



EPDM Membrane

www.lineflex.com

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ABOUT US

AK-İZO Yalıtım Sistemleri San. ve Tic. A.Ş. is a company established in 2005, within the structure of AKTAŞ GROUP. Aktaş Group, the foundations of which were laid in a small tire workshop in 1938, completed its conglomeration at the beginning of 2011 and was restructured as AKTAŞ HOLDING. Aktaş Holding continues its operations in three main lines of work, namely the Transportation, Construction and Green Energy groups, with 10 companies and 50 thousand square meter indoor space in total.

AK-İZO Yalıtım Sistemleri San. ve Tic. A.Ş. within the Aktaş Holding Construction Group manufactures and sells the first and only EPDM Membrane in Turkey.

A reliable brand has been created in the water insulation sector by means of the projects we realized using the Lineflex EPDM Membranes manufactured by AK-İZO Yalıtım Sistemleri.



As AK-İZO Yalıtım Sistemleri, we aim to become an international brand by producing world-class products with our Lineflex brand, both domestically and internationally and by developing solutions for the water insulation field.

We serve our customers with the production system, management processes and high quality standards which we have guaranteed by means of international quality certificates. Lineflex EPDM Membranes' compliance to TS EN 13956, TS EN 13859, TS EN 13967, TS EN 13361, TS EN 13362, TSEN 13491, TS EN 134 92, TS EN 13493, TS EN 15382 norms has been certified by CE documents.

SUPERIOR TECHNICAL PROPERTIES

Superior Endurance against Atmospheric and Environmental Conditions

It exhibits superior endurance against the atmospheric ozone gas and the aging caused by the UV rays from the sun, thanks to the elastomer structure and polymers. It preserves its properties even during sudden temperature shifts between -40C and +120 C. It is durable against the plant roots, salt and many other chemicals found in the soil and water.

Superior Physical and Mechanical Properties

It suits various geographical conditions and does not lose its flexibility even in very cold weather conditions such as temperatures as low as -40C. It can stretch more than 300%. It continues to serve for many years without requiring any extra structural measure against any structural movements that might occur due to the expansion of concrete surfaces.



| Lineflex EPDM Membrane Characteristics / Lineflex EPDM Membran Özellikleri | | | |
|---|---|--------------------------------|---|
| Özellik / Characteristics | Parametre / Parameter | Test Metodu / Test Method | İstenen / Compliance Criteria |
| Sıvı su Geçirmezlik / Water Tightness to Liquid Water | W1 | EN 1928 | 2 KPa ve 60 KPa'da su sızdırmaz olmalı / Watertight at 2 KPa and 60 KPa |
| Statik Yük Dayanımı / Resistance to Static Loading | 20 kg. | EN 12730 | min. 15,0 kg |
| Cekme Dayanımı / Tensile Properties | | | |
| Donatısız Plaka / Unreinforced Sheets | 7,01 Mpa | EN 12311-2 | min. 6,00 MPa |
| Donatılı Plaka / Reinforced Sheets | 8,62 MPa | PrEN 13859-1 | min. 6,00 MPa |
| Uzama / Elongation | 509,71 | EN 12311-2 | min. 300 % |
| Yaşlandırılmalı Su Geçirmezlik Dayanımı / Durability of Watertight Against Ageing | 10 KPa'da su sızdırması görülmedi / No leakage detected at 10 KPa | EN 1296, Afterwards to EN 1928 | KPa ve 60 KPa'da su sızdırmaz olmalı / Watertight at 2 KPa and 60 KPa |
| Darbe Dayanımı (1,00 mm ve üzerine kalınlıklar) / Resistance to Impact (for 1,00 mm thickness and greater than 1,00 mm) | Method A = 300 mm - Sızdırma Yok / No Leakage Detected Method B = 1000 mm - Sızdırma Yok / No Leakage Detected | EN 12691 (But with H = 300 mm) | Method A = 300 mm Method B = 1000 mm |
| Yırtılma Dayanımı (Civril) / Resistance to Tear (Nail Shank) | | | |
| Donatısız Plaka / Unreinforced Sheets | 82,72 N/mm | EN 12310-1 | min. 50,0 N/mm |
| Donatılı Plaka / Reinforced Sheets | 426,11 N/mm | PrEN 13859-1 | min. 200 N/mm |
| Yanma Özelliği / Reaction to Fire | E | EN 13501-1 | Classification |
| Ek Yeri Kayma Dayanımı / Joint Peel Strength | 5,74 N/mm | EN 12317-2 | min. 3,50 N/mm |
| Ek Yeri Soyulma Dayanımı / Joint Shear Strength | 3,70 N/mm | EN 12316-2 | min. 2,00 N/mm |
| Su Buharı Geçirgenliği / Water Vapour Transmission | 0,516 g/(m2.d) | EN 1931 / Din EN ISO 12 572 | min. 0,459 g/(m2.d) |
| Düşük Sıcaklıkta Esneklik / Foldability at Low Temperature | Pass | TSE EN 495-5/TS 4709 | |
| Ozon Dayanımı / Resistance to Ozone | Pass | EN 1844 / ISO 1431 1 / TS 2680 | Pass |
| Alkalilere Karşı Direnc / Resistance to Alkali | 10 KPa'da su sızdırması görülmedi / No leakage detected at 10 KPa | EN 1847, Afterwards to 1928 | Pass |

Stand-alone. Long Lasting and Economic Solution for Water Insulation

Through aging tests, it was proven to last at least thirty years in the application location without any deterioration. Thanks to this feature it presents a maintenance-free and economic insulation solution to its user.

Product Range and Application Areas

Lineflex EPDM membranes are produced and marketed as 25m and 50m rolls of 0.50mm-3 mm thickness and 1.8 m width. If requested they can be produced as project-based wide panels. Thus time-savings can be achieved due to reduced number of seams.

Lineflex EPDM Membranes are used in:

- Terrace and dome shaped roofs, under the tiles
- Metal rooftops
- Green roofs.
- Building foundation and side partition insulation
- Curtain walls
- Cut-and-cover tunnel constructions
- Base of ponds, landscaping and garden ponds
- Structures with dilatation
- As single layer water insulation cover in water treatment facilities.

EPDM and BUTYL TAPES



EPDM Membrane

Lineflex EPDM membranes are produced black or colored, texture patterned, reinforced or unreinforced and with a thickness ranging from 0.50mm to 3.00 mm. The membrane rolls have a width of 150-180 cm and are 25 or 50 m long.



Dilatation Tape

These are used in the dilatation regions in all types of structures. It is a UV durable long lasting material which can stretch more than 300%. It is produced from EPDM membrane with a thickness ranging between 1.20-2.00 mm. 3cm They are provided for use as 15-100 cm wide 25 m long rolls, with both faces applied with 3 cm tape holes and both sides laminated with geotextile felt.



EPDM Felted Membrane

Lineflex EPDM felted membranes are produced by laminating felts of densities between 150 gr/m² to 250 gr/m² on membranes with a thickness ranging from 100 mm to 2.5mm.



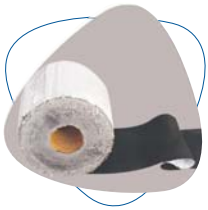
Double Adhesive Butyl Tape

This is a double-faced tape which adheres easily and rapidly on many materials. It has a high UV durability, resistance to acid, etc. chemicals and provides good results even at high and low temperatures. It is used in all types of old and new rooftops and seams and endpoints of curtain wall panels. It is provided as rolls in various sizes and lengths.



Butyl Aluminum Tape

Butyl adhesive laminated on aluminum foil. It is a self-adhesive tape and adheres rapidly and easily on many materials. It has a high UV durability, resistance to acid, etc. chemicals and provides good results even at high and low temperatures. It is used in all types of old and new rooftops and seams and endpoints of curtain wall panels. It is provided as rolls in various sizes and lengths.



EPDM Butyl Tape

It is a self-adhesive tape, produced by laminating butyl adhesive on EPDM membrane surface. It adheres well on almost all surfaces. It is of extremely flexible make and adapts to movement. It gives perfect results in insulation of the joints in any structure, such as roof sheet plates, chimney corner joins, façade panel seams, etc. against water, moisture and dust. It is provided as 1 mm thick, 10 cm wide and 30 m long rolls.



EPDM Cord Tape

This is used as water insulation barrier at the joints of curtain walls and joineries. It is a UV durable, flexible and long lasting material. It is provided in various sizes and lengths.



Interlining Tape

Butyl adhesive is laminated on texture patterned interlining fabric. It is flexible, self-adhesive and has the property of filling gaps. It is used in water -tightness of critical spots (wet floor corner details, windows blind frame undersides, around roof hatch casing, etc. Provided as 10 cm wide, 30 m long rolls.

ADHESIVE AND MASTIC



KNT Adhesive

It is used for gluing EPDM membranes on various non-EPDM surfaces such as walls, wood, metal. It is a neoprene based contact adhesive. Average consumption amount is 500 gr/m² and it is applied on both surfaces and pressure is applied for attaching, after waiting for 10-15 minutes depending on the weather conditions.



Polyurethane, Silicon Mastic and Silicon Adhesives

Polyurethane, silicon mastic and silicon adhesives are special purpose products suitable for all areas of use, provided as 310 ml. cartridges and 600 ml. sausages.



EPDM Mastics

It is an EPDM-based, elastic product which perfectly adheres to concrete, metal, wood and PVC surfaces. EPDM mastics are used for repairing membrane overlap spots, and as filler and insulation mastic between the pressure bar and the surface you're fixing the membrane onto. It is used for attaching the EPDM membrane on the surface in curtain wall systems, metal rooftops and aluminum joinery systems.



Epoxy Adhesive

This is used in dilatation tape applications, for anchoring the dilatation tape on the concrete. It is solvent-free and easy to use. It has high mechanical strength and water impermeable. Adheres perfectly on concrete and steel.

FITTING AND AUXILIARY ELEMENTS



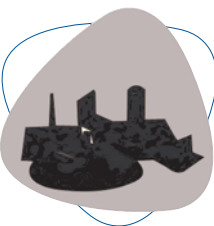
Pressure Bar, Fastener, Screw and Dowels

It is used for the finishing of EPDM membrane. It is 100-300 cm long. Prepared as 20- 50 mm wide, 1,20-3,00 thick flat sheets from aluminum or galvanized metal. Fasteners are metal plates manufactured using galvanized metal and used for anchoring the EPDM membrane. Screws and dowels are used for anchoring the pressure bar, fastener and various fastening elements on the underlying surface.



Linefix Mechanical Anchoring Apparatus

Linefix mechanical anchoring apparatus is a plastic apparatus used for anchoring EPDM membranes on metal rooftops without drilling a hole.



Detail Parts

All detail parts are manufactured from EPDM based material and designed specially according to their functions. The fastening of detail parts on the EPDM membrane is performed via thermic weld or gluing. Main detail parts are inner corner, vertical pipe drop, side parapet rise, antenna connections details.



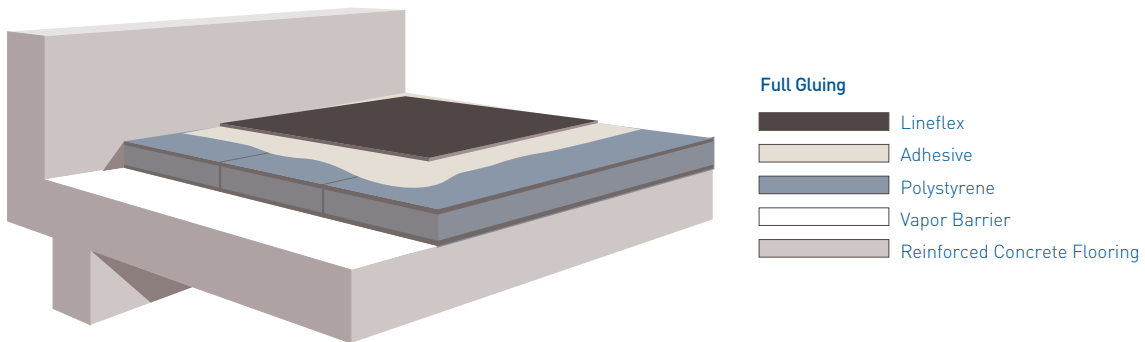
Membrane Welding Machines

Turkey distributorship and technical service services are provided for the Herz brand welding machines used in membrane applications.

TERRACE ROOFTOPS

Full Gluing

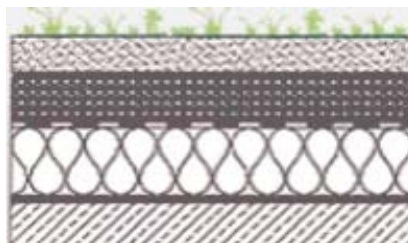
On rooftops where mechanical anchoring is not appropriate, the EPDM membrane is anchored by gluing it on the entire surface. In this system no additional load is applied on the roof. Full Gluing system is more suitable for irregular, unusual and dome shaped rooftops. Heat insulation materials with upper surfaces suitable for gluing should be used. The edges of the membranes are seamed by welding with thermic tapes or using EPDM adhesive. If adhesive is used the overlapping width must be minimum 10 cm. Perlite sheets, rock wool or polystyrene sheets can be used as heat insulation material.



GREEN ROOFS

Green Roof

In the cities transforming into concrete jungles, with the rise of the environmentalism, especially in Western Europe many terrace rooftops are designed as gardens or transformed into green roofs at a later time, in order to provide green spaces and also in order to help protect the natural order. The most critical issue in the waterproofing of green terraces is that the roots of the plants, if dehydrated, grow deeper and damage the waterproofing materials. For this reason, using the Lineflex EPDM membrane which is durable against plant roots provides to its user an exact and guaranteed solution for green roof insulation.



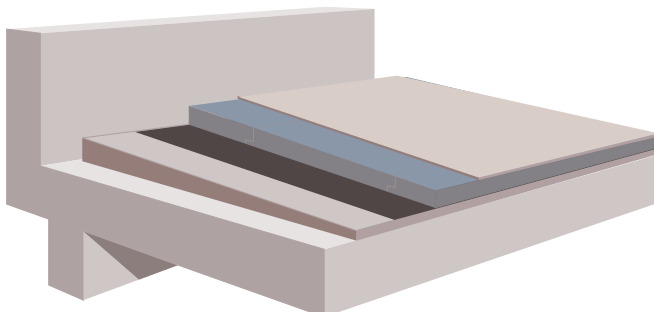
Green Roofs

- 1 Vegetation
- 2 Topsoil
- 3 Geotextile
- 4 Drainage
- 5 Geotextile
- 6 Lineflex EPDM
- 7 Heat Insulation
- 8 Vapor Barrier
- 9 Reinforced Concrete

Green Roof application over LINEFLEX EPDM on heat insulated rooftops.

Inverted Roof

In this roof system, contrary to the flat roofs, the membrane is laid under the heat insulation instead of over it, as it can be understood from its name. Also there's no need for mechanical anchoring or full gluing. The heat insulation plates or placed on the membranes which are laid loose on the floor and a 200gr/m² geotextile felt is laid on the insulation plates. Finally, in order to block the lifting force of the wind, river gravel with a minimum density of 50 kg/m² or 50 mm thick concrete plates or placed. The gravel size should be minimum 20- 40 mm.



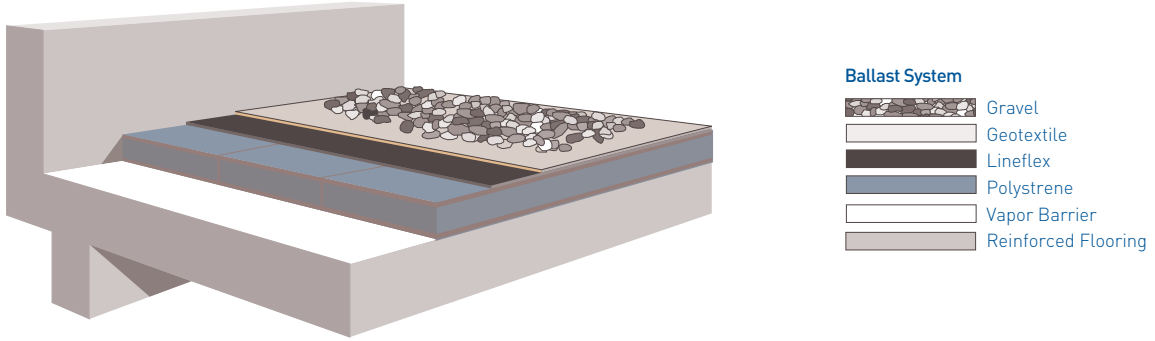
Inverted Roof

- Protective Screed
- Geotextile
- Polystyrene
- Lineflex
- Slope Screed
- Reinforced Flooring

BALLAST SYSTEM

Ballast System

The most economic method for building terrace rooftop insulation is the ballast roof system. This system can easily be used in various roof shapes. For the application of the system, EPDM membranes are laid next to each other, overlapping 4 cm and are welded using welding machines. In special circumstances adhesive can also be used on the overlaps. In this case the overlap width must be at least 10 cm. The roof parapets, pipe and rain water drains and similar details are resolved using detail parts made of EPDM membrane. Perlite sheets, polyurethane sheets, rock wool or polystyrene sheets can be used as heat insulation materials.



Aerotextile is laid on the EPDM membrane for protection purposes. 50 kg/m² river gravel is laid on the geotextile in order to prevent the heat insulation material from getting lifted off due to the wind force. The gravels should not have any sharp edges or points. The gravel size should be in the 20-40 mm range. If crusher rock gravels are used minimum 200gr/m² grade geotextile should be used. Minimum 50 mm thick concrete plates are laid on rooftops which are walked on.



METAL ROOFS








Linefix

Linefix membrane is mechanically anchored onto rooftops without drilling, using the Linefix system. The Linefix mechanical anchoring system is generally used on rooftops made of corrugated sheets and for the improvement of old roofs.

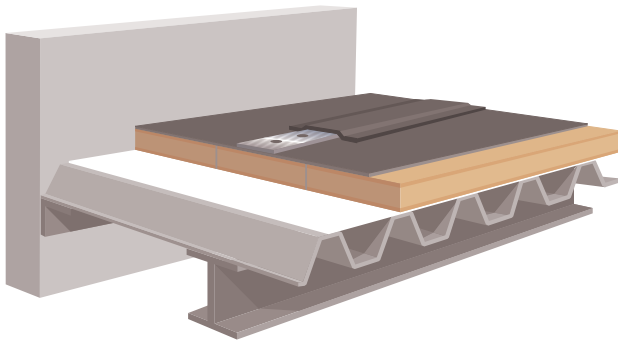


UNEFIX Anchoring






-  Lineflex
-  Rock Wool
-  Vapor Barrier
-  Corrugated Steel Flooring
-  Steel Profile

Mechanical Anchoring

On slightly flat rooftops where additional loads are not allowed statically, the membrane is anchored mechanically, using fasteners and special screws. The rock wool layer placed on corrugated sheet is covered with Lineflex membrane. The membrane strip is fixed on the corrugated sheet on its edge that doesn't have a welding tape via mechanical anchoring. 15 cm overlap width is covered with mechanically anchored membrane strip. Hot air welding is applied on the overlaps. The membrane edges which do not have overlap thermic welding strips are joined with thermic tapes or special adhesives.



Mechanical Anchoring

-  Lineflex
-  Rock Wool
-  Vapor Barrier
-  Corrugated Steel Flooring
-  Steel Profile





Ready-Made Rooftop Applications

For multiple-rooftop applications (when cladding multiple similar rooftops), Ak-izo prepares model casts at the factory according to the project. The products which are prepared in these casts according to the measurements and details of the roofs are packaged and delivered to the construction site.

This way, the products which are prepared in accordance with the roof's geometry and measurements are packaged and delivered to the construction site. This way, the roof panel which is prepared according to the roof's geometry and measurements is directly cladded on the roof. Thus, the workmanship costs for covering roofs with LinefLex EPDM membranes is minimized.



CURTAIN WALLS



Curtain Walls

The spaces between the window frame and the structure is leak-proofed using Lineflex EPDM membrane against the sweating that occurs behind the wall and the moisture caused by the rain drops hitting the wall. In the application, 0,5mm-1mm thick EPDM membranes are used as strips of 150 cm or desired width. Plaster gluing mastic and pressure bars are used as accessories.

FOUNDATION WALL AND INSULATION

Bundling

The bundling water insulation is applied in order to protect the building foundations and basement walls against the harmful effects of underground waters and the effects of sulfate etc. on floors without underground waters. The usable life of buildings with basement bundling is very long. Mostly buildings with weak foundations are destroyed during earthquakes. High performance Lineflex EPDM membrane protects the buildings' foundations against water and chemicals such as salt, acid and alkali in the soil. The bundling application is performed by covering the building foundations and the side walls in contact with the soil with Lineflex EPDM membranes.



Dilatation Tape

These are used in the dilatation regions in all types of structures. It is a UV durable long lasting material which can stretch more than 300%. It is produced from EPDM membrane with a thickness ranging between 1.20-2.00 mm. Lineflex EPDM dilatations are produced in two varieties, i.e. with both faces applied with holes or with both sides laminated with geotextile felt. Lineflex EPDM dilatations are used by gluing them on concrete surfaces with epoxy. Felt dilatation tapes are recommended for dilatation solutions for bituminous. Dilatation is provided by melting the bituminous material by alurning and directly laminating on the felt.



PONDS

Because of the need for protection and efficient use of our natural water sources, which is gaining even more importance in our day, various water insulation and collection areas are being established, for energy purposes, irrigation purposes and also for using as a water reservoir during fire-fighting. Water collection ponds insulated using Lineflex EPDM Membrane provides its user a long and maintenance-free useful life thanks to its superior durability against natural conditions, plant roots, moss and the salts and numerous chemicals found in the soil and water. Rubber based, chemically reinforced Lineflex EPDM Membranes produced at Aktas Holding Akizo Yalitim Sistemleri A.Ş. facilities using state of the art technology preserves its elasticity and structural stability even under harsh natural conditions.

It has been proven through structural tests, than in the Lineflex EPDM Membrane, which has been tested even under the extraordinarily cold and hot weather conditions at -40 C and +120 C, the ozone which causes materials used in water-proofing of ducts which pose a problem for water-proofing to deteriorate in time and lead to serious problems do not have a harmful effect on Lineflex EPDM Membranes.

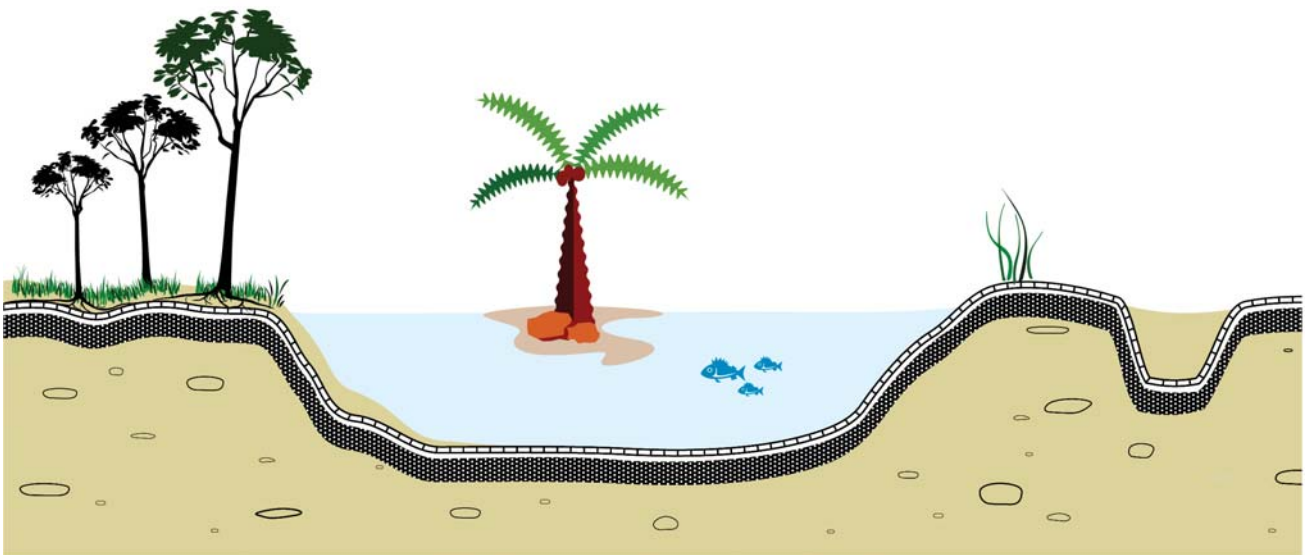
These can be laid as large panels (up to 1000 m²) by welding the panels to each other. This way the production speed at the construction site significantly increases and it is possible to complete the work in the shortest time.



PONDS

Canals

For preventing HPP (Hydroelectric Power Plant) canals or irrigation canals from leaking water, EPDM Membranes are laid inside the canal without pouring concrete. Since, if concrete has already been poured inside the canal, the flow rate will drop due to dilatations or water leakages due to settlement cracks, water-proofing can be obtained by laying EPDM membranes over the concrete.



PERFECT WELDING

Perfect Welding

In water insulation applications carried out using EPDM Membrane, full leak-tightness is obtained through the material itself, the application skill level and the correct method of application. The Lineflex EPDM Membranes which, as a standard, are manufactured ready to join with heat welding machines (hot air or automatic welding robots) applied on Thermoline edge tapes, which is a method used by our company since long years, are made into a single panel of the desired size. Guaranteed and exact leak-tightness is ensured with Lineflex EPDM Membranes which are welded together using thermoline edge tapes.

Lineflex Welding Technique

The Lineflex EPDM Membranes manufactured by our company AK-İZO Yalıtım Sistemleri A.Ş. can be successfully welded with EPDM rubber strips and Thermoline welding technique without requiring any chemicals (adhesive, solvent) and thus with no harm to nature. All of our products are equipped with Thermoline edge tapes which provide complete leak-tightness when welded.

Important Welding Parameters and Warnings

The welding temperature, pressure amount and the welding speed must be compatible in order to ensure an optimal welding. The overlaps which are to be welded should be dry and clean.

Welding Temperature

The welding is performed at a temperature of approximately 420 C - 470 C, manually using a welding machine or mechanically using an automatic welding machine.

Welding Speed

It is approximately 2m/min. mechanically with an automatic welding machine.



Pressure Amount

The pressure required to be applied on the overlaps during a manual welding is applied using a hand roller. In weldings carried out mechanically using automatic welding machine the pressure rollers should be adjusted according to the thickness of the membrane to be pressed. A test welding should be performed to adjust the optimal pressure force.

The Test Welding

Before starting the welding application or when a long break is given during welding application it is recommended to carry out a test welding. The most suitable times for this is in the morning before beginning the work and the time period just before the works after the lunch time. The test welding's peeling and breaking values can be checked using the test devices used at the worksite.

PERFECT WELDING

Weather Conditions and Contamination

If a membrane roll or a panel membrane is stored in such a manner that it will be exposed to rain outdoors for a period exceeding 24 hours the welding locations should be cleaned and cleansed of dust and dirt in order to obtain the best efficiency from the welding application. Solvent containing cleaning agents should never be used for this cleaning procedure.

Welding at Low Temperatures

When performing welding application at temperatures between +5 C and approximately +10 C, the welding parameters should be adjusted according to this temperature. At low weather temperatures a welding temperature that is higher than normal is required and the welding speed should be decreased.

Manual Welding

- The manual welding machine should be turned on and its temperature should be set to between 420 C - 470 C.
- The overlaps should be overlapped properly, with a minimum width of 4 cm. The manual welding machine and hand roller should be used in balance and equally in order to obtain the most suitable welding temperature in and the most appropriate pressing force in the Lineflex ThermoLine manual welding technique.
- Pressure should be applied on the welded overlaps, in such a way that is parallel to the tip of the welding machine, with 15 mm - 20 mm intervals.

Welding with Automatic Machines

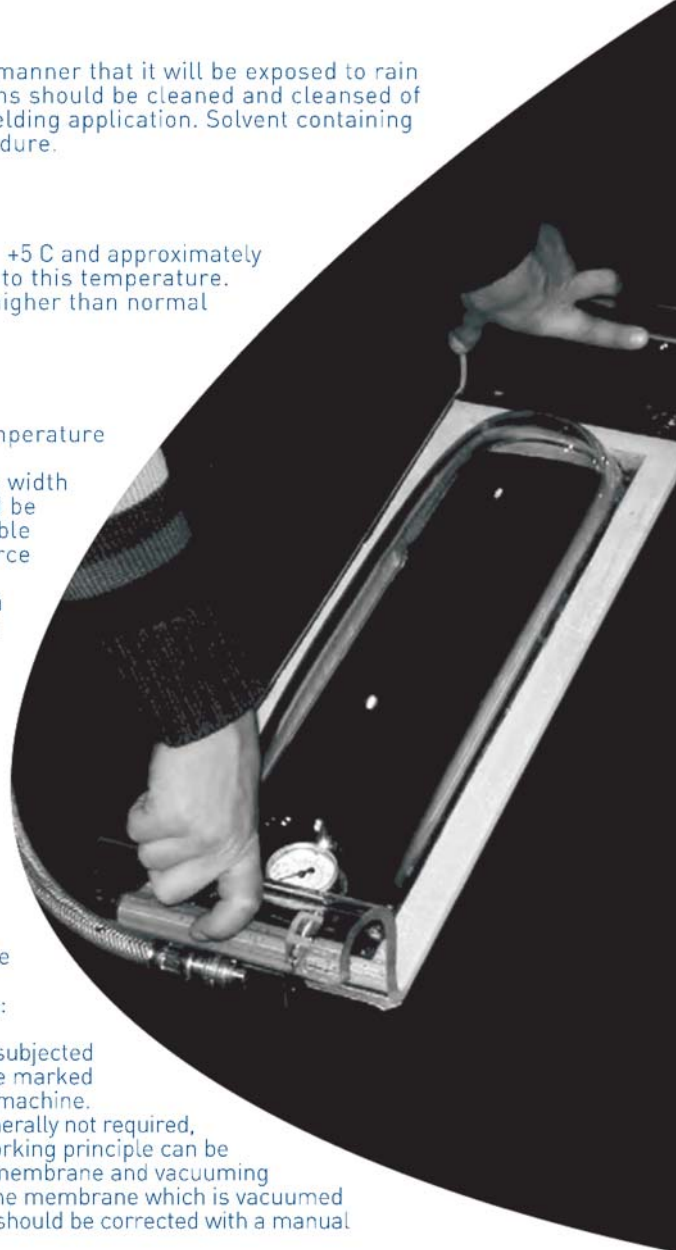
- Turn on the welding machine and set the temperature to between 420 C-470 C.
- Set the speed of the welding machine to 2m/min. and perform the checks.
- the welding in a controlled manner.

Checking the Welding Places

The welding places carry great importance for ensuring a complete insulation.

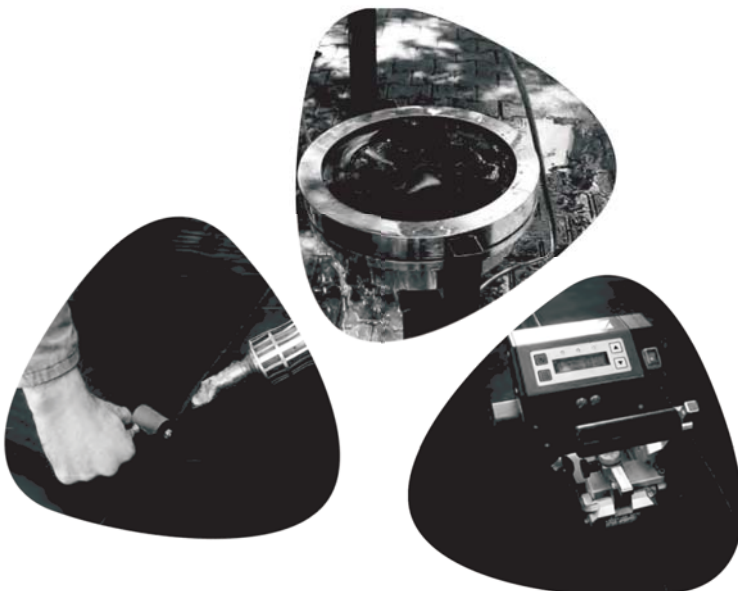
You can use two different methods for checking the leak-tightness:

The welding places which are welded together at the worksite are subjected to a leak-tightness test using a control rod. The faulty weldings are marked and the welding is repeated at those spots with a manual welding machine. Performing welding checks with vacuuming technique, although generally not required, is used in pond, storage and bundling applications. The general working principle can be described as applying a foamy liquid on the welding places of the membrane and vacuuming with a vacuum machine. If bubbles form at the welding places of the membrane which is vacuumed for test purposes it is understood that there's a defective welding it should be corrected with a manual welding machine.



Patches and Repairs

Even after a long period of time has passed, it is possible to apply patches on the Lineflex EPDM membrane or perform repairs or add detail parts to the application. In order to obtain an optimal leak-tightness the surface of the membrane which will be worked on should be cleaned thoroughly and sanded. Important: For a flawless welding the temperature and speed of the welding machine should stay constant.





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