

Application Specification:

LWM-90-U
November 2017

DIVISION 07 14 16: GACOFLEX LM-60 (90 Mil) POLYURETHANE ELASTOMERIC WATERPROOFING MEMBRANE

PART 1 – GENERAL

1.1 SUMMARY

- A. GacoFlex LM-60 is a two-component, 100% solids, liquid applied coating that cures by chemical action to form an elastomeric membrane. It is used as a waterproofing membrane over concrete, metal and plywood where it is not exposed to direct sunlight. This application also meets the standard specifications of ANSI A 118.10.

GacoFlex LM-60H is used on horizontal surfaces, in a between slab or below grade configuration. Application is by a squeegee in one coat or sprayed, if thinned, in two coats. The membrane is covered with a protection course and a wearing course of concrete, blacktop or pavers.

GacoFlex LM-60V is thixotropic in consistency and will cling to vertical surfaces without run-off at normal application rate. It may be applied with a 5/16" x 5/16" V notched trowel a one coat application or sprayed, if thinned, in two coats.

- B. This specification is prepared in brief form so it can be used verbatim in the waterproofing section. It is necessary only to make the selections indicated to complete it. Gaco Western's General Instructions, which are incorporated by reference, provide specific detailed instructions for the guidance of contractors and inspectors.

1.2 RELATED SECTIONS

- A. Drains, Vents, Ducts, Penetrations: Division 07 72 00
B. Cast-In-Place Concrete: Division: 03 30 00

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 a current "Qualified Applicator" Certificate from the specified waterproofing manufacturer.

1.4 QUALIFICATIONS

- A. Primary polyurethane, 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: Ten working days prior to the 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 of installation or specifications must be presented at the Pre-Bid Conference. If a change in the specification is accepted, it will be considered as an alternate and will be presented as an addendum five working days prior to the bid opening. No other changes to the specification or bid documents will be accepted.
- C. Materials other than those specified shall be submitted to the architect/owner for approval no later than ten days prior to the bid date. In requesting prior approval, it shall be necessary to submit: a letter from the manufacturer that the 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 the commencement of the fluid applied waterproofing system, 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. Store all coating materials in their original unopened containers at 50° to 80°F (10° to 27°C) until they are ready for use.
- B. Follow the special handling or storage requirements of the manufacturer for cold weather, hot weather, etc.
- C. Safety: Refer to all applicable data, including, but not limited to Material Safety Data Sheets, Product Data Sheets, Product labels, specific instructions for specific personal protection requirements.

When working with Part B, avoid contact with skin and eyes. If contact occurs, wash skin with water or alcohol; flush eyes immediately with large quantities of water and get medical attention. Do not smoke during mixing, application, or in the immediate area if thinners are used until all vapors have disappeared.

- D. Ventilation: Provide adequate ventilation during the application.
- E. Environmental requirements: Proceed with the 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.

1.6 WARRANTY

- A. The contractor shall guarantee that all work performed will be free from defects in workmanship. Upon notice of defects in writing to the contractor within one year after completion of the work, the contractor shall, at his own expense, make necessary repairs or replacements of the defective work in question.
- 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.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

Acceptable Manufacturers:

Gaco Western, LLC www.gaco.com

2.2 MATERIALS

- A. Polyurethane Coatings: GacoFlex LM-60H is for horizontal surfaces and GacoFlex LM-60V is for vertical surfaces. Liquid Polyurethane Elastomeric Membrane Materials shall meet the published properties of these products and also must meet applicable Air Pollution Control Regulations. *GacoFlex LM-60 is solvent free and has NSF61 approval for potable water applications; see Gaco Western's WV-64-U application specification for specific details.* GacoFlex LM-60 has the following physical properties:

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Property	Value	Test Method
Tensile Strength	240 ± 10 psi (1.65 ± .07 MPa)	ASTM D-412
Elongation	300% ± 20	ASTM D-412
Tear Resistance	30 pli (5.4 kg(f) / cm)	ASTM D-624
Hardness	50 Shore A min @70°F (21°C)	ASTM D-2240
Water Vapor Permeability	0.02 Perm Inches	ASTM E-96 Procedure BW
		100% R.H. Difference
Solids by Volume	100%	

- B. Sealer: GacoFlex U-5677 Polyurethane Sealer.
- C. Primer: GacoFlex E-5320 two-component Epoxy Primer.
- D. Detail: GacoFlex 66B or 66S Fabric Flashing Tape. GacoFlex NF-621 Neoprene Sheet Flashing, GacoFlex N-1207 Adhesive, polyurethane sealant, and other related materials as required for flashing drains, base angles, etc.
- E. Misc. Accessories: All items incorporated into this system, including the protection board shall be compatible with and approved by the coating manufacturer. See Section 3.3 J for recommended protection boards. Figure a 5% material loss during the application.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that the substrate is ready to receive the work, surface is clean, dry and free from projections, depressions, loose scale, sand, curing compounds, grease, oil, asphalt, and other foreign deposits.
- B. **Acceptable Plywood Grades:** Verify that the plywood shall conform to U.S. Product Standard PS 1-95 and shall carry the grade trademark of The Engineered Wood Association - APA EXT or APA AC EXT are acceptable. Underlayment grade plywood (APA AC EXT Underlayment) with solid, plugged cross bands under the face veneer are recommended for commercial installations.

Unacceptable Grades: APA C-D EXT, APA C-C EXT, Exposure 1 markings, oriented strand board (OSB), wafer board and Lauan or Mahogany plywood are **NOT** suitable substrates for liquid-applied coating systems. This is due to the poor dimensional stability, weak glue lines which allow buckling or lifting of the top ply, and excessive splintered, leafed and raised surface grain.

Refer to Gaco Western's General Instruction GW-2-3 for complete information on the installation and fastening of plywood.

- C. Do not begin the work until the concrete substrate has cured 28 days and/or has achieved a moisture content of no greater than 6.8%.
- D. Prior to application of waterproofing perform calcium chloride test, to verify a moisture content of 6.8% or less has been established.
- E. Verify that the concrete meets the requirements of the coating manufacturer. Refer to Gaco Western's General Instruction GW-2-1 for complete information on the installation and finishing of concrete.
- F. Verify with architect, general contractor and manufacture that substrate conditions are acceptable to receive waterproofing application.

3.2 PREPARATION

- A. Clean the 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 are not to receive the fluid applied waterproofing.

C. Provide a suitable workstation to mix the coating materials.

3.3 INSTALLATION

- A. Technical Advice: The installation of this waterproofing membrane 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. Sealing: Concrete surfaces do not require a primer to obtain adhesion. It is often necessary to use a sealer coat of thinned GacoFlex LM-60H to prevent pinholes and blistering from occurring in the coating, which is caused by air entrapped in the concrete when covered with 90 mils of coating. Dust or powdery concrete may also cause pinholes and a sealer coat is recommended. The sealer solution is made by adding one gallon (3.78L) of GacoFlex T-5116 Thinner to one unit of GacoFlex LM-60H during the original mixing process. This solution is applied preferably by roller or spray.

Consideration should be given to the application of the Gaco Western Sealer/Primer System when waterproofing exterior concrete decks that will experience solar heating during application. A phenomenon known as concrete outgassing may occur which causes blisters and pinholes in the applied coating. The use of the sealer/primer system is the best method known for the prevention of blisters and pinholes.

- C. Concrete Sealer: Seal the entire deck surface and all vertical or sloping surfaces of curbs, cants, parapets, etc. which are to receive coatings with one coat of GacoFlex U-5677 Sealer at the rate one gallon per 400 square feet (3.78 L / 27.9 m²). Allow the sealer to dry 4 hours minimum, but no more than 8 hours prior to applying the primer coat.
- D. Concrete Primer: Apply one coat of GacoFlex E-5320 Primer by roller at the rate of one gallon per 300 square feet (3.78 L / 23.2 m²). Allow the primer to dry 3 to 24 hours. For maximum solvent resistance, see drying times in Gaco Western's General Instructions GW-2-2. Drying times vary depending on weather conditions such as temperature, humidity and air movement.

Note: Approved wood surfaces do not require priming.

- E. Detail Work: Apply the primer, expansion joint covers (where required), seal cracks and joints, install flashings and apply liquid polyurethane membrane.
- F. Flashing and Joint Treatment:

1. Non-moving Cracks in Concrete: Stripe coat all non-moving cracks. Fill the crack first with GacoFlex LM-60V. After filling the cracks, apply GacoFlex LM-60V for a distance of 3" (7.62 cm) on each side of the crack 60 mils thick (1.52 mm) (1/16") and allow it to cure. When applying the membrane on the main field of the deck, go over the stripe coat to achieve a total thickness of 120 mils (3.05 mm) (1/8").
2. Control Joints and Moving Cracks: Remove all dirt and loose chips of concrete from the crack. Fill it with a polyurethane sealant and strike it flush with the deck surface. Center a 2" (5.08 cm) wide piece of release tape (or paper masking tape) over the crack and secure it firmly and thoroughly to the deck. Stripe coat 60 mils (1.52 mm) (1/16") of GacoFlex LM-60H over the tape and for 3" (7.62 cm) on each side of it. When installing the membrane on the main field of the deck, go over the stripe coat to achieve a total thickness of 120 mils (3.05 mm) (1/8").

F. Expansion Joint Covers:

1. Choose GacoFlex NF-621 field curing Neoprene Sheet Flashing in a width that will provide at least 3" (7.62 cm) of bonding area on each side of the joint plus enough material to loop over the backer rod. Use a chalk mark placed 3" (7.62 cm) on each side of the joint as a guide for applying the adhesive. Allow the adhesive to dry.
2. Stir GacoFlex N-1207 Neoprene Adhesive to obtain a uniform consistency. With roller or brush, apply GacoFlex N-1207 Neoprene Adhesive to the deck on either side of the joint to a point just beyond the chalk marks. Allow the GacoFlex N-1207 Neoprene Adhesive to dry until it can be touched without sticking, about 1/2 hour. Apply a second coat of N-1207 Neoprene Adhesive to the deck and one coat to the GacoFlex NF-621 Neoprene Sheet (on the side not covered with the polyethylene liner). Allow the GacoFlex N-1207 Neoprene Adhesive to dry as noted previously.

3. Fold the GacoFlex NF-621 Neoprene Sheet in half lengthwise so that the polyethylene surface is together. Place one edge of the sheet, adhesive side down, along the chalk line on one side of the joint. Place directly into position as the adhesive surfaces will bond immediately upon contact and the sheet cannot be moved. Stitch along the edge of the sheet to obtain a positive bond. Once the edge is bonded completely, work the stitcher or a flat faced steel roller toward the expansion joint to obtain 100% positive contact. End laps must be joined prior to placement of the flashing since a waterproof lap cannot be formed over a backer rod.
4. Place a backer rod material (solvent resistant expanded plastic such as polyethylene or polypropylene) in the joint. The backer material should be one third larger than the joint width so it can be compressed into the joint and flush to the deck.
5. Install the GacoFlex NF-621 Neoprene Sheet over the backer rod material and adhere it to the deck on the opposite side of the joint. Stitch the sheet from the joint outwards to the edge to obtain positive contact. Remove the polyethylene liner.
6. Apply a bead of polyurethane sealant along all edges and lap seams of the sheet.
7. After neoprene sheet has been in place a minimum of 24 hours; solvent wipe prior to the application of the GacoFlex LM-60H Membrane. (If in a VOC regulated area the use of GacoFlex T-5110 Solvent is required).
8. After placement of the protection board, a sheet metal protective cover must be installed to protect the expansion joint prior to the installation of any wear course.

G. Flashing at Deck and Wall Junctures:

1. If the joint at the wall and deck juncture is non-moving, apply GacoFlex LM-60V at a rate of 4 gallons per 100 square feet (15.4 L / 9.3 m²) (60 mils (1.52 mm) (1/16")) in a cove prior to the application of the main deck. Apply an additional 90 mils at the juncture when applying the overall membrane for a total thickness of 150 mils (3.05 mm).
2. If the joint at the wall and deck juncture is moving, flashing is accomplished by using field curing GacoFlex NF-621 Neoprene Sheet Flashing. This is placed prior to the application of the overall membrane.
 - a. Choose a width of GacoFlex NF-621 Neoprene Sheet Flashing sufficient to extend 3" (10.16 cm) onto the deck and 6" (15.24 cm) up the vertical wall. Roll out the sheet close to the application area. Use a length as long as possible to reduce the number of lap joints, but only as long as convenient to handle.
 - b. Place masking tape on the wall and a chalk line on the deck as a guide for the adhesive application.
 - c. Mix GacoFlex N-1207 Neoprene Adhesive to obtain a uniform consistency. Apply by brush or roller to the deck 1/2" (1.27 cm) beyond the chalk line and to the wall onto the masking tape. Remove the masking tape while the GacoFlex N-1207 Neoprene Adhesive is wet.
 - d. When the first coat of GacoFlex N-1207 Neoprene Adhesive is dry, apply a second coat of GacoFlex N-1207 Neoprene Adhesive to the deck, wall and to the GacoFlex NF-621 Neoprene Sheet Flashing on the side not covered by polyethylene liner.
 - e. Place a 1" (2.54 cm) plastic backer rod into the wet GacoFlex N-1207 Neoprene Adhesive at the juncture of the deck and wall.
 - f. When the GacoFlex N-1207 Neoprene Adhesive is dry, fold the GacoFlex NF-621 Neoprene Sheet Flashing in half lengthwise so that the polyethylene surface is together. Carefully lift the GacoFlex NF-621 Neoprene Sheet Flashing without stretching it and place the edge (adhesive surfaces together) along the chalk line on the deck. Stitch the edge to assure positive contact and continue with roller and stitcher toward the wall. On the wall, work from the bottom to the top, in the same manner. Remove the polyethylene liner. End laps must be joined prior to the placement of the GacoFlex NF-621 Neoprene Sheet Flashing since a waterproof lap cannot be formed over a backer rod.
 - g. Apply a bead of polyurethane sealant along the edges and the lap seams of the sheet.

h. After neoprene sheet has been in place a minimum of 24 hours; solvent wipe prior to the application of the GacoFlex LM-60H Membrane. (If in a VOC regulated area the use of GacoFlex T-5110 Solvent is required).

i. When the GacoFlex LM-60H Membrane comes into contact with a wall waterproofing system, the wall system must be installed prior to the GacoFlex LM-60H Membrane. Overlap GacoFlex LM-60V Membrane a minimum of 6" (15.24 cm) onto the wall system. An alternative method is to use GacoFlex NF-621 Neoprene Sheet Flashing as the dividing interface between the two systems.

H. Polyurethane Membrane: Apply GacoFlex LM-60V Membrane to achieve a total minimum coverage of 6 gallons per 100 square feet (15.4 L / 9.3m²). The total wet film thickness is 96 mils (1.62 mm). A 5/16" x 5/16" V notched trowel is effective in controlling the thickness. An alternate method is to use a squeegee. Spread the material over the deck at an average thickness of) 1/16" (1.6 mm). Six gallons per 100 square feet (15.4 L / 9.3 m²) will yield the proper thickness. Where LM-60V meets the neoprene sheet, the LM-60V must overlap a minimum of 3" (7.62 cm).

I. Water Test: Allow a minimum of 48 hours before running a water test. Plug the drains, flood the waterproofed area and leave the area flooded for 48 hours. Electronic Vector Mapping, performed by licensed third party inspectors, is an approved alternative to water testing.

J. Protection Board: GacoFlex LM-60 Membranes must be covered to protect it against any physical damage. When placing the protection board, pedestals for pavers etc., care should be taken to avoid physically damaging the installed membrane. A protection board must be used when pedestals are to be employed.

If a water test is not required and protection board is called for, it may be placed over the GacoFlex LM-60V/H prior to the complete cure and may be spot bonded with GacoFlex LM-60V/H. This placement can be done while the GacoFlex LM-60V/H is still tacky, but cured sufficiently so as not to extrude beneath the protection board... The protection board shall be rigid or semi-rigid asphalt composition board (minimum 1/8" (.32 cm) thick); expanded polystyrene board (minimum 1/2" (1.27 cm)) thick; 90 lb. rolled roofing. Apboard is not required if sand backfill to a thickness of 6" (15.24 cm) is used, or thick mortar bed without wire or steel reinforcing is used.

K. Pedestals: If pedestals or chairs are used for pavers, consideration should be given to use of rigid and thicker protection board such as 1/4" (.64 cm) composition board.

L. Protection of Membrane: GacoFlex LM-60V/H must be covered to be protected against physical damage. When placing the protection board, pedestals, pavers, etc., personnel shall be informed that care must be taken to avoid physically damaging the installed membrane. A course of protection board must be used when pedestals are to be employed.

3.4 FIELD QUALITY CONTROL

The contractor of the work under this section shall maintain a quality control program specifically to verify compliance with this specification. A daily log shall be kept to record actions in the field.

B. Inspections: A minimum of three inspections, substrate, application and final, by the manufacturer's representative are required on all projects requiring a warranty.

