



Feature: Geomembrane for High Temperature Applications

Polyethylene geomembranes are widely used for containment applications in waste and mining industries, liquid and gas barriers, and many more. In extreme temperatures, standard polyethylene liners tend to degrade quicker and need to be replaced to maintain continuous barrier performance. Ensuring the long-term performance of a geomembrane is the main concern of design engineers, it is especially challenging when the liners are exposed to temperatures above 60°C. The innovative formulation used in the high temperature resistance geomembrane allows it to perform, even at temperatures up to 100°C (212°F), for extended periods of time.

Applications that require the geomembrane to have good performance at elevated temperature includes:

- Hot liquid storage
- Mine leach pad
- Brine ponds
- Bioreactor landfill
- Process water containment
- Secondary containment

And many more...

Link: <https://www.solmax.com/en/products-and-services/pe-geomembranes/high-temperature-liner-series>

The Benefits

- Solmax's advanced resin gives exceptional long-term strength, even at elevated temperatures, and helps prevent the accelerated degradation that can occur when normal polyethylene reaches elevated temperatures
- Solmax's proprietary stabilization package prevents premature oxidation and induction that can occur when normal geomembranes are used at elevated temperatures. This reduces environmental stress cracking and allows tie-ins for subsequent phases of work or repairs to mechanical damage that can occur.
- Solmax High Temperature Liners are welded with standard welding equipment and the same construction quality control procedures that are expected of high-performance geomembranes.
- Solmax High Temperature geomembranes are engineered to provide exceptional quality, chemical resistance, and service life in prolonged exposure to temperatures up to 100°C (212°F).
- Solmax High Temperature geomembranes exceeds the international standard GRM13 and are fully compatible with existing GM13 geomembranes.

Case Study: Pit Thermal Energy Storage (PTES), Tibet



Project short summary:

In 2018, Tibet's first large solar thermal district heating system designed by Chinese/Danish JV was built at 4,600 meters elevation on the Tibetan Plateau. It comprises a 22,000 square meter solar collector field and a 15,000 square meter reservoir for pit thermal energy storage (PTES). The PTES designed to store 700 MW of energy, has water stored at temperatures of up to 90°C, helps bridge the gap between the seasonal production and use of energy. When demand exceeds energy supply in winter, the stored energy is withdrawn from the PTES in the form of heat and supplied to end customers via the district heating system.

The PTES is fully lined with appropriate geosynthetic system to prevent leaks and to help retain heat. Solmax's 2.5 mm High Temperature Liner, which offers resistance to weather extremes (hot summer/cold winter) and meets the demands of high-temperature operating conditions, was used to seal the reservoir.

Product on the spot:

High Temperature Liner

- Thickness: 2.5mm
- Surface Area: 10,000m²

Other geosynthetics include Solmax HD Coloured geomembrane, Solmax Fabrinet drainage and cushion protection material.

For more information, click on the link below.

Link: <https://www.solmax.com/uploads/tech-paper-document-en-files/pit-thermal-energy-storage-on-the-tibetan-plateau.pdf>



Project short summary:

For this project located in Saskatchewan, Canada, the site was constructed with a series of brine ponds and oil separation ponds for the primary containment of heated liquids. Due to the chemical constituents present in the mining solutions, the liner needed to withstand degradation from brine, used oil, diesel, distillate, and ultraviolet exposure. In addition, during the 25-year service life of the ponds, fluid temperatures were expected to fluctuate between extreme highs and lows, soaring up to 83°C in storage facilities or sinking to -20°C or below when exposed to the typical climate in the Canadian plains. Environmental stewardship was a critical success factor from the owner's perspective, and any liner that could not maintain its integrity against both the chemicals and elevated temperatures of stored liquids would be unacceptable.

Product on the spot:

High Temperature Liner

- Thickness: 2.0mm
- Surface Area: 65,000m²

Link: <https://www.solmax.com/uploads/tech-paper-document-en-files/case-study-high-temperature-liner-potash-mining.pdf>