

Methods of test for

Geotextiles —

Part 5: Determination of creep

Committees responsible for this British Standard

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- 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 forms Part 5 of a comprehensive British Standard on methods of test for geotextiles.

Geotextiles are being used increasingly in the reinforcement of soil structures and earthworks. An important characteristic of these materials, as of all plastics, is that their strain under a constant load is a function of time, i.e. they exhibit marked creep characteristics, in that the application of load may lead ultimately to rupture. These characteristics are also affected by environmental factors, in particular, temperature. Information on creep is essential for any consideration of the use of geotextiles as reinforcement.

The method described uses 50 mm wide specimens of woven textiles and corresponding samples of geogrids or sheathed strips. The specimen is narrower than the 200 mm width used for tensile testing (BS 6906-1) and has been chosen in this way in order to reduce the expense of long-term testing. However, the creep of a conventional woven material arises from two sources: the creep of the warp in tension and the relaxation of the crimp in the warp due to creep in the weft. A 50 mm wide specimen will provide data representative of wider material provided that the friction between warp and weft is sufficient to maintain tension in the weft over the greater part of the specimen width. If the weft becomes completely slack the subsequent creep may be an underestimation of the creep of a wider specimen. Materials that exhibit large lateral contractions under tensile load, such as nonwovens, will need to be tested at greater widths. Creep data are not generally required in the cross direction of woven materials.

For woven materials part of the extension on loading arises from a straightening of the weave structure and is relatively variable, while the subsequent time-dependent elongation, which is due to creep of the fibres, is more consistent. This method therefore requires application of a pre-load. Since the loads to be applied are percentages of the tensile strength, before carrying out this test, it is necessary to determine the tensile strength using the method in BS 6906-1.

In soil the creep of the geotextile is likely to be reduced because of transfer of the load to the soil. In-soil testing is, however, difficult to carry out reproducibly. The air environment represents a controlled and more clearly definable test, the results of which are conservative with regard to the behaviour of the material in service and which may also be used as the basis for estimating the performance in stress-relaxation and under other conditions of complex load.

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

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 6: Determination of resistance to perforation (cone drop test);*
- *Part 7: Determination of in-plane waterflow;*
- *Part 8: Determination of sand-geotextile frictional behaviour by direct shear.*

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Summary of pages

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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.