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Geosynthetics — Sampling and preparation of test specimens

Géosynthétiques — Échantillonnage et préparation des éprouvettes

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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This document was prepared by Technical Committee ISO/TC 221, *Geosynthetics*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 189, *Geosynthetics*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This third edition cancels and replaces the second edition (ISO 9862:2005), which has been technically revised.

The main changes are as follows:

— Geosynthetic products that do not come in rolls have been incorporated to this document.

A list of all parts in the ISO 9862 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

Geosynthetics are produced in many different ways, partly using traditional textile procedures, partly using procedures not commonly recognized as textile procedures. Geosynthetics are defined in ISO 10318-1.

Geosynthetics are typically supplied in rolls, however, some geosynthetic products may be supplied in the form of expandable panels, folded sheets or other forms.

Whilst sampling should ensure the best possible statistical significance of the average finding and its coefficient of variation, there are practical limits to the possible distribution of samples and specimens over the entire lot and its single units supplied to a construction site.

Geosynthetics — Sampling and preparation of test specimens

1 Scope

This document establishes general principles for the sampling of geosynthetics delivered to construction sites, and for the preparation of test specimens from the samples.

The sampling principles are applicable to geosynthetics supplied in rolls or expandable panels.

NOTE ISO 186 can be used for products supplied in sheet form.

The specimen-preparation principles are applicable to all geosynthetics.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 10320, *Geosynthetics — Identification on site*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
sample
portion of material which is taken for testing

3.2
specimen
specific portion of the *sample* (3.1) upon which a laboratory test is performed

4 Procedure

4.1 Sampling

4.1.1 Selection of rolls/panels

4.1.1.1 For each product type delivered to a construction site, take samples at frequencies as agreed between the parties involved.

4.1.1.2 With the exception of tests made in connection with claims, each roll or panel selected shall appear undamaged and the wrapping, if any, shall be intact.

4.1.1.3 Refer to individual test method standards for information on numbers of samples and specimens necessary.

4.1.2 Cutting

4.1.2.1 Information regarding the number of test specimens, their shape and any requirements shall be obtained from the relevant test standard(s) for all tests to be made on the sample.

For geosynthetic clay liner (GCL), with reference to ASTM D6072/D6072M -19, when cutting a sample from a roll, do not sample the first 1,0 m or the last 1,0 m of the roll. For large-diameter rolls, scrapping the initial 1,0-m length from the roll may not be enough. As such, samples should exclude material from the entire length of the outermost layer of the roll.

4.1.2.2 For rolled products, the first two turns of the roll shall not be used for sampling. For expandable panels, the two outermost strips of material shall not be used for sampling.

4.1.2.3 For rolled products, cut from the roll over its full width perpendicular to the machine direction (MD) the length of the sample necessary to obtain all specimens required, distributed in accordance with the principles in 4.2. For expandable panels, cut from the panel over its full width parallel to the fully expanded direction the length of the sample necessary to obtain all specimens required, distributed in accordance with the principles in 4.2.

4.1.2.4 Since specimens shall not contain damaged parts as defined in 4.2.4, either such parts shall be avoided in selecting the sample, or the sample shall be cut large enough to obtain the necessary number of acceptable specimens (except for the case specified in 4.1.1.2).

4.1.2.5 The sample may be rolled – except at expandable panels – but preferably not folded. The inner diameter of the roll shall not be less than that of the original packaging.

4.1.3 Identification of sample

Identification of samples shall be in accordance with ISO 10320.

4.2 Preparation of specimens

4.2.1 During and after sampling and during storage and transportation, care shall be taken to ensure that the physical condition of the sample remains unchanged prior to testing. For example, samples of clay geosynthetic barriers shall be maintained at the moisture content prevailing at the time of sampling.

NOTE For GBR-C, also known as geosynthetic clay liner (GCL), reference can be taken from ASTM D6072/D6072M-19.

4.2.2 If the sample is not to be cut into specimens immediately, it shall be kept in a dry, dark place, free from dust, at ambient temperature and protected against chemical and physical changes. Storage and/or transportation of geosynthetics samples shall be done in such a way that their properties are not adversely influenced. For example, this may be rolling, folding or as recommended by the manufacturer.

4.2.3 For each type of test, the required number of specimens shall be cut from positions evenly distributed over the full width and length of the sample, but not closer than 100 mm to the edge.

4.2.4 Except for specimens for tests to be made in connection with claims (see 4.1.1.2), specimens shall not contain any dirt, irregular areas, creases, holes or other visible defects of accidental origin produced subsequent to manufacture.

4.2.5 Unless otherwise required in a test standard, for the same type of test, the same longitudinal or transverse direction of two or more specimens shall be avoided. If unavoidable (e.g. due to narrow roll width), a note to this effect shall be included in the sampling report.

4.2.6 Except when additional tests are required, the specimens shall be cut along the machine and cross-machine directions. When the test procedure calls for the specimen to be marked with the machine direction, the marking indicating the machine direction on the sample shall be transferred to the specimen, or the specimen shall be kept separate in such a way that there can be no risk of a misunderstanding.

4.2.7 When cutting test specimens reference shall be made to the particular test standards for which the specimens are being prepared. In tests where accuracy of dimensions is of special importance, the specimens may be cut to an oversize and then cut or frayed to the exact dimensions after conditioning.

4.2.8 Appropriate identification markings on the sample shall be transferred to all specimens to ensure correct specimen identification.

4.2.9 If the cutting causes fragments of the geosynthetic to become loose, or if accidental fraying occurs, all loose fragments shall be kept with the specimen until the test is carried out. If the loosening of fragments cannot be avoided and this is likely to influence the test result, the fact that loosening has occurred shall be reported in the sampling report as well as in the test report.

4.2.10 The specimens shall be kept in a dry, dark place free from dust, at ambient temperature and protected against chemical and physical changes until the test is performed.

5 Sampling and specimen preparation report

The sampling report shall include the following information:

a) statement that the sampling and preparation of specimens was performed in accordance with this document, i.e. ISO 9862:2023;

b) details of any special observations made during the selection, sampling, transportation, storage or preparation of specimens, such as:

   1) the number and type of defects;

   2) loosening of fragments from the geosynthetic;

   3) the necessity for taking specimens for the same test in only one longitudinal or transverse direction;

c) details of any deviation from the specified sampling procedure;

d) full identification of product in accordance with 4.1.3, dates of cutting of the sample and reference number(s) of the rolls, sheet selected.