

Section: 07545
GACOFLEX ELASTOMERIC COATING SYSTEMS OVER SEAMLESS
SPRAYED IN PLACE POLYURETHANE FOAM INSULATION

PART 1 - GENERAL

1.1 SUMMARY

NOTE TO ARCHITECTS AND ENGINEERS: This specification provides for a fire resistant roof covering system. 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.

The deck should have at least a ¼" (0.64 cm) to the foot slope for drainage and avoid ponding water. Ponding water is defined as standing water in excess of 100 square feet (9.3 m²) or in excess of ½" (1.27 cm) deep or water that does not evaporate within 72 hours.

Thickness of the foam insulation may vary to allow slope to drain, build crickets in corners, and fill low areas. The appearance of the system depends on the surface of the foam insulation that normally has slight profile. Sprayed in-place polyurethane foam follows the contour of the substrate, reflecting projections and depressions.

The GacoFlex elastomeric coating systems in this specification have moderate rate of water vapor transmission and are 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.

The Specifier must choose one of the base coat/top coat combinations listed in the systems chart included. This selection is determined by the physical properties listed in the back of this specification.

This specification is intended only as a guide for the development of a project specification. A qualified representative of the owner must determine the suitability of this specification for a particular project.

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" (30.48cm x .30.48cm) 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, and 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 polyurethane 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 km/h) (Without use of windscreen)

1.7 WARRANTY

- A. The manufacturer shall provide a warranty upon the successful completion of the roofing system. Application for a warranty must be made prior to start of job.
- B. 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 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.
- C. Substrate: Proceed with work as specified only after substrate construction, preparation, and detail work has been completed.
- D. 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 MANUFACTURERS

Acceptable Manufacturers:
Gaco Western

2.2 MATERIALS

- A. Primer: Choose the appropriate Gaco Western primer from the Primer Recommendation Chart.
- B. Polyurethane Foam: Gaco RoofFoam 273.
- C. Elastomeric Base Coating:
1. GacoFlex Acrylic Latex Coating A-30 or A-32.
 2. GacoFlex Single Component Aromatic Polyurethane Ure-Shield U-6006.
 3. GacoFlex Two Component Aromatic Polyurethane Base Coats UB-64 series.

D. Elastomeric Top Coating:

1. GacoFlex Acrylic Latex Coating A-30 or A-32.

Note: GacoFlex A-3200 white meets Energy Star reflectance performance requirements (for low-slope roofs).

2. GacoFlex Single Component Aromatic Polyurethane Ure-Shield U-6006.

See SI-22-GS10 and SI-22-GS20 for Silicone Application

E. Elastomeric Single Pass Coating:

1. GacoFlex U-62 two component 100% Solids Polyurethane.
2. GacoFlex U-8782 two component Fast Set Polyurea Hybrid.

F. Miscellaneous Accessories: All items incorporated into this system shall be compatible with and approved by the system manufacturer.

2.3 PERFORMANCE QUALIFICATIONS

A. General: This entire system including all accessories shall be a seamless, insulated and waterproof roofing system designed for the intended use. It shall meet the requirements of UL 790 Class A on non-combustible substrates. It shall not be adversely affected by normal weathering for exposure to occasional foot traffic required for maintenance of roof mounted equipment. The service temperatures of this system shall range from -40°F to 200°F (-40° to 93° C) (exempt acrylics which would be 0°F to 200°F) (-18° to 93° C). The manufacturer shall test it to meet the following minimum physical properties.

B. Polyurethane Foam: In addition to the following minimum properties the polyurethane foam insulation shall be designed for spray application resulting in high quality, rigid polyurethane foam under the prevailing application conditions. Polyurethane foam shall be of the proper formulation to meet climatic conditions at the time of application.

NOTE: Polyurethane foam used in interior walls or ceilings may represent an unreasonable fire hazard unless it is covered with a thermal barrier and that the resulting composite construction has a minimum 15-minute rating as listed by an acceptable agency.

1. Gaco RoofFoam 273

| <u>Property</u> | <u>Value</u> | <u>Test Method</u> |
|------------------|-----------------------------|--------------------|
| Nominal Density | 2.5/3.0 lbs/ft ³ | ASTM 1622-93 |
| Closed Cells | 94.3 % | ASTM D-2856 C-94 |
| Compressive | 50.1 psi | ASTM D-1621 |
| R Factor Initial | 7.1 @ 40°F | ASTM C-518 |
| R Factor Aged | 6.6 @ 40°F | ASTM C-518 |

C. Elastomeric Base Coating: Enter physical properties from product data sheets.

| <u>Property</u> | <u>Value</u> | <u>Test Method</u> |
|------------------|--------------|--------------------|
| TensileStrength | _____ | ASTM D-412 |
| Elongation | _____ | ASTM D-412 |
| Tear Resistance | _____ | ASTM D-624 |
| Hardness | _____ | ASTM D-2240 |
| Water Absorption | _____ | ASTM D-471 |
| Permeability | _____ | ASTM E-96 |
| Volume Solids | _____ | Calculated |
| Reflectance | _____ | |
| Emmittance | _____ | |

D. Elastomeric Top Coating: Enter physical properties from product data sheets.

| <u>Property</u> | <u>Value</u> | <u>Test Method</u> |
|------------------|--------------|--------------------|
| Tensile Strength | _____ | ASTM D-412 |
| Elongation | _____ | ASTM D-412 |
| Tear Resistance | _____ | ASTM D-624 |
| Hardness | _____ | ASTM D-2240 |
| Water Absorption | _____ | ASTM D-471 |
| Permeability | _____ | ASTM E-96 |
| Volume Solids | _____ | Calculated |
| Reflectance | _____ | |
| Emittance | _____ | |

E. Elastomeric Single Pass Coatings:

| <u>Property</u> | <u>Value</u> | <u>Test Method</u> |
|------------------|--------------|--------------------|
| Tensile Strength | _____ | ASTM D-412 |
| Elongation | _____ | ASTM D-412 |
| Tear Resistance | _____ | ASTM D-624 |
| Hardness | _____ | ASTM D-2240 |
| Water Absorption | _____ | ASTM D-471 |
| Permeability | _____ | ASTM E-96 |
| Volume Solids | _____ | Calculated |
| Reflectance | _____ | |
| Emittance | _____ | |

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that substrate is ready to receive work; surface is clean, dry and free of substances that 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: Appropriate primers are as follows:
 - 1. Metal: Apply GacoFlex E-5320 applied at the rate of one gallon per 250 square feet (3.78 L /23.2m²).
 - 2. Copper: Apply GacoFlex E-5320 applied at the rate of one gallon per 250 square feet (3.78 L /23.2m²) or GacoFlex U-5677 applied at the rate of one gallon per 300 square feet (3.78 L / 27.9 m²).

3. Concrete: Apply GacoFlex U-5677 applied at the rate of one gallon per 300 square feet (3.78 L / 27.9m²) followed by GacoFlex E-5320 applied at the rate of one gallon per 250 square feet (3.78 L / 23.2m²).

Alternative Concrete Primer/Sealer: Apply one coat of GacoFlex E-5511 to all surfaces to receive the fluid applied waterproofing. Apply at a rate of one gallon per 150 sq. ft. (3.78 L / 13.9m²) and allow curing at least 6 hours, but no more than 3 days before applying the basecoat.

- C. Install Gaco RoofFoam 273 in a thickness of _____ ± 1/4" (0.64cm), (1" (2.54cm) 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" (7.62cm) or 2¹/₂ times as specified minimum foam thickness.

Example: If 1" (2.54 cm) minimum is specified, all vertical terminations shall have a minimum of 2 ½" (6.35cm) sprayed up onto the vertical surface and canted to the horizontal surface.

1. The foam spray application shall be limited to only that amount which can be completed to full foam thickness in one day and base coat applied.
2. The completed foam surface shall be between smooth to orange peel in surface texture. Popcorn texture is not acceptable.
3. The completed surface shall be free of pinholes and "fisheyes" due to improper equipment calibration or climatic condition.
4. The polyurethane foam shall be sprayed in a manner so as to achieve a full and proper spray pattern. The polyurethane foam application shall be applied in passes no less than 1" (2.54cm) in thickness.

- D. Base Coating: Apply base protective coating to foam surface on the same day as the foam application (2 hour minimum). Apply _____ coat(s) of Gaco Western's _____ to achieve a nominal, film thickness of _____ dry mils. The coverage rate shall be no less than _____ gallon(s) per 100 square feet (9.3m²). Double coat flashing and edge termination. Refer to the product label for application instructions.

1. Base coat shall be allowed to cure a minimum of _____ before proceeding with topcoat application.
2. Base coat shall be second coated or top coated within _____. If application is delayed beyond that time, consult Gaco Western for primer recommendations.

NOTE: Base coat must cover all surfaces completely, extending at least 2" (5.08 cm) beyond foam on vertical terminations. Extra base coat material is required at all edges and penetrations if neoprene sheet flashing is not used. Losses due to overspray, surface profile, foam texture and wind, increase material required.

- E. Top Coating: Apply one top coat of Gaco Western's _____ to achieve a nominal film thickness of _____ dry mils. The coverage rate shall be no less than _____ gallon(s) per 100 square feet (9.3m²). The final color shall be _____ from the manufactures standard color chart.

NOTE: Topcoat must completely cover the base coats including expansion joint covers and flashing. Losses due to overspray, foam texture, surface profile, or wind may increase material requirements.

F. GacoFlex Single Pass System:

GacoFlex Elastomeric Coatings provide the necessary flexibility, toughness and weather resistance for long-term protection of the polyurethane foam insulation. The system is designed to achieve a uniform coating thickness over the urethane foam insulation, which has a slightly textured finish. GacoFlex Elastomeric Coatings, when applied according to this specification, will provide a nominal _____ dry film thickness.

PHYSICAL PROPERTY CHART**SI SPEC**

The following chart is needed to complete Section 2.3 Performance Qualifications Part C,D & E and 3.3 Installation Parts D, E & F of this specification. Simply choose a base coat and a top coat that meet the physical properties required for your project.

| TEST METHODS PRODUCTS | PRODUCT TYPE(BASE, TOP, SINGLE) | TENSILE STRENGTH ASTM D-412 | TENSILE ELONGATION ASTM D-412 | TEAR STRENGTH ASTM D-642 | HARDNESS ASTM D-2240 SHORE A | W.V.P. ASTM E-96 PROC. B | PARTS | RECOAT MIN. 70°F | RECOAT MAX. 70°F |
|-----------------------|---------------------------------|-----------------------------|-------------------------------|--------------------------|------------------------------|--------------------------|-------|------------------|------------------|
| A-30** Series | Base or Top | 225 psi | 200% | 65 pli | 65 | 0.06 perm. in. | One | | |
| A-3200 | Top Coat | 275 psi | 200% | 75 pli | 65 | 0.06 perm. in. | One | 18 hrs | NA |
| U-6006*** | Base or Top | 1600 psi | 400% | 230 pli | 70 | 0.02 perm. in. | One | 12 hrs | 48 hrs |
| U-66 Series | Base or Top | 2600 psi | 300% | 400 pli | 95 | 0.02 perm in. | Two | | |
| UB-64 | Base Coat | 2100 psi | 400% | 375 pli | 90 | 0.02 perm. in. | Two | 12 hrs | 96 hrs |
| U-87 Series^^ | Single | 2200 psi | 225% | 200 pli | 80 | 0.02 perm in. | Two | N/A | N/A |

** Acylics are base coats only for Acrylic top coats.

*** U-6006 is a base coat only for U-6006.

^^ These are FAST SET coatings which require special equipment

The following charts are needed to complete Section 3.3 Installation Parts D, E & F. Simply choose the systems that matches the base coat and top coat chosen from the previous page.

SYSTEM CHARTS FOR 32 MILS

| SPEC | | BASE COAT 20 DRY MILS | | | TOP COAT 12 DRY MILS | | | | |
|-------|---------|-----------------------|--------|-------|----------------------|-----------------|--------|-------|--------|
| REF # | PRODUCT | SOLIDS (VOLUME) | GAL/SQ | COATS | PRODUCT | SOLIDS (VOLUME) | GAL/SQ | COATS | UL 790 |
| AC/AC | A-30 | 59.3% | 2.1 | 2 | A-30 | 59.3% | 1.26 | 1 | NO |
| AC/AC | A-3211 | 59.3% | 2.1 | 2 | A32 | 59.3% | 1.26 | 1 | YES |
| U87 | U-8782 | 100% | 2 | 1 | N/A | N/A | N/A | N/A | YES |
| US/US | U-6006 | 66.4% | 2.08 | 2 | U-6006 | 66.4% | 0.94 | 1 | YES |
| UB/U | UB-64 | 75% | 1.66 | 2 | U-66 | 75.5% | 1 | 1 | YES |

SYSTEM CHART FOR 40 MILS

| SPEC | | BASE COAT 28 DRY MILS | | | TOP COAT 12 DRY MILS | | | | |
|-------|---------|-----------------------|--------|-------|----------------------|-----------------|--------|-------|--------|
| REF # | PRODUCT | SOLIDS (VOLUME) | GAL/SQ | COATS | PRODUCT | SOLIDS (VOLUME) | GAL/SQ | COATS | UL 790 |
| AC/AC | A-30 | 59.3% | 2.95 | 2 | A-3000 | 59.3% | 1.26 | 1 | NO |
| AC/AC | A-3211 | 59.3% | 2.95 | 2 | A-3200 | 59.3% | 1.26 | 1 | YES |
| U87 | U-8782 | 100% | 2.5 | 1 | N/A | N/A | N/A | N/A | YES |
| US/US | U-6006 | 66.4% | 2.62 | 2 | U-6006 | 66.4% | 1.14 | 1 | YES |
| UB/U | UB-64 | 75% | 2.34 | 2 | U-66 | 75.5% | 1 | 1 | YES |