

Geosynthetic Clay Liners vs Compacted Clay Liners

Geosynthetic Clay Liners (GCLs) have several important advantages over traditional compacted clay liners (CCLs), especially in terms of hydraulic performance, ease of installation and air space savings.

Long- term performance

Deterioration by freeze/thaw, dessication/rewetting and differential settlement can increase CCL leakage dramatically over time. GCLs eliminate these problems. Natural environment stresses such as freeze/thaw and dessication/rewetting cycles have no effect on sodium bentonite's performance. Differential settlement, common in landfill cover applications, is accomodated by bentonite's high plasticity and self-healing capabilities. CCLs, on the other hand, can crack in these conditions, leading to significant increases in leakage.

Ease of construction

With CCLs it is not uncommon for thousands of tons of clay to be hauled long distances to the job site, resulting in added construction time, traffic, noise and cost. GCLs can be delivered and installed with far greater efficiency. In fact, it takes about 400 truckloads of clay to equal the coverage of just one truckload of GCL! Unrolling and overlapping adjacent GCL panels is far easier than hauling, dumping, spreading and compacting clay in several lifts. Moreover, GCLs pass through strict manufacturing quality control programs ensuring uniform performance throughout the entire area of the project. CCLs are subject to a variety of irregularities due to variability in materials, equipment, weather, topography and personnel.

Minimum air space requirements

The most valuable asset in any landfill is its air space. A CCL needlessly devours this precious resource and robs a landfill of its future revenue. But a GCL provides the same, if not better levels of performance and occupies virtually no air space. Always consider these savings when comparing the actual costs between a CCL and a GCL in a landfill liner and cover system.

Landfill air space illustration

The green band in the illustration represents the increased air space (landfill volume) in a typical landfill project when a GCL is substituted for a CCL. Note that air space is gained on both the bottom liner and cover systems. A saving of **10 % or more air space** in an average sized landfill.

