

A blue-tinted photograph of a construction site. In the foreground, a large roll of dark, textured material (the Drain Liner) is being unrolled. A crane arm is visible on the left, and several workers in safety gear are standing in the background. The ground is covered with the material, showing a grid-like pattern of small holes.

## Drain Liner® Geomembrane

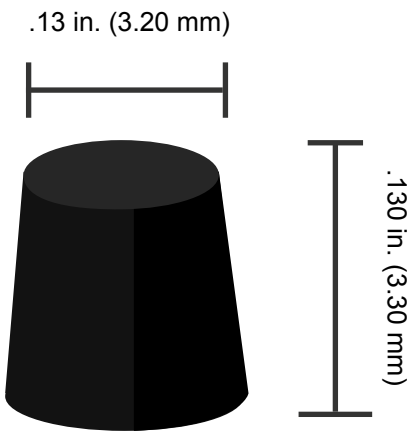
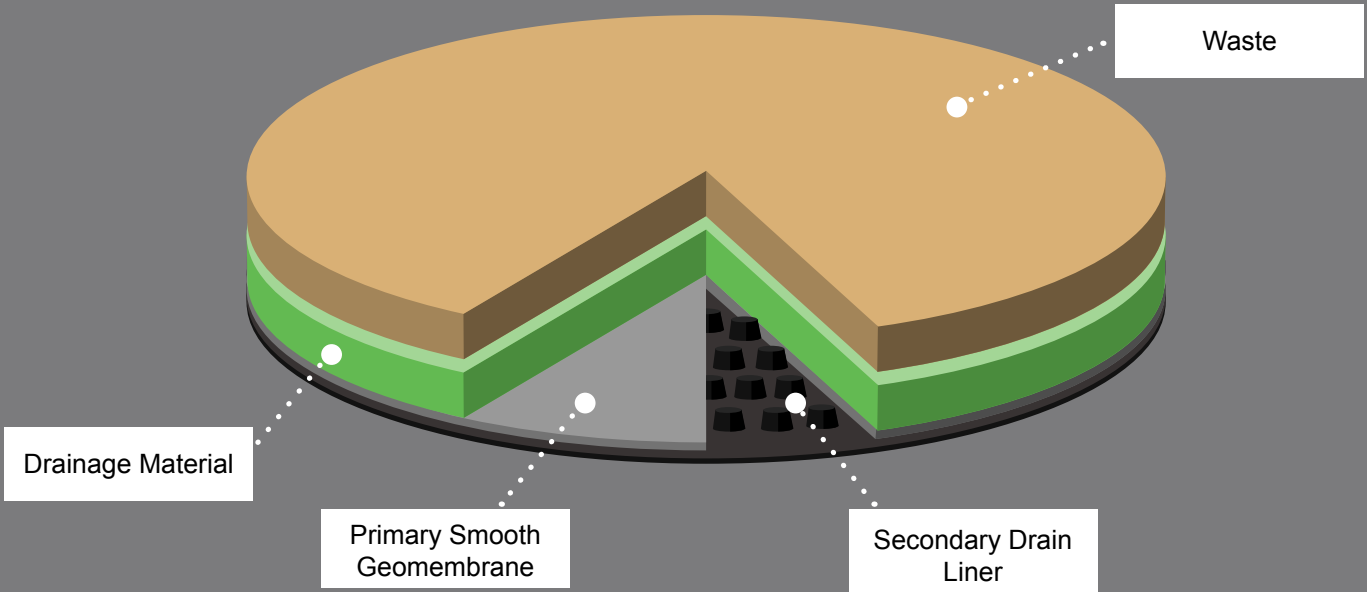
Applications for HDPE and LLDPE Agru Drain Liner include single or double lined projects where containment drainage and leak detection are critical such as landfills, waste ponds/lagoons, mining heap leach pads and process ponds. Using Drain Liner in place of a geonet and geomembrane results in significant cost savings in material and installation.





Agru America's structured geomembranes are manufactured on state-of-the-art manufacturing equipment using a flat cast extrusion manufacturing process as opposed to blown film extrusion. Agru America uses only the highest grade of HDPE and LLDPE resins manufactured in North America. The flat cast process results in a consistent core thickness which corresponds to higher tensile strength values than traditional textured materials. It also gives consistent structuring as the material production rollers are embossed with the appropriate pattern for the structured liner requirements. This results in higher flow rates and consistent drain capacity.

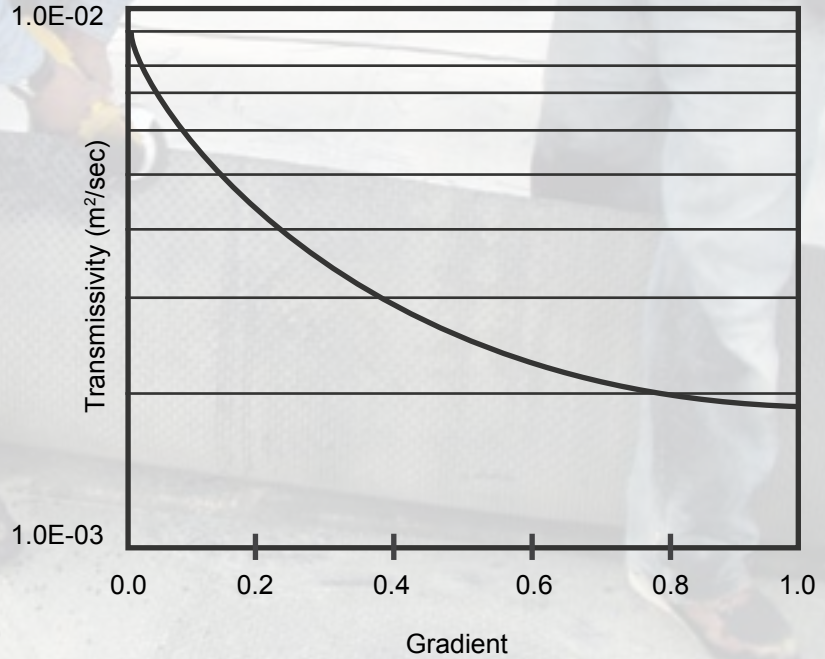
### Dual Liner System Profile



- Benefits**
- "Integrated Drainage System" (IDS)
  - Consistent Pattern
  - High Water Flow Rate
  - Specify smooth or MicroSpike for bottom of liner surface
  - Resistance to long term creep

## Transmissivity Testing

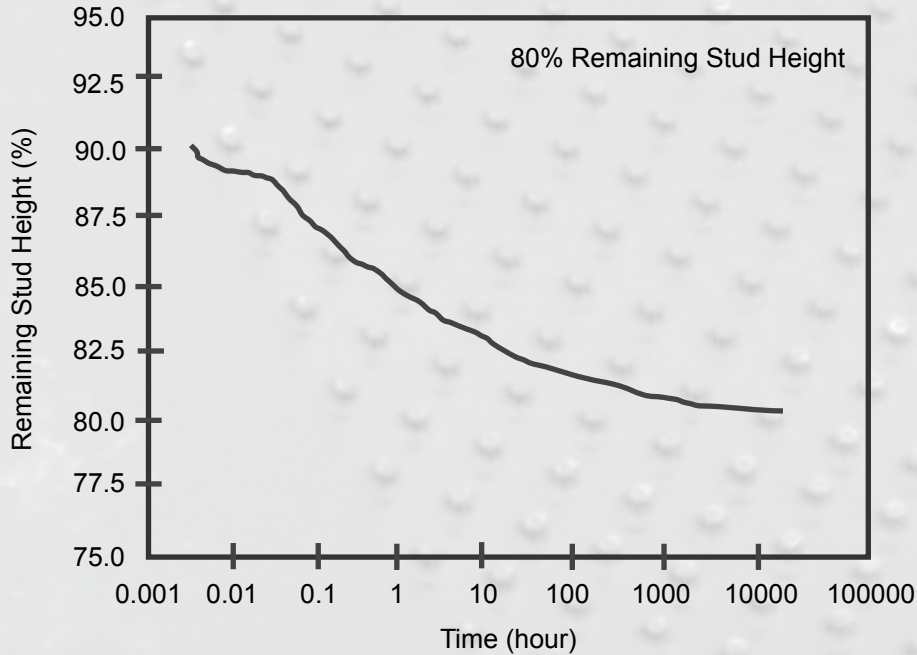
**Drain Liner/Smooth HDPE**  
 Transmissivity under 15,000 psf  
 Normal stress  
 ASTM D4716



The in-plane drainage capacity of the Drain Liner used as either a primary or secondary liner is always higher than a conventional geonet due to the structure of the studs and stud spacing which results in a more laminar (less turbulent) flow and a constant bi-directional flow over time, with minimal reduction due to creep. Additionally, the Drain Liner allows flow at very low gradients due again to the stud spacing and integral design.

Detection of potential leaks is faster with a Drain Liner structure than with a conventional geonet which forms an indirect flow path due to the net structure. Also, reduction factors for the potential of chemical or biological clogging are less for a stud or Drain Liner structure due to the fact that the studs do not form intermediate dams or inhibit water flow.

## Long Term Creep Testing



### Drain Liner 10,000 hour Creep

Testing under 15,000 psf

Normal stress

ASTM D5262

Thus, the Drain Liner is a Integrated Drainage System(IDS) which has decided advantages over conventional geonets:

- Installed in one layer as an integral drain with the primary or secondary liner (depending on installation): reduces installation time dramatically, reduces material and installation costs, less CQA cost, better consistency and bi-directional flow.
- Higher flow rates than a conventional geonet
- Minimal reduction for creep (80% retention under 15,000 psf loading)
- Less impact by chemical/biological clogging
- Faster response time for leak detection
- Studs totally integrated with the liner-single production process
- No waste due to cutting and fitting of geonet sections or discard of end of rolls
- Excellent fluid barrier
- Manufactured in the most modern plant meeting stringent quality control standards



**Looking for more information?**

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