KAYTECH

ENGINEERED FABRICS

Who we are?

Leading manufacturer and supplier of Geosynthetics technology to throughout South Africa, reaching Africa and the Middle East.

Branches throughout South Africa

Supply throughout Africa reaching to Middle East

1978

Under the license to Rhone Poulenc, manufacture of bidim® started at purpose built factory in Atlantis, Cape Town, South Africa.

1993

- **Noel Hunt Geofabrics (NHG) changed its name to Kaytech. Branding evolution.**

2006-2009

Diversification of product manufacturing.

- Geocomposite grids
- Geosysnthetic Clay liners
- Multilayered geotextile

Benefits of using geosynthetics in Mining

Economic

•Reduce construction costs by limiting imported soil volumes
•Lower infrastructure development expenses, especially in remote areas

Technical

•Minimize variability in construction outcomes
•Standardized material quality across projects
•Enables consistent design solutions globally

Environmental

•Reduce quarrying and carbon footprint
•Improve containment of waste and contaminants
•Protect waterways from erosion and sediment runoff

Safety

•Decrease worker exposure to hazardous conditions
•Support safer underground and slope operations
•Enhance protection in rockfall-prone areas

BENEFITS OF USING GEOSYNTHETICS IN MINING

30%

Reduction in construction costs

50+

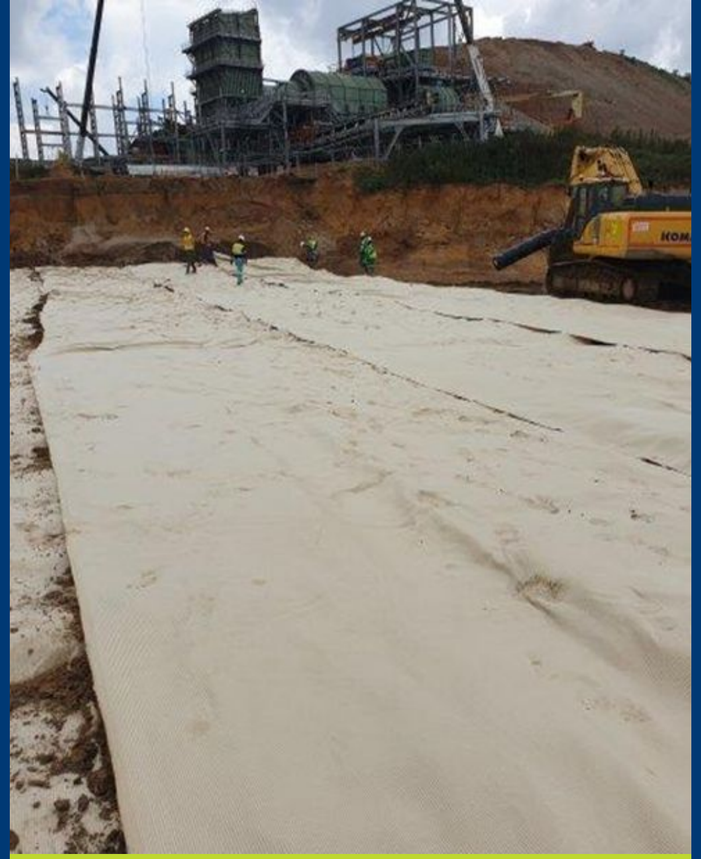
Years lifespan , reducing the need for frequent repairs

6x

Improved design life

30-50%

Productivity gains (faster installation than conventional methods)

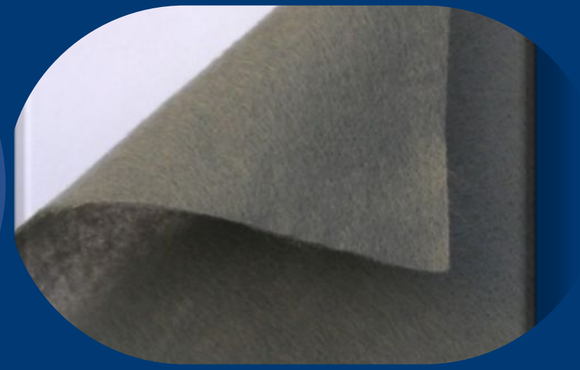


MINING APPLICATIONS

1. Haul roads
2. Railways
3. Tailings facilities & heap leach pads
4. Water management
5. Return water dams
6. Embankments and Slopes
7. Retaining structures
8. Slurry Management
9. Mine closure & Rehabilitation

Commonly used geosynthetics Tailings facilities & heap leach pads

Geotextiles
Separation

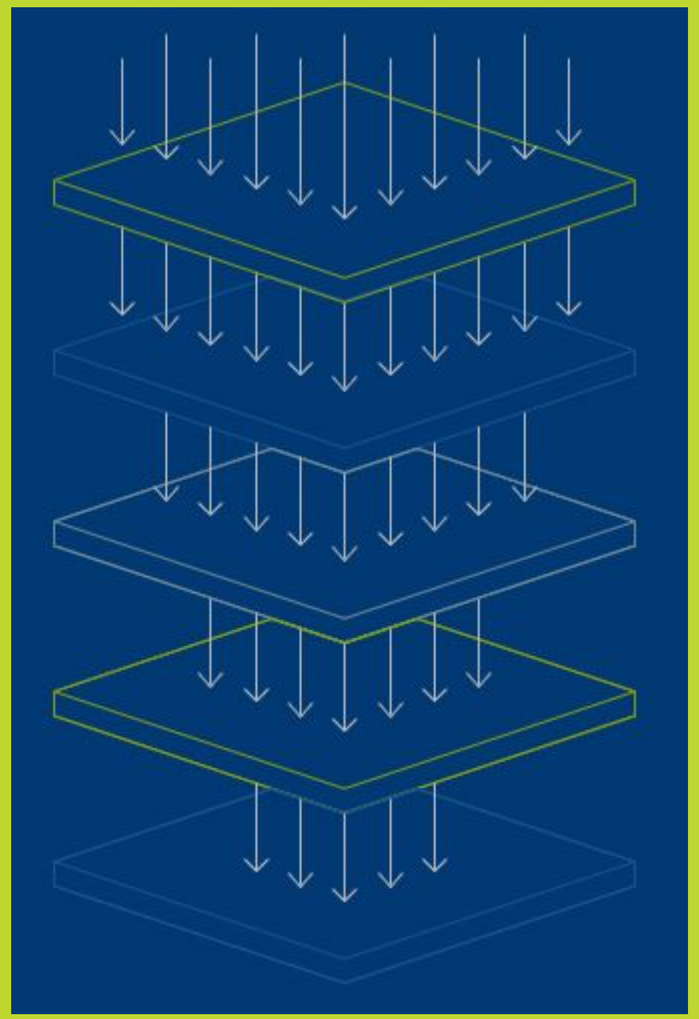


Geocells
Protection

GCLs
Barrier

Liner systems used as heap leach pad

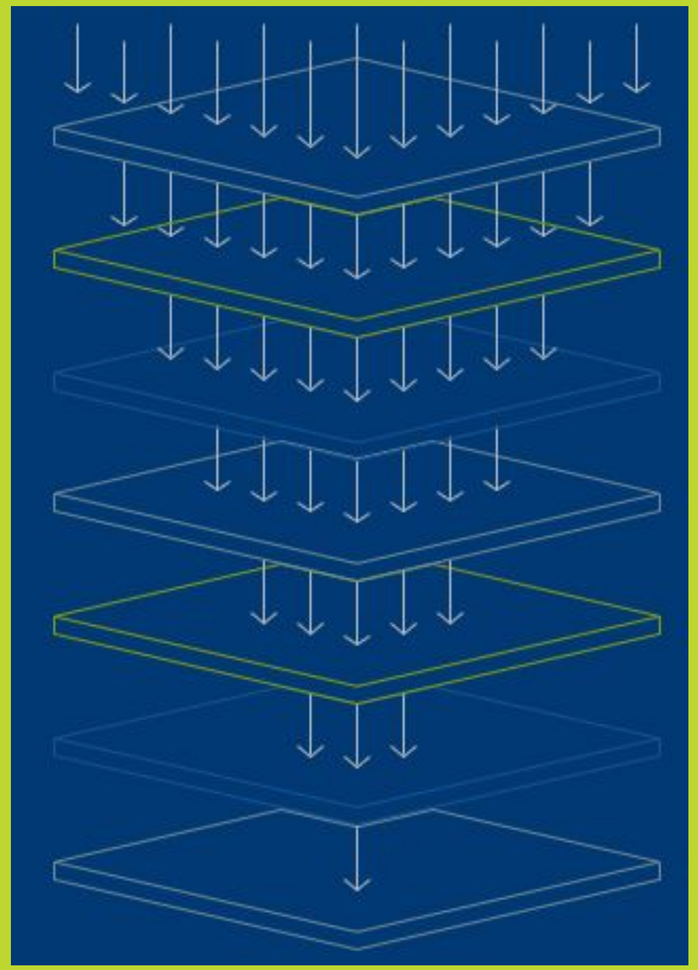
Single composite liner systems - Typical Layer Composition



- **Drainage layer: Mineral drainage material with solution collection piping and/or air injection**
- **Protection layer: e.g. geotextile to shield geomembrane**
- **Geomembrane: Main barrier layer**
- **Low permeability soil/GCL: Compacted clay or engineered layer**
- **Foundation: Prepared natural subgrade or engineered surface**

Liner systems used as heap leach pad

Double composite liner systems - Typical Layer Composition



- **Drainage layer: Mineral drainage material with solution collection piping and/or air injection**
- **Protection layer: e.g. geotextile to shield geomembrane**
- **Primary Geomembrane: Main barrier layer**
- **Leak detection layer: Geonet or geocomposite to monitor and recover leaks**
- **Secondary Geomembrane: Backup barrier reducing leakage risk**
- **Low permeability soil/GCL: Compacted clay or engineered layer**
- **Foundation: Prepared natural subgrade or engineered surface**

PROTECTION GEOTEXTILE

- Placed above the geomembrane in landfill composite liner systems
- Acts as a barrier to protect the geomembrane from damage during:
  - Installation
  - Operation
  - Long-term exposure
- Provides cushioning, abrasion resistance, and mechanical protection
- Purpose: Shields the geomembrane from stress and prolongs system integrity.

Benefits of Protection geotextile

Mechanical Protection

Shields the geomembrane against punctures, tears, and abrasion during installation and operation.

Load Distribution

Absorbs and spreads loads from waste and heavy machinery to prevent stress concentration.

Puncture Resistance

Blocks sharp or uneven materials below that could pierce or harm the geomembrane.

Extended Lifespan

Helps preserve the geomembrane's performance over time by minimizing wear and tear.

Integrity Improvement

Supports the liner system's reliability, lowering the chance of failure or leakage.

GCL Barrier (Secondary)

- A geosynthetic clay liner is an engineered barrier system that combines a layer of bentonite clay sandwiched between geotextile layers.
- The bentonite clay swells upon contact with water, forming a self-sealing barrier that restricts leachate movement.
- The GCL enhances the barrier properties of the liner system.

Benefits of GCL Barrier

Alternative to Compacted Clay

•GCLs offer equal or better sealing performance when clay is unavailable.
•Ideal for regions lacking suitable in-situ clay materials.

Enhanced Transmissivity

•A 10mm GCL can match the transmissivity (θ) of 30cm of clay.

Efficient Installation

•Fast and easy to install compared to thick clay layers.
•Reduces construction time and labour.

Superior Hydraulic Performance

•Typical GCL permeability: < 5×10^{-11} m/s at 35kPa
•Performs similar to or better than a 30cm compacted clay layer (k ≈ 1×10^{-8} m/s).

Self-Healing Properties

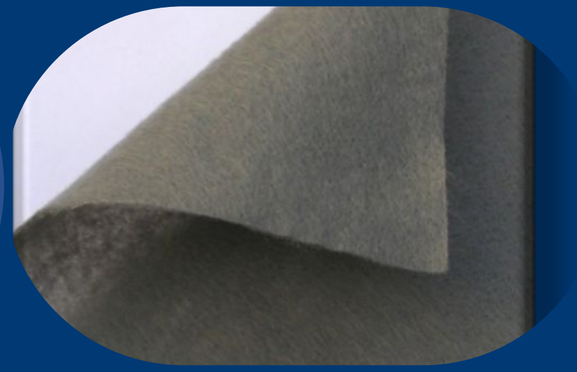
•Reactivates sealing capability during wet-dry cycles – a feature not provided by compacted clay liners (CCLs).

Robust Under Load & Chemistry

•Maintains performance under loading and ionic exchange.
•Effective k-value remains better than 3×10^{-9} m/s even in challenging conditions.

Commonly used geosynthetics in Water Management

Geotextiles
Separation



Geopipes
Drainage

GCCMs
Hydraulic barrier

Commonly used geosynthetics in Slurry Management

Dewatering tubes Filtration

Dewtaering tube

Key benefits

Technology a COMPLEMENT or a SUBSTITUTE

Affordability

•Lower capital and operational expenditure compared to mechanical systems
•No motors, moving parts, or complex maintenance

Scalable and Flexible

•Can be deployed temporarily or permanently•
•Suitable for small to large volumes, and constrained or remote sites

Minimal Land Use

•Compact footprint compared to ponds or drying beds
•Tubes can be stacked

Environmentally Friendly

•Reduces risk of contamination and spillage
••Effluent can be reused, treated, or safely discharged

Reduced-Risk Operation

•Passive system with fewer failure points
•Does not require highly skilled labour

Commonly used geosynthetics in Mine closure & rehabilitation

Geotubes
Dewatering

Geocells/
Geocomposites
Reinforcement

Geojute/
Geomats
Erosion
control

CQA plan

Prior to delivery

Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	Step 7
						
Documentation Before Delivery	**Required Submittals**	**Declaration of Conformity**	**Geomembrane Material Verification**	**Resin Quality Requirements**	**GCL Metal Detection Certification**	**Preventing Non-Compliant Deliveries**
Each **geosynthetic material** must have supporting data sheets and certifications before arriving on site.	These documents must include the manufacturer's certifications and quality control test results.	A signed declaration and supporting document must list mean values and acceptable tolerances for key product properties.	Manufacturers must confirm that the resin, rolls, and welding rods meet project specifications if required.	Some projects have strict standards for resin & additives; compliance documentation should be submitted before delivery.	**Needle-punched GCLs must be certified** as inspected with full-width metal detectors to confirm they contain no stray needles.	Early submittals ensure only approved materials are delivered to site, avoiding costly rejections or delays.

CQA plan

Material delivery on site

Step 1	Step 2	Step 3	Step 4
			
Verify Labels on Delivery	**Hold Unlabeled Rolls**	**Inspect for Damage**	**Report and Action on Defects**
Each roll must display the manufacturer's name, geosynthetic type, lot & roll number, dimensions, weight, material composition, & CE marking.	Do not deploy materials without proper labelling until they are verified against project specifications.	Visually check each roll for any damage such as punctures, rips, or grease on the geosynthetic or plastic cover.	Any damage should be documented & reported; depending on the project protocol, damaged wraps may be rejected, or materials returned to the supplier.

CQA plan

Material Storage and handling – Geosynthetics and GCLs

Step 1	Step 2	Step 3
		
Follow Manufacturer Guidelines	**Protect from Environmental Exposure**	**Special Handling for GCLs**
All geosynthetics must be stored & handled according to the manufacturer's specific instructions.	Store materials in areas shielded from construction activity, sunlight, heat, cold, moisture, & contaminants like dirt or grease.	GCLs must be kept completely dry, store rolls in moisture-free areas until they are ready for installation.

Thank You

VISIT US AT STAND N. 3

Geosynthetics play a vital role in various mining applications, providing solutions for environmental protection, waste management, slope stability, and erosion control.

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