

भूकृत्रिम — परीक्षण नमूनों का नमूनाकरण
और तैयारी

(पहला पुनरीक्षण)

Geosynthetics — Sampling and
Preparation of Test Specimens

(First Revision)

ICS 59.080.70

© BIS 2024

© ISO 2023



भारतीय मानक ब्यूरो
BUREAU OF INDIAN STANDARDS
मानक भवन, 9 बहादुर शाह ज़फर मार्ग, नई दिल्ली - 110002
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI - 110002

www.bis.gov.in www.standardsbis.in

NATIONAL FOREWORD

This Indian Standard (First Revision) which is identical to ISO 9862 : 2023 'Geosynthetics Sampling and preparation of test specimens' issued by the International Organization for Standardization (ISO) was adopted by the Bureau of Indian Standards on recommendation of the Geosynthetics Sectional Committee and approval of the Textiles Division Council.

This standard was first published in 1999. This revision of the standard has been brought out to align it with the latest version of ISO 9862 : 2023.

The text of ISO standard has been approved as suitable for publication as an Indian Standard without deviations. Certain conventions are, however, not identical to those used in Indian Standards. Attention is particularly drawn to the following:

- a) Wherever the words 'International Standard' appear referring to this standard, they should be read as 'Indian Standard'; and
- b) Comma (,) has been used as a decimal marker while in Indian Standards, the current practice is to use a point (.) as the decimal marker.

In this adopted standard, reference appears to certain International Standard for which Indian Standard also exist. The corresponding Indian Standard which are to be substituted in their respective places is given below along with their degree of equivalence for the edition indicated:

<i>International Standard</i>	<i>Corresponding Indian Standard</i>	<i>Degree of Equivalence</i>
ISO 10320 Geosynthetics Identification on site	— IS 17421 : 2020 Geosynthetics Identification on site —	Identical

In reporting the result of a test or analysis made in accordance with this standard, if the final value, observed or calculated, is to be rounded off, it shall be done in accordance with IS 2 : 2022 'Rules for rounding off numerical values (*second revision*)'.

Contents

Page

Introduction	iv
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Procedure	1
4.1 Sampling.....	1
4.1.1 Selection of rolls/panels.....	1
4.1.2 Cutting.....	2
4.1.3 Identification of sample.....	2
4.2 Preparation of specimens.....	2
5 Sampling and specimen preparation report	3
Bibliography	4

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.

Indian Standard

GEOSYNTHETICS — SAMPLING AND PREPARATION OF TEST SPECIMENS

(*First Revision*)

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.

Bibliography

- [1] ISO 186, *Paper and board — Sampling to determine average quality*
- [2] ISO 10318-1, *Geosynthetics — Part 1: Terms and definitions*
- [3] ASTM D6072/6072M-19, *Standard Practice for Obtaining Samples of Geosynthetic Clay Liners*

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act, 2016* to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Copyright

BIS has the copyright of all its publications. No part of these publications may be reproduced in any form without the prior permission in writing of BIS. This does not preclude the free use, in the course of implementing the standard, of necessary details, such as symbols and sizes, type or grade designations. Enquiries relating to copyright be addressed to the Head (Publication & Sales), BIS.

Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the website-www.bis.gov.in or www.standardsbis.in.

This Indian Standard has been developed from Doc No.: TXD 30 (25140).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002

Telephones: 2323 0131, 2323 3375, 2323 9402

Website: www.bis.gov.in

Regional Offices:

Central : 601/A, Konnectus Tower -1, 6th Floor,
DMRC Building, Bhavbhuti Marg, New
Delhi 110002

Telephones

{ 2323 7617

Eastern : 8th Floor, Plot No 7/7 & 7/8, CP Block, Sector V,
Salt Lake, Kolkata, West Bengal 700091

{ 2367 0012
{ 2320 9474

Northern : Plot No. 4-A, Sector 27-B, Madhya Marg,
Chandigarh 160019

{ 265 9930

Southern : C.I.T. Campus, IV Cross Road, Taramani, Chennai 600113

{ 2254 1442
{ 2254 1216

Western : 5th Floor/MTNL CETTM, Technology Street, Hiranandani Gardens, Powai
Mumbai 400076

{ 25700030
{ 25702715

Branches : AHMEDABAD, BENGALURU, BHOPAL, BHUBANESHWAR, CHANDIGARH, CHENNAI, COIMBATORE, DEHRADUN, DELHI, FARIDABAD, GHAZIABAD, GUWAHATI, HARYANA (CHANDIGARH), HUBLI, HYDERABAD, JAIPUR, JAMMU, JAMSHEDPUR, KOCHI, KOLKATA, LUCKNOW, MADURAI, MUMBAI, NAGPUR, NOIDA, PARWANOO, PATNA, PUNE, RAIPUR, RAJKOT, SURAT, VIJAYAWADA.