

Engineering Support

The GSE Engineering Support Staff is comprised of multidisciplinary product professionals to support every aspect of your project design, from concept to installation. Rely on our project team to help you solve your design challenges. Our extensive network of industry experts offer comprehensive

- [→] Technical Support
- [→] Design Tools
- [→] Customer Service
- [→] Alternative Solution Development and Assessment
- [→] Project Management

Responsibility

Our industry has an inherent responsibility to help protect the environment. But at GSE we take protection to another level, making it a part of everything we do. We know it's also our responsibility to protect our customers and their surrounding communities, so we go to the greatest lengths possible to guard the interests of those we serve.

Flexibility

GSE may stand out in the industry because of our expertise and global capabilities, but it's our determination that makes us willing and able to adapt to the needs of our customers and provide consistently reliable service.

No situation or problem is too uncommon or complicated for us. We collaborate with our customers to come up with a custom, purpose-fit solution.



Corporate Headquarters
19103 Gundle Road
Houston, Texas 77073
www.GSEworld.com
☎ 281.443.8564

{ DURABILITY RUNS DEEP }



HIGH TEMPERATURE SYSTEM

FACING THE CHALLENGE

Polyethylene geomembranes have a long-established reputation of protecting the environment against hazardous materials, and are trusted by engineers and regulators around the world to line landfills, ponds, mine leach pads, and other applications. However, certain processes produce highly elevated temperatures, presenting a unique challenge for engineers responsible for protecting the environment.

In general, prolonged exposure to temperatures above 60°C (140°F) can have a negative effect on standard polyethylene geomembranes. When the temperature exceeds 60°C, the liner's mechanical properties more rapidly begin to break down, causing acceleration in stress cracking and oxidation. This, in turn, leads to potential failure. While there are other materials, such as PVC and polypropylene, which can be used at high temperatures, they are very expensive and are not adequately resistant to UV or chemical degradation. In addition, these materials are not easily welded, making installation difficult and time-consuming, especially when tying new work into existing material.



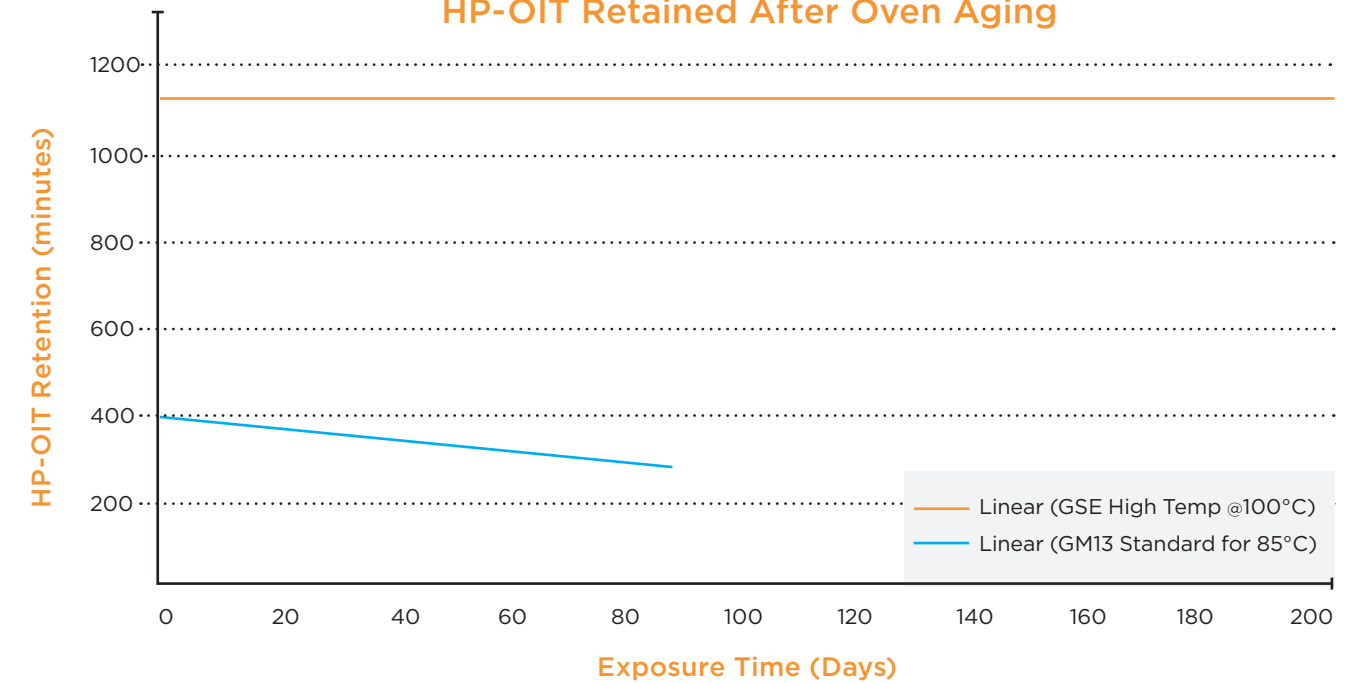
Laying the Groundwork

GSE's innovative team of engineers combined high temperature resins with GSE's proprietary formula of carbon black, UV stabilizers, and antioxidants to develop a liner that withstands the effects of extreme temperatures. GSE High Temperature Liner delivers the same durability and chemical resistance as standard liners, but will retain its mechanical and physical properties in applications with sustained elevated temperatures of up to 100°C (212°F). GSE high temperature resins meet the stringent requirements of US PPI TR4 and European EN ISO 9080, and are approved by these organizations for high temperature liquid conveying. GSE's stabilization package has undergone an extensive battery of testing at temperatures up to 100°C with outstanding results. GSE wouldn't have it any other way.

BENEFITS OF HIGH TEMPERATURE LINER

- [→] GSE'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.
- [→] GSE'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.
- [→] GSE High Temperature Liners are welded with standard welding equipment and the same construction quality control procedures that are expected of high performance geomembranes.
- [→] GSE High Temperature geomembranes are engineered to provide exceptional quality, chemical resistance, and service life in prolonged exposure to temperatures up to 100°C.
- [→] GSE High Temperature geomembranes exceeds the international standard GRM13 and are fully compatible with existing GM13 geomembranes.

HP-OIT Retained After Oven Aging



GSE Can Take the Heat

In extreme temperatures, standard polyethylene liners may weaken and need to be replaced more frequently to maintain continuous barrier performance. In laboratory tests, at elevated temperatures GSE High Temperature Liner showed improved tensile strength and superior resistance to stress cracking, punctures, and UV degradation, making it essential for high temperature applications where liner integrity and long service life are required.

- [→] Bioreactor Landfill
- [→] Oil & Gas Operations
- [→] Hot Liquid Storage Tanks
- [→] Mine Leach Pads
- [→] Industrial Ponds
- [→] Process Water Containment
- [→] Secondary Containment
- [→] Food Processing Systems
- [→] Waste Water Treatment



Worldwide Locations

Our business is global because our customers are global. Headquartered in the U.S. and with manufacturing facilities in Chile, China, Germany, Thailand and Egypt, as well as engineering and sales professionals in numerous countries, GSE can provide local service to our worldwide customers.

[→] *Houston - United States*

[→] *Bangkok - Thailand*

[→] *Santiago - Chile*

[→] *Hamburg - Germany*

[→] *Cairo - Egypt*

[→] *Suzhou - China*