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Second edition  
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## **Geosynthetics — Screening test method for determining the resistance of geotextiles and geotextile-related products to oxidation**

*Géosynthétiques — Méthode de détermination de la résistance des  
géotextiles et produits apparentés à l'oxydation*



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## 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](http://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](http://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](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 221, *Geosynthetics*.

This second edition cancels and replaces the first edition (ISO 13438:2004), which has been technically revised. The main changes compared to the previous edition are as follows:

- procedural guidance regarding the use of exposure ovens has been added;
- procedural guidance regarding the use of autoclaves has been added.

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](http://www.iso.org/members.html).

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## Introduction

In many civil engineering applications, geotextiles and geotextile-related products can come into contact with water or aqueous solutions present in the soil environment. At the same time, in specific parts of the construction, they can be exposed to oxygen, giving rise to oxidative degradation processes. These processes are usually very slow.

Polyolefin materials, such as polypropylene (PP) and polyethylene (PE), are inherently more sensitive to oxidation than those based on polyethylene terephthalate (PET). Other polymers, such as poly(vinyl alcohol) (PVAL according to ISO 1043-1), are also sensitive to oxidation in specific conditions (aqueous media with oxidizing agent). This behaviour can be improved very effectively by the use of appropriate stabilizing additives.

It is the purpose of this document to provide a method for screening the resistance to oxidation of geotextiles and geotextile-related products in service for 25, 50 and 100 years. In order to achieve the sufficiently short exposure times needed for screening tests, the oxidative degradation process is accelerated. This acceleration can be achieved either by raising the temperature or by increasing the concentration of the active reaction partner. Raising the temperature can lead to the oxidation rate being limited by oxygen diffusion, thus invalidating the acceleration. This applies particularly to materials with a low surface-to-volume ratio and less to nonwovens made from fine fibres. Two methods are therefore proposed.

Method A (which was Method B in the previous edition) uses temperature alone as the accelerating factor and is used for PE, PP, PA and AR.

Method B operates at moderately high temperatures and, at the same time, the oxygen concentration is increased by using pure oxygen at high pressure. Method B is used for PVAL.