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भारतीय मानक ब्यूरो
BUREAU OF INDIAN STANDRADS

Draft For Comments Only

भारतीय मानक मसौदा

भूकृत्रिम — स्थायित्व के मूल्यांकन के लिए दिशानिर्देश

Draft Indian Standard

GEOSYNTHETICS — GUIDELINES FOR THE ASSESSMENT OF DURABILITY

ICS : 59.080.70

Geosynthetics Sectional Committee, TXD 30	Last date for receipt of comments is **23 September 2025**

NATIONAL FOREWORD

(*Formal clauses will be added later*)

This Indian Standard intended to be adopted is identical with ISO/TS 13434 : 2020 'Geosynthetics — Guidelines for the assessment of durability' issued by the International Organization for Standardization (ISO).

The conditioning temperature of (20 ± 2) °C as specified in International Standard is not suitable for tropical countries like India where the atmospheric temperature is normally much higher than 20 °C. It is almost impossible to maintain this temperature specially during summer when the atmospheric temperature rises even up to 50 °C. In view of the above, IS 6359 : 2023 'Method for conditioning of textiles (first revision)' which specifies a temperature of (27 ± 2) °C for conditioning of the test specimens for the tropical countries like India shall be referred.

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'.
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 the standard intended to be adopted, reference appears to certain International Standards for which Indian Standards also exist. The corresponding Indian Standards which are to be substituted in their respective places are listed below along with their degree of equivalence for the editions indicated:

International Standard	*Corresponding Indian Standard*	*Degree of Equivalence*
ISO 10318-1 Geosynthetics — Part 1: Terms and definitions	IS 13321 (Part 1) : 2022 Geosynthetics (Part 1) : Terms and definitions (*first revision*)	Identical
ISO 13431 Geotextiles and geotextile-related products — Determination of tensile creep and creep rupture behaviour	IS 14739 : 2021 Geotextiles and geotextile-related products — Determination of tensile creep and creep rupture behaviour (*first revision*)	Identical
ISO 13438 : 2018 Geosynthetics —Screening test method for determining the resistance of geotextiles and geotextile-related products to oxidation	IS 17360 : 2020 Geosynthetics — Screening test method for determining the resistance of geotextiles and geotextile-related products to oxidation	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*)'.

EXTRACT OF ISO/TS 13434 : 2020 GEOSYNTHETICS — GUIDELINES FOR THE ASSESSMENT OF DURABILITY

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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 documents 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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be

in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

ISO/TS 13434 was prepared by Technical Committee ISO/TC 221, *Geosynthetics*.

This first edition cancels and replaces ISO/TS 13434 : 2008, which has been technically revised. The main changes compared to the previous edition are as follows:

- standards and wording actualized;
- added product types in 5.1;
- updated subclauses 5.4, 8.4, 8.5 and Table 3.

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.

1 Scope

This document provides guidelines for the assessment of the durability of geosynthetics, the object of which is to provide the design engineer with the necessary information, generally defined as changes in material properties or as partial safety factors, to ensure that the expected design life of a geosynthetic can be achieved with confidence.

This document is not applicable to products designed to survive for only a limited time, such as erosion-control fabric based on natural fibres.

This document is applicable to the durability of the geosynthetics and not to the durability of the geotechnical structure as a whole.

NOTE The calculation of reduction factors for soil reinforcement applications is described in ISO/TR 20432.

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 10318-1, *Geosynthetics — Part 1: Terms and definitions*
- ISO 13431, *Geotextiles and geotextile-related products — Determination of tensile creep and creep rupture behaviour*

A rate of degradation

A_0 constant in Arrhenius equation

d_{50} 50 % soil gradation

E activation energy

M_n number-averaged molecular weight

M_w weight-averaged molecular weight

R universal gas constant (8,314 J/mol·K)

t_g glass transition temperature

T absolute temperature

- ISO 13438:2018, *Geosynthetics — Screening test method for determining the resistance of geotextiles and geotextile-related products to oxidation*

3 Terms, definitions, symbols and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 10318-1 apply.

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

- ISO Online browsing platform: available at https://www.iso.org/obp
- IEC Electropedia: available at http://www.electropedia.org/

3.2 Symbols

3.3 Abbreviated items

CMD cross-machine direction

CPE chlorinated polyethylene

CSPE chlorosulfonated polyethylene

DSC differential scanning calorimetry

EIA ethylene interpolymer alloy

ENB ethylidene norbornene

EPDM ethylene propylene diene monomer

EPS expanded polystyrene

ESC environmental stress cracking

fPP	flexible polypropylene
GBR-B	bituminous geosynthetic barrier
GBR-C	geosynthetic clay barrier
GBR-P	polymeric geosynthetic barrier
HALS	hindered amine light stabilizers
PE-HD	high-density polyethylene
HP-OIT	high-pressure oxidation induction time
KEE	ketone ethylene ester
PE-LLD	linear low-density polyethylene
MB	modified bitumen
MD	machine direction
OIT	oxidation induction time
PA	polyamide
PCM	post-consumer material
PE	polyethylene
PEN	polyethylene naphthalate
PET	polyethylene terephthalate
PIM	post-industrial material
PP	polypropylene
PS	polystyrene
PVAL	polyvinyl alcohol
PVC-P	flexible polyvinyl chloride
RPP	reinforced polypropylene
RWM	reworked material
SBS	styrene-butadiene-styrene
S-OIT	oxidation induction time measured by standard method
XPS	extruded polystyrene
UV	ultraviolet

FORMAT FOR SENDING COMMENTS ON BIS DOCUMENTS

(Please use A4 size sheet of paper only and type within fields indicated. Comments on each clause/sub clause/table/fig etc. be started on a fresh box. Information in column 3 should include reasons for the comments and suggestions for modified working of the clauses when the existing text is found not acceptable. Adherence to this format facilitates Secretariat's work)

Please e-mail your comments to txd@bis.gov.in

NAME OF THE COMMENTATOR/ORGANIZATION:

DOCUMENT NO: TXD 30 (28440) WC

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Item, Clause Sub-Clause No. Commented upon (Use Separate Box afresh)	**Comments**	**Specific Proposal (Draft clause to be add/amended)**	**Remarks**	**Technical References and justification on which (2), (3), (4) are based**
(1)	**(2)**	**(3)**	**(4)**	**(5)**