°F) and although constant immersion is not expected, puddling of methylene chloride can take place on the coating for periods of time. Damage can be done to the coating before it reaches a sufficient cure. Under these conditions, clean up is necessary relatively soon after exposure until a sufficient cure is achieved. At 60°F, a couple of months may be necessary.

In constant immersion conditions, 150°F post-cure may be difficult to achieve. There is a time/temperature relationship and at 95°F it appears that a 14 day cure for constant immersion service is necessary.

Because of the small absorption factor, we do not recommend SEMSTONE™ 245 for steel tank lining for constant immersion service.

To put the performance of SEMSTONE™ 245 in the proper perapective compared to other systems, conventional epoxies and vinyl esters generally fail in a matter of hours if not post-cured and last about a day when they are post-cured.

Ray Stavinoha
Technical Director

Sentry POLYMERS

Methylene Chloride Resistance of SEMSTONE™ 245

Laboratory Report
June 26, 1989

Objective: Conventional chemical resistant lining systems have poor resistance to methylene chloride. Methylene chloride migrates into the cured matrix causing it to swell and crack. SEMSTONE™ 245 possesses new chemistry and is formulated in such a manner to resist methylene chloride migration. Its degree of resistance was determined in this test.

Test Method: Cured samples of SEMSTONE™ 245 were manufactured such that approximately 30 sq. in. of surface area was exposed to the two sided testing. The test samples were cured per the Sentry Polymers technical data sheet on SEMSTONE™ 245. The samples were totally immersed in methylene chloride at ambient temperature. Weight change and appearance change were noted at various intervals.

Test Data:

Date	Sample Weight	Appearance Change
7-12-88(start)	76.39 gr.(original)	----
7-16-88	76.56 gr.	None
8-01-88	76.86 gr.	None
1-12-89	77.12 gr.	None
7-16-89	7714 gr. ~~77.14~~	None

Observations & Conclusions: The sample slowly gained weight the first 5 to 6 months. The weight gain then leveled out to a total weight gain of approximately 1%. There was no sign of swelling or cracking even though the sample was exposed on both sides. Long-term service life can be expected from SEMSTONE™ 245 in methylene chloride service.

< 1.0%

Ray Stavinoha
Technical Director

P.O.BOX 2076-A / FREEPORT, TEXAS 77541 / (409) 233-0312