

Section 07120: GACO WESTERN LIQUID URETHANE RUBBER MEMBRANE WATERPROOFING LM-60

PART 1 - GENERAL

1.1 SUMMARY

- A. LM-60 is a two component, 100% solids liquid applied rubber that cures by chemical action to form an elastomeric membrane. It is used as a waterproofing membrane over concrete, metal and plywood where not exposed to direct sunlight.

LM-60H is used on horizontal surfaces in a between slab or below grade configuration. Application is by notched trowel or squeegee in a 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.

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 trowel in 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: Section 07700
B. Cast-In-Place Concrete: Section: 03300

1.3 SUBMITTALS

- A. Product Data: Submit manufacturers 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.

1.4 QUALIFICATIONS

- A. Primary waterproofing materials shall be products of a single manufacturer. The primary manufacturer shall recommend secondary materials. Manufacturer shall have a minimum of 10 years experience in the manufacture of materials of this type.
- B. 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.
- C. 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 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 a bid amendment issued 5 working days prior to the bid opening. No other changes to the specification or bid documents will be accepted.
- D. Pre-Installation Conference: Just prior to commencement of the fluid application 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 the original unopened containers at 50° - 80°F (10°-26°C) until 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 MSDS sheets, PDS 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 solvents have disappeared.

- D. Ventilation: Provide adequate ventilation to prevent the accumulation of hazardous fumes during application.
- E. 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.

1.6 WARRANTY

- A. The contractor shall guarantee that all work performed will be free from defects in materials and workmanship. Upon notice of defect in writing to the contractor within one year after completion of work, the contractor shall, at his own expense, make necessary repairs or replacements of the defective work in question.
- B. A 5 year no leak warranty is available with this system provided it has been installed by a Gaco Western Approved 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, Inc.

2.2 MATERIALS

- A. Urethane Coatings: LM-60H for horizontal surfaces and LM-60V for vertical Liquid Urethane Rubber Membrane materials shall meet the published properties of these products and also must meet applicable Air Pollution Control regulations. *LM-60 is solvent free and has NSF61 approval for potable water applications.*

- B. Primer/Sealer: Gaco Western Urethane Concrete Primer U-5677 and GacoFlex two component Epoxy Concrete Sealer E-5320.

Alternate Concrete Primer Sealer, Gaco Western E-5400 two component 100% solids Epoxy concrete primer/sealer.

- C. Flashing and Joint reinforcing fabric: Gaco Western's 66B and 66S fabric. GacoFlex NF-621 neoprene sheet flashing, and related materials as required for flashing drains, base angles, etc.

- D. Metal Primer: Prime metal surfaces according to Gaco Western's "Primer Recommendation Chart".

- E. Misc. Accessories: All items incorporated into this system shall be compatible with and approved by coating manufacturer.

NOTE: Allow additional material for rough or irregular surfaces add 2% to 3% for material loss during application.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that substrate is ready to receive work, surface is clean, dry and free from projections, depressions, loose scale, sand, curing compounds, grease, oil, asphalt, and other foreign deposits. Construction work on the vault should be completed and all penetrations installed.
- B. Verify that the plywood shall conform to US Product Standard PS-1-92 and shall carry the grade trademark of the American Plywood Association Grades APA BC EXT or APA AC EXT are acceptable. These are minimum grades suitable for liquid coating applications. Refer to Gaco Western's General Instruction GW-2-3 (formerly GW-3) for complete information on the installation and fastening of plywood.

- C. Do not begin work until concrete substrate has cured 28 days, minimum.
- D. The work shall not be started when temperature is under 40°F (4°C) or when precipitation is imminent.
- E. 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 (formerly GW-1, 1B), 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 frequently necessary to use a sealer coat of thinned LM-60 to prevent pinholes and blistering from occurring in the coating, which is caused by air entrapped in the concrete when covered with a full 60 mils (1.5 mm) 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 (3.8L) thinner to one unit of LM-60 during the original mixing process. This solution is applied preferably by roller, or spray to effectively.

Consideration should be given to the application of the Gaco Western primer-sealer 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 primer-sealer system is the best method known for prevention of blisters and pinholes.

- C. Concrete Primer/Sealer: Prime entire deck surface and all vertical or sloping surfaces of curbs, cantos, parapets, etc. which are to receive coatings with one coat of GacoFlex U-5677 Sealer at the rate 1 gallon per 300 square feet (4.2 L / 10 m²). Allow to dry a minimum of 1 hour and no more than 72 hours before applying primer coat.

Apply one coat of E-5320 by roller at the rate of ½ gallon per 100 square feet (.1 L / 10 m²). Allow to dry a minimum of 24 hours. For maximum solvent resistance, see drying time directed in Gaco Western's General Instructions GW-2-2 (formerly GW-1, Section II).

Alternative Concrete Primer/Sealer. Apply one coat of Gaco Western's E-5400 to all surfaces to receive the fluid applied waterproofing, except areas previously caulked, flashed or fabric reinforced. Apply at a rate of one gallon per 150 sq. ft. (4.1 L / 15 m²) and allow to cure at least 6 hours, but no more than 3 days before applying the basecoat.

Note: Plywood surfaces do not require priming.

- D. Detail Work: Apply primer, expansion joint covers (where called for), seal cracks, and joints, install flashing and apply liquid urethane membrane.
- E. Flashing and Joint Treatment:

1. Non-moving Cracks in Concrete: Stripe coat all non-moving cracks. Fill the crack first with LM-60. After filling apply LM-60 for a distance of 3" (8 cm) on each side of the crack 60 mils thick (1.5 mm) (1/16") and allow curing. 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 mm) (1/8").

2. Control Joints and Moving Cracks: Remove all dirt and loose chips of concrete from the crack. Fill with a urethane caulking (if possible) and strike flush with the deck surface. Center a 2" (5 cm) wide piece of 66R release tape (or paper masking tape) over the crack and stick it firmly and thoroughly to the deck. Stripe coat 60 mils (1.5 mm) (1/16") of LM-60 over the tape and for 3" (8 cm) on each side of it. 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 mm) (1/8").

F. Expansion Joint Covers:

1. Choose NF-621 field curing neoprene sheet in a width that will give at 3" (8 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" (8 cm) on each side of the joint as a guide for applying adhesive. Allow adhesive to dry.
2. Stir N-1207 adhesive to obtain a uniform consistency. With roller or brush apply N-1207 to the deck on either side of the joint to a point just beyond the chalk marks. (This coat may be thinned on unprimed deck). Allow N-1207 to dry until it can be touched without sticking, about 1/2 hour. Apply a second coat of adhesive to the deck (not required on primed deck) and one coat to the neoprene sheet (on the side not covered with the polyethylene liner). Allow drying.
3. Fold the 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 flashing since a waterproof lap cannot be formed over a backer rod.
4. Place a backer material (solvent resistant expanded plastic such as polyethylene or polypropylene) in the joint. The backer material should be oversized so it can be compressed into the joint and allowed to protrude 2" (5 cm) above the deck.
5. Unfold the neoprene sheet over the backer 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 fillet bead of urethane caulking along all edges and lap seams of the sheet.
7. After all neoprene sheet has been in place a minimum of 24 hours; apply a tie coat of N-1207 prior to application of the LM-60 membrane that will go over the sheet.

8. After placement of protection board, a sheet metal protective cover must be installed to protect the expansion joint prior to 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 LM-60 at 60 mils (1.5 mm) (1/16") in a cove prior to application of the main deck. Apply an additional 60 mils (1.5 mm) (1/16") at the juncture when applying the overall membrane for a total thickness of 120 mils (3 mm).
2. If the joint at the wall and deck juncture is moving flashing is accomplished by using field curing neoprene sheet. This is placed prior to application of the overall membrane.
 - a. Choose a width of neoprene sheet sufficient to extend 4" (10 cm) onto the deck and 6" (15 cm) up the vertical wall. Roll out the sheet close to application area. Use 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 adhesive application.
 - c. Mix adhesive to obtain a uniform mixture. Apply by brush or roller to the deck 1/2" (1.3 cm) beyond the chalk line and to the wall onto the masking tape. This coat may be thinned on unprimed surface. Remove masking tape while adhesive is wet.
 - d. When the first coat of adhesive is dry, apply a second coat (not required on pre-primed surface) of unthinned adhesive to the deck, wall and to the neoprene sheet on the side not covered by polyethylene liner.
 - e. Place a 1" (3 cm) expanded plastic backer rod into the wet adhesive at the juncture of the deck and wall.
 - f. When the N-1207 adhesive is dry, fold the neoprene sheet in half lengthwise so that the polyethylene surface is together. Carefully lift the neoprene sheet with out 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 placement of flashing since a waterproof lap cannot be formed over a backer rod.

g. Apply a fillet bead of urethane caulking along edges and lap seams of the sheet.

h. After all flashing is installed, wait 24 hours then apply a tie coat of N-1207 to the horizontal surfaces of the neoprene sheet or wherever the LM-60 will be applied.

i. When the LM-60 membrane will come into contact with a wall waterproofing system, the wall system must be installed prior to the LM-60 membrane. Overlap LM-60 a minimum of 6" (15 cm) onto the wall system. An alternative method is to use neoprene sheet as the dividing interface between the two systems.

H. Urethane Membrane: Apply urethane membrane to secure a total minimum coverage of 4 gallons per 100 square feet (16.3 L / 10 m²) (Total wet film thickness - 64 mils (1.6 mm). With a trowel (5/16" x 5/16" V notched trowel is effective in controlling thickness) or squeegee, spread the material over the deck at an average thickness of 1/16" (1.6 mm). Four gallons per 100 square feet (15 L/10 m²) will yield this thickness. Where LM-60 meets neoprene sheet, the LM-60 must overlap a minimum of 3" (8 cm).

I. Water Test: Allow a minimum of 48 hours before running a water test. Plug drains, flood area waterproofed and leave flooded for 48 hours.

J. Protection Board: LM-60 membranes must be covered to protect against physical damage. When placing protection board, pedestals for pavers, pavers, etc., care should be taken to avoid physically damaging the installed membrane. An overall course of protection board shall be used when pedestals are to be employed as a protection against damage.

If no water test is to be run and protection board is called for, it may be placed over LM-60 prior to complete cure and may be spot bonded with LM-60. This placement can be done while LM-60 is still tacky, but cured sufficiently so as not to extrude material beneath the protection board. Protection board shall be rigid or semi-rigid asphalt composition board (minimum 1/8" (.3 cm) thick); expanded polystyrene board (minimum 1/2" (1.3 cm) thick; 90 lb. rolled roofing.

Protection board is not required if sand backfill to a thickness of 6" (15 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" (.6 cm) composition board.

L. Protection of Membrane: LM-60 must be covered to protect against physical damage. When placing protection board, pedestals, pavers, etc., personnel shall be informed and care shall be taken to avoid physically damaging the installed membrane. An overall course of protection board shall be used when pedestals are to be employed as a protection against damage.

3.4 FIELD QUALITY CONTROL

- A. The contractor for 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 (Substrate, Application and Final) inspections, by an approved manufacturers representative, will be required on all projects requiring a warranty.
- C. Thickness: Minimum overall dry film thickness of the completed fluid applied waterproofing will average not less than 60 mils (1.5 mm).