Installation Manual

Elastoseal EPDM Geomembrane

Introduction

We make every effort to ensure that the information provided in this document is current and accurate. However, errors, misprints, inaccuracies, omissions or other errors may sometimes occur despite our best efforts. SealEco does not warrant that the content of this document including, without limitation, product-/installation descriptions or photographs and illustrations, is accurate or complete.

This Installation Guidelines Manual provides procedures for the installation of the Elastoseal EPDM Geomembrane System

in landfill capping and waterproofing applications. It also give general guidance on design and site preparation for water containment projects.

The Manual is not a document describing The SealEco Quality System QAS. For information on the SealEco QAS see the specific QAS manual.

In general, the lining installation contractor takes responsibility for the installation according to specifications for the geomembrane and other geotechnical products. Professional project site surveys, design and construction considerations, site drawings, soil and earth analyses etc. is of major importance for the proper function of a water containment or landfill capping. This is the responsibility of the site owner and the design engineer, as quality and measurements of excavations are the responsibility of the general contractor or excavating contractor on the site.

This guidelines manual describes the installation of the Elastoseal EPDM Geomembrane System and gives general guidance to the installer on aspects that must be checked and observed to avoid problems with the final water reservoir or landfill capping.

Before the start of any installation or commitments on performance are made, a physical inspection of the site should be made. It is important that the site owner and design engineer investigate soil quality and stability, excavation surface quality, ground water level and variations, presence of gases in the soil, risk of cavities and settlements and that the excavation size conforms to drawings and panel specifications.

The Elastoseal EPDM Geomembrane System should only be installed by an installer approved by SealEco and according to design specifications, current local code of practice and CQA requirements. The Installer shall inspect and approve the site before the start of any installation.

Designing with Geomembranes

Site considerations

A thorough analysis of the site should be done by a professional geotechnical engineer. The presence and flow of groundwater and surface water in different seasons must be understood, and the stability of substrates under all seasons and weather conditions must be verified. Presence of contamination and gas generation must be evaluated and designed for as well as the risk of settlements due to earth movements or dissolving/collapsing of organic materials in the earth.

Soil type

The lining design is dependant on soil characteristics, which must be well defined. The geotechnical engineer must evaluate soil type and quality, slope angle stability, compaction, requirements for protective geotextiles, aspects of stability. Any wet areas in the bottom surface of the excavation must be drained before deployment and seaming of panels. The risk of dissolving earth fractions, like content of lime have to be considered.

Ground Water Level

The minimum depth to groundwater as well as groundwaters´ seasonal fluctuation must be evaluated. If the level is higher then the bottom level of the reservoir, the membrane will be subjected to hydrostatic pressure. Also, when the groundwater level is rising, air and gas will move upwards, which will cause gas accumulation and ballooning of the membrane. The above groundwater/gas considerations must be designed for by the site owner and design engineer.

Installation Manual

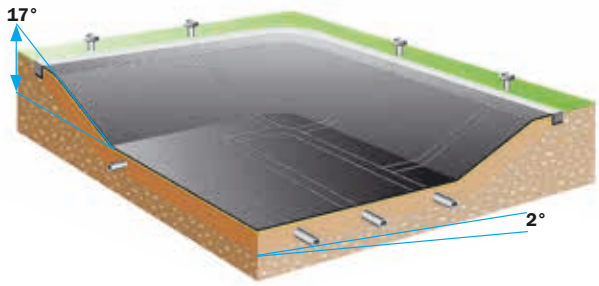
Elastoseal EPDM Geomembrane

Reservoir Specifications

Accurate design drawings specifying depth, size and shape of the reservoir should provided and must include slopes and perimeter details, anchoring and attachments to concrete or other structures. Construction design should be specified, including geomembrane and other geosynthetic materials for drainage of gas and water, protection and cover stability. Pipes and penetrations shall be specified, and water distribution from pipes, over exposed liner or earth surfaces should be protected.

Bottom slopes

The bottom of the excavation of any reservoir must have a positive slope of minimum 1-2%. This is to allow gas to evacuate along the bottom liner to side slopes and vents. Any areas with a negative slope can result in gas traps, causing ballooning of the membrane. Such balloons can very well rise above the water level.



Embankment slopes

Stability of embankments is a fundamental issue, and shall be considered by geotechnical engineers. It is recommended that interface friction is measuered using soil material from the actual site and the EPDM membrane, geotextile or other geotechnical product in contact with the soil. A general rule is that slopes should not be steeper than 3H :1V. Most soil slopes will become unstable when steeper then 2 H :1 V (26,5°).

Embankment crest

The embankment crest is often the point where liners are exposed to the maximum of stress and mechanical abuse. The soil surface on the crest and 1 meter down the slope shall be smooth and free of any stones or debris. A slope of 2° from the reservoir is recommended for drainage. The crest must be wide enough for an anchoring trench width min 0,5 meter, and for safe work by men and machines when anchoring the liner. Its further advised that a running length of 1,0 meter from crest to edge of anchor trench be used.

Water Level

The water level in the reservoir must be controlled to prevent overtopping and waves. An overflow pipe or spillway must be used to avoid overfilling. On small backyard ponds a minimum distance between water level and embankment crest of 0,2 m can be accepted, but in larger reservoirs minimum 0,5 m distance should be required by the design engineer.

Soil Cover

The risk of soil slippage down the slope of a reservoir should be considered by the geotechnical engineer, when an earth covered liner is designed. Geogrid nets and water drainage layers are often used for increased stability of slopes.

Typical interface direct shear data for the Elastoseal EPDM is:

- EPDM to sand 23°
- EPDM to clay 14°
- EPDM to Glacial Tile 26°
- EPDM to geotextile 23°

The above is a general guidance only. Actual design data should be derived with materials from the site. For proper drainage of water during melting periods, the soil layer must be over 1 me-

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Installation Manual

Elastoseal EPDM Geomembrane

ter in thickness in sub arctic areas. The depth of the soil cover must also take into consideration cold climates and maximum frost depth in order to provide stability.

Geotextiles and other Geosynthetics

Geotextiles are generally recommended to provide smooth substrates and for protection of the liner during installation and service. The weight should be minimum 270 g/sqm, but up to 800 g/sqm is often used. A geotextile provides for a more stable substrate than thick sand layers. Additionally, other geosynthetics such as geonets for drainage may be required.

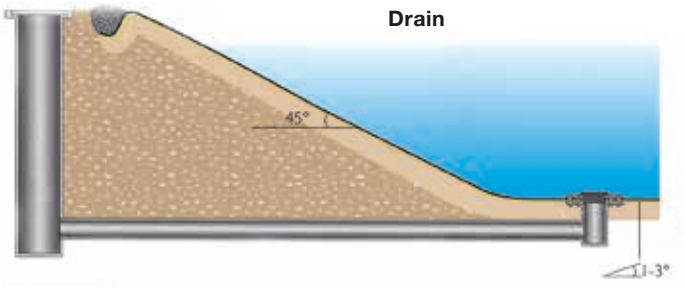
Drainage

Drainage of water and gas is perhaps the most critical problem which must be addressed when designing a reservoir. A large number of installations suffer unnecessary and often disastrous problems with water and gas under the lining system. Whenever water flows or gas is possible under the liner or variations in ground water level is expected the drainage of water and gas must be considered and designed for.

Drainage of ground water

Some actions that can provide water drainage:

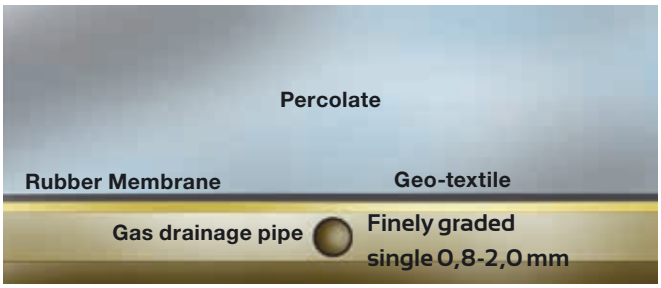
- Always slope the bottom surface 1-2% towards the embankments and control grades so that no negative slope can be found.
- Provide a layer of min 10 cm permeable sand under the liner.
- Provide permeable Geonets under the liner.
- Provide drainage piping under the liner.



Drainage of gas

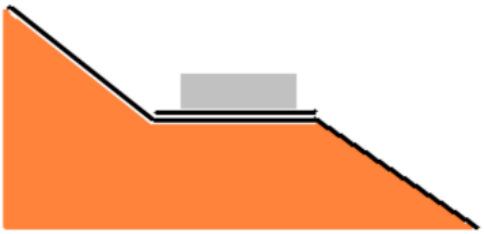
Some actions that can provide gas evacuation:

- Always slope the bottom surface 1-2% towards the embankment, control grades so that no spots with negative slope can be found.
- Use Geotextiles, Geonets or Geocomposites for gas transmission.
- Drainage piping under the liner.
- Provide gas vents on top of slopes.



Terracing

Terracing of slopes should be considered and is often recommended for safety reasons. On long slopes and slopes with seaming parallel to the slope terracing is necessary.



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Installation Manual

Elastoseal EPDM Geomembrane

Elastoseal EPDM installation

Earthworks

Site layout

Approved installation layout shall be available prior to beginning, with panel size, positioning details and numbering. It is recommended that the site is visited of the work, and that free access to the site and unloading/storage and transport is provided.

Surface preparations

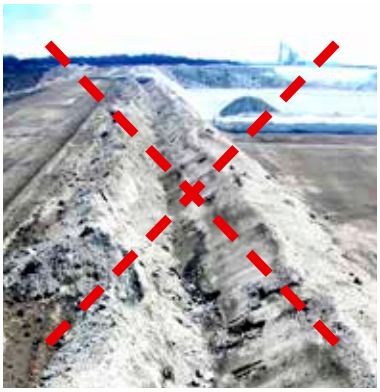
The Contractor will be ultimately responsible for preparing the subgrade soils in accordance with the project specifications. Prior to any Geosynthetics installation, the Installer shall verify the following:

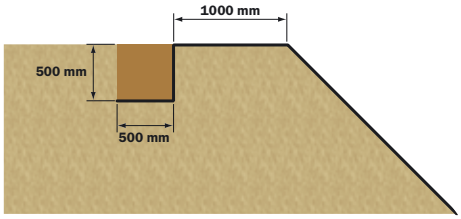
1. The surveyor has defined and verified all lines and grades.
2. The excavation size, depth and slopes are in accordance with design drawings.
3. The Contractor has verified that the supporting soils meet the density specification.
4. The surface to be lined has been rolled and compacted and that the surface is free of irregularities, loose soil and abrupt changes in grade.
5. That the soil surface does not contain loose stones larger than 20 mm or debris that may be damaging to the EPDM geomembrane.
6. That there is no area of softened soils due to high water content and there is no standing water.
7. That compaction of the earth around pipes and structures is in accordance with design requirements.

If the accepted surface becomes damaged or deteriorates, all liner installation work shall stop and the condition brought to the attention of the Contractor for repair.

Anchor Trenches

All anchor trenches, runouts or terminations shall be excavated according to design and to lines and grade shown on the drawings prior to geomembrane placement. Anchor trenches shall be prepared just in advance of geomembrane deployment to prevent damage to trenches. The edges of the anchor trench in contact with the geomembrane shall be slightly rounded and free of loose soil, protrusions or debris that could damage the geomembrane. Up to a reservoir depth of 10 meter, and slope maximum 3V:1H, the trench size should be 50 x 50 cm with a horizontal crest platform of 100 cm. In the case of deeper reservoirs, increase this sizes of the trench with 10 cm for every 5 meter of increased depth. Backfilling of the anchor trenches or run outs shall be accomplished as soon as practical after geomembrane installation and seaming. If backfilling cannot be completed at the end of each day, temporary ballast (sandbags) should be placed at the terminations. The trench should be machine compacted after backfilling.





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Installation Manual

Elastoseal EPDM Geomembrane

Geomembrane Installation

Product Information

The SealEco Elastoseal EPDM Geomembrane System provides an engineered system where all products and methods are designed for an installation meeting the highest expectations on quality and performance. Only SealEco products and methods that are authorized by SealEco are to be used in the geomembrane installation. Each panel delivered to site is marked with product identification, panel number and a sketch, where position of unrolling and directions of unfolding the panel are indicated.

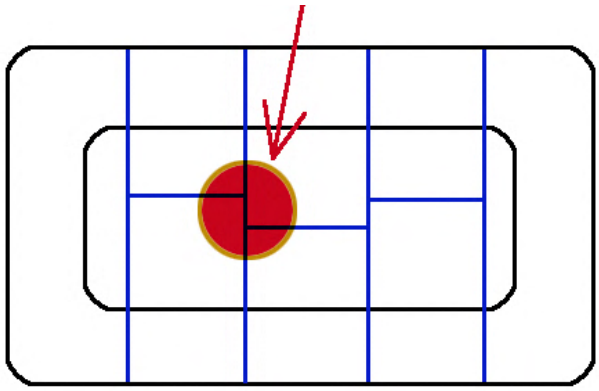
Delivery, storage and handling

In most cases panels are delivered to site in 2 meter wide rolls, rolled on a plastic or iron pipe, and strapped on a pallet. Care should be taken not to damage rolls with forklifts or during handling. Rolls should be left on pallets until they are used, with transport cover sheets in place. Keep the panels covered and protect them from sun exposure. Sunlight will result in a surface oxidation of rubber. This oxidation must be removed by machine grinding when splicing TPE directly against an EPDM surface. Panel to panel seaming is not affected, but repairs, cross splicing and seaming a pipe boot to the membrane will be affected.

Panel layout

A field panel is the unit area of prefabricated EPDM geomembrane which will be placed and seamed in the field.Panels should have an oversize of min. 2% in length and width compared to drawings of the reservoir, to allow for slack and folds occurring during installation. Each field panel is given a number or letter-number “identification code”. The field panel identification code should be as simple as possible for cross reference to panel numbers, or be the same as panel numbers.

A site panel layout plan shall be available, showing the position and seaming of each panel. Panels shall be designed and positioned to avoid double cross joints (i.e. 4 sheets meeting at one point). All seams shall run parallel to the slope of the excavation. In corners or irregular shaped reservoirs this is not always possible, but panel design shall restrict seam angles exceeding 45° across the slope.



Geomembrane Placement

The Installer shall ensure that each field panel is marked and referenced with the original panel number as well as the identification code. Each panel shall be placed at the location indicated on the panel layout plan.

As a general guidance an installation crew of 3 people can position panels up to 800 – 1000 sqm in size, provided they have machines for unrolling the panel.

Each panel is placed one at a time and each panel is seamed immediately after placement, or ballasted with sand bags if required to be left overnight. An EPDM panel is very flexible, a useful technique for moving and position the panel to the correct position is to pump the panel up and down, which will create an air cushion under the panel. Three people can move a 1000 sqm panel several meters in any direction using this technique.

Wrap the sheet around a wood stick and wear gloves when pulling the panel out.

If left overnight it is recommended to fold over seam areas 0,5

Installation Manual

Elastoseal EPDM Geomembrane

meter, for protection of the surface to be seamed the next day.

Each panel is to be installed with overlaps shingled down gradient to allow for drainage in the event of precipitation. Orientation of overlaps will also be placed in the direction of prevailing winds if the wind conditions are over 7 m/sec. The Installer shall record the location, identification code and date of installation for each field panel on an as-built drawing.

Geomembrane placement shall not proceed at ambient temperatures below -15˚ C or above +30° C unless approved by the design engineer. Elastoseal EPDM can be installed and seamed at temperatures down to -15° C if required due to location and construction schedule.

Geomembrane placement shall not be performed during any type of precipitation, in the presence of surface moisture or ponding water, or in the presence of winds exceeding 11 m/sec.

The Installer shall ensure that the following procedures are followed:

1 Deployment equipment does not damage the geomembrane or the supporting soil.

2. Personnel working on the geomembrane do not smoke, wear damaging shoes or engage in activities that could damage the geomembrane.

3. The method used for unroll/unfold the panels does not cause any damage to the geomembrane or soil surface.

4. Temporary ballast does not damage the geomembrane.

5. Adequate protection against wind uplift is provided and that there is no possibility of damage due to wind action.

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Installation Manual

Elastoseal EPDM Geomembrane

Geomembrane Field Seaming

Seams shall be oriented parallel to the direction of maximum slope, i.e. oriented parallel to and not across the slope.

Seams shall be minimized in corners and odd-shaped geometric locations. Horizontal seams shall not be allowed on a panel less than 1,0 m from the toe of slopes greater than 10 %. For slopes less than 10 % this requirement does not apply.

A seam numbering system using adjacent panel numbers shall be used for identification and recording of each seam.

Manufacturer approved processes for field seaming the Elastoseal EPDM and for repair are thermo-fusion welding. All welding equipment shall have accurate temperature monitoring devices to ensure proper measurement of the weld temperature at the point of surface fusion.

All field seam thermo-fusion welds shall be of the dual track type to allow for an air channel used in non-destructive air pressure testing.

All repair or small area welds shall be by hand held hot air gun or hot wedge and hand rolled with a silicone roll.

Only Manufacturer approved cleaning solutions or grinding methods shall be used to clean seam areas of dirt, debris or oxidation.

Seam Preparation

The seam overlaps shall be a minimum of 100 mm, properly aligned and free of wrinkles. The seam area shall be free of any moisture, dust, dirt, sand or debris of any nature and free of surface oxidation.

The surface below the EPDM must be smooth and non yielding. In the case of soft or rough surfaces, a roped seaming board (i.e. conveyor belt, wood- or plastic board) may be required below the seam area.

Trial Seam or Trial Welds

Prior to actual production seaming, trial seams on pieces of EPDM shall be made to verify that seaming equipment and conditions are acceptable and will produce a field seam which meets specifications. The correct speed, heat setting and machine setting should be established for the specific weather and wind conditions of the site.

Trial seams are performed for each welding machine to be used and by each operator.

A passing trial weld seam must be made prior to the beginning of each seaming period, typically at the start of the day and after lunch.

The trial seam sample shall be approximately 1,0 m x 0,3 m with the seam centered lengthwise.

Both the inside and outside seams of a dual track thermo-fusion seam shall be tested. All shear and peel test specimens shall either break in the membrane or exceed 300 % elongation of the membrane without break in the seam.

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Installation Manual

Elastoseal EPDM Geomembrane

Production Seaming of Panels

After approval of the Trial Weld Seams, production seaming on the deployed panels will commence. All production seams will be non-destructively tested and each completed seam shall be labelled with proper identification. As an example, a typical welding speed, using a Leister Twinny welder, at an ambient temperature of 15 – 23° C, clouded conditions and wind speed not exceeding 6 m/s, is 2 m/min with the machine set at 400° C. If required, a firm substrate must be provided by placing a strip of conveyor belt material or wood/plastic board directly under the seam area.

Wrinkles or “fish mouths” at the seam overlap shall be eliminated prior to seaming by pulling the EPDM smooth. Seaming will extend to the outside edge of panels to be placed in the anchor trench. Note that the hot wedge will not seam the first 0,2-0,3 meter of each seam, this part must be seamed with a hot air gun and roller.

Non-Destructive Seam Continuity Test

The Installer shall non-destructively test all field seams over their full length using an air pressure test (for dual track seams), an air lance test or other approved method. The purpose of the non-destructive test is to check the continuity of the seams. Continuity testing must be completed as the seaming progresses and not at the completion of all field seaming.

The following procedure is used for all production seaming using the dual track thermofusion process. In general, follow the procedures outlined in ASTM D 5820 – Pressurized Air Channel Evaluation of Dual Seamed Geomembranes and the following:

Equipment shall be comprised of the following

1. Manual or Motor Driven air pump capable of generating up to 350 kPa/3,5 bar pressure.
2. A hose with quick connects and valve to isolate pump from test once air pressure is achieved in seam.
3. Pressure gauge capable of indicating pressure in 5 kPa/0,2 bar increments within the test range.
4. A sharp hollow needle, diameter 1,5-2,0 mm, that can be injected without loss of pressure to one end of the air channel.
5. Hot Air Gun or mechanical clamps to seal both ends of the air channel.

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Installation Manual

Elastoseal EPDM Geomembrane

Procedure:

1. Seal both ends of the air channel length to be tested.

2. Insert the needle and connect the air pressure indicator to the needle assembly.

3. Pressurize the air channel to 150 kPa/1,5 bar (min 1,4 – max 1,6 bar) and shut off the pump.

4. Allow the air pressure to stabilize and observe that the entire channel is inflated.

5. With a pressure of approx. 150 kPa/1,5 bar stabilized in the channel, record the pressure. After 2 minutes, record the pressure again. If the difference between the two readings is more than 40 kPa/0,4 bar, the seam will require retesting.

6. If the pressure drop is greater than 40 kPa/0,4 bar (failure) check all seals for air leaks and retest.

7. If the pressure drop is still unacceptable after retest of the apparatus and checking for air leaks locate the failed area and repair. Perform re-testing.

The Air Lance testing will only be performed on seams that cannot be tested using the dual track air pressure techniques.

The air lance equipment and procedures are generally outlined in ASTM D 4437 and as follows:

Air lance test equipment consists of a compressor that can deliver a continuous exit pressure of min 350 kPa/3,5 bar to a 4,75 mm diameter nozzle on the end of a hand held lance.

1. The nozzle opening shall be directed to the edge of the seam an held a maximum of 25 mm away from the edge.
2. The rate of travel along the edge of the seam shall not exceed 12 m/min.
3. Any defect is identified by a distinct change in sound by the air passing through an opening or obvious de-bonding due to the air pressure force. Defects shall be marked for repair.

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Installation Manual

Elastoseal EPDM Geomembrane

Cover Material

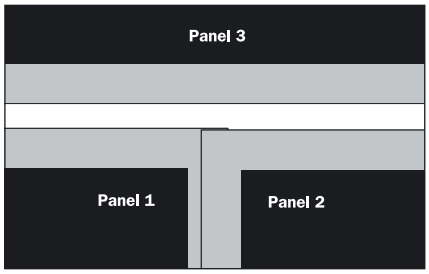
Cover material must be placed with care and in accordance with the design specification, avoiding damages to the membrane. The EPDM surface shall be protected with geotextile or fine sand layers, min 0,5 m in thickness.

Details

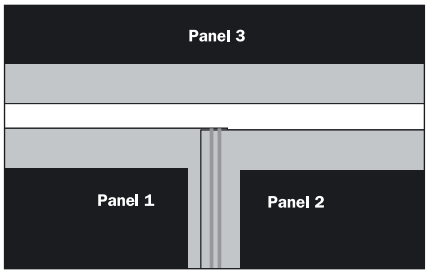
In general the EPDM membrane shall not be cut or split unless absolutely necessary. Whenever a cut is made, there is an increased leakage risk. EPDM rubber membranes conform to irregular substrates like no other membrane type, and can be folded in corners like a serviette without risk of cracking, even if exposed to the atmosphere.

T-joints between panels

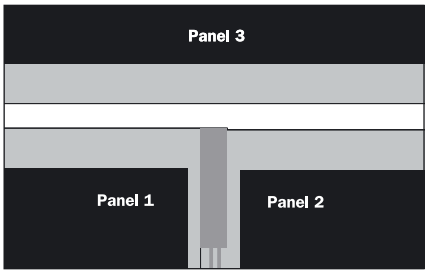
Panels should run over the entire width of a reservoir whenever possible. When the width of the excavation exceeds 60 meter it is necessary to make T-joints between panels at the bottom surface. A T-joint is produced as follows:



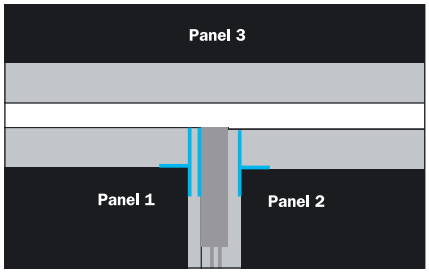
1. Position panel 1 and 2.



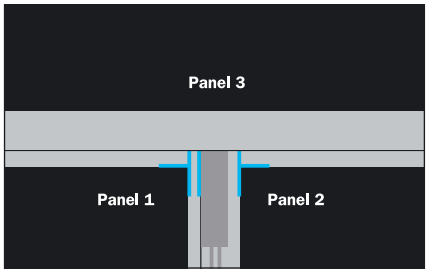
2. Seam panel 1 and 2 with dual hot wedge.



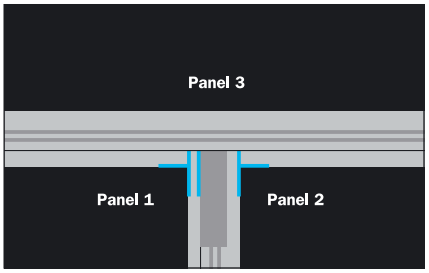
3. Using a hot air gun, seam the full surface of the flap.



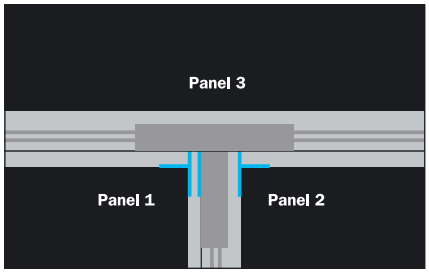
4. Level the height differances with Hot Melt Sealant and Hot air Gun.



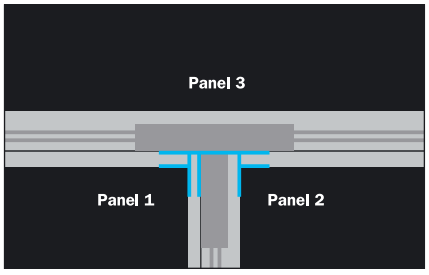
5. Position panel 3.



6. Seam the panel with dual hot wedge.



7. Seam entire surface of panel 3 overlapping flap with hot air gun.



8. Seal the edges of panel 3 with Hot Melt Sealant.

Warning: Use Hot Melt Sealant and not Sealant 5590. Sealant 5590 is based on silicone, no hot air or wedge seaming is possible on a siliconized surface.

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Installation Manual

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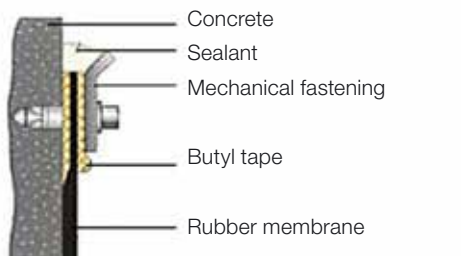
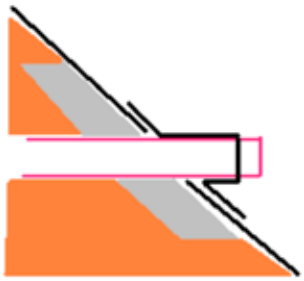
Batten Connection to concrete structures

The soil around all concrete structures must be thoroughly compacted and stabilized. Depending on the design data, fasten the membrane using a stainless- or aluminum bar using butyl tape 9060 and silicone sealant 5590 for waterproofing. Fixings should be made with maximum 0,3 m c/c. Adhering the membrane partially with paste adhesive 3300 or contact adhesive 5000 will improve stability of the installation.



Pipe Penetration

Factory made Thermobond pipe boots for seaming with hot air guns are available in most sizes. Soils around pipes shall be stabilized by compaction or concrete reinforcement. Grind the EPDM surface with rotating grinding machine and heat splice the seam. Cut corners 45 º. Apply sealant 5590 around edges. The boots are then bonded to the pipe according to design detail provided.

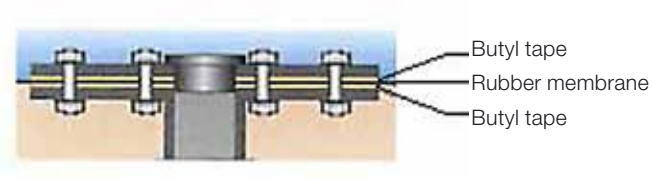


Drains

A concrete base is required for stable construction of inlet/outlet pipes in the bottom surface. The EPDM membrane is mechanically clamped to a drain pipe fastened in the concrete base or attached to the concrete base by batten.

Corners

Prefabricated corners are rarely used in EPDM geomembrane applications, inside angles are usually folded like a serviette. If a concrete outside corner design is necessary Thermobond pre-moulded corners and Thermobond 2 mm sheet, in TPE material suitable for hot air seaming, are available.



Defects and Repairs

Several procedures exist for the repair of Elastoseal EPDM geomembrane. Manufacturer directions must be applied to for effective repairs.

1. Patching. Patching is used to repair large holes, tears, destructive cut-outs, fishmouth repair or any defects that are found to be suspect.
2. Cap Strip. Cap Strips of Thermobond strips are usually 150 mm in width and are used to repair long lengths of defective seam area or suspected seam area.
3. All surfaces to be repaired must be clean, dry and grinded for oxidation.
4. All patches shall extend a minimum of 100 mm beyond the edge of the defect and shall have rounded corners. Small patches shall be round or oval in shape.
5. The repair procedures, materials and equipment shall be as recommended by SealEco.

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Installation Manual

Elastoseal EPDM Geomembrane

Quality Assurance System

Installations are always tested by the installer regarding non-destructive seam integrity, as described above. A panel design drawing “as built” and test certificates on air channel testing is always provided by the installer.

In case the SealEco QAS System is contracted full documentation and records on quality control in production, prefabrication and installation as well as records on the installation for long term tracebility shall be provided.

To enable the SealEco QAS System to be applied smoothly it is essential, that

- The QAS requirement is specified when order is placed with SealEco and prefabricator.
- That the Site Owner, General Contractor or Excavation Contractor, whoever is the direct partner, have appointed a quality manager, who is the receiver of the test results and follow the installation on a daily basis.

The following documentation shall be provided by the installer (For detailed information, see the SealEco Quality Assurance System Specification):

Membrane Production Records

QM1 Physical Properties of membranes
QM2 Physical Properties of membranes

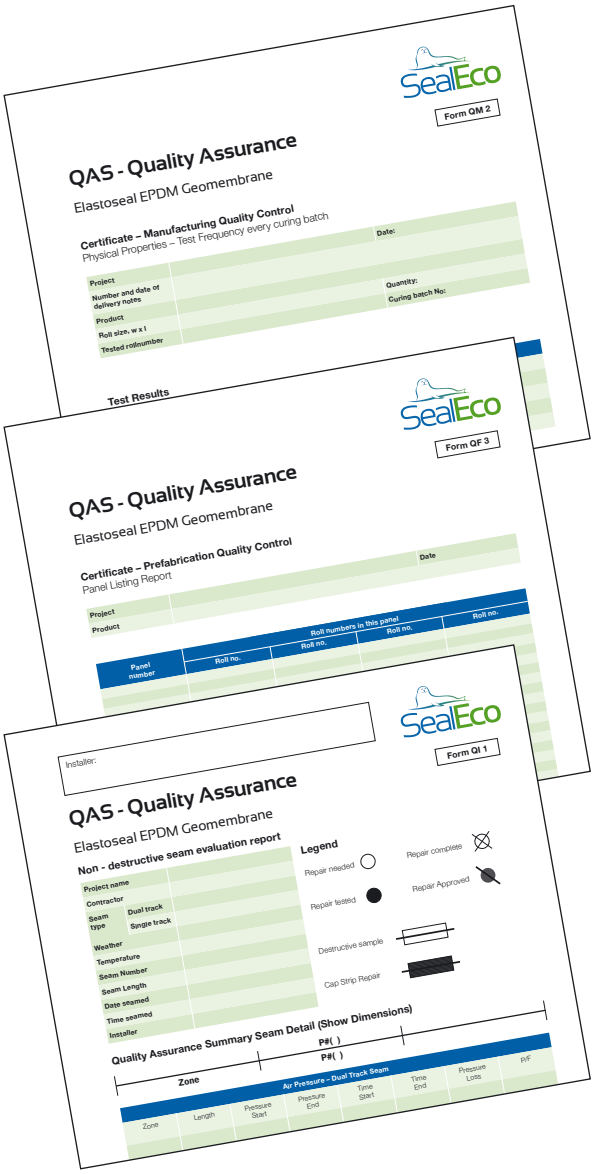
Prefabrication Records

QF1 Air Lance testing of seams
QF2 Destructive testing of seams
QF3 Panel listing report

Installation Records

QI1 Non-destructive seam test
QI2 Destructive seam test
QI3 Panel placement report
“As built” drawing

Destructive seam testing can be made by SealEco or on site by the use of a testing rig.



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Damage considerations

The following typical damages to liners have to be considered in design and installation.

Mechanical damages

The stress and subsequent puncture caused by rocks, machines, inferior preparation of soil surfaces, light weight geotextiles are common reasons for failures.

Settlements and movements

Although EPDM has superior properties and multidimensional elasticity the risk of collapsing structures and materials dissolving must be considered.

Gas uplift

Gas is a constant issue and a difficult problem to solve after installation of the liner. Always provide gas drainage if conditions on the site are questionable.

Cover soil slippage and slides

Consider interface friction properties of soil and geomembrane in design and construction to prevent surface slides and damage.

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Installation Manual

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Rough substrates
Concern about quality of surfaces and precautions during installation is necessary to avoid punctures. Use of geotextiles or fine grain soil is advisable.

Wind uplift
All membrane edges must be carefully and adequately anchored under earth. During installation loading with sand bags and follow up on weather reports are essential. The picture shows a broken geo pipe after a 5000 sqm membrane up lift in strong winds. Long term ballast design must be considered for long slopes left exposed.

Weather limitations
Installation and seaming of panels can not continue with rain or intermittent showers. Stop seaming under these conditions, or the quality of the installation will be jeopardized. Also stop installation at wind speeds over 11 m/sec.

Wave and ice action
Side slopes of reservoirs must be protected by armour if excessive wave and ice damage may occur.

Traffic
Driving on the liner surface is not permitted and will damage the membrane. A minimum of 30 cm of soil cover is necessary for occasional traffic and 60 cm for sustained traffic by vehicles. Light weight, wide track vehicles should be used over soil covered geomembranes. They are commonly referred to as low ground pressure (LGP) tracked vehicles.

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Installation Manual

Elastoseal EPDM Geomembrane

Safety

When designing and installing a pond, reservoir or other water containment or conveyenace project safety during installation and during the service life of the installation must be considered.

People and animals must be protected. Examples of precautions are:

- Fences around reservoir or impoundments.
- Intermediate sections or benches built in to reservoir slopes. This is important when slopes exceed 3H:1V.
- Access to ladders and float devices.
- Animal access ramps.

Elastoseal installation equipment

An indicative list of equipment and tools include the following items:

- ✓ Scissors, knives with hooked blades.
- ✓ Tape measures/wheels.
- ✓ Chalk line.
- ✓ Rubber squeegee for water removal.
- ✓ Rags.
- ✓ Markers suitable for rubber.
- ✓ Silicone handrollers.
- ✓ Hot Air Guns, type Leister Triac or similar.
- ✓ Dual Hot Wedge thermal fusion machine, type Leister Twinny.
- ✓ Generator and cables.
- ✓ Compressor and air lance for testing of seams.
- ✓ Grinding Machine and Grinding Discs.
- ✓ Ropes or straps for unrolling panels.
- ✓ Tractor, winch or 4-wheel drive LPG vehicle for pulling out panels
- ✓ Air Pump, needle and other equipment for continuous air pressure testing of seams.
- ✓ Board or conveyer belting for support over wet areas.
- ✓ Sump pumps for water removal.
- ✓ Sand bags/ballast.
- ✓ Spreader bar/lift assembly for large rolls.
- ✓ Gloves for protection when pulling and waving membrane panels.

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Installation Manual

Elastoseal EPDM Geomembrane

SealEco EPDM Geomembrane Products

Elastoseal T EPDM

EPDM membrane rolls for prefabrication to panels using a hot wedge.

Thickness, mm	Rollsize, width x length, m	Package	Weight, kg/m²
0,80	1,70 x 25 or 125	20 alt. 6 rolls on pallet	0,9
1,00	1,70 x 25 or 125	20 alt. 6 rolls on pallet	1,2
1,20	1,70 x 25 or 120	15 alt. 6 rolls on pallet	1,4
1,50	1,70 x 25 or 75	15 alt. 6 rolls on pallet	1,8

Elastoseal EPDM Geomembrane panels

EPDM membrane prefabricated to panels, with Thermobond splice edge for site seaming with dual track hot wedge. Elasoseal Panels are available in thickness 0,80, 1,00, 1,20 and 1,50 mm. Length of panels are max. 70 m. Delivered rolled on paper cores width 2,0 m.

The following panel size alternatives are available

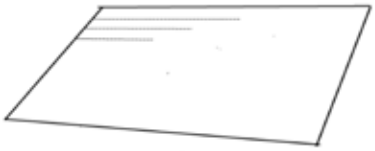
Standard size panels

Thermobond site seaming edges along panel length.
Width. 5,3 / 10,3 / 15,3 m.
Length: 25,0 or 50,0 m

Thermobond site seaming edges along all panel edges.
Width: 5,3 / 10,3 / 15,3 m
Length: 25,3 or 50,3 m

Customized panels, size and shape according to specifications. Maximum size 1000 m²

Prefabricated according to specification.



Prefabricated according to specification, Thermobond site seaming edges along pane length/roll direction.

Prefabricated according to specification, Thermobond site seaming edge along all panel edges.

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Accessories and Components

Thermobond Splice Strip
Laminate EPDM/TPE, for hot wedge seaming.
Thickness 1,50 mm.

Width, mm	Length, m	Weight kg/lin.m
150	20	0,2
200	20	0,3
300	20	0,5
450	20	0,7
600	20	0,9
900	20	1,4

Thermobond Hot Melt Sealant
Homogenous TPE rod for sealing of T-splices. Diameter 4 mm. Delivered in 30 meter rolls.

Thermobond Hot Melt Strip
Homogenous TPE strip for heat seaming applications. Width 40 mm, thickness 0,7 mm. Delivered in 20 meter rolls.

Thermobond Pipe Boots
EPDM Pipe Boots with EPDM/TPE laminate flange for heat splicing to membrane. Available in 90° and 45° angel and in closed or open design. Stock sizes are Ø 50, 70, 100, 125, 150 mm.

Thermobond PE drain/overflow
Black polyethylene pipe with flange of EPDM/TPE laminate, for heat splicing to membrane. Stock sizes inner Ø 63, 75, 90, 110, 125 mm.

Cleaning Wash 9700
For cleaning of EPDM membrane. Delivered in 5 l tin.

Contact Adhesive 5000
For adhering EPDM membrane to substrates like concrete, wood etc. Delivered in 5 l bucket.

Sealant 5590
Silicone sealant for EPDM membrane. Delivered in 310 ml cartridge, 15 pcs. per box.

Thermobond TPE 100 strip
Homogenous TPE sheet, thermoplastic, for details and connections. Thickness 2,00 mm.

Width, mm	Length, m	Weight kg/lin.m
300	10	0,7
450	10	1,1
600	10	1,4
1700	10	4,1

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