



Design W-A; EPDM
Tank Lining Specification

For Decks, Tank Linings & Foundations

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Spec Note: Specifier shall indicate choice from alternatives by crossing out inapplicable alternative in square brackets (ex: [~~Steel~~; Concrete]).

1.0 GENERAL

1.1 Section Includes:

- .1 Substrate preparation.
- .2 Membrane installation.
- .3 Membrane flashing.

1.2 Related Work Under Other Sections

- .1 [Steel, concrete, wood] deck, foundation, wall

1.3 Description

- .1 Furnish and install an adhesive adhered EPDM tank lining system and related accessories in strict accordance with specifications and details approved by the tank lining system supplier.

1.4 Quality Assurance

- .1 Tank lining contractor shall be an approved applicator of the tank lining system supplier.
- .2 Workmen shall be trained and experienced in the installation of this type of tank lining system and shall be under full time competent supervision.
- .3 Comply with all industry recommended safety practices during construction.

1.5 Submittals

- .1 Shop Drawings are to be prepared detailing the dimensions and shape of the area(s) to be waterproofed, the location of all protrusions, corners and direction changes and the positioning of all membrane panels. A shop drawing of the membrane termination shall also be provided. Samples of materials to be used are to be supplied upon request.
- .2 Submit shop drawings and any proposed non-standard details to the tank lining system supplier and the specifier a minimum of two weeks prior to job start for approval.

1.6 Delivery, Storage & Handling

- .1 Deliver all tank lining materials in original, unopened containers, complete with labels indicating brand name, contents, usage instructions and safety precautions.
- .2 Protect membranes from cuts, abrasion or other abuse that might adversely affect its performance in service.
- .3 WHMIS safety bulletins on all hazardous products are to be readily available to the work crew at all times.

- .4 Adhesives, sealants and flashing accessories are to be stored in a clean, dry area at a temperature between 5°C and 27°C. If exposed to a lower temperature, restore to an acceptable level before using.
- .5 Do not work during periods of rain, fog, sleet, snow or cold temperatures (below -5°C).

1.7 Warranty

- .1 Contractor shall advise the tank lining system supplier in writing a minimum of two weeks prior to job start that a warranty has been requested for this project and the probable start date of the tank lining work.
- .2 Tank lining System supplier shall provide a written material warranty on supplier's standard form for a period of [5,10] years from the date of tank lining system completion.

2.0 PRODUCTS

2.1 Tank lining Membrane System

- .1 MEMBRANE: Lexcan [1.5 mm; 2.3 mm thick Standard EPDM; 1.1 mm; 1.5 mm thick Reinforced EPDM] membrane meeting the physical characteristics shown in table [1;2].

TABLE 1: Lexcan Standard EPDM Membrane

PROPERTY	A.S.T.M. TEST METHOD	MIN. SPECIFICATION VALUES	
		BLACK	WHITE*
THICKNESS TOLERANCE	D-751	± 10%	± 10%
ELONGATION, Ultimate	D-412	350%	350%
TENSILE STRENGTH	D-412	9 MPa (1305 psi)	9 MPa (1305 psi)
TEAR RESISTANCE, min.	D-642, Die C	30.8 kN/m (175 lbf/in.)	26.3 KN/m (150 lbf/in.)
FACTORY SEAM STRENGTH	D-816 (modified)	Stronger than membrane	
OZONE RESISTANCE [7 days at 100pphm, 40°C, 50% ext.]	D-1149	No Cracks @ 7x magnification	No Cracks @ 7x magnification
BRITTLENESS	D-2137	Does not break @ -60°C	Does not break @ - 60°C
WATER ABSORPTION, max.	D-471	4%	4%
WATER VAPOUR PERMEABILITY	E-96, proc. B	2.0 perm·mils	2.0 perm·mils
OUTDOOR EXPOSURE (UV) [Xenon Arc @ 80°C]	G-26	No cracks or crazing after 4,000 hrs	No cracks or crazing after 2,000 hrs
<u>After Heat Aging for 28 days @ 116°C</u>			
ELONGATION, Ultimate, min.	D-412	225%	200%
TENSILE STRENGTH, min.	D-412	8.3 MPa (1200 lbs/in.)	8.3 MPa (1200 lbs/in.)
TEAR RESISTANCE, min.	D-642, Die C	28.3 kN/m (150 lbf/in.)	21.9 kN/m (125 lbf/in.)
LINEAR DIMENSIONAL CHANGE, max.	D-1204	± 2%	± 2%

TABLE 2: Lexcan Reinforced EPDM Membrane

PROPERTY	A.S.T.M. TEST METHOD	SPECIFICATION VALUES	
		BLACK	WHITE*
THICKNESS TOLERANCE	D-751	± 10%	± 10%
ELONGATION, Ultimate	D-412	250%	250%

Lexcan Reinforced EPDM Membrane Specification, continued ...

BREAKING STRENGTH	D-751 Grab Mtd	400 N (90 lbf)	400 N (90 lbf)
TEAR RESISTANCE, min.	D-751, B Tongue Tear	45 N (10 lbf)	45 N (10 lbf)
FACTORY SEAM STRENGTH	D-816 (modified)	Stronger than membrane	
OZONE RESISTANCE [7 days at 100pphm, 40°C, 50% ext.]	D-1149	No Cracks @ 7x magnification	No Cracks @ 7x magnification
BRITTLENESS	D-2137	Does not break @ -45°C	Does not break @ -45°C
WATER ABSORPTION, max.	D-471	4%	4%
OUTDOOR EXPOSURE (UV) [Xenon Arc @ 80°C]	G-26	No cracks or crazing after 4,000 hrs	No cracks or crazing after 2,000 hrs
<u>After Heat Aging for 28 days @ 116°C</u>			
ELONGATION, Ultimate, min.	D-412	200%	200%
BREAKING STRENGTH, min.	D-751	355 N (80 lbf)	355 N (80 lbf)
LINEAR DIMENSIONAL CHANGE, max.	D-1204	± 2%	± 2%

- .2 FLASHING [DECK & FOUNDATION TANK LINING ONLY. NOT FOR USE IN CONTINUAL SUBMERSION APPLICATIONS]: Lexflash Flashing; a 1.9 mm (75 mil) thick laminate of uncured EPDM and Lexcan's proprietary butyl adhesive compound. Flashing is cut to suit application as per Lexcan details.
- .3 MISC. MEMBRANE CLEANING: Lexcan SC-1 Seam Cleaner.
- .4 SEAM ADHESIVE: Lexcan SA-747 Seam Adhesive.
- .5 SEAM TAPE: LexSeam T-325 Seam Tape; a 75 mm wide seam tape composed of Lexcan's proprietary butyl adhesive compound.
- .6 LAP SEALANT: Lexcan Lap Sealant.
- .7 BONDING ADHESIVE: Lexcan BA-90 Adhesive.
- .8 POURABLE SEALER: Lexcan Pourable Sealer.
- .9 WATER CUT-OFF MASTIC: Lexcan Water Cut-off Mastic.
- .10 TERMINATION SEALER TAPE: Lexcan Termination Sealer Tape.
- .11 TERMINATION BAR: Lexbar Termination Bar.

3.0 EXECUTION

3.1 General

- .1 Comply with the system supplier's published installation instructions and details throughout the tank lining membrane installation.
- .2 Examine substrate to verify proper placement of all openings, pipes, curbs, sleeves, ducts, vents and drains. Ensure all wood blocking is installed where required. Ensure substrate to receive tank lining is clean, dry and free from debris that might be detrimental to the performance of the membrane. THE TANK LINING CONTRACTOR IS RESPONSIBLE TO ENSURE THE SUSBRATE IS ACCEPTABLE TO RECEIVE THE TANK LINING SYSTEM.
- .3 Conduct work with a minimum of disruption to other trades, construction, the building or its occupants. Before commencing work, consult with [owner, specifier, consultant] over space requirements, possible disruptions and other construction requirements.

3.2 Positioning & Adhering Membrane Sheets – Horizontal and Low Slope Surfaces

- .1 Thoroughly clean the substrate, removing all dirt, debris and dust. Ensure that the substrate is dry, structurally sound and suitable for bonding.
- .2 Unroll membrane sheets and position according to the shop drawings, overlapping sides and ends a minimum of 100 mm (4"). LET SHEETS RELAX FOR A MINIMUM OF 30 MINUTES PRIOR TO BONDING. When the roll is properly positioned, roll one-half of the sheet back over top of the other.
- .3 Using a paint roller or airless spray equipment, apply Bonding Adhesive evenly, without globs or puddles, to the underside of the membrane and the substrate (approved insulation) where the membrane is to be positioned. Avoid applying the bonding adhesive to seam area of membrane. Allow the adhesive to dry until it is tacky but does not string to a dry finger touch. If applying by hand, maximum net coverage rate of adhesive shall not exceed 6.0 m² (65 sq. ft.) / gallon. If applying by an automatic adhesive applicator, maximum net coverage shall not exceed 7.0 m² (75 sq. ft.) / gallon.
- .4 Roll coated membrane into adhesive on substrate, avoiding blisters or wrinkles. Brush down bonded half of sheet with a push broom to achieve maximum contact.
- .5 Fold back unbonded half of sheet and repeat the bonding procedure. Apply remaining membrane sheets in a similar manner.

3.3 Positioning & Adhering Membrane Sheets – Vertical or High Slope Surfaces

Installer's Note: There are a variety of useful tips for efficiently handling EPDM on vertical or high slope surfaces. Contact your Lexcan technical representative for assistance.

- .1 Thoroughly clean the substrate, removing all dirt, debris and dust. Ensure that the substrate is dry, structurally sound and suitable for bonding.
- .2 Lexcan recommends that sheet sizes be limited to 10' widths or less when working on high slope surfaces. Design how membrane panels will be positioned on the substrate, allowing a minimum of 10 cm (4") overlap for all seams and perhaps an additional 15 cm (6") excess membrane along the top for termination purposes. Generally, membrane panels should have their longer dimension running parallel with the slope. Design sheet sizes into easily manageable pieces if necessary. If more than one panel is required to reach the top of the wall / slope, upper panels should overlap lower panels, shingle fashion.
- .3 Pre-cut EPDM sheets as designed in section 3.3.2. If desired, apply 2 x 4 wood clamps and ropes along the upper edge of the sheet for handling on high walls or slopes.
- .4 Lay out EPDM sheets on a flat surface. Using a paint roller or airless spray equipment, apply Bonding Adhesive evenly, without globs or puddles, to the underside of the membrane and the substrate (or approved insulation) where the membrane is to be positioned. Avoid applying the bonding adhesive to seam area of membrane. If applying by hand, maximum net coverage rate of adhesive shall not exceed 6.0 m² (65 sq. ft.) / gallon. If applying by spray equipment, maximum net coverage shall not exceed 7.0 m² (75 sq. ft.) / gallon.
- .5 When the adhesive has sufficiently dried until it does not string when touched by a dry finger, lift the EPDM membrane up into position, being careful to keep the membrane flat and away from the substrate until it is ready to be adhered. Carefully align the top edge of the roll then mate the membrane to the substrate, working down from the top and out from the middle. Avoid wrinkles and blisters. Press the membrane to the substrate with a push broom, ensuring complete contact.
- .6 When the panel is completely adhered, remove the supporting clamp and either seam the remaining flap of membrane as per 3.4 or neatly trim off.
- .7 Repeat steps 3.3.1 to 3.3.6 for remaining panels.

3.4 Splicing Membrane Sheets

- .1 Ensure the splice area of the EPDM membrane is clean and free from dirt, grease, asphalt or other contaminants (use detergent and water to clean, if necessary).
- .2 Using lint free cloths, clean the areas to be spliced with SC-1 Seam Cleaner. Replace cloths frequently as they become soiled. Allow SC-1 Seam Cleaner to completely flash off before proceeding.

- .3 Ensure the Seam Adhesive is stirred well and stirred every fifteen minutes while in use. Apply the Seam Adhesive to seam areas of the membrane by paint brush, avoiding globs or puddles. Allow the adhesive to dry until it doesn't string when touched with a dry finger.
- .4 Fold back the upper sheet and apply Seam Adhesive to both sides of the seam area as per 3.4.3 above. Unroll and apply the Seam Tape to the underside of the upper membrane. Tape edge should extend between 2 to 7 mm (1/8" to 1/2") beyond the upper sheet edge along the entire seam length. Roll the tape heavily with a steel hand roller along the seam. Cut tape ends on a 45° angle and lap a minimum of 75 mm (3"). When the tape has been applied along the length of the seam, remove the poly backing and unfold the upper sheet overtop of the base membrane avoiding air bubbles or fishmouths.
- .5 Roll completed seams heavily with a steel hand roller across the seam to ensure complete contact.
- .6 Apply Flashing membrane to all seam tape splices, seam 'T' junctions and horizontal / vertical transitions with Seam Adhesive as per the tank lining system supplier's flashing instructions and details. Roll flashing with a rubber hand roller to ensure complete contact without air bubbles or voids.
- .7 Clean seam and flashing edges with SC-1 Seam Cleaner. Apply Lap Sealant to all flashing and seam edges and feather with the tool provided.

3.5 Parapet or Wall Terminations

- .1 Unless approved detail shows otherwise, membrane must either terminate in a reglet, be fastened according to paragraph 3.5.2 below, or be carried over top of wall or parapet and counterflashed with sheet metal or capped with stone.
- .2 If terminating membrane partway up a wall or parapet, apply Termination Sealer Tape or 25 mm (1") wide bead of Water Cut-off Mastic to backside of membrane edge. Press membrane against wall and roll with a steel hand roller. Position Termination Bar over the upper edge of the membrane and fasten into the wall with approved termination bar anchors. Separation between termination bars should be 13 mm (1/2"). Apply Lap Sealant along upper edge of termination bar and overtop of all fastener heads.

3.6 Corner, Curb & Protrusion Flashing

- .1 Flash all horizontal seam T-junctions, corners, posts, curbs, pipes etc. in strict accordance with current Lexcan tank lining flashing instructions and details. LexFlash II Flashing membrane may be used to flash details that are not under continual water submersion. Otherwise, use Standard EPDM membrane, adhered with the LexSeam adhesive and tape seaming system as per section 3.4. Ensure all flashing pieces are cut with rounded corners and edges are caulked with Lap Sealant. Drains are to be sealed with Water Cut-off Mastic as per the tank lining system supplier's details.

3.7 Back Filling [Where Required]

SPEC NOTE: Applying back fill directly against the EPDM membrane is only acceptable if the fill is clean, granular in nature and free of all sharp objects or stones. If appropriate fill is not available, use a Protection Course over top of the EPDM membrane. Protection Course must be moisture resistant material free of sharp edges, fibers or corners. If insulation is used it should have ship-lapped edges.

- .1 Apply sufficient amounts of Water Cut-Off Mastic or other approved adhesive to the backside of the protection panels to adhere them in position on the EPDM membrane.
- .2 Overlap flexible protection materials by a minimum of 25 mm.
- .3 Proceed with back filling ensuring that the protection panels are not dislodged in the process.

3.8 Clean-Up

- .1 Remove all cut pieces, wrappings, waste and debris from the job site.
- .2 Ensure that the membrane is cleaned of all spilled adhesives or residues and presents an aesthetically attractive appearance.

END OF SECTION