StreetBond™

Comparing the Durability of Asphalt Pavement Coatings

PRODUCT KNOWLEDGE DEVELOPMENT SERIES

QUEST CONSTRUCTION PRODUCTS

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Comparing the Durability of Asphalt Pavement Coatings

OVERVIEW

- For any coating product, durability is the most sought after indicator of performance by customers.
- Wet Wear Durability is a better indicator than Dry Wear Durability because it is more representative of the elements in which the coatings will be required to perform (i.e., wet weather).
- This comparison includes testing of the following water-borne asphalt pavement coatings:

  ColorPave HD-500 by SealMaster

  Texture Coat by Pattern Paving Products

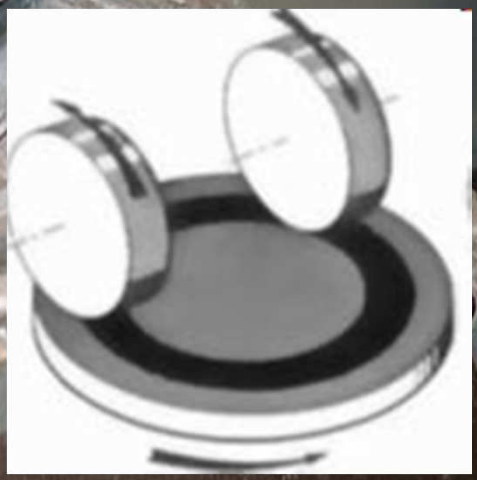
  UltraBond UB300 by ThermOTrack

  StreetBond150 by Quest Construction Products
- We used a widely accepted test method: the Modified ASTM D-4060 Abrasion Resistance of Coatings using the Taber Abraser.
- The tests were conducted in United Coating's laboratory. To ensure the tests were un-biased, these were witnessed by GeoEngineers, a global firm (15 offices world-wide) that is well respected in the testing of materials.

GLOSSARY OF TERMS

- **ASTM:** American Society for Testing and Materials is an international standards organization that publishes technical standards for a wide range of materials and products.
- **Taber Rotary Platform Abraser:** An ASTM D-4060 test method developed to perform accelerated wear testing in an abrasive environment such as rubbing, scraping, or erosion, all typical conditions that asphalt pavement coatings are subjected to. Completed in a laboratory, it provides reliable data in a matter of minutes, compared to the years required by in-use testing.
- **Taber Wear Index (WI):** Indicates rate of wear of a coating when tested on the Taber Abraser. The lower the wear index number, the better the abrasion resistance**.**

Weighted (1000g) H10 Abraser wheels (2)



Rotating platform

Wet, coated test disk

Taber Rotary Platform Abraser

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EXPLANATION OF THE ASTM D-4060 TABER TEST

- The test coating is applied to a sample disk and allowed to cure for 7 days, then soaked in water for 24 hours.
- Sample disk is then mounted on the Taber Abraser platform.
- The Abraser wheels provide the abrasion for the test.
- The wheel selected for this test is the H-10 Wheel with 1000g of weight applied.
- Note that the wheels are off-center which provides shear.
- The sample is misted with water throughout the test.
- The number of cycles (platform rotations) is counted to complete wear-through of the coating.
- The disk is weighed before and after to determine weight loss.

Taber Wear Index (WI): Indicates rate of wear, and is calculated using the following formula:

$$\mathbf{WI = (\Delta W \times 1{,}000)/C}$$

ΔW = disk weight loss; C = number of cycles to wear-through

- The lower the wear index, the better the abrasion resistance**.**

The photos on the next slides show the test performed on StreetBond150.

StreetBond150 sample after 220 cycles

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StreetBond150 sample after 348 cycles

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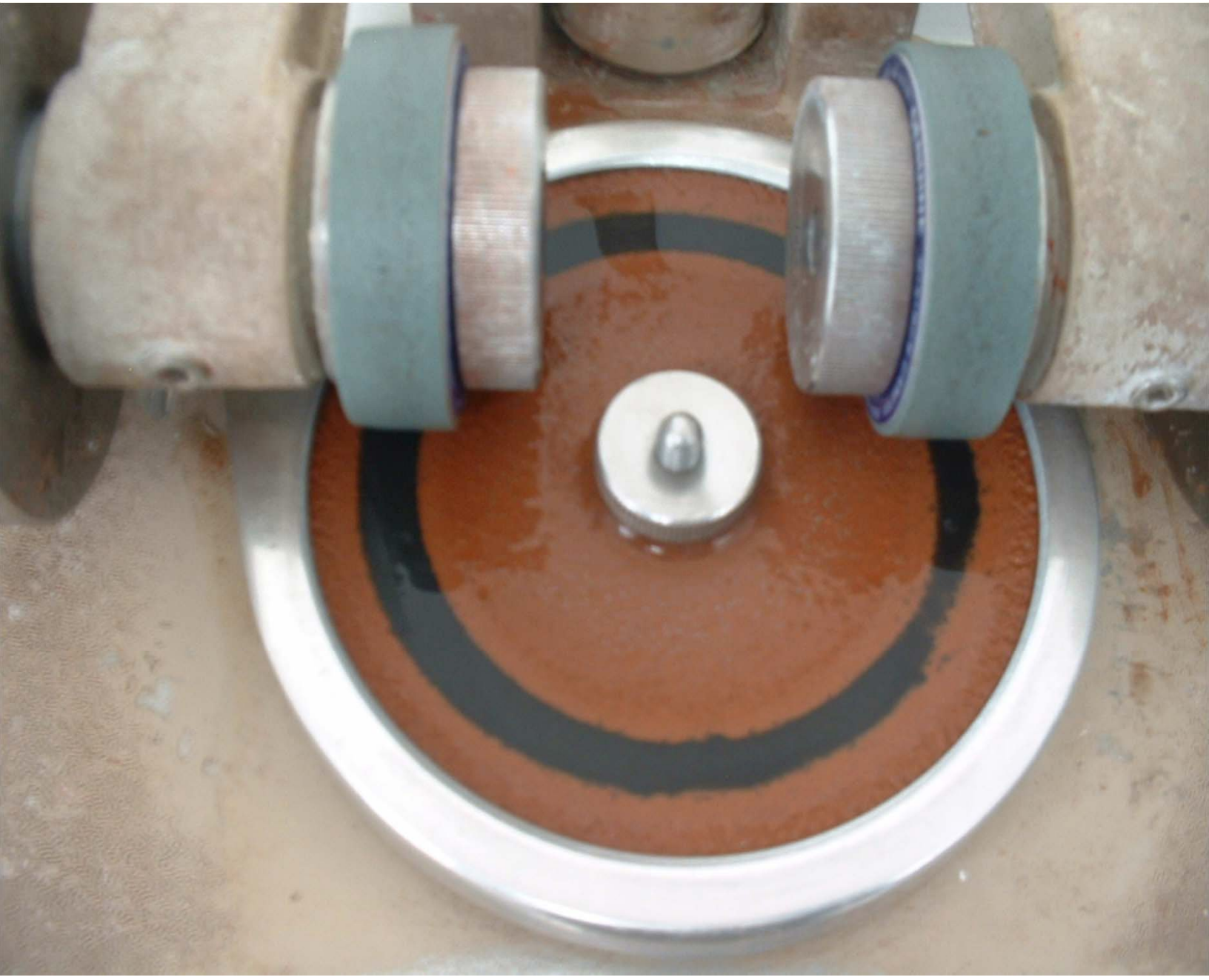
StreetBond150 sample after 427 cycles



Coating Wear-through.
Average # of cycles (C) to wear-through = 491 (3 tests)
Average weight loss ΔW = 1.88 grams
WI = (ΔW x 1000)/C = (1.88 x 1000)/491 = 3.86

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Test Results

using the Modified ASTM D-4060 (witnessed and certified)

Coating	Avg. Cycles to Wear-through	Wear Index (WI)	Comparative Wear
StreetBond150	491	3.86	100%
Pattern Paving	105	25.1	15.4%
SealMaster	45	45.9	8.4%
Ultrabond	31	52.6	7.3%

NOTES:

- Cycles to Wear-through data is the average quantity based on three tests of each coating.
- The lower the Wear Index (WI), the more durable is the coating.
- Comparative Wear illustrates the % difference in WI.
- StreetBond150 employs an epoxy modifier (Part B) that contributes to the wear resistance.
- Both SealMaster and Pattern Paving Products publish the results for ASTM 2486 the Standard Test Method for Scrub Resistance of Wall Paints.
- Certificates of Analysis are available.

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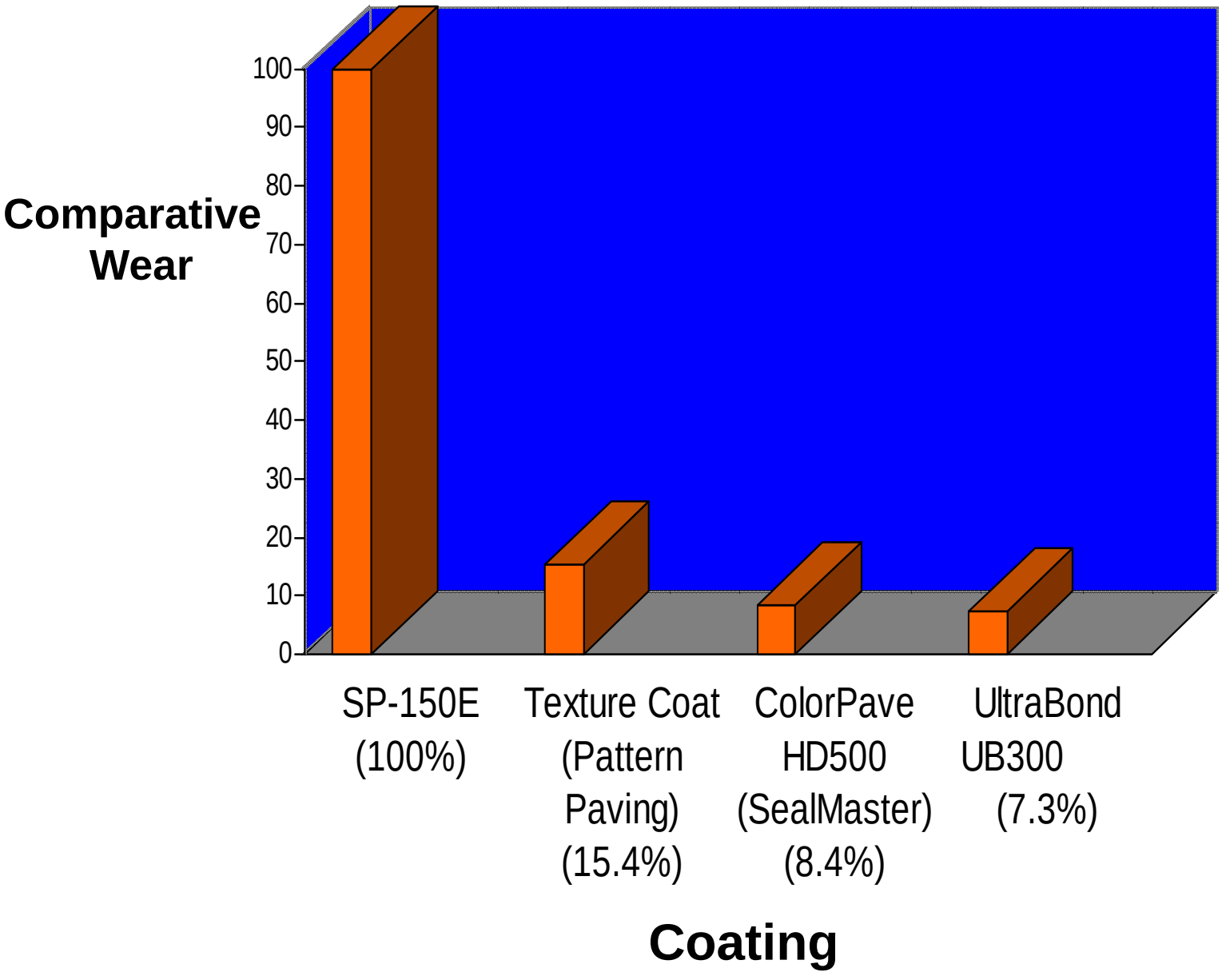
Comparative Wear as a % of StreetBond150
(based on Wear Index data)



StreetBond150 has far superior wear resistance in laboratory . Wet wear testing using the Taber Abraser.

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Comparing the Durability of Asphalt Pavement Coatings

KEY TAKE-AWAYS

- Water based asphalt pavement coatings are easy to use and are friendly to the environment; however when water is re-introduced (wet weather, humidity, irrigation), water-based coatings will soften which decreases their resistance to abrasion.
- StreetBond150 uses a unique epoxy modifier that limits the softening effect that water has on abrasion resistance.
- StreetBond150 has a Taber Wet Wear Index more than 6X better than that of our nearest North American competitor's coating.

Certificate of Analysis

SP-150E

GeoEngineers

Certificate of Analysis

Taber Abrasion Traffic Paint Spec Version

Study Number	CS0898
Manufacturer	Integrated Paving Concepts
Product Name	**StreetBond SP-150E Coating**
Batch Number	Part A: #105687, Colorant: Terra Cotta: #106473, Part B: #107138
Manufacture Date	Part A: 6/4/2008, Colorant: Terra Cotta: 9/9/2008, Part B: 2/19/2009
Sample Prep Date	3/2/2009
Testing Date(s)	3/9/2009; 3/10/2009; 3/11/2009
Test Method	Modified ASTM D-4060 Abrasion Resistance of Organic Coatings By the 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

Reportable Parameter	Thickness	Cure History	Cycles	Loss	Wear Index
	Mils			grams	
Weight Loss (Wet)	21	7 Day Cure; 24 Hour Soak; 24 Hour Dry in 125°F Oven	491	1.88	3.86

Test conditions (if different from standard test conditions) and/or notes.
Taber Abraser wheels/load used: H-10 / 1000g
Cure Condition @ 23°C 50% R.H.
Reported Test Results are an average of three values; thickness an average of 9 values
Samples were removed from abraser at 100% wear through.
3/9/2009 Test Conditions: Temp: 22.9°C RH: 30.1%
3/10/2009 Test Conditions: Temp: 24.9°C RH: 21.6%
3/11/2009 Test Conditions: Temp: 23.9°C RH: 21.0%

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

Reviewed by:
Timothy D. Barber

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Certificate of Analysis

Pattern Paving Products Texture Coat

GeoEngineers

Certificate of Analysis

Taber Abrasion Traffic Paint Spec Version

Study Number	CS0898
Manufacturer	Pattern Paving Products
Product Name	**Texture Coat**
Batch Number	Base: N86T470, Colorant: Old Brick: Not Supplied
Manufacture Date	Base: 6/16/2008, Colorant: 9/19/2008
Sample Prep Date	3/2/2009
Testing Date(s)	3/9/2009; 3/10/2009; 3/11/2009
Test Method	Modified ASTM D-4060 Abrasion Resistance of Organic Coatings By the 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

Reportable Parameter	Thickness	Cure History	Cycles	Loss	Wear Index
	Mils			grams	
Weight Loss (Wet)	32	7 Day Cure; 24 Hour Soak; 24 Hour Dry in 125°F Oven	105	2.63	25.12

Test conditions (if different from standard test conditions) and/or notes.
Taber Abraser wheels/load used: H-10 / 1000g
Cure Condition @ 23°C 50% R.H.
Reported Test Results are an average of three values; thickness an average of 9 values
Samples were removed from abraser at 100% wear through.
3/9/2009 Test Conditions: Temp: 22.9°C RH: 30.1%
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Certificate of Analysis

SealMaster Color Pave HD 500

GeoEngineers

Certificate of Analysis

Taber Abrasion Traffic Paint Spec Version

Study Number	CS0898
Manufacturer	SealMaster Pavement Products & Equipment
Product Name	**Color Pave HD 500**
Batch Number	Base: Not Supplied, Colorant: 877-1035 (U23)
Manufacture Date	Base: Not Supplied, Colorant: Not Supplied
Sample Prep Date	3/2/2009
Testing Date(s)	3/9/2009; 3/10/2009; 3/11/2009
Test Method	Modified ASTM D-4060 Abrasion Resistance of Organic Coatings By the 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

Reportable Parameter	Thickness	Cure History	Cycles	Loss	Wear Index
	Mils			grams	
Weight Loss (Wet)	22	7 Day Cure; 24 Hour Soak; 24 Hour Dry in 125°F Oven	45	2.07	45.92

Test conditions (if different from standard test conditions) and/or notes.
Taber Abraser wheels/load used: H-10 / 1000g
Cure Condition @ 23°C 50% R.H.
Reported Test Results are an average of three values; thickness an average of 9 values
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