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# GACO WESTERN

*Application Specification:*

**SI-22-GS20**

February 2007  
Supersedes 03/06

## Section: 07545

### **GACOSIL 22 MIL S-20 SOLVENTLESS SILICONE ELASTOMERIC COATING SYSTEMS OVER SEAMLESS SPRAYED IN PLACE POLYURETHANE FOAM INSULATION**

#### 1.1 SUMMARY

**NOTE TO ARCHITECTS AND ENGINEERS:** This specification provides for a fire resistant roof covering system which meets Class A non combustible deck requirements under ASTM E-108 Class "A". Suitable substrates include concrete, gypsum board, metal and certain heavy wood decks. For re-roofing over BUR or other roof covering materials, system, applied according to this specification will not alter the existing fire resistance rating. Surfaces to receive the roof covering system must comply with applicable building codes.

Sprayed in place polyurethane foam is applied at a desired thickness (1" (2.54 cm) minimum)) to fulfill thermal insulation requirements and to provide seamless monolithic surface over a variety of roof designs, shapes, and draining slopes.

When properly applied, GacoSil S-20 series coating system provides a weathertight seal that protects the polyurethane foam from degradation caused by ultra violet light, water and other normal weathering hazards. This application incorporates the optional application of granules. The thickness of the foam insulation can be varied to provide a desired thickness to create a positive slope to drain. The appearance of the system depends on the finished surface of the foam insulation which normally has slight undulations in thickness. Sprayed-in-place polyurethane foam follows the contour of the substrate and will reflect projections and depressions.

The GacoSil S-20 coating system discussed in this specification has a moderate rate of water vapor transmission and is not recommended for use on cold storage or cryogenic structures. Such structures may have constant high water vapor drive causing long-term accumulation of moisture in the insulation. Consult Gaco Western for vapor retardant systems to use on refrigerated structures.

*This specification is intended only as a guide for the development of a project specification. The suitability of this specification for a particular project must be determined by a qualified representative of the owner.*

Elements of this specification may require modification in order to clearly delineate project requirements. Sections that are not pertinent may be deleted.

#### 1.2 RELATED SECTIONS

A. Cast-In-Place Concrete:	Section 03300	F. Vapor barriers/air barriers:	Section 07190
B. Flashing/Sheet Metal:	Section 07600	G. Board Insulation:	Section 07212
C. Roof Accessories:	Section 07800	H. Skylights:	Section 05300
D. Rough Carpentry/ wood blocking	Section 06100	I. Metal decking:	Section 05300
E. Drains, vents, penetrations	Section 07700		

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### 1.3 SUBMITTALS

- A. Product Data: Submit manufacturer's standard submittal package including specification, installation instructions, and general information for each waterproofing material.
- B. Applicator Qualifications: Submit current "Qualified Applicator" certificate from the specified waterproofing manufacturer.
- C. Sample: Two physical samples reflecting completed installation, i.e. finish, color, shall be submitted to the owner/owners representative. Size of these samples shall be 12" X 12" (30.48 cm x 30.48 cm) minimum.
- D. Substrate Conditions:
  - 1. Manufacturer's representative to present to owner a completed inspection form verifying substrate condition and any noted defects not specifically addressed in regard to this installation.
  - 2. Surface shall be free from loose dirt, stone, debris, moisture, and shall be in stable condition. Any work on the area to receive this application shall be completed prior to installation.
  - 3. Applicator shall complete a substrate inspection prior to start of roofing. The architect/owner and applicator shall accept the surface. Start of the work constitutes acceptance.

### 1.4 QUALIFICATIONS

- A. Primary polyurethane foam insulation and the designated elastomeric coating system shall be of:
  - 1. Single manufacturer. Manufacturer shall have a minimum of 10 years experience in the manufacture of materials of this type.
  - 2. Applicators shall have a minimum of 5 years experience in the application of waterproofing materials of the type specified. Applicator shall possess a current "Qualified Applicator" certificate from the specified waterproofing manufacturer.
- B. Pre-Bid Conference: 10 working days prior to bid opening there is to be a mandatory Pre-Bid Conference. Anyone not attending the Pre-Bid Conference will not be allowed to bid the project. All products considered an equal to the specified product or any changes in the scope of work installation or specifications must be presented at the Pre-Bid Conference. If a change in the specifications is accepted, it will be considered as an alternate and will be presented as a bid amendment issued 5 working days prior to the bid opening. No other changes to specification or bid documents will be accepted.
- C. Materials other than specified shall be submitted to the architect/owner for approval no later than ten days prior to bid date. In requesting prior approval, it shall be necessary to submit:
  - 1. A letter of certification, signed by an officer of the manufacturer, stating that the alternative material is equal to or better than the specified product.
  - 2. Independent laboratory test data giving physical property values in comparison to the specified material.
- D. Pre-Installation Conference: Just prior to commencement of the installation, meet at the site with a representative of the coating manufacturer, the waterproofing contractor, the general contractor, the architect and other parties affected by this section. Review methods and procedures, substrate conditions, scheduling and safety.

### 1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver all materials in sufficient quantities as not to cause delays in application of the roofing system. Owner/owner's representative shall reject damaged materials not conforming. Rejected materials shall be removed immediately from the job site and replaced at no additional cost to the owner.

- B. Store materials as recommended by manufacturer and conforming to applicable safety regulatory agencies: town, state, and federal. Refer to all applicable data including but not limited to MSDS sheets, Product Data sheets, product labels and specific instructions for personal protection.
- C. Provide adequate ventilation, protection from hazardous fumes, overspray potential to workers and associated trades in close proximity of site applications.

### 1.6 ENVIRONMENTAL REQUIREMENTS

Proceed with work of this section only when existing and forecasted weather conditions will permit the application to be performed in accordance with the manufacturer's recommendations.

- A. **Do not** install foam insulation under the following conditions:
  - 1. When ambient temperature is below 50°F (10° C) or surface temperature is above 160°F (71° C).
  - 2. When relative humidity is above 80% or temperature is within 5°F of dew point.
  - 3. When wind velocity exceeds 15 mph (24 kph)  
(Without use of wind screen)

### 1.7 WARRANTY

- A. The contractor shall guarantee that all work performed under this section will be free from defects in material and workmanship. Upon notice of defect in writing to the contractor within one year after completion of the work, the contractor shall, at his own expense, make necessary repair or replacement of the defective work.
- B. A warranty is available with this system provided it has been installed by a Gaco Western Qualified Applicator and is installed according to this specification. Application for Warranty must be made prior to start of job.
- C. Protection of building and occupants:
  - 1. All surfaces not to receive system specified shall be protected from overspray hazard i.e. windows, doors, exterior and vehicles. Protective coverings shall be secured against wind and shall be vented if used in conjunction with applications preventing collection and moisture.
  - 2. Contractor is to post signs noting potential overspray hazard within 400' (121.90 m) of applications.
  - 3. All air intake ventilation equipment shall be turned off to prevent fumes from entering building.
  - 4. Surfaces damaged during application shall be restored at no expense to the owner.
  - 5. No smoking signs to be posted as mandated by local fire officials.
- D. Substrate: Proceed with work as specified only after substrate construction, preparation, and detail work has been completed.
- E. Equipment: All equipment used during operations shall be located so as not to adversely effect the daily operations or endanger occupants, structure or materials on-site. All spray equipment must be grounded during operations.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURER:

Acceptable Manufacturers:

Gaco Western

**2.2 MATERIALS**

- A. Primer: Prime steel, aluminum, copper and ferrous metals with GacoFlex E-5320.
- B. Polyurethane foam insulation shall be designed for spray application resulting in high quality, rigid urethane under the prevailing application conditions. Polyurethane foam shall be of the proper formulation to meet climatic conditions at the time of application.
  - 1. Polyurethane foam insulation shall be Gaco RoofFoam 273 manufactured by Gaco Western meeting the following minimum physical and performance properties.

Gaco RoofFoam 273

<u>Property</u>	<u>Value</u>	<u>Test Method</u>
Nominal Density	2.5/3.0 lbs/ft <sup>3</sup>	ASTM 1622-93
Closed Cells	94.3 %	ASTM D-2856 C-94
Compressive	50.1 psi	ASTM D-1621
R Factor	7.1 @ 40°F (4°C)	ASTM C-518

**NOTE:** It is Gaco Western's position that the use of foamed plastic insulation for interior application on walls or ceilings may represent an unreasonable fire hazard unless the foamed plastic insulation is covered with a thermal barrier and that the resulting composite construction has a minimum 15 minute rating as listed by Factory Mutual Research Corporation or other equally accepted listing agency.

Fire rated coating systems for plastic foam insulation tested under ASTM E-108 Class "A" Roof Composite Construction do not qualify for thermal barrier use on interior walls and ceilings.

- C. Expansion Joint Covers: Where called for on drawings, expansion joint covers will be GacoFlex Neoprene Sheet, 1/16" (.16 cm) thick, using GacoFlex N-1207 Neoprene Adhesive, in a width of \_\_\_\_\_ (to be stated in the published specification. If none stated, bids will be based on 12" (30.48 cm)) Apply in accordance with Gaco Western's General Instructions GW-5-D3 Details.
- D. Elastomeric Coating:  
Gaco Western GacoSil S-20 series using contrasting colors and having the following physical properties:

<u>Property</u>	<u>Value</u>	<u>Test Method</u>
Tensile Strength	550 psi	ASTM D-412
Elongation	150%	ASTM D-412
Tear Resistance	21 pli	ASTM D-624
Hardness	55 Shore A	ASTM D-2240
Water Vapor Permeability	5.3 perms Procedure B at 0.5 mm (20 mils) thickness ± 10% Minimum permeance requirement is 2.5 U.S. perms	ASTM E-96
Volume Solids	95% ± 1%	Calculated
Reflectance	0.88	ASTM C-1549 S-2000 White
Emittance	0.87	ASTM C-1371 S-2000 White

- E. Flashing: Gaco RoofFoam can be self flashing at curbs, parapets, walls and penetrations. Contact a Gaco Western Representative for assistance.

Flashing at seismic joints require GacoFlex Field Curing Neoprene Sheet 1/16" (.16 cm) and GacoFlex N-1207 Neoprene Adhesive.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verify that substrate is ready to receive work, surface is clean, dry and free of substances which could affect bond.
- B. Cleaning of the roof should be accomplished by using power vacuum equipment, power sweepers, air blowers, power washers or other suitable means.
- C. All associated construction (i.e. drain installation, edge flashing, penetrations and mechanical apparatus) shall be completed prior to commencement of specified roofing system.
- D. Verify that all other work involved with this area, done under other sections, has been completed and accepted by the architect and general contractor prior to starting the waterproofing application.

### 3.2 PREPARATION

- A. Clean substrate to remove any and all surface contaminants. Refer to Gaco Western's General Instructions GW-1-1, Surface Preparation.
- B. Mask off all adjoining areas that will not receive the roofing system.

### 3.3 INSTALLATION

- A. Technical Advice: The installation of this roofing system shall be accomplished in the presence of, or with the advice of the manufacturer's technical representative. Contact the nearest regional office for assistance.
- B. Primer/Sealer: Apply GacoFlex E-5320 at one gallon per 300 square feet (3.78 L / 27.9 m<sup>2</sup>) to steel, aluminum, copper and ferrous metals. Apply primers as required according to published application instructions. The primer must be completely dry before foam application.
- C. Install Gaco RoofFoam 273 in a thickness of \_\_\_\_\_ ± 1/4" (.64 cm), (1" (2.54 cm) minimum required.) Neatly terminate the sprayed-in-place polyurethane foam on all vertical surfaces, (i.e. pipe penetrations, vents, mechanical equipment, parapet walls, etc.) a minimum of 3" (7.62 cm) or 2<sup>1</sup>/<sub>2</sub> times as specified minimum foam thickness.  
  
Example: If 1" (2.54 cm) minimum is specified, all vertical terminations shall have a minimum of 2 1/2" (6.35 cm) sprayed up onto the vertical surface and canted to the horizontal surface.
  - 1. Foam spray application shall be limited to an area which can be completed to full foam thickness in one day.
  - 2. The completed foam surface shall be smooth to orange peel texture; popcorn texture is not acceptable.
  - 3. The completed foam surface shall be free of pinholes and "glass windows" due to improper equipment calibration or climatic conditions.
  - 4. Apply base protective coating to foam surface on the same day (2 hours minimum).
- D. Elastomeric Base Coating: Apply one coat of GacoSil S-20 silicone coating system to achieve a nominal dry film thickness of 11 dry mils (.28 mm). The coverage rate shall be no less than .75 gallon per 100 sq. ft. (2.84 L / 9.3 m<sup>2</sup>) Double coat flashing and edge terminations.

**NOTE:** Base coat must cover all surfaces completely extending at least 2" (5.08 cm) beyond foam on vertical terminations. An extra pass of base coat material is required at all edges and penetrations if neoprene sheet flashing is not used. Contractor need to figure losses due to overspray, foam texture and wind. Increasing estimated gallonage required by 10% should suffice.

Base coat shall be allowed to cure a minimum of 2 to 6 hours. For best results, apply at temperatures above 50°F. (10°C) to a dry, frost free surface. Surface must be dry, clean & free of debris between coats.

E. Elastomeric Top Coating: Apply one coat of GacoSil S-20 coating system to achieve a nominal film thickness of 11 dry mils (.28 mm). The coverage rate shall be no less than .75 gallon per 100 square feet. (2.84 L / 9.3 m<sup>2</sup>). Double coat flashing and edge termination.

**NOTE:** Topcoat must completely cover the base coat (base coat must be alternate color from top coat) including expansion joint covers and flashing. Contractor needs to figure losses due to overspray, foam texture and wind. Increasing estimated gallons required by 10% should suffice.

**NOTE:** The S-20 Silicone coating may be sprayed in a single pass @ 1.5 gallons per 100 square ft. (5.68 L / 9.3 m<sup>2</sup>). **This type of application is only acceptable on polyurethane foam with a texture classified as slight orange peel as per the SPFA.** The 1.5 gallons per 100 square ft (5.68 L / 9.3 m<sup>2</sup>) shall yield a total of 22 dry film (.56 mm). See our GacoSil S-20 Product Data Sheet for more information on spraying the material.

F. Granular Coat: An additional granular coat may be added. Apply one coat of GacoSil S-20 at the rate of not less than .5 gallon per 100 square feet (1.89 L / 9.3m<sup>2</sup>), (8 mils dry (.20 mm)). Immediately broadcast roofing granules into finish coat at the rate of 30 lbs per 100 square feet. (13.6 kg / 9.3m<sup>2</sup>).

G. No traffic shall be permitted on the coated surface for a minimum of 3 days. Damage to the surface by other trades shall not be the responsibility of the roofing contractor.

### 3.4 FIELD QUALITY CONTROL

A. The contractor shall maintain system to verify compliance with this specification.

1. Thickness of polyurethane foam and applied coating shall be measured and recorded for each coat and the total protective coating system.

B. The owner's representative has the option of taking core samples to verify compliance with the specification.

1. Cut out sections shall be immediately repaired by the contractor at his cost.

2. All costs of testing the core samples shall be paid by the owner.

C. Any variations from specified limits found by contractor or owner's representative shall be corrected by the contractor.

D. Dry Film Thickness: The total dry mil thickness of the coating, without granular coat, shall measure a minimum of 20 dry mils (.51 mm) with an average of 22 mils (.56mm). Rough foam which increases surface area will require proportionate increases in coating to maintain average dry film thickness.