Canada 1.855.530.4226
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www.LayfieldGroup.com

HEATGARD™

HeatGard™ geomembranes are the next generation in high temperature resistant geomembrane materials.

HeatGard™ HDPE geomembranes contain a new type of bi-modal polyethylene resin *(details about bi-modal resin technology on the next page)* that is uniquely resistant to higher temperatures and chlorine. HeatGard™ HDPE has been tested to be able to withstand continuous use at 85°C [185°F] for over 20 years. Typical HDPE geomembrane materials are generally not suitable for extended periods above 60°C [140°F]. HeatGard™ HDPE has excellent chlorine resistance, chemical resistance, is fully stabilized against UV light exposure, and has excellent stress cracking resistance. Superior chlorine resistance is imperative in the highly oxidative environments of water and wastewater treatment facilities. HeatGard™ HDPE has been subjected to over a year of exposure testing to confirm its high-temperature properties. It is available in wide format for efficient field installation.

FULLY STABILIZED AGAINST UV EXPOSURE

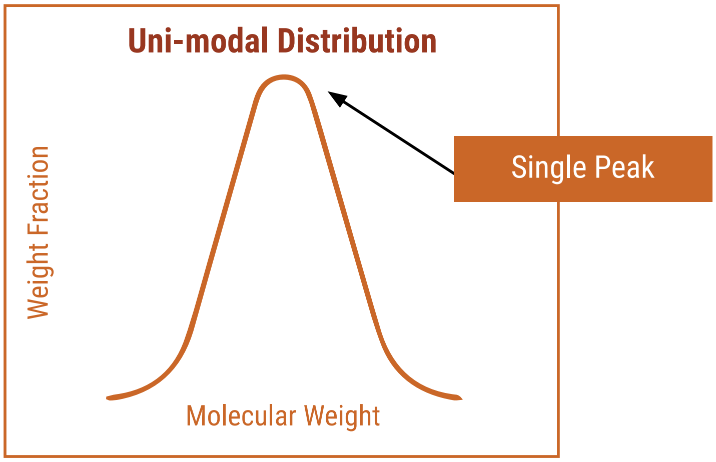
ENHANCED CHEMICAL RESISTANCE

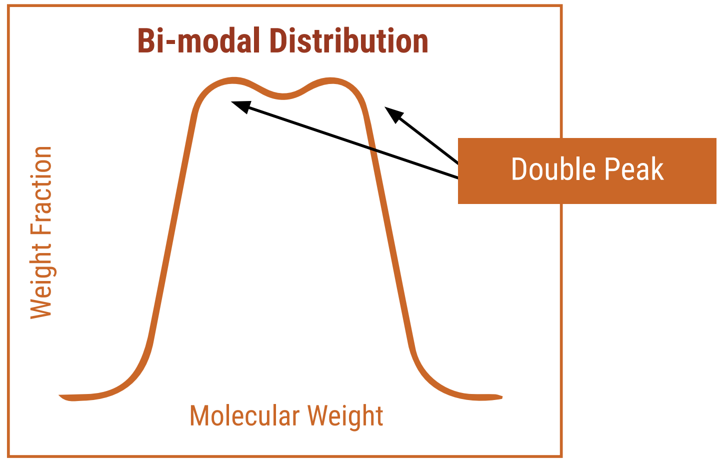
SUPERIOR CHLORINE RESISTANCE

HOT LIQUID RESISTANCE

Bi-Modal Resin Technology

To understand bi-modal resins, let's first understand how to construe a molecular distribution curve of a polymer. During the manufacture of polymer resins, the polymer molecules form in a variety of different lengths. When you analyze the molecules formed, you see a distribution of these chain lengths which we call molecular weight distribution. The bottom axis in both graphs shows the molecular weight (the length of each chain). The vertical axis shows the weight fraction (how many of each chain there are). These graphs usually create a classic Bell Curve (normal distribution in statistics).





The above graphs show both Uni-modal (left) and Bi-modal (right) distribution. For Uni-modal, the polymer shows a single peak. A very narrow distribution will be strong, stiff, and difficult to process (all other properties being equal). A very wide distribution (graph is shorter and wider at the base) will normally be softer and more pliable, and easier to process. A bi-modal distribution shows two distinct peaks on the graph. Bi-modal resins are generally made utilizing dual reactors and combine high-molecular-weight and low-molecular-weight resins to improve the balance of processability, mechanical and endurance properties.

Discussion

When considering Environmental Stress Cracking (ESCR) as a failure mechanism, in the traditional unimodal sense, the lower the density generally led to better performance (less stress cracking risk). This is a result of a higher amount of comonomer incorporation into the polymer backbone. Unfortunately, the higher the amount of comonomer, the lower the density; thus, lower chemical resistance. With Bi-modal resins, the resulting resin has a very high amount of comonomer incorporated into the high molecular weight region. This leads to a stronger crystal from both the high molecular weight portion and the lower molecular weight polyethylene. The result is a more robust product with a very low risk of stress cracking.

Layfield performed long term immersion testing at different temperatures to determine key performance properties of HeatGard™. **Our extensive testing and results on Bi-modal resins can be found by visiting our website www.LayfieldGroup.com.**