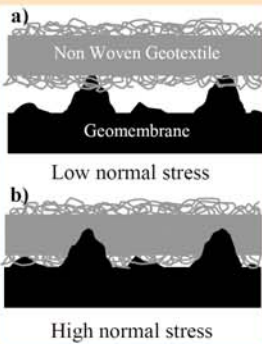
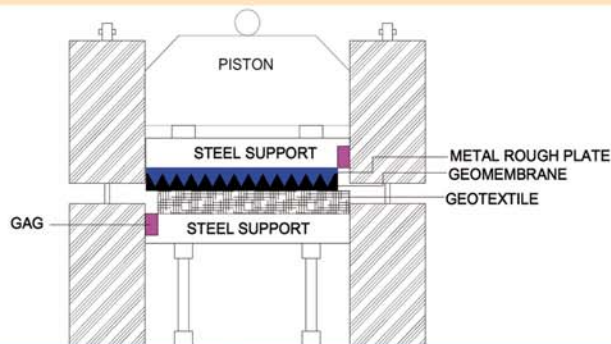


Storage of waste requires the design of repositories underlain by multi-layer liner systems.

These systems contain some geosynthetic/geosynthetic interfaces with low shear strength which can act as potential failure surfaces.



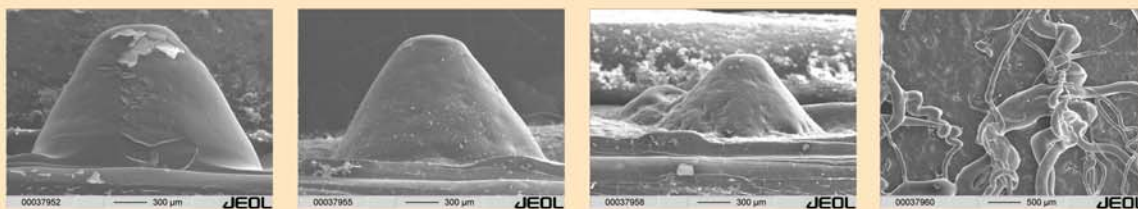
Landfill failure (Kettelmann Hills, 1988)



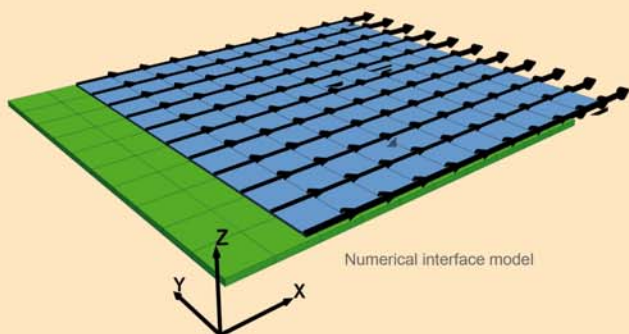
Interaction mechanism:
- Hoop and loop
- Interbedding
- Friction

Interactions depend on applied normal stress:
a) Low stress: Surface level
b) High stress: Matrix level

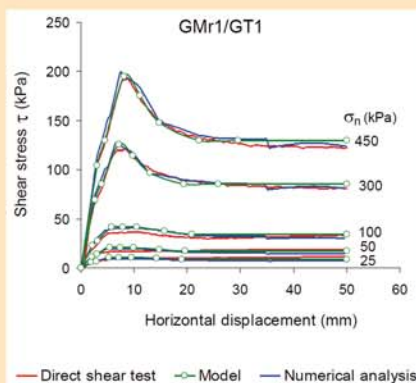
Direct shear test was used to obtain frictional parameters and to investigate the interaction mechanism of the geomembran - geotextile contact.



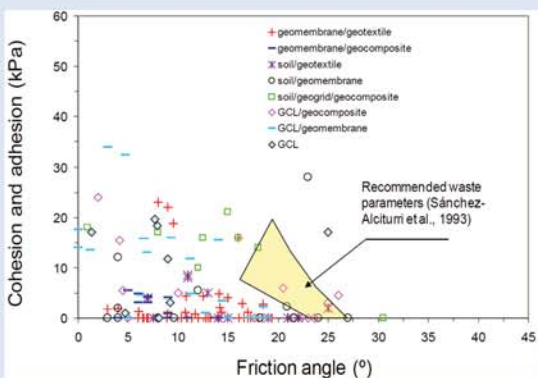
Electronic microscope images of textured geomembranes roughness



Numerical interface model



The new constitutive law geomembrane /geotextile interface arose from the resemblances with non-planar rock joints (Barton 1973): surfaces of both contacts have roughness and show strain-softening responses in the direct shear tests.



Frictional parameters of waste and geosynthetic interfaces

Conclusions:

Parameters for different geotextile / geotextile and geotextile / soil interactions were determined by 233 tests with the big shear box device. A new conceptual model for the interaction was developed and successfully implemented into the numerical simulation tool FLAC 3D. Finally, the lab tests were backanalysed by using the new developed constitutive law.

A new constitutive model for textured geomembrane/geotextile interface

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