

## Web of Science®

[<< Back to results list](#)

Record 7 of 10

Record from Web of Science®

## Effect of straining on gas advective flow of a needle-punched GCL

[Print](#) | [E-mail](#) | [Add to Marked List](#) | [Save to EndNote® Web](#)  
[Save to EndNote®, RefMan, ProCite](#) [more options](#)

Author(s): Bouazza A, Vangpaisal T

Source: GEOSYNTHETICS INTERNATIONAL Volume: 11 Issue: 4  
 Pages: 287-295 Published: 2004

Times Cited: 2 References: 16 [Citation Map](#)

**Abstract:** Although geosynthetic clay liners (GCLs) have gained advantage over compacted clay liners regarding the ability to withstand large differential settlement in cover systems, the ability of strained GCLs to mitigate gas flow is still not known. A series of gas permeability tests on partially hydrated GCLs subjected to straining is presented in this paper. Tests were performed on partially hydrated needle-punched GCLs subjected to straining (up to 30% of area strain). The GCL samples were strained either before hydration or after hydration. It was found that the gas flow rate through the strained GCL depended on GCL moisture content and straining conditions. The tensile strain seemed to have no adverse effect on dry GCL (straining before hydration) as long as the geotextile components were able to maintain their functions, and the mass of bentonite per area was preserved. However, in the case of straining (up to 15% area strain) after hydration, tensile strains possibly induced tension cracks in the bentonite component, providing preferential gas flow paths and higher gas flow rate than that of an unstrained GCL. At higher degree of area strain ( $15\% < \epsilon < 30\%$ ), the gas flow rate was found to be similar to the flow through an unstrained GCL, particularly at high moisture content ( $MC > 90\%$ ). Poiseuille's equation for laminar flow of fluid through space between parallel solid planes can be used to describe the flow of gas through cracks in the hydrated bentonite component.

Document Type: Article

Language: English

KeyWords Plus: GEOSYNTHETIC CLAY LINERS; PERMEABILITY

Reprint Address: Bouazza, A (reprint author), Monash Univ, Dept Civil Engn, Bldg 60, Clayton, Vic 3800 Australia

## Addresses:

1. Monash Univ, Dept Civil Engn, Clayton, Vic 3800 Australia
2. Ubon Ratchathani Univ, Dept Civil Engn, Warin Chamrap 34190, Ubon Ratchathan Thailand

## Cited by: 2

This article has been cited 2 times (from Web of Science).

Gates WP, Bouazza  
 A Bentonite transformations in strongly alkaline solutions GEOTEXTILES AND GEOMEMBRANES 28 2 219-225 APR 2010

Abuel-Naga HM, Bouazza  
 A Numerical Characterization of Advective Gas Flow through GM/GCL Composite Liners Having a Circular Defect in the Geomembrane JOURNAL OF GEOTECHNICAL AND GEOENVIRONMENTAL ENGINEERING 135 11 1661-1671 NOV 2009

[ [view all 2 citing articles](#) ]

[Create Citation Alert](#)

## Related Records:

Find similar records based on shared references (from Web of Science).

[ [view related records](#) ]

## References: 16

View the bibliography of this record (from Web of Science).

## Suggest a correction

If you would like to improve the quality of this product by suggesting corrections, [please fill out this form](#).

**E-mail Addresses:** [malek.bouazza@eng.monash.edu.au](mailto:malek.bouazza@eng.monash.edu.au),  
[thaveesak.v@ubu.ac.th](mailto:thaveesak.v@ubu.ac.th)

**Publisher:** THOMAS TELFORD PUBLISHING, THOMAS TELFORD HOUSE, 1 HERON QUAY, LONDON E14 4JD, ENGLAND

**Subject Category:** Engineering, Geological; Geosciences, Multidisciplinary; Materials Science, Multidisciplinary

**IDS Number:** 877LG

**ISSN:** 1072-6349

[<< Back to results list](#)

◀ Record 7 of 10 ▶

Record from **Web of Science®**

### Output Record

#### Step 1:

- Authors, Title, Source
  - plus Abstract
- Full Record
  - plus Cited Reference

#### Step 2: [\[How do I export to bibliographic management software?\]](#)

View in [简体中文](#) [English](#) [日本語](#)

*Please give us your [feedback](#) on using ISI Web of Knowledge.*

[Acceptable Use Policy](#)  
Copyright © 2010 Thomson Reuters



**THOMSON REUTERS**

*Published by Thomson Reuters*