Australian Standard™

Geotextiles—Methods of test

Method 9: Determination of permittivity, permeability and flow rate

1 SCOPE

This Standard sets out the method for determining the permittivity of geotextiles by measuring the flow of water through the fabric normal to its surface under a constant head.*

2 APPLICATION

This Method is applicable to both woven and non-woven geotextiles.

NOTE: The test is intended to simulate laminar flow conditions. The permittivity will vary significantly with the flow rate in turbulent flow conditions. It should also be remembered that the permittivity may decrease under in-service conditions if the geotextile is placed in the soil (e.g. owing to compressive stresses and contamination).

3 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

AS

1289 Methods of testing soils for engineering purposes

1289.6.7.1 Method 6.7.1: Soil classification tests—Determination of permeability of a soil—Constant head method for a remoulded specimen

3704 Geotextiles—Glossary of terms

3706 Geotextiles—Methods of test

3706.1 Method 1: General requirements, sampling, conditioning, basic physical properties, and statistical analysis

RILEM

SM-9 Synthetic membranes—Geotextiles. Hydraulic permittivity

4 PRINCIPLE

Water is made to flow at a constant rate under laminar flow conditions through a specimen comprising one or more layers of fabric with a known cross-sectional area. The head loss is measured using piezometric tubes. Measurements are made using at least five different flow rates, and the permittivity is determined by graphical methods.

NOTES:

1 The determination of the permittivity (ψ) is based on Darcy's law. This means that ψ is only constant for a particular material if laminar flow conditions exist, which is likely in a typical soil environment where geotextiles are used.

2 It appears that for most fabrics, Darcy's law holds if the approach velocity (the velocity of the water approaching the fabric) is kept at or below 0.035 m/s.

* This Method is based on RILEM SM–9.