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File R21919
Project 04CA37330

November 10, 2004

REPORT

on

ROOFING SYSTEMS

Under The

CLASSIFICATION PROGRAM

FOR

LAFARGE ASPHALT ENGINEERING
MISSISSAUGA, ONTARIO CANADA L5N 5Z2

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DESCRIPTION

PRODUCT COVERED:

The product covered by this Report is an asphaltic-based spray applied emulsion identified by the Project sponsor as "Liquid Rubber Spray Grade."

The product in this Report is Classified as to external fire exposure only.

USE:

The product is intended for use as building materials as permitted by authorities having jurisdiction.

TEST RECORD NO. 1

GENERAL:

Test results relate only to the items tested.

INVESTIGATION:

The purpose of this investigation was to establish a program of Follow-Up Service and subsequent Classification and for a spray-applied emulsion identified by the Project sponsor as "Liquid Rubber Spray Grade" as produced at Lafarge Asphalt Engineering's Mississauga, Ontario Canada manufacturing facility.

A representative of Underwriters Laboratories Inc. visited Lafarge Asphalt Engineering's Mississauga manufacturing facility to identify the ingredients, witness blending of the formula and manufacture of a representative batch of "Liquid Rubber Spray Grade" finished product. The information obtained during the visit of UL's representative will be used in establishing specifications for use in the Follow-Up Service Program at Lafarge Asphalt Engineering's Mississauga, Ontario Canada manufacturing facility.

EXAMINATION OF MATERIALS:

Based upon our fire test experience with ballasted Inverted Roofing Emulsion Assembly (IRMA) systems and since stone ballast applied at 1000 lb/sq has shown to be an adequate barrier relative to fire resistance when exposed to the Class A Spread-of-Flame fire test, Class A Spread-of-Flame Fire tests were not required. Therefore, Roofing System Classification incorporating "Liquid Rubber Spray Grade" will be promulgated as Class A noncombustible deck roofing covering systems.

PRACTICABILITY:

The construction materials used in the roofing systems were readily installed by qualified workers with tools and methods commonly used for construction work of similar nature. Materials and installation procedures in accordance with those previously described in this Report are significant factors in the exterior fire performance of the construction.

The following represents the judgment of Underwriters Laboratories Inc. based upon the results of the examination and data analysis presented in this Report, as they relate to established principles and previously recorded data.

Based upon the results of the examination and data analysis presented in this Report, as they relate to established principles and previously recorded data, "Liquid Rubber Spray Grade" emulsion as described herein is judged to be eligible for Classification and Follow-Up Service of Underwriters Laboratories Inc.

Under the Follow-up Service program, the manufacturer is authorized to use the Laboratories' Classification Marking on such products, which comply with the Follow-Up Service Procedure and any other applicable requirements of Underwriters Laboratories Inc. Only those products, that properly bear the Laboratories' Classification Marking, are considered as Classified by Underwriters Laboratories Inc.

CLASSIFICATION MARKING

The Classification Marking to be used with the "Liquid Rubber Spray Grade" finished product is illustrated below:



CEMENTS AND COATINGS FOR
ROOFING SYSTEMS
AS TO AN EXTERNAL FIRE EXOSURE
(Control No.)

CLASSIFICATION

Lafarge Asphalt Engineering's Roofing Covering System Classification card will be promulgated as follows:

LAFARGE ASPHALT ENGINEERING
2283 Argentina Road, Unit 16
Mississauga
Ontario CANADA L5N 5Z2

R21919

COLD APPLICATION SYSTEMS

Class A - Ballasted

Unless otherwise indicated, the insulation and emulsion are laid loosely.

As an alternate, the insulation may be mechanically fastened to the deck with screws and metal or plastic discs, hot roofing asphalt or a combination of screws/discs and hot roofing asphalt.

An optional layer of gypsum board may be placed between the insulation and the roof deck on all systems.

As an alternate, crushed stone conforming to ASTM D-448 No. 4 may be used in lieu of river bottom stone at the same coverage rate.

As an alternate, river bottom or crushed stone conforming to ASTM D-448 No. 3 or 24 may be used in lieu of the No. 4 stone applied at 1000 lbs/sq (min).

As an alternate, river bottom or crushed stone conforming to ASTM D-448 No. 1 or 2 may be used in lieu of the No. 4 stone applied at 1300 lbs/sq (min).

As an alternate, concrete pavers weighing 15 lb/sq (min) and spaced $\frac{1}{4}$ -in. (max) apart may be used in lieu of (or in combination with) the river bottom or crushed stone.

As an alternate in either river bottom stone or paver systems, a protective mat may be placed between the emulsion and surfacing.

1. **Deck:** NC

Incline: 2

Insulation (Optional): Perlite, wood fiber, glass fiber, polyurethane, polyisocyanurate, polystyrene (expanded or extruded), phenolic, perlite/urethane composite, perlite/polyisocyanurate or polystyrene/perlite composite, any thickness. NOTE: When Polystyrene is used on combustible decks, a layer of $\frac{1}{2}$ -in. min Johns Manville "Retrofit Board", $\frac{1}{2}$ -in. min Gypsum Board (not UL Classified) or $\frac{3}{4}$ -in. perlite must be placed either above or below the polystyrene.

Protective Mat (Optional): Exception: Noninsulated systems, polyester or polypropylene protective mat).

Emulsion: " Liquid Rubber Spray Grade" applied at 7- $\frac{1}{2}$ gal/sq.

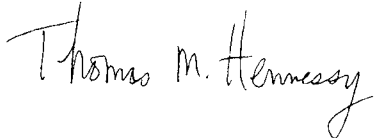
Surfacing: River bottom stone ($\frac{3}{8}$ to 1- $\frac{1}{2}$ -in. diameter) at 1000 lb/sq.

Test Record 1 Summary:

The results of this investigation indicate that the roof covering systems evaluated comply with applicable requirements, and therefore, are judged to be eligible for Classification.

TEST RECORD No. 1 by:

Reviewed by:



THOMAS M. HENNESSY (1.847.664.2623)
Senior Engineering Associate

R. K. LAYMON (1.847.664.2687)
Senior Staff Engineer

TEST RECORD No. 1:

Test results relate only to the items tested.

INVESTIGATION:

The scope of the investigation conducted under Project 05CA21350 is to promulgate Class A, B or C maintenance and repair roof covering system Classification under the Laboratory's product category Roofing Systems (TGFU).

The focus of fire test plan was to evaluate a roof covering system that was engineered to represent a more critical condition in which to measure fire test performance. Therefore, for evaluation purposes, a simulated existing insulated Class A smooth surfaced BUR roof system was constructed whereby loose gravel was removed. The use of the maintenance and repair roof covering system evaluated under this Test Record is intended to maintain an existing Class A, B or C noncombustible roof deck roof covering system Classification.

EXAMINATION OF MATERIALS:

The constituent materials used in the construction of the roof covering system covered by this Test Record were produced under the Follow-Up Service Program of the Laboratories as evidenced by the Classification Marking on the product.

FIRE TESTS:

SAMPLES

SYSTEM No.

DESCRIPTION OF SYSTEM

Simulated Existing Roofing System:

- a. ¼-in. perlite insulation mechanically fastened
- b. Three plies Type 15-lb asphalt saturated felt hot mopped in place
- c. Flood coat of hot roofing asphalt applied at 35-lbs/sq.

Surfacing: "Liquid Rubber Spray Grade/Daclar" emulsion applied at 7½-gal/sq.

Simulated Existing Roofing System:

- a. 3/4-in. perlite insulation mechanically fastened
- b. Three plies Type 15-lb asphalt saturated felt hot mopped in place
- c. Flood coat of hot roofing asphalt applied at
2 35-lbs/sq.

Base Coat: "Liquid Rubber Spray Grade/Daclar" emulsion applied at 7 1/2-gal/sq.

Surfacing: One application BASF "ARC60" White applied at 2-gal/100 ft.² followed by broadcast application of No. 11 ceramic coated roofing granules applied at 40-lbs/100 ft.²

Class A fire tests were conducted on the above systems. These tests were conducted in accordance with the Test Standard ANSI/UL 790, "Tests for Fire Resistance of Roof Covering Materials."

In the spread-of-flame fire test described in this Report, the temperature of the test flame, as measured by a No. 14 gauge chromel-alumel wire thermocouple located as described in Standard ANSI/UL 790, was found to be 1400 ± 50°F. The physical appearance of the test flame when the test apparatus was calibrated for flame temperature, was generally triangular in shape, being about 3-ft wide at the deck's leading edge and gradually narrowing to a width of approximately 6 in. at the top of the 52-in. long calibration deck, with licks of flame extending approximately another 1-ft.

The wind velocity required by ANSI/UL 790 was determined by taking readings on a smooth deck (40-in. wide and 52-in. long) midway up the deck at the center and 3-in. from each vertical edge with a vane type anemometer and timer. The velocity measured at an incline of 5-in./ft was found to be 1050 ± 50-ft/min (12 ± 1/2-mi./h) with the carriage in position.

The results of these tests are summarized below:

SPREAD OF FLAME TEST- CLASS A

Test Code	System No.	Class	Slope of deck, (in/ft)	Maximum Flame Spread, (ft)	Exposure of roof deck (Yes/No)
05310501	1	A	1/2	6.5	No
05310502	1	A	0	5.5	No
07190509	2	A	1/2	3	No
07190510	2	A	1/2	4.5	No

CLASSIFICATIONS

Lafarge Asphalt Engineering's Roofing System Classification card will be revised as follows:

MAINTENANCE & REPAIR SYSTEMS

Class A, B or C

1. Deck: NC

Incline: 1/2

Existing Roof: Class A, B or C insulated or uninsulated, smooth surfaced BUR (loose gravel removed), to retain the existing Classification

Base Coat: "Liquid Rubber Spray Grade/Daclar" emulsion applied at 7 1/2-gal/sq.

Surfacing: One application BASF "ARC60" white applied at 2-gal/100 ft.² followed by broadcast application of No. 11 ceramic coated roofing granules applied at 40-lbs/100 ft.²

Class C

1. Deck: NC

Incline: 0

Existing Roof: Class A, B or C insulated or uninsulated, smooth surfaced BUR (loose gravel removed), to retain the existing Classification

Surfacing: "Liquid Rubber Spray Grade/Daclar" emulsion applied at 7 1/2-gal/sq.

Test Record 2 Summary:

The results of this investigation indicate that the roof covering system evaluated under this Test Record complies with applicable requirements, and therefore, is judged to be eligible for Classification.

TEST RECORD No. 2 by:

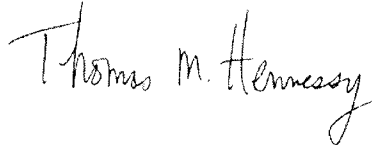
Reviewed by:

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Samples of the product covered by this Report has been found to comply with the requirements and the product is judged to be eligible for Classification and Follow-Up Service. The manufacturer is authorized to use the Laboratories' Mark on such products, which comply with the Follow-Up Service Procedure and any other applicable requirements of Underwriters Laboratories Inc. Only those products, which properly bear the Laboratories' Mark, are considered as Classified by Underwriters Laboratories Inc.

Reported by:



THOMAS M. HENNESSY (1.847.664.2623)
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