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APPROVAL REPORT

GACOSIL S-20 SERIES SILICONE COATINGS FOR USE OVER EXISTING CLASS 1 SINGLE PLY ROOF DECK ASSEMBLIES

Prepared for:

**Gaco Western LLC
PO Box 646
Waukesha, WI 53187-0646**

Project ID: 3039605

Class: 4470

Date of Approval:

3 August 2010

Authorized by:

[Signature]
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**GACOSIL S-20 SERIES SILICONE COATINGS FOR USE OVER
EXISTING CLASS 1 SINGLE PLY ROOF DECK ASSEMBLIES**

From

**GACO WESTERN LLC
PO BOX 646
WAUKESHA, WI 53187-0646**

I INTRODUCTION

- 1.1 Gaco Western LLC submitted their GacoSil S-20 Series Silicone Coatings to determine if they meet the approval requirements of the **Standard** listed below for Class 1 maintenance coatings when used with existing Approved single ply Class 1 insulated roof deck constructions.
- 1.2 This Report may be reproduced only in its entirety and without modification.
- 1.3 **Standard:**

Title	Class Number	Date
Single-Ply, Polymer-Modified Bitumen Sheet, Built-Up Roof (BUR) and Liquid Applied Roof Assemblies for use in Class 1 and Noncombustible Roof Deck Construction	4470	April, 2010

- 1.4 Examination included ASTM E108–10a Spread of Flame testing.
- 1.5 Testing was completed at the FM Global Research Campus in W. Gloucester, RI.
- 1.6 Tests show that the GacoSil S-20 Series Silicone Coatings as tested, meet the Approval requirements of the **Standard** listed above for use in Class 1 insulated roof deck constructions.
- 1.7 **Listings:** The tested constructions meet the Approval criteria of FM Approvals when installed as described in the **CONCLUSIONS** of this report and will be listed in RoofNav.

II DESCRIPTIONS

- 2.1 GacoSil S-20 Series Silicone Coatings are single component, elastomeric, waterproofing, moisture curing, petroleum-free silicone coatings. They include S-2000 white, S-2022 gray and S-2029 dark gray. They are used as a maintenance coating and designed to protect single ply roof cover systems. The system is brush, roller, or spray applied to the roof cover at a rate of 1.67 gal/sq (0.68 L/m²) to achieve a thickness of 22 dry mils.
- 2.2 All other products are as described in RoofNav. Proprietary formulations, specifications and drawings are on file at FM Approvals.

III EXAMINATIONS AND TESTS

3.1 Samples were submitted for examination and testing as follows:

3.1.1 Since the GacoSil S-20 Series Silicone Coatings (S-2000 white, S-2022 gray and S-2029 dark gray) are used as maintenance coatings applied to FM Approved roof cover assemblies, testing was limited to exterior combustibility (ASTM E108-10a) testing specified in the Standard referenced in paragraph 1.3 above.

3.1.2 Components incorporated into test samples were selected by FM Approvals personnel. Test samples were prepared by, or under the supervision of, FM Approvals personnel.

3.1.3 All materials except the GacoSil S-20 products were produced under the FM Approvals Facilities and Procedures Audit program as indicated by FM Approval labels.

3.1.4 All data is on file at FM Approvals under projects 3039605 along with other documents and correspondence applicable to this program.

3.2 ASTM E-108-10a Spread of Flame Tests:

3.2.1 The fire tests from above the roof cover were conducted in accordance with ASTM E108-10a Spread of Flame Tests.

3.2.2 Sample size was 3-1/3 by 8 ft. (1.0 by 2.4 m).

3.2.3 The wind velocity over the top of the standard panel was adjusted to 12±0.5 mph (5.3±0.2 m/s).

3.2.4 Flame exposure: The flame was adjusted to 1400±50°F (760±28°C) for Class A tests. The flame temperature was measured by a thermocouple located 1 in (25.4 mm) above the surface of the standard panel and 1/2 in (13 mm) toward the flame source from the lower edge of the standard panel. The flame was applied to each test panel for 10 minutes.

3.2.5 During and after the application of the flame, each panel was observed for the distance of maximum flame spread, glowing brands and other damage.

3.2.6 Eight 3-1/3 by 8 ft. (1.0 by 2.4 m) test samples were prepared. The components and sequence of installation were as follows:

Test Samples No. 1 and 2:

- 1/2 in. (13 mm) thick plywood deck
- 1.5 in. (38 mm) thick Johns Manville ENRGY 3, preliminarily fastened to the wood deck.
- 0.045 in. (1.2 mm) Burkeline Hypalon (CSPE) roof cover mechanically fastened through to the deck
- GacoFlex E5320 Primer applied to the substrate at a rate of 0.29 gal/sq (0.12 L/m²) [mixed gallon (½ gal A Side - ½ gal B Side)]
- GacoSil S-20 (S-2000 White) Silicone Coating applied at a rate of 1.67 gal/sq (0.68 L/m²) to achieve 22 dry mils

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Test Sample No. 3 and 4:

- 1/2 in. (13 mm) thick plywood deck
- 1.5 in. (38 mm) thick Firestone ISO 95+ GL, preliminarily fastened to the wood deck
- 0.060 in. (1.5 mm) Firestone RubberGard LS-FR EPDM roof cover mechanically fastened through to the deck
- GacoFlex E5320 Primer applied to the substrate at a rate of 0.29 gal/sq (0.12 L/m²) [mixed gallon (½ gal A Side - ½ gal B Side)]
- GacoSil S-20 (S-2000 White) Silicone Coating applied at a rate of 1.67 gal/sq (0.68 L/m²) to achieve 22 dry mils

Test Samples No. 5 and 6:

- 1/2 in. (13 mm) thick plywood deck
- 1.5 in. (38 mm) thick Johns Manville ENRGY 3, preliminarily fastened to the wood deck
- 0.060 in. (1.2 mm) Johns Manville PVC roof cover mechanically fastened through to the deck
- GacoFlex E5320 Primer applied to the substrate at a rate of 0.29 gal/sq (0.12 L/m²) [mixed gallon (½ gal A Side - ½ gal B Side)]
- GacoSil S-20 (S-2000 White) Silicone Coating applied at a rate of 1.67 gal/sq (0.68 L/m²) to achieve 22 dry mils

Test Samples No. 7 and 8:

- 1/2 in. (13 mm) thick plywood deck
- 1.5 in. (38 mm) thick Johns Manville ENRGY 3, preliminarily fastened to the wood deck
- 0.060 in. (1.2 mm) thick Johns Manville TPO roof cover mechanically fastened through to the deck
- GacoFlex E5320 Primer applied to the substrate at a rate of 0.29 gal/sq (0.12 L/m²) [mixed gallon (½ gal A Side - ½ gal B Side)]
- GacoSil S-20 (S-2000 White) Silicone Coating applied at a rate of 1.67 gal/sq (0.68 L/m²) to achieve 22 dry mils

Spread of Flame Test Results:

<u>Sample & Slope:</u>	<u>Max Flame Spread:</u>	<u>Class Passed:</u>
1 – 2.0 in 12	28 in. (711 mm)	A
2 – 2.0 in 12	32 in. (813 mm)	A – confirming of # 1
3 – 0.5 in 12	16 in. (406 mm)	A
4 – 0.5 in 12	No ignition	A – confirming of # 3
5 – 1.0 in 12	27 in. (686 mm)	A
6 – 1.0 in 12	20 in. (508 mm)	A – confirming of # 5
7 – 0.75 in 12	12 in. (305 mm)	A
8 – 0.75 in 12	06 in. (152 mm)	A – confirming of # 7

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Deck exposure, flying brands and significant lateral flame spread were not observed during the tests.

IV MARKING

- 4.1 The manufacturer shall mark each container with the manufacturer's name and product trade name. In addition, the container must be marked with the Approval Mark of FM Approvals.
- 4.2 Markings denoting Approval by FM Approvals shall be applied by the manufacturer only within and on the premises of manufacturing locations that are under the FM Approvals Facilities and Procedures Audit program.
- 4.3 The manufacturer agrees that use of the FM Approvals name or Approval Mark is subject to the conditions and limitations of the Approval by FM Approvals. Such conditions and limitations must be included in all references to Approval by FM Approvals.

V REMARKS

- 5.1 The securement of the roof system to which the maintenance coating is applied must be enhanced at the building corners and perimeter as outlined in FM Global Property Loss Prevention Data Sheet 1-29.
- 5.2 The maintenance coating must be installed over a roof cover using a roof perimeter flashing system Approved by FM Approvals. See RoofNav.

VI FACILITIES AND PROCEDURES AUDITS

The Gaco Western LLC manufacturing facilities in Waukesha, WI is subject to periodic audit inspections to determine that the quality and uniformity of the materials have been maintained and will provide the same level of performance as originally Approved. The facilities and quality control procedures in place have been found to be satisfactory to manufacture product identical to that examined and tested as described in this report.

VII MANUFACTURER'S RESPONSIBILITIES

- 7.1 To assure compliance with his procedures in the field, the manufacturer shall supply to the roofer such necessary instruction or assistance required to produce the desired performance achieved in the tests.
- 7.2 The manufacturer shall notify FM Approvals of any planned change in the Approved products, prior to general sale or distribution, using Form 797, Approved Product Revision Report.

VIII DOCUMENTATION

The following documents describe GacoSil S-20 Series Coatings.

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Document	Issue or Revision	Description
FACILITIES AND PROCEDURES AUDIT MANUAL FOR POLYFOAM 273 SPRAY FOAM ROOF INSULATION AND URESHIELD 6006 and GACOSIL S-10 LIQUID APPLIED ROOF COVERS AND GACOSIL S-20 SERIES MAINTANENCE COATINGS	July, 2010	Audit Manual

IX CONCLUSIONS

- 9.1 The test results from this test program indicates that the Gaco Western LLC, GacoSil S-20 Series Silicone Coatings (S-2000 white, S-2022 medium gray and S-2048 tan) meet the FM Approvals Standard 4470 Approval requirements as a roof coating when applied over existing Approved mechanically secured or adhered Hypalon (CSPE), EPDM, PVC, CPA, or TPO single ply roof assemblies in steel or concrete deck roof constructions when used as follows. The primer and coating can be brush, roller, or spray applied.

Coating applied as noted below to any FM Approved Hypalon (CSPE), EPDM, PVC, CPA, or TPO single ply roof assemblies. Wind and hail ratings remain the same as currently Approved assembly.

9.1.1

Roof Cover:	Hypalon (CSPE)
Coating:	GacoFlex E5320 Primer applied to the substrate at a rate of 0.29 gal/sq (0.12 L/m ²) [mixed gallon (½ gal [1.9 L] A Side and ½ gal [1.9 L] B Side), followed by GacoSil S-20 Series (S-2000 white, S-2022 gray and S-2029 dark gray) Silicone Coating applied at a rate of 1.67 gal/sq (0.68 L/m ²) to achieve 22 dry mils.
ASTM E108:	2 in 12

9.1.2

Roof Cover:	EPDM
Coating:	GacoFlex E5320 Primer applied to the substrate at a rate of 0.29 gal/sq (0.12 L/m ²) [mixed gallon (½ gal [1.9 L] A Side and ½ gal [1.9 L] B Side), followed by GacoSil S-20 Series (S-2000 white, S-2022 gray and S-2029 dark gray) Silicone Coating applied at a rate of 1.67 gal/sq (0.68 L/m ²) to achieve 22 dry mils.
ASTM E108:	1/2 in 12

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9.1.3

Roof Cover:	PVC
Coating:	GacoFlex E5320 Primer applied to the substrate at a rate of 0.29 gal/sq (0.12 L/m ²) [mixed gallon (½ gal [1.9 L] A Side and ½ gal [1.9 L] B Side), followed by GacoSil S-20 Series (S-2000 white, S-2022 gray and S-2029 dark gray) Silicone Coating applied at a rate of 1.67 gal/sq (0.68 L/m ²) to achieve 22 dry mils.
ASTM E108:	1 in 12

9.1.4

Roof Cover:	CPA
Coating:	GacoFlex E5320 Primer applied to the substrate at a rate of 0.29 gal/sq (0.12 L/m ²) [mixed gallon (½ gal [1.9 L] A Side and ½ gal [1.9 L] B Side), followed by GacoSil S-20 Series (S-2000 white, S-2022 gray and S-2029 dark gray) Silicone Coating applied at a rate of 1.67 gal/sq (0.68 L/m ²) to achieve 22 dry mils.
ASTM E108:	1 in 12

9.1.5

Roof Cover:	TPO
Coating:	GacoFlex E5320 Primer applied to the substrate at a rate of 0.29 gal/sq (0.12 L/m ²) [mixed gallon (½ gal [1.9 L] A Side and ½ gal [1.9 L] B Side), followed by GacoSil S-20 Series (S-2000 white, S-2022 gray and S-2029 dark gray) Silicone Coating applied at a rate of 1.67 gal/sq (0.68 L/m ²) to achieve 22 dry mils.
ASTM E108:	3/4 in 12

9.1.6 The above constructions meet the requirements for Class 1A fire classification when installed at the slopes indicated above. If the existing roof cover meets a lower classification and/or a lower slope the rating of the completed assembly meets the lesser rating.

9.2 Consult RoofNav for details of all constructions.

9.3 Tests show that the tested roof constructions in and of themselves would not create a need for automatic sprinklers.

9.4 Since a duly signed Master Agreement is on file for this customer, Approval is effective as of the date of this report.

9.5 Continued Approval will depend upon satisfactory field experience and periodic Facilities and Procedures Audits.

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TESTING SUPERVISED BY:

M. P. DeSousa

PROJECT DATA RECORD:

Project I.D. # 3039605

ORIGINAL TEST DATA:

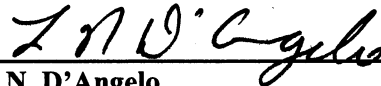
PDR for Project I.D. # 3039605

REPORT BY:



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