

Certificate of Analysis

Tensile Strength

Product Name	CemBase 150
Batch Number	Resin: #96996, Colorant: Brick, #96605, Hardener: #A2841
Manufacture Date	Resin: 11/4/03, Colorant: Brick, 9/17/03, Hardener: 10/13/03
Test Date	12/16/03
Test Method	ASTM D-2370 Standard Test Method for Tensile Properties of Organic Coatings
Test Conditions	As per ASTM standard. Any deviation reported at end of certificate.

This certificate confirms that the above product was tested as per stated standard specification using calibrated equipment and qualified staff. The following test results were obtained.


Test Results

Parameter	Symbol	Unit	Result
Tensile Strength	TS	MPa	1.007
		PSI	146
Elongation	E	%	2%

Test conditions (if different from standard test conditions) and/or notes.

Samples prepared from fully mixed CemBase 150 system including resin, water, hardener.
 Results represent average taken from 10 samples.
 Test Specimens: 0.5" wide x 0.040" thick free film.
 Initial gauge length: 1"
 Crosshead speed: 5"/min.
 Temperature and Humidity: 25.1°C / 25.5% RH.
 Specimen cure time: 12 days at ambient lab temperature.
 MPa results obtained by calculation 1.0 MPa = 145.0 lb/in²
 Shimadzu Autograph AG-1 Calibration: New 7/28/03

Results witnessed and verified by a technical representative of GeoEngineers, Inc.


 Reviewed by:
 Timothy D. Barber

Certificate of Analysis

Water Absorption of Plastics (Hydrophobicity)

Product Name	CemBase 150
Batch Number	Resin: #96996, Colorant: Brick, #96605, Hardener: #A2841
Manufacture Date	Resin: 11/4/03, Colorant: Brick, 9/17/03, Hardener: 10/13/03
Test Date	12/15/03 (initial)
Test Method	ASTM D-570 Standard Test Method for Water Absorption of Plastics
Test Conditions	As per ASTM standard. Any deviation reported at end of certificate.

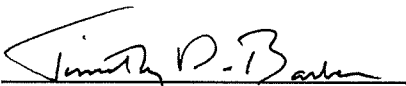
This certificate confirms that the above product was tested as per stated standard specification using calibrated equipment and qualified staff. The following test results were obtained.

Test Results

Parameter	Result
Days Immersed	% Water Absorption
1	8.3%
3	9.3%
7	10.2%

Test conditions (if different from standard test conditions) and/or notes.
Samples prepared from fully mixed CemBase 150 system including resin, water, hardener. 2"x 2"x 0.040" samples cut from free film, weighed, and immersed in deionized water bath at ambient lab temperatures (aprx. 24.5° C/25% RH). Results represent average taken from 3 samples. Reconditioning section of standard not recorded.

Results witnessed and verified by a technical representative of GeoEngineers, Inc.



Reviewed by:
Timothy D. Barber

Certificate of Analysis

Shore Hardness

Product Name	CemBase 150
Batch Number	Resin: #96996, Colorant: Brick, #96605, Hardener: #A2841
Manufacture Date	Resin: 11/4/03, Colorant: Brick, 9/17/03, Hardener: 10/13/03
Test Date	1/7/04
Test Method	ASTM D-2240 Standard test method for Rubber Property - Durometer Hardness
Test Conditions	As per ASTM standard. Any deviation reported at end of certificate.

This certificate confirms that the above product was tested as per stated standard specification using calibrated equipment and qualified staff. The following test results were obtained.

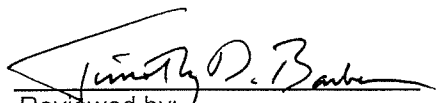
Test Results

Parameter		Result	Result
Hardness value		Type A	Type D
1		75	25
2		75	30
3		70	35
4		80	30
5		85	30
6		80	35
7		70	40
8		80	30
9		75	35
10		80	40
Average		77	33

Test conditions (if different from standard test conditions) and/or notes.

Samples prepared from fully mixed CemBase 150 system including resin, water, hardener.
 Description of Specimen: 0.040" average thickness x 6 plies = .242" overall
 Temperature and Humidity: 23.0°C / 22% RH.
 Type and S/N of Durometer: Shore Type A 42193-A Calibration due 8/26/04
 Type and S/N of Durometer: Shore Type D 41945-D Calibration due 8/26/04
 All readings held at one second per reading.

Results witnessed and verified by a technical representative of
 GeoEngineers, Inc.


 Reviewed by:
 Timothy D. Barber

Certificate of Analysis

Mandrel Bend Test of Attached Organic Coatings

Product Name	CemBase 150
Batch Number	Resin: #96996, Colorant: Brick, #96605, Hardener: #A2841
Manufacture Date	Resin: 11/4/03, Colorant: Brick, 9/17/03, Hardener: 10/13/03
Test Date:	12/15/03
Test Method	ASTM #D-522-93A Standard Test Method for Mandrel Bend Test of Attached Organic Coatings, Method B.
Test Conditions	As per ASTM standard. Any deviation reported at end of certificate.

This certificate confirms that the above product was tested as per stated standard specification using calibrated equipment and qualified staff. The following test results were obtained.

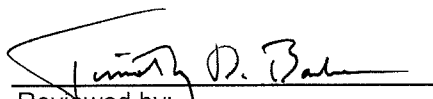
Test Results

Mandrel Size		70°F(21°C)	0°F(-18°C)
4"		Pass	Fail
2 3/4"		Pass	NA
2"		Pass	NA
1"		Pass	NA
3/4"		Pass	NA
1/2"		Pass	NA
7/16"		Pass	NA
3/8"		Pass	NA
5/16"		Fail	NA
1/4"		NA	NA
3/16"		NA	NA
1/8"		NA	NA

Test conditions (if different from standard test conditions) and/or notes.

Samples prepared from fully mixed CemBase 150 system including resin, water, hardener.
Specimens: 0.5" wide x 0.044" thick free film.
Specimens tested as free film unattached to rigid or flexible substrate.
NA result indicates no need for further testing.

Results witnessed and verified by a technical representative of GeoEngineers, Inc.


Reviewed by:
Timothy D. Barber

Certificate of Analysis

Adhesion to Asphalt (Pull)

Product Name	CemBase 150
Batch Number	Resin: #96996, Colorant: Brick, #96605, Hardener: #A2841
Manufacture Date	Resin: 11/4/03, Colorant: Brick, 9/17/03, Hardener: 10/13/03
Testing Date:	12/18/03
Test Method	ASTM D-4541 Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers
Test Conditions	As per ASTM standard. Any deviation reported at end of certificate.

This certificate confirms that the above product was tested as per stated standard specification using calibrated equipment and qualified staff. The following test results were obtained.

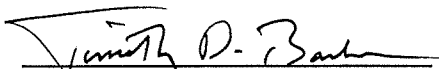
Test Results

"Asphalt" Side	Condition	Specimens	MPa	PSI	Primary MOF
Average	Dry	3	2.38	340	Cohesive Substrate Failure
Average	Wet	3	1.43	207	Cohesive Coating Failure
"Aggr." Side	Condition	Specimens	MPa	PSI	Primary MOF
Average	Dry	3	3.91	567	Cohesive Substrate Failure
Average	Wet	3	1.95	283	Cohesive Coating Failure

Test conditions (if different from standard test conditions) and/or notes.

Samples prepared from fully mixed CemBase 150 system including resin, water, hardener. Specimens prepared by securing aluminum dollies with epoxy to asphalt substrate. Aluminum dollies: Diameter = 0.788", Area = 0.487"
Measuring the force of separation from the substrate (pull-off strength) performed using DeFelsko PosiTest (model A) portable adhesion tester. (lbs / in²)
Wet condition consisted of soaking specimens in water at 140° for 24 hours prior to testing. Temperature and Humidity: 25.9° C / 24% RH
"Asphalt" side is the actual standard asphalt surface.
"Aggr." (Aggregate) side is the cut surface used to simulate aged asphalt.

Results witnessed and verified by a technical representative of GeoEngineers, Inc.


Reviewed by:
Timothy D. Barber

Certificate of Analysis

Adhesion to Asphalt (Peel)

Product Name	CemBase 150
Batch Number	Resin: #96996, Colorant: Brick, #96605, Hardener: #A2841
Manufacture Date	Resin: 11/4/03, Colorant: Brick, 9/17/03, Hardener: 10/13/03
Testing Date:	12/15/03
Test Method	ASTM D-903 Standard Test Method for Peel or Stripping Strength of Adhesive Bonds
Test Conditions	As per ASTM standard. Any deviation reported at end of certificate.

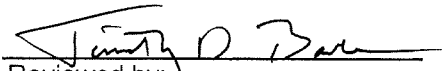
This certificate confirms that the above product was tested as per stated standard specification using calibrated equipment and qualified staff. The following test results were obtained.

Test Results

"Asphalt" Side	Condition	Width	Specimens	PSI	Primary MOF
Average	Dry	1"	3	5.7	Cohesive Coating
Average	Wet	1"	3	2.6	Cohesive Coating
"Aggr." Side	Condition	Width	Specimens	PSI	Primary MOF
Average	Dry	1"	3	5.9	Cohesive Coating
Average	Wet	1"	3	3.1	Cohesive Coating

Test conditions (if different from standard test conditions) and/or notes:
<p>Samples prepared from fully mixed CemBase 150 system including resin, water, hardener. Specimens prepared by embedding a strip of cloth between coatings on asphalt substrate. Embedded cloth was peeled off at aprx. 90° while measuring the force of separation from the substrate.</p> <p>Rate of separation: 2" / min. Length of separation: Approximately 5"</p> <p>Wet condition consisted of soaking specimens in water at 140° for 24 hours prior to testing.</p> <p>Temperature and Humidity: 24.1° C / 28% RH</p> <p>"Asphalt" side is the actual standard asphalt surface.</p> <p>"Aggr." (Aggregate) side is the cut surface used to simulate aged asphalt.</p>

Results witnessed and verified by a technical representative of GeoEngineers, Inc.



Reviewed by:
Timothy D. Barber

Certificate of Analysis

Taber Abrasion

Product Name	CemBase 150
Batch Number	Resin: #96996, Colorant: Brick, #96605, Hardener: #A2841
Manufacture Date	Resin: 11/4/03, Colorant: Brick, 9/17/03, Hardener: 10/13/03
Test Date	12/9/2003 (initial)
Test Method	ASTM D-4060-95 Abrasion Resistance by Taber Abraser
Test Conditions	As per ASTM standard. Any deviation reported at end of certificate.

This certificate confirms that the above product was tested as per stated standard specification using calibrated equipment and qualified staff. The following test results were obtained.

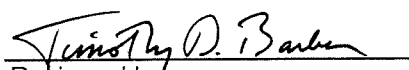
Test Results

Parameter	Cure Time	Average Wear Index
Wear (Dry)	1 Day	0.41
	3 Days	0.37
	7 Days	0.41
Wear (Wet)	1 Day	9.03
	3 Days	8.89
	7 Days	6.92

Test conditions (if different from standard test conditions) and/or notes.

Samples prepared from fully mixed CemBase 150 system including resin, water, hardener.
Average wear index represented as grams per 1000 cycles.
Taber Abraser wheels/load used: H-10 / 1000g.
Abrasion disks prepared from 0.040" wet drawdown on Lenetta Panels.
Average wear index represents average of 2 samples run at each cure time.

Results witnessed and verified by a technical representative of
GeoEngineers, Inc.


Reviewed by:
Timothy D. Barber

Certificate of Analysis

Accelerated Weathering - QUV

Product Name	CemBase 150
Color	Brick
Batch Number	Resin: #96996, Colorant: Brick, #96605, Hardener: #A2841
Manufacture Date	Resin: 11/4/03, Colorant: Brick, 9/17/03, Hardener: 10/13/03
Test Date	12/16/03 (Initial)
Test Method	ASTM G-154 Standard Practice for Operating Florescent Light Apparatus for UV Exposure of Nonmetallic Materials.
Test Method	ASTM D-2244 Standard Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates.
Spectrophotometer	X-Rite SP-62 Calibration due: 6/12/04 Illuminate Value of D6500 at 10°, Specular Gloss included.
Test Conditions	4 hrs Condensation, 4 hrs UV exposure in repeating cycles at 40° C panel temperature.
Lamp	UVB 313/280 nm

This certificate confirms that the above product was tested as per stated standard specification using calibrated equipment and qualified staff. The following test results were obtained.

Test Results

Parameter	L*	a*	b*	ΔE
Initial	28.79	8.61	6.56	
500 hr	33.64	8.84	7.36	4.92
1000 hr	34.89	8.59	6.94	6.11
1500 hr	37.94	8.40	6.30	9.16

Shrinkage

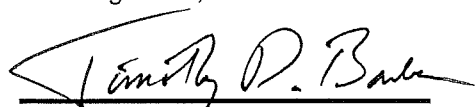
500, 1000, 1500 hr. evaluation shows no evidence of shrinkage or separation along center joint.

Test conditions (if different from standard test conditions) and/or notes.

Samples prepared from fully mixed CemBase 150 system including resin, water, hardener. Shrinkage test results do not represent a Standard Test Method and are intended primarily for informational purposes.

Sample substrate is a Medium Density Fiberboard (MDF) with asphalt coating and used strictly for this test method. A 3/8" routed joint (half round) in the center of the sample is used as a means of evaluating shrinkage.

Results witnessed and verified by a technical representative of GeoEngineers, Inc.



Reviewed by:
Timothy D. Barber

Certificate of Analysis

Volume Solids

Product Name	CemBase 150
Batch Number	Resin: #96996, Colorant: Brick, #96605, Hardener: #A2841
Manufacture Date	Resin: 11/4/03, Colorant: Brick, 9/17/03, Hardener: 10/13/03
Test Date	12/9/03
Test Method	ASTM D-2697 Standard Test Method for Volume Nonvolatile Matter in Clear or Pigmented Coatings
Test Conditions	As per ASTM standard. Any deviation reported at end of certificate.

This certificate confirms that the above product was tested as per stated standard specification using calibrated equipment and qualified staff. The following test results were obtained.

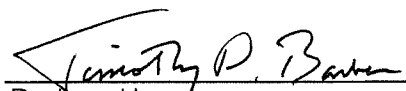
Test Results

Parameter	Sample	Result
Volume Nonvolatile Content	1	60.21
(Percent Solids by Volume)	2	60.24
	3	60.36
	Average	60.27%

Test conditions (if different from standard test conditions) and/or notes.

Samples prepared from fully mixed CemBase 150 system including resin, water, hardener.
Percent weight solids: 73.94%
Nonvolatile matter in 1 gram of wet coating = 0.7394
Density of liquid coating material: 1.7035
Samples cured at ambient lab temperatures (aprx. 24° C/ 22% RH)

Results witnessed and verified by a technical representative of
GeoEngineers, Inc.



Reviewed by:
Timothy D. Barber

Certificate of Analysis

Viscosity

Product Name	CemBase 150
Batch Number	Resin: #96996, Colorant: Brick, #96605, Hardener: #A2841
Manufacture Date	Resin: 11/4/03, Colorant: Brick, 9/17/03, Hardener: 10/13/03
Test Date	12/8/03
Test Method	ASTM D-562 Standard Test Method for Consistency of Paints Using the Stormer Viscometer
Test Method	ASTM D-2196 Standard Test Method for Rheological Properties of Non-Newtonian Materials by Rotational Viscometer
Test Conditions	As per ASTM standard. Any deviation reported at end of certificate.

This certificate confirms that the above product was tested as per stated standard specification using calibrated equipment and qualified staff. The following test results were obtained.

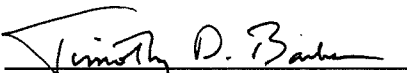
Test Results

Parameter	Unit	Result
Viscosity	KU	81
	CPS at 10 rpm	760
	CPS at 20 rpm	505
	CPS at 50 rpm	300
	CPS at 100 rpm	206

Test conditions (if different from standard test conditions) and/or notes.

Samples prepared from fully mixed CemBase 150 system including resin, water, hardener.
Brookfield viscometer model DV-II using spindle 4. Calibration due: 9/04
Brookfield KU-1 Viscometer. Calibration due: 9/04
Sample was at ambient lab temperature after mechanical mixing (aprx. 24°C/ 25% RH)
KU (Krebs Units) value is significant only for informational purposes.
CPS (Centipoises) value is the apparent viscosity at differing speeds.
KU and CPS readings taken 10 minutes after initial mixing.
The precision of viscosity measurements is not determined but considered to be at the 95% confidence level.

Results witnessed and verified by a technical representative of
GeoEngineers, Inc.


Reviewed by:
Timothy D. Barber

Certificate of Analysis**Dry Time**

Product Name	CemBase 150
Batch Number	Resin: #96996, Colorant: Brick, #96605, Hardener: #A2841
Manufacture Date	Resin: 11/4/03, Colorant: Brick, 9/17/03, Hardener: 10/13/03
Test Date	12/8/03
Test Method	ASTM D-5895 Standard Test Method of Drying or Curing During Film Formation of Organic Coatings Using Mechanical Recorders
Test Conditions	As per ASTM standard. Any deviation reported at end of certificate.

This certificate confirms that the above product was tested as per stated standard specification using calibrated equipment and qualified staff. The following test results were obtained.

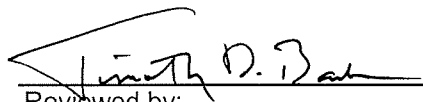
Test Results

Parameter	Result
Circular Drying Time	99 min.

Test conditions (if different from standard test conditions) and/or notes:

Samples prepared from fully mixed CemBase 150 system including resin, water, hardener.
10 mil wet draw down applied to Leneta - Penopac Chart.
Gardner circular mechanical dry time recording device.
Calibration due date: 8/04/04
Dry time value derived after completion of initial mixing to set to touch.
Duration of test at ambient lab temperature (aprx. 24°C/ 25% RH).

Results witnessed and verified by a technical representative of
GeoEngineers, Inc.



Reviewed by:
Timothy D. Barber

Certificate of Analysis**Gel Time**

Product Name	CemBase 150
Batch Number	Resin: #96996, Colorant: Brick, #96605, Hardener: #A2841
Manufacture Date	Resin: 11/4/03, Colorant: Brick, 9/17/03, Hardener: 10/13/03
Test Date	12/8/03
Test Method	ASTM D-2471 Standard Test Method for Gel Time and Peak Exothermic Temperature of Reacting Thermosetting Resins
Test Conditions	As per ASTM standard. Any deviation reported at end of certificate.

This certificate confirms that the above product was tested as per stated standard specification using calibrated equipment and qualified staff. The following test results were obtained.

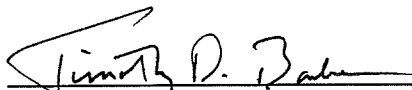
Test Results

Parameter	Result
Gel Time	171 min.

Test conditions (if different from standard test conditions) and/or notes.

Samples prepared from fully mixed CemBase 150 system including resin, water, hardener.
10 mil wet draw down applied to Leneta - Penopac Chart.
Gardner circular mechanical gel time recording device.
Calibration due date: 1/6/04
Gel time value derived after completion of initial mixing to solidification.
Volume of sample aprx. 300 g. in plastic beaker.
Duration of test at ambient lab temperature (aprx. 24°C/ 25% RH).

Results witnessed and verified by a technical representative of
GeoEngineers, Inc.



Reviewed by:
Timothy D. Barber

Certificate of Analysis

Density

Product Name	CemBase 150
Batch Number	Resin: #96996, Colorant: Brick, #96605, Hardener: #A2841
Manufacture Date	Resin: 11/4/03, Colorant: Brick, 9/17/03, Hardener: 10/13/03
Test Date	12/8/03
Test Method	ASTM D-1475 Standard test method for Density of Paint, Varnish, Lacquer, Other Related Products
Test Conditions	As per ASTM standard. Any deviation reported at end of certificate.

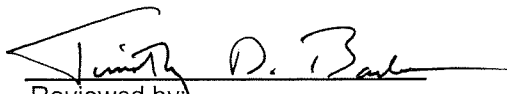
This certificate confirms that the above product was tested as per stated standard specification using calibrated equipment and qualified staff. The following test results were obtained.

Test Results

Parameter	Unit	Result
Density	Pounds per Gallon	14.19
	Grams per mL	1.70

Test conditions (if different from standard test conditions) and/or notes.
Samples prepared from fully mixed CemBase 150 system including resin, water, hardener. Calibrated cup used to calculate weight per gallon.

Results witnessed and verified by a technical representative of GeoEngineers, Inc.


Reviewed by:
Timothy D. Barber

Certificate of Analysis

Weight Solids

Product Name	CemBase 150
Batch Number	Resin: #96996, Colorant: Brick, #96605, Hardener: #A2841
Manufacture Date	Resin: 11/4/03, Colorant: Brick, 9/17/03, Hardener: 10/13/03
Test Date	12/8/03
Test Method	ASTM D-2369 Standard Test Method for Volatile Content of Coatings
Test Conditions	As per ASTM standard. Any deviation reported at end of certificate.

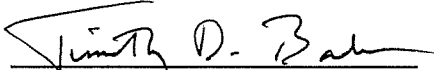
This certificate confirms that the above product was tested as per stated standard specification using calibrated equipment and qualified staff. The following test results were obtained.

Test Results

Parameter		Result
Percent Solids by Weight		73.94%

Test conditions (if different from standard test conditions) and/or notes.
Samples prepared from fully mixed CemBase 150 system including resin, water, hardener.

Results witnessed and verified by a technical representative of
GeoEngineers, Inc.



Reviewed by:
Timothy D. Barber

Certificate of Analysis**Permeance**

Product Name	CemBase 150
Batch Number	Resin: #96996, Colorant: Brick, #96605, Hardener: #A2841
Manufacture Date	Resin: 11/4/03, Colorant: Brick, 9/17/03, Hardener: 10/13/03
Testing Date	12/11/03
Test Method	ASTM D-1653 (Method A) Standard Test Method for Water Vapor Transmission of Organic Coating Films
Test Conditions	As per ASTM standard. Any deviation reported at end of certificate.

This certificate confirms that the above product was tested as per stated standard specification using calibrated equipment and qualified staff. The following test results were obtained.

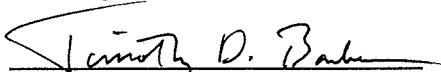
Test Results

Parameter	Thickness	Unit	Result
Permeance	0.055"	$\text{g/m}^2/24 \text{ hr/mmHg}$	13.43
			(metric perms)

Test conditions (if different from standard test conditions) and/or notes.

Samples prepared from fully mixed CemBase 150 system including resin, water, hardener.
Results represent average taken from 2 samples.
Temperature and Humidity: 23°C. / 18.3% RH.
Samples cut from free films cured at ambient lab temperatures (aprx. 24°C. / 22% RH).
Sample Cure Time: 12 days at ambient lab temperatures.

Results witnessed and verified by a technical representative of GeoEngineers, Inc.



Reviewed by:

Timothy D. Barber