

Methods of test for

Geotextiles —

**Part 8: Determination of
sand-geotextile frictional behaviour by
direct shear**

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Textiles and Clothing Standards Policy Committee (TCM/-) to Technical Committee TCM/35, upon which the following bodies were represented:

- Association of Consulting Engineers
- British Polyolefin Textiles Association
- British Textile Technology Group
- Chemical Industries Association
- Department of Transport
- Department of Transport (Transport and Road Research Laboratory)
- ERA Technology Ltd.
- Federation of Civil Engineering Contractors
- Institution of Civil Engineers
- Lambeg Industrial Research Association
- Ministry of Agriculture, Fisheries and Food
- Ministry of Defence
- Society of Engineers Incorporated

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Foreword

This Part of BS 6906 has been prepared under the direction of the Textiles and Clothing Standards Policy Committee and is Part 8 of a comprehensive British Standard on methods of test for geotextiles.

The standard describes procedures for investigating the index shear properties of the following:

- a) geotextile against geotextile;
- b) geotextile on rigid substrate against sand;
- c) geotextile on sand substrate against sand.

However, the procedure may be modified using soils as found on site, for which additional procedures are recommended in Appendix A.

The procedure is carried out on three identically prepared specimens of sand and geotextile under different normal pressures to determine the relationship between shear stress and normal stress.

Information on accuracy of the test is given in Appendix B.

Other Parts of BS 6906 are as follows.

- *Part 1: Determination of the tensile properties using a wide width strip;*
- *Part 2: Determination of the apparent pore size distribution by dry sieving;*
- *Part 3: Determination of water flow normal to the plane of the geotextile under a constant head;*
- *Part 4: Determination of the puncture resistance (CBR puncture test);*
- *Part 5: Determination of creep;*
- *Part 6: Determination of resistance to perforation (cone drop test);*
- *Part 7: Determination of in-plane waterflow.*

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 8, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

1 Scope

This Part of BS 6906 describes methods for determining the frictional or shear resistance of a geotextile against sand.

The test is applicable to all geotextiles which will transmit load from the geotextile to soil.

NOTE The titles of the publications referred to in this standard are listed on the inside back cover.

2 Definitions

For the purposes of this Part of BS 6906, the following definitions apply.

2.1 adhesion

apparent shear stress at zero normal stress

2.2 angle of bond friction

the angle of friction between geotextile and soil, defined as the slope of the best fit straight line, in degrees, through values of shear stress plotted against corresponding values of normal stress

2.3 coefficient of friction

the tangent of the angle of bond friction

2.4 direct shear test

a shear test in which a specimen sand/sand, sand/geotextile or geotextile/geotextile interface, contained within a shearbox, under an applied normal load, is stressed to failure by moving one section of the shearbox relative to the other in a horizontal plane

2.5 normal stress

a constant vertical stress applied to the specimen interface contained in the shearbox (in kPa)

2.6 shear stress

the ratio of shear resistance to the contact area of a specimen interface (in kPa)

2.7 shear resistance

the resistance to horizontal shearing along a specimen interface at a given displacement of the shearbox (in kN)

2.8 peak shear resistance

the maximum shear resistance measured during a test at a given normal stress (in kN)

2.9 residual shear resistance

the shear resistance measured during a test whilst the soil is shearing at constant volume, usually obtained at large displacements (in kN)

2.10 residual/peak ratio

the ratio of the residual angle of bond friction to the peak angle of bond friction

2.11 friction ratio

the ratio of the peak angle of bond friction to the peak angle of shearing resistance of the soil

3 Principle

The coefficient of friction between a geotextile and sand or between any combination of geotextiles selected by the user is determined by placing the geotextile and sand at the contact surface within a direct shearbox (see Figure 1). A constant normal compressive stress is applied to the specimen and a tangential (shear) force is applied to the apparatus so that one section of the box moves in relation to the other along the contact surface. The shear force is recorded as a function of the displacement of the moving section of the shearbox.

The test is performed at a minimum of three different normal stresses. The peak and residual shear stresses obtained are plotted against their corresponding values of normal stress. The slope of the best fit straight line passing through the points of peak shear stress defines the peak coefficient of friction. Similarly, the slope of the best fit straight line passing through the points of residual shear stress defines the residual coefficient of friction.

CAUTION. This standard involves high loads and forces when operating the test apparatus. The standard does not address all of the safety problems associated with the use of the test apparatus. Appropriate safety precautions should therefore be taken.

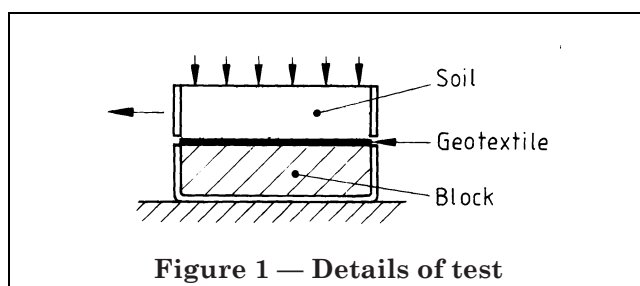


Figure 1 — Details of test