

Geotextiles and geotextile-related products — Strength of internal structural junctions —

Part 1: Geocells

The European Standard EN ISO 13426-1:2003 has the status of a British Standard

ICS 59.080.70

National foreword

This British Standard is the official English language version of EN ISO 13426-1:2003. It is identical with ISO 13426-1:2003.

The UK participation in its preparation was entrusted to Technical Committee B/553, Geosynthetics, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this committee can be obtained on request to its secretary.

Cross-references

The British Standards which implement international or European publications referred to in this document may be found in the *BSI Catalogue* under the section entitled “International Standards Correspondence Index”, or by using the “Search” facility of the *BSI Electronic Catalogue* or of British Standards Online.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, the EN ISO title page, pages 2 to 16, an inside back cover and a back cover.

The BSI copyright notice displayed in this document indicates when the document was last issued.

Amendments issued since publication

Amd. No.	Date	Comments

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 18 July 2003

© BSI 18 July 2003

ISBN 0 580 42275 5

English version

Geotextiles and geotextile-related products - Strength of internal structural junctions - Part 1: Geocells (ISO 13426-1:2003)

Géotextiles et produits apparentés - Résistance des liaisons de structures internes - Partie 1: Géosynthétiques alvéolaires (ISO 13426-1:2003)

Geotextilien und geotextilverwandte Produkte - Festigkeit produktinterner Verbindungen - Teil 1: Geozellen (ISO 13426-1:2003)

This European Standard was approved by CEN on 1 August 2002.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

Contents

	page
Foreword	3
Introduction	3
1 Scope	3
2 Normative references	4
3 Terms and definitions	4
4 Principle	4
4.1 Method A: Tensile shear test (Figure 1)	5
4.2 Method B: Peeling test (Figure 2)	5
4.3 Method C: Splitting test (Figure 3)	5
4.4 Method D: Local overstressing test (Figure 4)	5
5 Conditioning of specimens	5
6 Test specimens	6
7 Apparatus	6
7.1 Tensile testing machine	6
7.2 Clamps	6
8 Test procedure	6
9 Calculations	7
9.1 General.....	7
9.2 Method A: Tensile shear	7
9.3 Method B: Peeling	7
9.4 Method C: Splitting	7
9.5 Method D: Local overstressing.....	8
10 Test report	8

Foreword

This document (EN ISO 13426-1:2003) has been prepared by Technical Committee CEN/TC 189 "Geosynthetics", the secretariat of which is held by IBN, in collaboration with Technical Committee ISO/TC 221 "Geosynthetics".

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by July 2003, and conflicting national standards shall be withdrawn at the latest by July 2003.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.

Introduction

Geocells are geotextile-related products composed of single strips interconnected in several possible ways (extrusion, thermal bonding, gluing, hot melt, stitching, etc) to form a panel of adjacent cells, where generally the contact between two elements occurs along lines or in specific points, and not uniformly on the whole surface. These lines or points are referred to as "junctions".

A geocell junction may fail in four different ways:

- 1) by shear (see Figure 1): when failure is caused by a force parallel to the junction itself;
- 2) by peeling or delamination (see Figure 2): when failure is caused by a force, normal to the junction, which separates the cells from each other at one edge of the junction;
- 3) by tensile stress (see Figure 3): when a force, normal to the junction, pulls away the two cells adjacent to the junction;
- 4) by local overstressing (see e.g. Figure 4: geocells secured with pins) : when the fixation element locally overstresses the junction, leading to a compression, shear or peel failure.

NOTE This can be considered as a performance property, in the same way as a tensile test on seams/joints.

It is therefore impossible to define one single testing method for measuring the junction strength of geocells. Hence this standard includes the principles for testing the four failure mechanisms explained above. These principles should be adapted to each single product. In order to avoid confusion about the interpretation of figures, reference should be made to the exact test method in test reports and data sheets, e.g. EN ISO 13426-1, method A – shear strength of internal structural junctions.

1 Scope

This standard describes index test methods for the determination of the strength of internal structural junctions of geocells under different loading conditions.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 963,	<i>Geotextiles and geotextile-related products - Sampling and preparation of test specimens (ISO 9862:1990)</i>
EN ISO 7500-1,	<i>Metallic materials - Verification of static uniaxial testing machines - Part 1: Tension/compression testing machines (ISO 7500-1:1999)</i>
ISO 554,	<i>Standard atmospheres for conditioning and/or testing – Specifications</i>

3 Terms and definitions

For the purposes of this European Standard, the following terms and definitions apply:

3.1

geocell

three-dimensional, permeable, polymeric (synthetic or natural) honeycomb or web structure made of strips linked in a staggered pattern, used to hold soil particles, roots and small plants for erosion control and soil containment applications in civil engineering

3.2

junction

point, line or area where two strips are connected to form the unit cells of a geocell structure

3.3

fastening system

system (staples, pegs, U-shaped bars, etc.) used to fix the geocells to the ground at single points

3.4

nominal cell size

length L_c (in machine direction) and width W_c (in cross-machine direction) of the cell when opened according to the specification

4 Principle

Specimens of geocells are tested in accordance with one or more of the following four test methods representing different stress modes.

NOTE 1 It is possible that, for some products, not all four test methods can be applied.

NOTE 2 In order to perform the tests correctly, information about the nominal open cell sizes (L_c , W_c) and the direction of installation of the geocells panels, e.g. with the machine direction down the slope or parallel to the contour lines, should be provided.