
THOMPSON ENGINEERING TESTING, INC.

GEOTECHNICAL, MATERIALS AND ENVIRONMENTAL
ENGINEERS • LABORATORIES





THOMPSON ENGINEERING TESTING, INC.

Geotechnical, Materials and Environmental Engineers • Laboratories
Main Office and Laboratories 3707 Cottage Hill Road • 205/666-2443 P.O. Drawer 9637 Mobile, Alabama 36681
Nondestructive Testing and Examination 4234 Halls Mill Road • 205/666-1433



March 12, 1985

The Horton Company
P.O. Box 57
Gulf Breeze, Florida 32561
Re: Laboratory Testing of Hortoncrete
TET Job No. C85046

Dear Mr. Horton:

Thompson Engineering Testing, Inc. has concluded the compressive strength, flexural strength, tensile strength, shrinkage and absorption tests on the Hortoncrete product as requested by client.

1. A representative from the Horton Company batched and mixed the Hortoncrete to the product specifications by hand in a five gallon container. All batching and mixing was conducted at the Thompson Engineering Testing laboratory in the presence of laboratory personnel.
2. All specimens were molded within general accordance to ASTM requirements by Thompson Engineering Testing, Inc. personnel.
3. Enclosed are the test results and photographs are attached.

Thompson Engineering Testing, Inc. appreciates the opportunity to provide our engineering testing services to The Horton Company on this project.

If you have any questions regarding this report, please advise.

Very truly yours,

THOMPSON ENGINEERING TESTING, INC.

Charles G. Canning, Jr.
Materials Engineer
Construction-Materials Department

TABLE NO. 1
COMPRESSIVE STRENGTH RESULTS
HORTONCRETE
TET JOB NO. C85046

TEST DATA

All compressive strength tests were conducted in general accordance to ASTM C-39.

<u>Specimen I.D.</u>	<u>Specimen Size (In.)</u>	<u>Age (Hrs.)</u>	<u>Curing</u>	<u>Compressive Strength (PSI)</u>
*Core #1 Removed from Beam #1	4.15 x 6.52	4.0	Air Cured 73°F	4890
Cylinder #1	3 x 6	14.5	Air	7780
Cylinder #2	3 x 6	14.5	Cured 73°F	<u>8420</u>
Average				8100
Cylinder #3	3 x 6	16.0	Air	6790
Cylinder #4	3 x 6	16.0	Cured 73°F	<u>7000</u>
Average				6900
Cylinder #5	3 x 6	16.0	Air	7210
Cylinder #6	3 x 6	16.0	Cured	<u>7000</u>
Average				7110

*NOTE: After testing, this core was set aside in laboratory conditions. Fifteen hours later, the core was retested in compression with the test result being 5650 PSI.

Each group of two specimens were molded from separate batches.

TABLE NO. 2
FLEXURAL STRENGTH RESULTS
HORTONCRETE
TET JOB NO. C85046

TEST DATA

All flexural strength tests were conducted in general accordance to ASTM C-78.

<u>Specimen I.D.</u>	<u>Specimen Size LXWXH (In.)</u>	<u>Age (Hrs.)</u>	<u>Curing</u>	<u>Flexural Strength (PSI)</u>
Beam No. 1	21.0 x 6.02 x 5.94	3.5	Air Cure 73°F	1565
*Beam No. 2	21.0 x 6.11 x 5.86	5.0	Air Cure 73°F	1740
*Beam No. 3	21.0 x 6.00 x 5.94	20.0	6.0 Hours Air Cure 73°F 14.0 Hours Oven Cure 130°F	1490
Beam No. 4	21.0 x 5.58 x 5.94	8.0	Air Cure 73°F?	1830
Beam No. 5	21.0 x 6.10 x 6.02	8.0	Air Cure 73DF	1740

*NOTE: Beam molds were lined with plastic, to keep the Hortoncrete from bonding to the molds. The failure occurred in a deep crease in the beam which was caused by the plastic.

TABLE NO. 3
SPLIT TENSILE STRENGTH OF
CYLINDRICAL SPECIMENTS
TET JOB NO. C85046

TEST DATA

All splitting tensile strength tests were conducted in general accordance to ASTM D-496.

<u>Specimen I.D.</u>	<u>Specimen Size (In.)</u>	<u>Age (Hrs.)</u>	<u>Curing</u>	<u>Splitting Tensile Strength (PSI)</u>
*1	6X12	12.0	Air Cured 73°F	900
2	6X12	12.3	Air Cured 73°F	700
3	6X12	12.5	Air Cured 73°F	730

*NOTE: Each specimen was made from three separate batches.

ALSO NOTE: Specimen One was molded from the same batch that cylinders one and two (from the compressive strength test) were molded.
Specimen Two was molded from the same batch that cylinders three and four (from the compressive strength test) were molded.
Specimen Three was molded from the same batch that cylinders five and six (from the compressive strength test) were molded.

TABLE NO. 4
ABSORPTION AND SHRINKAGE
HORTONCRETE
TET JOB NO. C85046

TEST DATA

Absorption

An absorption test was conducted on a cooled 3 x 6 inch cylinder specimen. After weighing, the specimen was immersed in potable water for a period of 24.0 hours. At the end of this period, free water was removed from the specimen and the specimen was reweighed. The result was that less than 0.01 percent water/moisture was absorbed.

Shrinkage

Based on 24.0 hours only, the Hortoncrete showed no indications of shrinkage. However, some expansion (0.3 percent) was noted.



P.O. Box 13525 • Pensacola, Florida 32591 • (850) 4384111 • FAX: (850) 4384226

To ALL AGENTS

From Lowell Horton

Date March 5, 1987

Subject ASTM Abrasion Resistance and
Freeze/Thaw Test Reports-
HORTONCRETE

Copies

For your information, I am enclosing herein copies of the above subject ASTM test reports. THEY ARE IMPORTANT TO YOU IN YOUR HORTONCRETE SALES EFFORT.

The abrasion resistance report simply indicates (on page 2) that HORTONCRETE, just 2 days old, is already 97.4% more resistant to traffic wear than 60-day-old, 4,000 psi concrete the same concrete you find on interstate highways.

The freeze/thaw test report tells us that, after 300 freeze/thaw cycles, HORTONCRETE shows no physical change or loss of strength.

Both these reports will carry great import with your design engineers and maintenance customers.

Please call at anytime should you have questions or need sales assistance.

Best regards,

A handwritten signature in black ink, appearing to read "LH", written over the typed name "LCH/sl".

LCH/sl

Enclosures



LAW ENGINEERING TESTING COMPANY
geotechnical, environmental & construction materials consultants
396 PLASTERS AVENUE, N.E.
P.O. BOX 13260 • ATLANTA, GEORGIA 30324
(404) 873-4761

November 18, 1986

Tnemec Company, Inc.
Horton Division
P.O. Box 57
Gulf Breeze, Florida 32561

Attention: Mr. Lowell Horton

Subject: Abrasion Testing of HORTONCRETE POLYMER CONCRETE
ASTM C944
LETCo Job Number AM10700

Gentlemen:

As per your request in your letter dated October 20, 1986, Law Engineering Testing Company has completed the above referenced testing. This project consisted of testing HORTONCRETE POLYMER CONCRETE and a 4000 psi Portland cement concrete for abrasion resistance in general accordance with ASTM C944. We have also included a range of results from similar testing performed on concrete treated with cemetitious floor hardeners. The testing procedures used for all tests were three .2 minute cycles on separate samples using a double load of 20 kilograms. The following are our results.

SAMPLES

1. HORTONCRETE

Three 9 inch x 6 inch x 2 inch blocks, cured for 48 hours.

2. Portland Cement Concrete

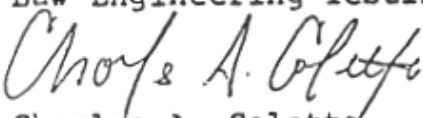
Three 6 inch by 6 inch. by 2 inch blocks of 5.5 bag non-air entrained Portland cement concrete, cured for approximately 2 months. Compressive strength approximately 4000 psi.

RESULTS

<u>Sample I.D.</u>	<u>Initial Weight</u>	<u>Final Weight</u>	<u>Weight Loss</u>
Hortoncrete			
-1	3671.3 grams	3671.2 grams	0.1 grams
-2	3717.7	3717.6	0.1 grams
-3	3609.7	3608.9	0.8
Average			0.3 grams
P.C. Concrete			
-1	2796.4 grams	278302 grams	11.2 grams
-2	2810.6	2789.7	11.9
-3	2815.9	2806.5	9.4
Average			11.5 grams

The results presented above indicate that after only 48 hours of cure, the HORTONCRETE abraded only 2.6% as much material as did 4,000 psi portland cement concrete that had been cured for over 60 days. Similar testing performed previously on portland cement concrete treated with cementitious floor hardeners .resulted in weight loses ranging from 1.5 grams to 3.2 grains. The HORTONCRETE abraded only 10% to 20% as much material as did the floor hardened concrete.

Thank you for letting us be of service to you on this project. If you should have any questions, please feel free to call us at (404) 873-4761.

Sincerely,
Law Engineering Testing Company

Charles A. Coletta
Materials Engineer





LAW ENGINEERING TESTING COMPANY
geotechnical, environmental & construction materials consultants
396 PLASTERS AVENUE, N.E.
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(404) 873-4761

February 17, 1987

Tnemec Company, Inc.
Horton Division
P.O. Box 57
Gulf Breeze, Florida 32561

Attention: Mr. Lowell Horton

Subject: Freeze / Thaw Testing of HORTONCRETE POLYMER CONCRETE
ASTM C944
LETCo Job Number AM10700

Gentlemen:

As per your request in your letter dated October 20, 1986, Law Engineering Testing Company has completed the above referenced testing. This project consisted of testing HORTONCRETE POLYMER CONCRETE for freeze/thaw resistance in general accordance with ASTM C666. The testing procedures used for all tests consisted of 300 fully immersed F/T cycles of 0° F to 40° F. Weight loss was measured before and after cycling. The following are our results.

SAMPLES

1. HORTONCRETE

Three 3 inch x 3 inch x 10 inch blocks, cured for 48 hours.

RESULTS

<u>Sample I.D.</u>	<u>Initial Weight</u>	<u>Final Weight</u>	<u>Weight Loss</u>	<u>% Change</u>
HORTONCRETE				
-1	3046 grams	3046 grams	0 grams	0%
-2	3053	3053	0	0%
-3	3035	3035	0	0%
Average			0 grams	

The results presented above indicate that after 300 F/T cycles, the HORTONCRETE had not visibly changed. There was no apparent physical degradation to any of the HORTONCRETE samples. Dynamic modulus measurements taken before and after the temperature cycling indicate that there was no apparent loss of strength in any of the samples.

Thank you for letting us be of service to you on this project. If you should have any question, please feel free to call us at (404) 873-4761.

Sincerely,

Law Engineering Testing Company



Charles A. Coletta
Materials Engineer

CAC/sjj





LAW ENGINEERING TESTING COMPANY
geotechnical, environmental & construction materials consultants
396 PLASTERS AVENUE, N.E.
P.O. BOX 13260 • ATLANTA, GEORGIA 30324
(404) 873-4761

April 23, 1987

Tnemec Company, Inc.
Horton Division
P.O. Box 57
Gulf Breeze, Florida 32561

Attention: Mr. Lowell Horton

Subject: Heat Resistance Testing of BORTONCRETE POLYMER CONCRETE
LETCo Job Number: AM10700

Gentlemen:

As per your request, Law Engineering has completed the above referenced testing conducted on HORTONCRETE POLYMER CONCRETE. This testing program consisted of compressive strength testing on 2" by 2" by 2" cubes of Hortoncrete after being subjected to high temperatures for either 1 or 7 days. The samples were heated in an oven and then allowed to cool for 1 hour before testing. The following are our results.

SAMPLES

1. HORTONCRETE

27 - 2 inch x 2 inch x 2 inch blocks, cured for a minimum of 48 hours.

RESULTS

<u>Sample I.D.</u>	<u>Temperature</u>	<u>Exposure Time</u>	<u>Compressive Strength*</u>	<u>% of Control</u>
HORTONCRETE				
1	Room	1 Day	9140 psi	-
2	200°F	1 Day	8740 psi	96 %
3	300°F	1 Day	13110 psi	143 %
4	400~F	1 Day	11160 psi	122 %
5	500~F	1 Day	3090 psi	34 %
6	600°F	1 Day	1350 psi	15 %
7	200~F	7 Days	7290 psi	80 %
8	300~F	7 Days	7640 psi	84 %
9	4000F	7 Days	7340 psi	80 %

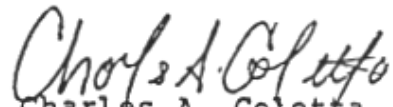
* Average of 3 Breaks

The results presented above indicate that the HORTONCRETE POLYMER CONCRETE can withstand short periods (1 day) of high heat (up to 400°F) with no strength loss, and can withstand longer periods (up to 7 days) of exposure up to 4000? with only a 20% loss in compressive strength.

Thank you for letting us be of service to you on this project. If you should have any questions please fee]. free to call us at (404) 873-4761.

Respectfully submitted,

Law Engineering



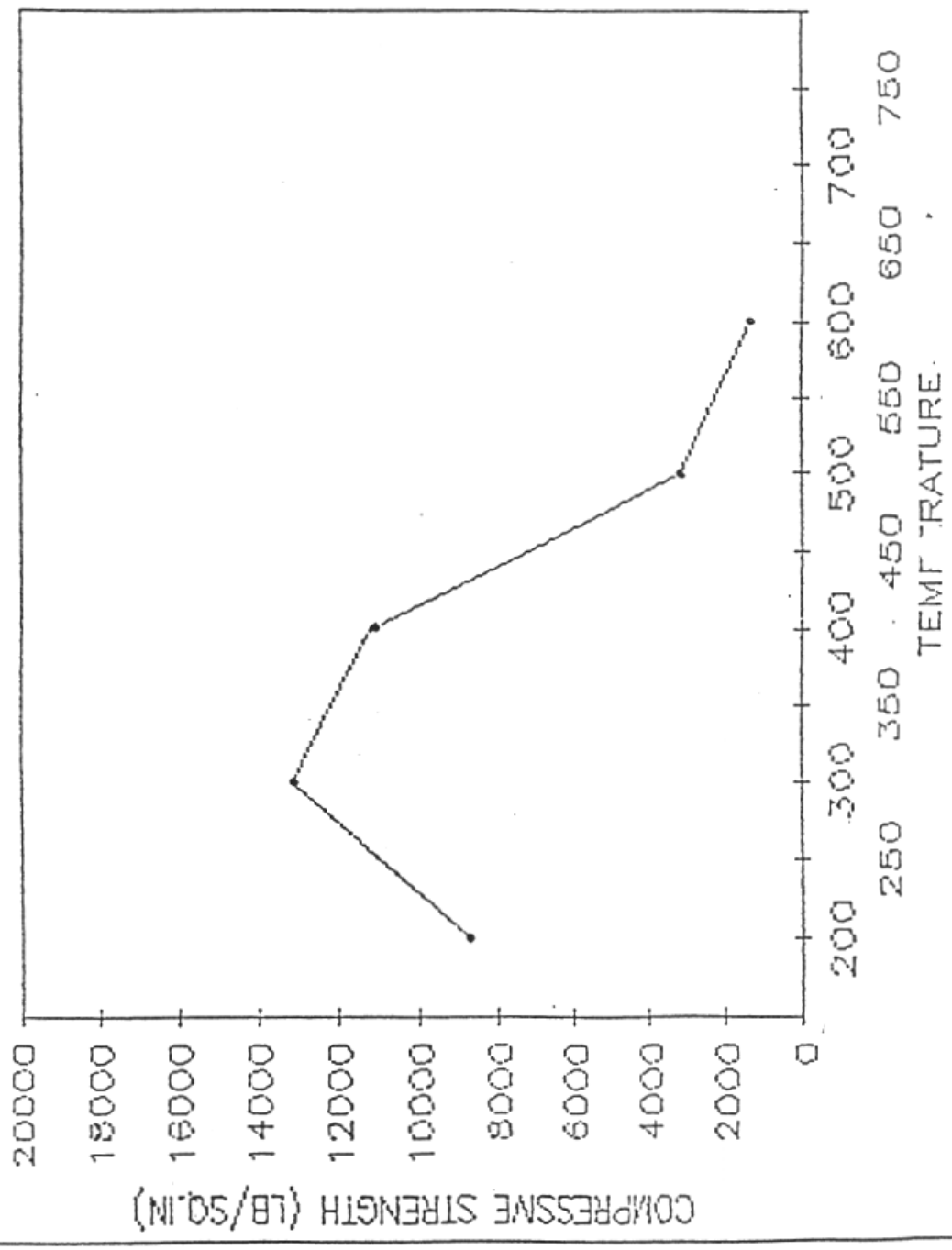
Charles A. Coletta, P.E.
Materials Engineer

CAC/sjj



PROJECT : HORTONCRETE
ONE-DAY COMPRESSIVE STRENGTH VS. TEMPERATURE

LEGEND





LAW ENGINEERING TESTING COMPANY
geotechnical, environmental & construction materials consultants
396 PLASTERS AVENUE, N.E.
P.O. BOX 13260 • ATLANTA, GEORGIA 30324
(404) 873-4761

February 25, 1988

Tnemec Company, Inc.
Horton Division
P.O. Box 57
Gulf Breeze, Florida 32561

Attention: Mr. Lowell Horton

Subject: Test Results of Polymer Concrete
Law Engineering Job No.: AM10700

Gentlemen:

Law Engineering is pleased to present this report of testing performed on polymer concrete specimens submitted to our laboratory by your firm. We were asked to determine Resistivity on two samples received by our laboratory. The results of our testing as well as our comments are presented below.

TEST RESULTS

ASTM D257

The test was run in general accordance with ASTM D257, "Resistance or Conductance of Insulated Materials."

Resistivity and Conductivity

Sample	Resistivity of Polymer Concrete	Conductivity
1	35.2 x 10 ⁶ ohm-cm	28.4 nS/cm
2	26.4 x 10 ⁶ ohm-cm	37.9 nS/cm



Comments

ACI Monograph No. 6 states that normal weight concrete has a resistivity value, which ranges from 104 ohm-cm for moist concrete to 10 ohm-cm for dry concrete. The resistivity as shown here is very dependent on the amount of water in the concrete. Other constituents could also effect the resistivity of concrete, such as the type of cement used.

Age of Test Samples

Test samples were greater than 28 days old when tested.

We appreciate the opportunity to have been of service to you on this project. Should you have any questions or comments concerning this report, do not hesitate to contact us at (404)873-4761.

Respectfully submitted,

Law Engineering

John E. Lynch

Laboratory Services Manager

JEL/sj j

396 PLASTERS AVENUE, N.E.
ATLANTA, GEORGIA 30324
404-873-4761
TELEFAX 404-881-0508



February 10, 1988

TNEMEC Company, Inc.
Horton Division
P.O. Box 57
Gulf Breeze, Florida 32561

Attention: Mr. Lowell Horton

Subject: Test Results of Polymer Concrete
Law Engineering Job No.: AM10700

Gentlemen:

Law Engineering is pleased to present this report of testing performed on polymer concrete specimens submitted to our laboratory by your firm. We were asked to determine Modulus of Elasticity (MOE) and Resistivity on two samples received by our laboratory. The results of our testing as well as our comments are presented below.

TEST RESULTS

Modulus of Elasticity

The two concrete cylinders (3" x 6") were loaded in compression. Two resistance type strain gages were used to measure the strain produced as the sample was loaded in compression. From the load versus deflection curve the Modulus of Elasticity was calculated.

<u>Sample</u>	<u>Modulus of Elasticity of Polymer Concrete</u>
1	3.9 X 10 ⁶ psi
2	4.1 X 10 ⁶ psi

The samples were loaded to failure in compression.

<u>Sample</u>	<u>Maximum Compressive Strength of Polymer Concrete</u>
1	9070 psi
2	10400 psi

396 PLASTERS AVENUE, N.E.
ATLANTA, GEORGIA 30324
404-873-4761
TELEFAX 404-881-0508



Comments

Using American Concrete Institute (ACI) Monograph No. 6 as a reference we can compare the Modulus of Elasticity values given for normal weight concrete of comparable compressive strength to the polymer concrete tested.

<u>ACI Compressive Strength Range</u>	<u>Modulus of Elasticity Range For Normal Weight Concrete</u>
8000 to 10000 psi	5.2 to 5.8 X 10 ⁶ psi

Comparing the test values for MOE of the polymer concrete at this same compressive strength range we find the MOE values are less than those predicted for normal weight concrete. This Monograph however, points out that the MOE depends on the modulus of the materials used as constituents in the concrete. Considering that in the polymer concrete the ingredients are very different than the ingredients in normal weight concrete, the differences in the MOE values are understandable.

Resistivity

<u>Sample</u>	<u>Resistivity</u>
1	35.2 x 10 ⁶ ohm-cm
2	26.4 x 10 ⁶ ohm-cm

Comments

ACI Monograph No. 6 states that normal weight concrete has a resistivity value which ranges from 10 ohm-cm for moist concrete to 10⁴ ohm-cm for dry concrete. The resistivity as shown here is very dependent on the amount of water in the concrete. Other constituents could also effect the resistivity of concrete, such as the type of cement used.

Age of Test Samples

Test samples were greater than 28 days old when tested.



We appreciate the opportunity to have been of service to you on this project. Should you have any questions or comments concerning this report, do not hesitate to contact us at (404) 873-4761.

Respectfully submitted,

Law Engineering

John E. Lynch

John E. Lynch
Laboratory Services Manager

6/30/88

Jackie Lamb - LAW exp's:

Use the following values
for electronic conductivity

TEST:

$$2.84 \times 10^{-8} \text{ ohm/cm}^{-1}$$

$$3.78 \times 10^{-8} \text{ ohm/cm}^{-1}$$

3.31 average/2 TESTS



11 EAST OLIVE ROAD

PENSACOLA, FLORIDA 32514
PHONE (904)474.1001

Co: TNEMEC Company Horton Division
P.O. Box 57
Gulf Breeze, Florida 32561

Lab I.D.: 87-1652 1-116
Date of Order: June, 1, 1987
Sample Site: Plant Laboratory
Sample I.D.: Hortoncrete -
Polymer Concrete

Hortoncrete Project

Chemical Resistance Test

Note: This project consists of Hortoncrete samples submerged in the different test solutions at ambient temperatures, and observed once a month for six (6) months. Following are the conclusions of those tests:



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Lab I.D.: 87-1652 1-116
Date of Order: June, 1, 1987
Sample Site: Plant Laboratory
Sample I.D.: Hortoncrete -
Polymer Concrete

**Hortoncrete Project
Chemical Resistance Test**

ID	%	Parameter	Results
87-1652-01	U	Acetone	Passed Test
87-1652-02	U	Methylene Chloride	Exposed aggregate deteriorated Surface passed test.
87-1652-03	U	Tap Water	Passed Test
87-1652-04	U	Methanol	Passed Test
87-1652-05	U	Distilled Water	Passed Test
87-1652-06	U	Toluene	Passed Test
87-1652-07	U	Jet Fuel	Passed Test
87-1652-08	U	Butanol	Passed Test
87-1652-09	U	Carbon Tetrachloride	Passed Test
87-1652-10	U	Benzene	Passed Test
87-1652-11	85	Phosphoric Acid	Passed Test
87-1652-12	U	Butyric Acid	Passed Test
87-1652-13	U	Urine	Passed Test
87-1652-14	30	Ammonium Hydroxide	Passed Test
87-1652-15	U	Methyl Isobutyl Ketone	Passed Test
87-1652-16	90	Formic Acid	Passed Test
87-1652-17	U	Chlorobenzene	Passed Test
87-1652-18	10	Ammonium Chloride	Passed Test
87-1652-19	10	Aluminum Sulfate	Passed Test
87-1652-20	10	Barium Chloride	Passed Test
87-1652-21	10	Boric Acid	Passed Test
87-1652-22	10	Calcium Chloride	Passed Test
87-1652-23	10	Ferric Chloride	Passed Test
87-1652-24	U	Ethylene Glycol.	Passed Test
87-1652-25	10	Magnesium Chloride	Passed Test
87-1652-26	50	Chromic Acid	Passed Test
87-1652-27	10	Oxalic Acid	Passed Test
87-1652-28	10	Potassium Nitrate	Passed Test
87-1652-29	10	Potassium Chloride	Passed Test
87-1652-30	10	Sodium Carbonate	Passed Test
87-1652-31	10	Sodium Bicarbonate	Passed Test
87-1652-32	10	Sodium Nitrate	Passed Test
87-1652-33	10	Potassium Sulfate	Passed Test
87-1652-34	10	Sodium Phosphate	Passed Test
87-1652-35	U	Stearic Acid	Passed Test

PAGE 1 OF 5
U =Undiluted



11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904)474.1001

Co: TNEMEC Company Horton Division
P.O. Box 57
Gulf Breeze, Florida 32561

Lab I.D.: 87-1652 1-116
Date of Order: June, 1, 1987
Sample Site: Plant Laboratory
Sample I.D.: Hortoncrete -
Polymer Concrete

**Hortoncrete Project
Chemical Resistance Test**

ID	%	Parameter	Results
87-1652-35	10	Sodium Chloride	Passed Test
87-1652-35	15	Nitric Acid	Black particulate matter appear immediately. Liquid is yellow color and producing toxic vapor 4 hours later cement is destroy leaving nothing but stones in liquid. Failed Test,
87-1652-35	U	Xylene	Passed Test
87-1652-35	U	Bromine	June 19, 1987 — no reaction at first, vapors being produced. June 22, 1987 — upon returning after weekend, sample had been destroyed. It had charred appearance. Failed Test.
87-1652-35	10	Sugar	Passed Test
87-1652-35	10	Calcium Hydroxide	Passed Test
87-1652-35	10	Calcium Sulfate	Passed Test
87-1652-35	10	Calcium Nitrate	Passed Test
87-1652-35	10	Ferric Nitrate	Passed Test
87-1652-35	U	Chloroform	June 22, 1987 — turned cloudy gray. Black particles showing. August 5, 1987 - concrete has been completely destroyed. Failed Test.
87-1652-35	50	.Acetic Acid 50~	Passed Test
87-1652-35	U	Pyridine	June 30, 1987 — yellow liquid with strong odor. August 5, 1987 — concrete has been completely destroyed. Failed Test
87-1652-35	10	Magnesium Nitrate	Passed Test
87-1652-35	10	Magnesium Sulfate	Passed Test
87-1652-35	10	Sodium Sulfate	Passed Test
87-1652-35	10	Stannous Chloride	Passed Test
87-1652-35	U	Kerosene	Passed Test
87-1652-35	10	Alum	Passed Test
87-1652-35	0	Beer	Passed Test
87-1652-35	U	Grape Juice	Passed Test



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P.O. Box 57
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Lab I.D.: 87-1652 1-116
Date of Order: June, 1, 1987
Sample Site: Plant Laboratory
Sample I.D.: Hortoncrete -
Polymer Concrete

**Hortoncrete Project
Chemical Resistance Test**

ID	%	Parameter	Results
87-1652-56	u	Lard	Passed Test
87-1652-57	U	Milk	Passed Test
87-1652-58	U	Tomato Juice	Passed Test
87-1652-59	U	Vegetable Oil	Passed Test
87-1652-60	40	Citric Acid	Passed Test
87-1652-61	U	Vinegar	Passed Test
87-1652-62	U	Turpentine	Passed Test
87-1652-63	U	Benzoic Acid	Passed Test
87-1652-64	U	Carbon Disulfide	Passed Test
87-1652-65	U	Butyl Acetate	Passed Test
87-1652-66	U	Mineral Oil	Passed Test
87-1652-67	30	Phenol .	July 2, 1987 — liquid is black and phenol is eating concrete badly. August 5, 1987 — concrete has been totally destroyed. Failed Test
87-1652-68	10	Nickel Sulfate	Passed Test
87-1652-69	10	Nickel Chloride	Passed Test
87-1652-70	10	Nickel Nitrate	Passed Test
87-1652-71	10	Zinc Sulfate	Passed Test
87-1652-72	U	Ether	Passed Test
87-1652-73	10	Zinc Chloride	Passed Test
87-1652-74	10	Ferric Sulfate	Passed Test
87-1652-75	35	Potassium Hydroxide, 35%	Passed Test
87-1652-76	10	Calcium Hypochlorite	Passed Test
87-1652-77	U	Tall Oil	Passed Test
87-1652-78	U	Black Liquor	Passed Test
87-1652-79	U	White Liquor	Passed Test
87-1652-80	U	Green Liquor	Passed Test
87-1652-81	U	Ethyl Acetate	Passed Test
87-1652-82	U	Ethyl Alcohol	Passed Test
87-1652-83	U	Ethanol	Passed Test
87-1652-84	85	Lactic Acid	Passed Test
87-1652-85	10	Hydrogen Peroxide	Sample turned white after 30 day Could not determine effect on surface, Passed Test



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Polymer Concrete

**Hortoncrete Project
Chemical Resistance Test**

ID	%	Parameter	Results
87-1652-86	U	1, 2-Dichloroethane	Passed Test
87-1652-87	30	Flourosilic Acid	Passed Test
87-1652-88	20	Urea	Passed Test
87-1652-89	10	Ammonium Nitrate	Passed Test
87-1652-90	10	Ammonium Sulfate	Passed Test
87-1652-91	10	Chloroacetic Acid	Passed Test
87-1652-92	10	Copper Sulfate	Passed Test
87-1652-93	10	Copper Chloride	Passed Test
87-1652-94	U	Methyl Ethyl Ketone	Passed Test
87-1652-95	U	Methyl Alcohol	Passed Test
87-1652-96	36%	Formaldehyde	Passed Test
87-1652-97	U	Oleic Acid	Passed Test
87-1652-98	U	Tetrachloroethylene	Passed Test
87-1652-99	U	Trichloroethylene	Passed Test
87-1652-100	U	Petroleum Ether	Passed Test
87-1652-101	10	Cupric Nitrate	Passed Test
87-1652-102	10	Zinc Nitrate	Passed Test
87-1652-103	10	Sodium Hypophosphite	Passed Test
87-1652-104	10	Hydrobromic Acid	Passed Test
87-1652-105	10	Phosphorus Oxychloride	Passed Test
87-1652-106	U	Thionyl Chloride	Passed Test
87-1652-107	U	Benzyl Chloride	Passed Test
87-1652-108	U	Barium Sulfate	Passed Test
87-1652-109	U	Toluenesulfonic Acid	Passed Test
87-1652-110	U	Acrylonitrile	Passed Test
87-1652-111	10%	Chlorophenol	Passed Test
87-1652-112		Fatty Acid (bacon grease)	Test Pending
87-1652-113		HCL (Hydrochloric)	Test Pending
87-1652-114		Chlorobenzene	Test Pending
87-1652-115		Petroleum	Test Pending
87-1652-116		Sulfuric Acid	Test Pending

PAGE 4 OF 5

U =Undiluted



11 EAST OLIVE ROAD

PENSACOLA, FLORIDA 32514

PHONE (904)474.1001

Co: TNEMEC Company Horton Division
P.O. Box 57
Gulf Breeze, Florida 32561

Lab I.D.: 87-1652 1-116
Date of Order: June, 1, 1987
Sample Site: Plant Laboratory
Sample I.D.: Hortoncrete -
Polymer Concrete

**Hortoncrete Project
Chemical Resistance Test**

ID	%	Parameter	Results
		Acrylic Acid	Chemical on Order
		Benzenesulfonic Acid	Chemical on Order
		Chloroisobutane	Chemical on Order
		Dimethyl Diakly Ammonum Chloride	Chemical on Order
		Maleic Acid	Chemical on Order
		Sulfurous Acid	Chemical on Order
		Sulfur Dioxide	Chemical Not Available
		Bleaching Liquor 2%~	Chemical Not Available

PAGE 5 OF 5
U =Undiluted

Approved By: W. F. Bowers



11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904)474.1001

Lab I.D.: 86-2869

PRIORITY POLLUTANTS ANALYSES

COVER SHEET FOR RESULTS

Client; TNE MEC Company Incorporated
Horton Division
P.O. Box 57
Gulf Breeze, FL 32561

System Name; County;

Director: Mr. Horton System I.D. No.:

Sample Site: Cement/Black (Hortoncrete) DER District:

Raw or Treated: Date and Time Collected: 9/10/86

Date and Time Samples Received: September 10, 1986

Analysts: Bernie Fuson, Bruce Hunt

Date Analyses Started: Date Analyses Completed:

Date Reported; September 26, 1986

Laboratory I.D. No.: 81142

Note: E.P. Tox Extraction Followed by S.O.C. test

Approved By: W. F. Brewer



11 EAST OLIVE ROAD

PENSACOLA, FLORIDA 32514
PHONE (904)474.1001

TO: TNEMEC Company Inc.
Horton Division
P.O. Box 57
Gulf Breeze, FL 32561

Lab I.D. #86-2869

SYNTHETIC ORGANIC CONTAMINANTS

	ACID EXTRACTABLES*	
	Reported in	Detection Limit
	<u>ppb</u>	<u>ppb</u>
2-Chlorophenol	BDL	15
2,4-Dichlorophenol	BDL	10
2,4-Dimethylphenol	BDL	5
2,4-Dinitrophenol	BDL	30
2-Methyl-4,6-Dinitrophenol	BDL	20
4-Nitrophenol	BDL	20
Pentachlorophenol	BDL	10
Phenol	BDL	5
2,4,6-Trichlorophenol	BDL	10

*As listed in DER 14-22.105(1) (h)4., Dated 5/84.

Notes: ppb = parts per billion
BDL = Below Detection Limits



11 EAST OLIVE ROAD PENSACOLA, FLORIDA 32514
PHONE (904)474.1001

TO: TNEMEC Company Inc.
Horton Division
P.O. Box 57
Gulf Breeze, FL 32561

Lab I.D. #86-2869
Date of Order: Sept. 10, 1986

SYNTHETIC ORGANIC CONTAMINANTS
BASE **NEUTRAL** EXTRACTABLES*

	Reported <u>In ppb</u>	Detection		Det. Limit <u>ppb</u>
		Limit <u>ppb</u>		
Acenapntnene	BDL	10	Diethylphthalate	BDL 10
Acenaphthylene	BDL	10	Dimethylphthalate	BDL 10
Anthracene	BDL	10	2,4-Dinitrotoluene	BDL 10
Benzo (a)anthracene	BDL	10	2,6-Dintrotoluene	BDL 10
Benzo (b)uluoranthene	BDL	10	Diocetylphthalate	BDL 10
Benzo (k)fluoranthene	BDL	10	1,2-Diphenylhydrazine	BDL 10
Benzo (a)pyrene	BDL	10	Fluoranthene	BDL 10
Benzo(g,h,i)perylene Benzidine	BDL	10	Flourene	BDL 10
	BDL	10	Hexachlorobenzene	BDL 10
Bis(2-chloroethyl)ether	BDL	10	Hexachlorobutadiene	BDL 10
Bis 2-chioroethoxy) methane	BDL	10	Hexachloroethane	BDL 10
Bis(2-ethylhexyl)phthalate	BDL	10	Hexachlorocyclopentadiene	BDL 10
Bis (2-chioroisopropyl) ether	BDL	10	Indeno (1,2,3-cd) pyrene	BDL 10
4-Bromophenyl Phenyl Ether	BDL	10	Isophorone	BDL 10
Butyl Benzyl Phthalate	BDL	10	Naphthalene	BDL 10
2-Chloronaphthalene	BDL	10	Nitrobenzene	BDL 10
4-Chlorophenyl Phenyl Ether	BDL	10	N-Nitrosodiethylamine	BDL 10
Chrysene	BDL	10	N-Nitrosodi-n-propylamine	BDL 10
Dibenzo(a,h)anthracene	BDL	25	N-Nitrosodiphenylamine	BDL 10
Di-n-butylphthalate	BDL	10	Phenanthrene	BDL 10
1,3-Dichloroberizene	BDL	10	Pyrene	BDL 10
1,4-Dichlorobenzene	BDL	10	2,3,7,8-Tetrachlorodibenzo	BDL 10
1,2-Dichlorobenzcne	BDL	10	p-dioxin (Dioxin)	BDL 10
3,3-'Dichlorobenzidjne	BDL	10	1,2,4-'Trichlorobenzene	

*As listed in DER 17-22.105(1) (h)3., Dated 5/84. Notes: ppb = parts per billion

BDL = Below Detection Limits



11 EAST OLIVE ROAD

PENSACOLA, FLORIDA 32514

PHONE (904)474.1001

TO: TNEMEC Company Inc.
Horton Division
P.O. Box 57
Gulf Breeze, FL 32561

Lab I.D. #86-2869

SYNTHETIC ORGANIC CONTAMINANTS PESTICIDES*

	Reported in	Detection Limit
	ppb	ppb
	ppb	ppb
Aldrin	BDL	0.01
a-BHC	BDL	0.01
b-BHC	BDL	0.01
g-BHC-Lindane	BDL	0.01
d-BUC	BDL	0.01
Chlorodane	BDL	0.01
4,4'-DDD	BDL	0.01
4,4'-DDE	BDL	0.01
4,4'-DDT	BDL	0.01
Dieldrin	BDL	0.01
Endosulfan I	BDL	0.01
Endosulfan II	BDL	0.01
Endosulfan Sulfate	BDL	0.01
Ethion	BDL	1
Trithion	BDL	1
o,p-DDT, DDE and DDD	BDL	0.01
Tedion	BDL	0.4
Endrin Aldehyde	BDL	0.03
Heptachlor	BDL	0.01
Heptachlor Epoxide	BDL	0.01
Toxaphene	BDL	0 • 25
PCB-1016	BDL	0.2
PCB-1221	BDL	0.2
PCB-1232	BDL	0.2
PCB-1242	BDL	0.2
PCB-1248	BDL	0.2
PCB-1254	BDL	0.2
PCB-1260	BDL	0.2
Aldicarb(non-extractable)	BDL	5
Diazinon	BDL	1
Malathion	BDL	1
Parathion	BDL	1
Guthion	BDL	1
Keithane (Dicofai)	BDL	0.01

*As listed in DER 17-22.105(1)(h)2., Dated 5/84.

Notes: ppb = parts per billion
BDL = Below Detection Limits



11 EAST OLIVE ROAD

PENSACOLA, FLORIDA 32514

PHONE (904)474.1001

To: TNEMEC Company Horton Division
P.O. Box 57
Gulf Breeze, FL 32561

Lab I.D.: 87-2003 (1-5)
Date of Orders 6/25/87
Sampler: Del Horton

**42 - DAY TOTAL IMMERSION
TEST RESULTS: HORTONCRETE
EXPANSION JOIN COMPOUND**

**Hortoncrete Project
Exposure Test**

Solution

Results

50% Sulfuric Acid	Acid solution is discolored pink, joint is wrinkled and discolored. Could be considered a failure.
10% Sulfuric Acid	No discoloration to acid solution, but joint wrinkled and discolored gray. Could be considered a failure.
5% Sodium Hypochlorite	Slight discoloration of solution, joint is slightly discolored but intact. Joint passed.
50% Sodium Hydroxide	No discoloration of solution, joint passed.
25% Sodium Hydroxide	No discoloration of solution, joint passed.

Approved By: Paul Casavant



11 EAST OLIVE ROAD

PENSACOLA, FLORIDA 32514

PHONE (904)474.1001

Co: TNEMEC Company Horton Division
P.O. Box 57
Gulf Breeze, Florida 32561

Lab I.D.: 87-2348
Date of Order: 7/29/87
Sampler: Del Horton

Hortoncrete Project Exposure Test

**60-Day TOTAL IMMERSION
TEST RESULTS – HORTONCRETE
H-200 EXPANSION JOINT COMPOUND
POURED INTO HORTONCRETE SPECIMEN
TEST CONDUCTED WITH AND WITHOUT
PRIMER**

Sample Without Primer (Lab ID#: 2348-01)

<u>Sample ID</u>	<u>Solution</u>	<u>Results</u>
A	65% Sulfuric Acid	Concrete cracked; joint intact. Joint passed.
B	30-36% Hydrochloric Acid	Joint expanding, pulling slightly away from concrete. Not considered a failure.
C	Methylene Chloride – Strong Solvent	Joint and concrete decomposed and softened. Would be considered a failure.
D	25% Sodium Hydroxide	Joint intact. Joint passed.

Sample With Primer-PS 100 (Lab ID#: 2348-02)

<u>Sample ID</u>	<u>Solution</u>	<u>Results</u>
A	65% Sulfuric Acid	Concrete cracked badly, joint compound intact. Not considered a failure.
B	30-36% Hydrochloric Acid	Joint expanding some, but not as much as specimen without primer. Not considered a failure.
C	Methylene Chloride – Strong Solvent	Joint and concrete decomposed and softened. Would be considered a failure.
D	25% Sodium Hydroxide	Joint intact. Joint passed.

Approved By: Paul Casanova



Subject:

By: Curry Sanders

HORTONCRETE IMMERSION RESULTS

Date: 5/28/87

(Reference: 225B13)

Page 1 of 1

SUBSTRATE: 2" x 2-3/4" x 1" premixed, fully cured block aggregate exposed (2 sides saw cut)

SURFACE PREP; Dusted, hand wiped solvent (xylene)

CURED: 14 days

TEST RESULTS	Panel No.	Reagent	Temp.	Exposure Time	Results
	1405	50% H ₂ SO ₄	77°F	1 1/2 yrs.	OK
	1415	23% Hydrofluoric	77°F	1 yr.	OK, SL8
	1437	23% H ₂ SLF ₆	77°F	1 yr.	OK, SL8
	1438	28% UCL/Toluene	77°F	8 mos.	OK
	1416	30% HCL	77°F	8 mos.	OK
	1456A	50% HCL/50% H ₂ SO ₄	77°F	3 mos.	OK, SL8
	1427	10% Nitric	77°F	8 mos.	OK
	1529	20% Nitric	77°F	1 mo.	OK
	1458	45% HCL/50% H ₂ SO ₄ / 5% Hydrofluoric / 5% Chromic	77°F	3 mos.	OK

TEST GUIDELINES

OK = Still testing
F = Failed
S = Slight

1 = Cracked
2 = Slight softening
3 = Zlistered
4 = Discoloration
5 = Dissolved Coating
6 = Severe Softening
7 = Delamination
8 = Dissolved aggregate

CDS:omb
M95-85a[11]

October 20, 1983

Horton Company
P.O. Box 57
Gulf Breeze, FL 32561

Gentlemen:

Hortoncrete Polymer Concrete is acceptable for floors, curbs, walls, sumps, etc., for incidental food contact in federally inspected meat and poultry plants as long as the chemical composition and surface finish remain as submitted to USDA on June 7, 1983. This acceptance is review of the chemical constituents against appropriate FDA or USDA regulations or guidelines and the physical surface characteristics. This does not constitute a USDA endorsement of the peace of this product.

Where food adulterating vapors may be generated during the preparation or installation of this product, all unprotected food and packaging materials must be moved out of the affected area. Before food and packaging materials may be returned to the area where the material has been used, the area must be sufficiently free of odor to prevent contamination of the food.

Any unsanitary condition arising as a result of improper installation or maintenance will be cause for the USDA inspector to require correction.

Sincerely,



Ronald W. Anderson
Staff Officer
Environmental Engineering & Evaluation Section
Facilities, Equipment and Sanitation Division
Meat and Poultry Inspection Technical Services