



# SOLMAX

Covering the world. **Protecting the Earth.**

# HLR

## Solmax's HLR Series : Above and Beyond Market Expectations

Everyday growing market expectations require new high performance materials. Even traditional markets are raising the bar and their traditional products must be improved. Solmax's **HLR Series** is the only PE geomembrane to retain over 90% of its anti-oxidants after 90 days of full immersion in 80°C (176°F) water, making it the only PE geomembranes to be **Hot Liquid Rated**.

Due to the different nature of aging in air and in a liquid medium, water-immersion aging is a better prediction of a liner's oxidative performance since most containment applications are for liquids. Solmax's products resist hot liquids and maintain their endurance properties in as high as 80°C/176°F and despite the harshest environments. Now that's a product worth buying!

With its unique blend of special resins and high performance additives package, the **HLR Series** offers the same hydrostatic strength and long-term durability in hot liquids as traditional HDPE geomembranes do at typical service temperatures.

### WATER-BATH TESTING AT HIGH TEMPERATURES

As a pioneer of this practice in the geosynthetics industry, Solmax immersed its **HLR Series** in a hot water bath at 80°C/176°F and then evaluated the antioxidants retained after 3 months as part of the HP-OIT testing method. The test was also performed on competitors' products. As shown in table 1, competitors' products fall as low as 65% whereas Solmax's products maintain more than 90% of their antioxidants making them much more resistant and reliable.

### Solmax's product is simply, better!

Aging tests in air and in liquids are of different natures. A combination of different heat transfer phenomena and accelerated additive extraction in water, increases the rate of antioxidants loss in water compared to air. Solmax innovates once more by performing two types of heat aging tests on its products: A standard Oven-aging test as per ASTM D5721 as well as a Water-bath aging test as per ASTM D5322\*.

Property	Test Method	Unit	Competition	HLR Series (60 mils/1,5mm)
Water bath: 90 days at 80°C (176°F) (HPOIT)	ASTM D-5322 / ASTM D-5885	%	65	> 90

\*ASTM D5322 Modified

Table 1: Antioxidant depletion after 3 months in water-bath aging





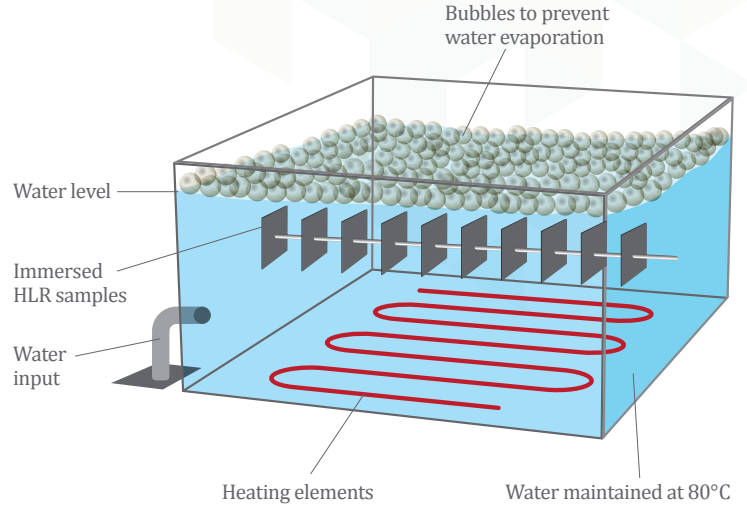
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The water bath test as per ASTM 5322\* provides a standard immersion procedure for investigating the chemical resistance of a geosynthetic to a liquid waste, leachate, or chemical. The conditions specified in this practice are intended both to provide a basis of standardization and to serve as a guide in order to investigate the aging resistance of a geosynthetic material.

Water-Bath aging is a great indicator of oxidative depletion in applications such as:

- Coal Seam Gas
- Petrochemical Secondary Containment
- Industrial Ponds
- Food Processing Systems
- Hot Liquid Storage
- Geothermal Ponds
- Waste Water Treatment
- Bioreactor and Hot Leachate Landfills
- Tailing dams

### HLR Series Waterbath Aging



In any application where the liner is in contact with a high temperature medium (60°C), it is HIGHLY recommended to use a high temperature resistant geomembrane.

## LONG-TERM PERFORMANCE

Just as a screw will rust at a higher rate in water than in air, the depletion rate of anti-oxidants in geomembranes is higher when immersed instead of exposed. Solmax continues to innovate by using a special additive package that allows its **HLR Series** to retain their anti-oxidants in hot liquids, which allows for long term durability of the geomembranes, even in the harshest conditions.

Property	Test Method	Unit	HLR Series (60 mils/1,5mm)
Water bath: 90 days at 80°C (176°F) (HPOIT)	ASTM D-5322 / ASTM D-5885	%	> 90
Oven Aging: 90 days at 100°C (212°F) (HPOIT)	ASTM D-5721 / D-5885	%	> 90

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Solmax's Patent Pending **HLR Series** is an innovative product in line with Solmax's core goals: Offering containment products that meet our customers' needs. Solmax is a pioneer of Innovation in the Geosynthetics Industry and offers value added products for most containment applications. **For additional information on the HLR Series or any other products, please contact your local Solmax representative.**

**HLR<sup>®</sup> SERIES**  
HOT LIQUID RATED



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