Form GS/STD 911

CITY OF LOS ANGELES

DEPARTMENT OF GENERAL SERVICES
STANDARDS DIVISION

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Lab. No.: 19-752-123 to 124 **(ThermaCote® - LACI Cool Pavement Demo)**
19-512-61 to 62

Rec'd: 12/09/18

Rep't'd: 02/15/19

To: Adel H. Hagekhalil, Executive Director
Bureau of Street Services

Attn: Greg Spotts, Assistant Director
Chief Sustainability Officer
Bureau of Street Services

cc: Keith Mozee, Assistant Director
Bureau of Street Services

Lisa Gabriel, Chief Sustainability Officer
Department of General Services

Test of
THERMACOTE®

At the request of the Bureau of Street Services, a series of tests was performed on **ThermaCote® by ThermaCote, Inc.,** ceramic acrylic weather barrier coating, to determine the safety performance and quality of this product. A 27 foot by 27 foot square was coated with **ThermaCote®** in the parking lot of the La Kretz Innovation Center on 12/9/2018 as part of a Cool Pavement demonstration highlighting multiple products. A representative from Standards was present at the job site on that day to take samples and witness the application process. The application consisted of one coat of material, and two samples were taken.

The samples were tested in accordance with Standard Specifications for Public Works Construction (Greenbook), 2012 Edition, Section 203-9, and for nonvolatile components, pH, specific gravity, and density in accordance with the Product Data Sheet for **ThermaCote®** provided by ThermaCote, Inc.

The samples were also tested for abrasion resistance in accordance with ASTM D3910-15, using Type I rubberized emulsion-aggregate slurry (REAS) as a base. Two specimens of the REAS base were prepared. Each specimen was then coated with one coat of **ThermaCote®** material to simulate the application procedure used in the field. Two additional specimens were prepared and left uncoated as control samples. The Type I REAS was produced by Petrochem Materials Innovation, LLC, and was obtained on 12/11/2018 from a local job site.

In addition, the applied coating was tested to determine the static coefficient of friction and the surface skid resistance in accordance with ASTM C1028 and California Test 342, respectively. These slip and skid resistance tests were performed within the area coated with **ThermaCote®**, with an additional control section (uncoated) also being tested.

On the day of application, an L-shaped area of roughly 2000 square feet was originally planned to be coated with **ThermaCote®**, however, due to issues with the application equipment and lack of sufficient material, the contractor (ThermaCote, Inc.) decided to reduce the application area to a 27' x 27' square (729 square feet). These issues also caused the application to begin more than 5 hours later than the originally scheduled time.

Visual inspections of the application were performed on 12/9/2018, 12/10/2018, and 1/25/2019 at which time the material appeared to be in good condition. Photos from each of these days are included at the end of this report.

Analysis:

The samples were tested for characterization in accordance with manufacturer's Product Data Sheet. Four characterization tests were performed.

Next, the samples were tested for abrasion resistance. This test (Wet Track Abrasion Test) simulates friction from vehicle tires under wet conditions, and measures how much of the product is lost from wear. The maximum allowable loss for REAS under the standard in accordance with Greenbook 2012, Table 302-4.9.1 (A) – type fine aggregate, is 50 grams per square foot of material. The maximum allowable loss established by the City for previously tested Cool Pavement coatings is 25 grams per square foot. The REAS samples coated with **ThermaCote®** lost 11 and 6 grams per square foot, respectively, on each test performed. This is less than the 25 grams per square foot threshold. This data suggests that **ThermaCote®** meets the standard for abrasion loss.

The application was also tested to determine the static coefficient of friction (slip test) and surface skid resistance (skid test). The coated area exceeded the minimum coefficient of friction specified by the City of Los Angeles and the California Department of Transportation (see attached test data sheets). These test results show that the material is safe for pedestrian and vehicular traffic.

Conclusion:

1. Based on this initial analysis, we can conclude that **ThermaCote®** is safe for vehicular and pedestrian traffic.

2. The effect of this product with regard to decreasing temperature on treated pavements over time will need to be evaluated shall the product be used in any future City projects. Testing for this Cool Pavement demo evaluated only the safety and durability of the materials.

3. Additionally, a cost-benefit analysis is recommended for this product, with close attention paid to potential application methods.

Four test data pages and two pages of photos are included.

Approved for release:

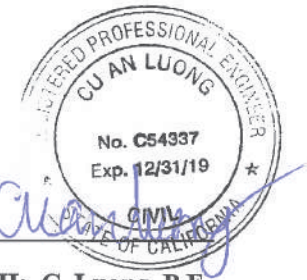
RAY H. SOLOMON, Director
General Services/Standards

RHS:RV:LV:AK:PC:eb

Lab. No.: 19-752-123 to 124

SAMPLE IDENTIFICATION

Sample Name: ThermaCote®
From: ThermaCote, Inc.
Location: LA Kretz Innovation Center (Section 1)
Date Sampled: 12/09/18



Certified By:

Section Head: R. Villacorta

TEST RESULTS

Associate III: C. Luong, P.E.

Test Description	Test Method	19-752-123	19-752-124	City Cool Pavement Specifications
Nonvolatile Components, % Weight	**2012 SSPWC 203-9.2**	52.5	53.0	**50.0 min**
Unit Weight, lbs. per gallon	**ASTM D1475-13**	5.6	5.4	**11.0 min***
Specific Gravity	**ASTM D70-18**	0.681	0.655	--
pH		8.5	8.5	--
Wet Track Abrasion Test, grams./ft^2 **(Type I REAS with one coat of ThermaCote)**	**ASTM D3910-15**	11	6	**25 max**
Wet Track Abrasion Test, grams./ft^2 **(Type I REAS - Control)**	**ASTM D3910-15**	27	24	**50 max**
Color as Received		Gray	Gray	
Cured Film		Gray	Gray	

REMARKS:

*Minimum density for Cool Pavement materials was established at 11 lbs/gallon by the City of Los Angeles based on past test results of a different Cool Pavement material. ThermaCote, however, has a density of 5 lbs/gallon (per Product Data Sheet provided by the manufacturer), which is consistent with test results on this report. Therefore, any potential future applications of this material will require further analysis of its density.

Unit Weight & Nonvolatile Components results were calculated as an average of two specimens.

REAS specimens used for WTAT were produced by Petrochem Materials Innovation, LLC and taken from a job site on 12/11/18 (REAS test results reported in 19-757-806 and 807)

Lab No: 2019-512-61

TEST FOR SURFACE SKID RESISTANCE

Project Title: LACI Cool Pavement Demo
Project Number: S17A0005
Date Tested: 2/12/2019
Test Method: California Test No. 342

Certified by:_____

Lab No.	*Location*	*COEFFICIENT OF FRICTION*				*SPECIFICATION REQUIREMENTS***
		1	*2*	*3*	*Avg.*	
61	**Thermacote**	**0.38**	**0.37**	**0.38**	**0.38**	***0.35 min***
Control	**Adjacent AC Pavement**	**0.37**	**0.37**	**0.40**	**0.38**	***0.35 min***

** For this type of road surface, L.A. City Standard Plan S-601-3 requires a dynamic coeffficient of friction of 0.35 but Caltrans Standard Specifications only require a dynamic coefficient of friction of 0.30 when tested under California Test 342.

Lab No. 2019-512-62

TEST FOR STATIC COEFFICIENT OF FRICTION

Project Title: LACI Cool Pavement Demo
Project Number: S17A0005
Date Tested: 2/12/2019
Specification: Standard Plan S-601 & Project Specifications

Certified by: _____

Lab No. 2019-512-62	Thermacote Cool Seal	
TEST METHOD	**TEST RESULTS**	**SPECIFICATION REQUIREMENTS**
Surface Type	Smooth	
Traffic Type	Vehicle	
Test for Static Coefficient of Friction, ASTM C1028		
Static Coefficient of Friction (Standard Heel Assembly: Neolite)		
Dry	0.92	*0.60 min*
Wet	0.80	

Lab No. 2019-512-62

TEST FOR STATIC COEFFICIENT OF FRICTION

Project Title:	LACI Cool Pavement Demo
Project Number:	S17A0005
Date Tested:	2/12/2019
Specification:	Standard Plan S-601 & Project Specifications

Lab No. 2019-512-62 Control	**Adjacent AC Pavement**	
TEST METHOD	**TEST RESULTS**	**SPECIFICATION REQUIREMENTS**
Surface Type	Smooth	
Traffic Type	Vehicle	
Test for Static Coefficient of Friction, ASTM C1028		
Static Coefficient of Friction (Standard Heel Assembly: Neolite)		
Dry	0.94	***0.60 min***
Wet	0.76	

PHOTOS TAKEN 12/09/2018 – DAY OF APPLICATION - THERMACOTE

Original section to be coated

Surface prep – sweeping and air blowing

Application process – spraying material

Application process

Coated area

Coated area

PHOTOS TAKEN 12/10/2018

12/10/18 – day after application

12/10/18 – day after application

PHOTOS TAKEN 1/25/2019

1/25/19

1/25/19

1/25/19