

Firestone

GeoGard™ EPDM



GEOGARD

Lining for life™



Dependable performance in demanding environments

Firestone GeoGard EPDM is a rubber geomembrane specially designed for demanding applications where failure is not an option. It offers a durable, reliable and efficient containment solution for a wide variety of applications related to environmental protection, agriculture and industry.

EPDM is a **high-grade terpolymer** that gives **exceptional properties** to Firestone GeoGard EPDM:

- **Highly durable** (UV resistant)
- **Elastic** (300 %) and **flexible** (-45°C)
- **High friction angle** (27°)
- **Environmentally friendly**
- **High puncture resistance**
- **Large panels**
(up to 15.25 m wide x 61 m long)

Over a century of experience in rubber technology

In 1903, Harvey S. Firestone founded the Firestone Tire & Rubber Company manufacturing tires for the first mass-produced automobiles in America. In the decades that followed, Firestone expanded to become a worldwide organization developing diversified rubber products.

Today, the Firestone brand is internationally known as a symbol of quality rubber products, innovation and leadership.

Firestone Building Products is part of the Bridgestone Corporation, the world's largest tire and rubber company.

BRIDGESTONE **Firestone**





_____ installed in 1973





Outstanding performance

Exceptional durability

The Firestone GeoGard EPDM membrane benefits from an unmatched **resistance to UV, heat, ozone, micro-organisms and extreme weather conditions**. It does not contain any plasticizers or antioxidants likely to degrade or migrate from the geomembrane and cause it to age prematurely. Some projects installed in the early 1970s are still in operation today.

Flexible and elastic

GeoGard is a highly **flexible membrane**, even at temperatures as low as -45°C. It can be folded without causing damages and can be elongated over 300% in all directions and return to its initial form afterwards (no yield point). This allows GeoGard to absorb substrate movements and mechanical stresses even at low temperatures without its physical properties being affected.

High puncture resistance

Because of its high **elasticity and flexibility**, GeoGard offers excellent puncture resistance. It withstands the mechanical stresses during installation and service and consequently guarantees the long-term watertightness of the lining system.

Quick and easy installation

GeoGard is available in **large panels** of up to up to 15.25 m wide x 61 m long (930 m²), which significantly reduces the need for on-site seams. This, in combination with its exceptional flexibility and seaming method make it quick and easy to install. In an industry that is highly dependent on weather conditions, the speed of installation of GeoGard represents a major advantage.

Seam testing

The quality of on-site seams can be **effectively tested** by destructive and non-destructive methods (visual inspection, vacuum chamber, air lance, etc.).



Quick and easy to repair

Given the inert nature of GeoGard, its composition does not vary over time. Consequently, it can still be assembled and/or repaired several years after being installed and having been exposed to climatic elements.

Environmentally friendly

Due to its very stable chemical composition, GeoGard has no effect on air or water quality and does not release any pollutants into the environment. Third-party tests demonstrate that it can be safely used for the storage of irrigation water. Its exceptional durability, easy maintenance and suitability for recycling, further contribute towards a sustainable environment.

High friction angle

GeoGard has a very high friction angle (27.5° with ground). This makes it easier to install, as workers do not slide and the membrane stays in place. Eventual covers are also more stable on the slopes and therefore do not require the use of a textured membrane.

Low thermal expansion coefficient

EPDM geomembranes have a very low thermal expansion/retraction factor compared to thermoplastic ones. This significantly reduces waving during installation (important for seaming) and the risk of tensions on details at cold temperatures. The risk of folds obstructing the water drainage on top of the membrane are also reduced.

Self-extinguishing

GeoGard has a high ignition temperature and stops burning when the heat source is removed. This is a major advantage for applications such as canals and landfill covers.







Aquaculture and algae ponds

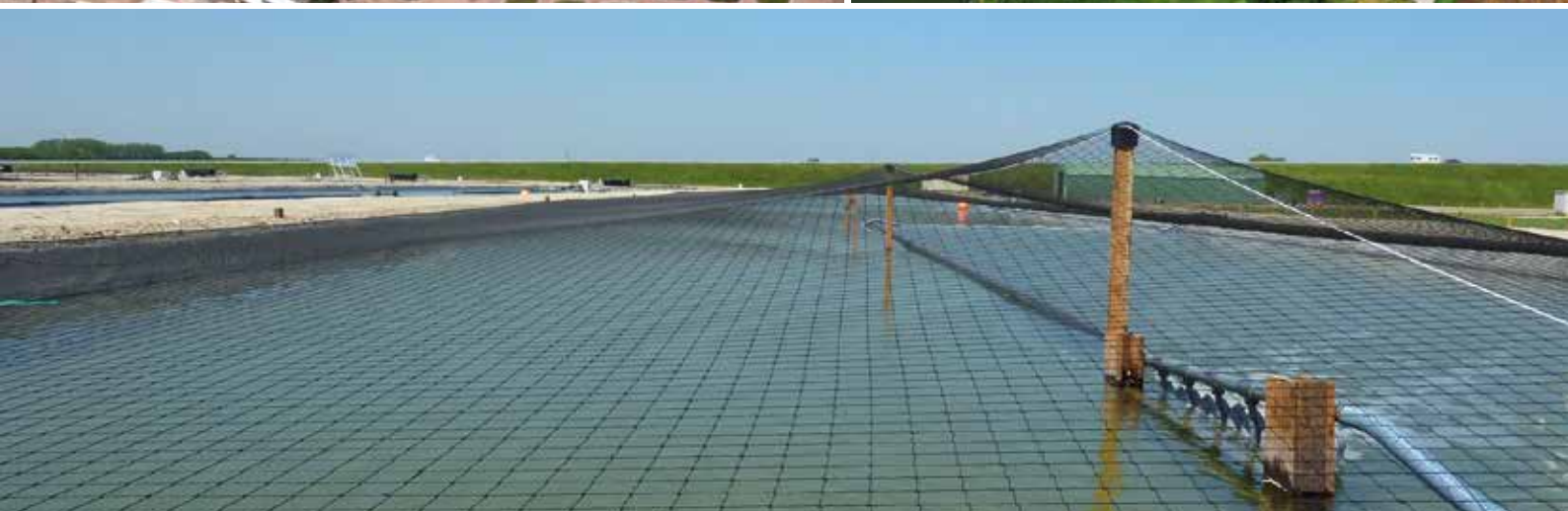
Fish and algae are very sensitive to pollution. GeoGard membranes are inert and do not release chemicals that could affect the fauna and flora's health and farm productivity.





Irrigation reservoirs and canals

Water is vital to grow crops. Farmers around the globe have been trusting Firestone EPDM geomembranes since the 1970s to store and convey this precious element.



Stormwater reservoirs

Open or underground stormwater reservoirs are an interesting answer to the increased risk of floods due to climate change and the growth of impermeable surfaces.





Fire reservoirs

These reservoirs are used to store water for fire protection when more water is demanded than the normal grid can supply.



Secondary containment

Some stored substances can be harmful to the environment in case of accidental leakage. A secondary containment system prevents the spill to propagate and facilitates the remediation process.



Dung pits

Animal slurry is a valuable fertilizer that needs to be stored with care to avoid ground and water pollution by nitrates. GeoGard membranes provide excellent protection in this aggressive environment.



Waste water reservoirs and wetlands

Storing waste water produced by human activities and cleaning it in a natural process before sending it back to the environment is made easy and durable with GeoGard.





Landfill covers

High elasticity (accepts differential settlement), large panels (fast installation), high friction angle (stable cover), excellent puncture resistance, self-extinguishing nature, cold vulcanization (no heat source) ... the GeoGard membrane offers an endless list of advantages for this sensitive application.



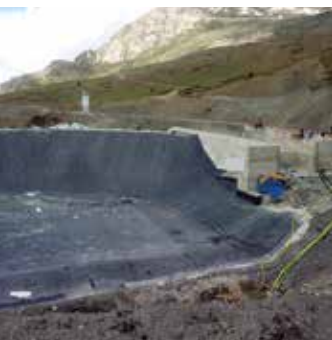
Artificial snow water reservoirs

Artificial snow has become mandatory to prepare the skiing slopes before the first snowfall. The excellent puncture resistance and cold bending ability of GeoGard makes it the perfect liner to safely store water in a very demanding environment.



Hydroelectric reservoirs and canals

Water power is an unlimited source of energy with a minimal carbon footprint. Hydroelectric infrastructures cannot afford any breakdown and rely on GeoGard's high performance and quality.



Artificial lakes and ponds

Decorative lakes and large ponds can be very technical and require a high-quality geomembrane and a professional installation system.





A fully engineered system

Reliable seaming method

GeoGard panels can be assembled on site using Firestone's QuickSeam™ Tape system. This field seaming technique is quick and easy, does not require any special tools that uses electricity or could damage the liner and provides high and consistent seam strength. Seaming is independent of membrane thickness.

Installation details

The flashing of pipes, penetrations and corners can be carried out in a quick and easy way with Firestone's QuickSeam™ FormFlash, an uncured EPDM flashing laminated to QuickSeam™ Tape. It can be easily molded to adapt to any shape and will progressively cure after installation.

Firestone also offers accessories to waterproof mechanical connections on concrete structures and adhesives which allow the membrane to be adhered to any type of surface (concrete, wood, steel, etc.).

Quality installation

The performance of a lining system is directly linked to the quality of its installation. For this reason, Firestone GeoGard EPDM is exclusively installed by Firestone trained and approved lining contractors. Firestone's technical department offers its contractors first class support, including assistance with specification development, theoretical and practical training, field support and inspection of finished installations.







Technical specifications

The detailed technical properties of Firestone GeoGard EPDM 1.1 mm and 1.5 mm are described in the Technical Information Sheets (TIS) and Safety Data Sheets (SDS) that are available on www.firestonebpe.com

THICKNESS (mm)	WIDTH (m) (up to 4 folds on a core)	LENGTH (m)
1.1	3.05 – 6.10 – 7.62 – 9.15 – 12.20 – 15.25	30.5 – 61.0
1.5	3.05 – 6.10 – 7.62 – 9.15 – 12.20 – 15.25	30.5 – 45.75 – 61.0

Note: Not all standard widths are available in all lengths.

Product certification

Firestone's EPDM manufacturing facilities are certified according to ISO 9001 and ISO 14001. GeoGard has obtained the CE marking, meeting current European requirements for health, safety, consumer protection and environment. GeoGard is also certified by national and international

bodies (e.g. French ASQUAL certification). Within the context of these certifications, regular audits are conducted at Firestone's EPDM factory to monitor the production process and quality control, as well as the quality of the finished product. Therefore,

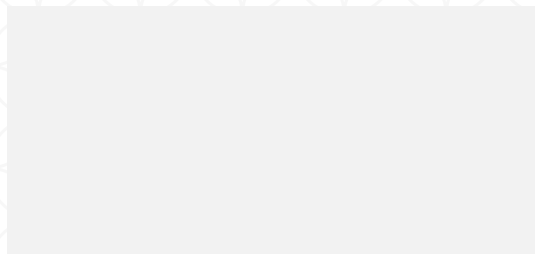
Firestone can guarantee that its membranes are of a consistently high quality.





Firestone Building Products

**For further information, please contact your
local Firestone GeoGard™ EPDM distributor:**



This brochure is meant only to highlight Firestone's products and specifications. Information is subject to change without notice. All products and specifications are listed in approximate weights and measurements. For complete product and detail information, please refer to the technical information posted on www.firestonebpe.com. Firestone takes responsibility for furnishing quality materials which meet Firestone's published product specifications. As neither Firestone itself nor its representatives practice architecture, Firestone offers no opinion on and expressly disclaims any responsibility for the soundness of any structure on which its products may be applied. If questions arise as to the soundness of a structure or its ability to support a planned installation properly, the owner should obtain opinions of competent structural engineers before proceeding. Firestone accepts no liability for any structural failure or for resultant damages and no Firestone Representative is authorized to vary this disclaimer.

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