



Technical  
Specification

**ISO/TS 5354-2**

**Molecular biomarkers — Detection of DNA in cotton used for textile production —**

Part 2:  
**Overview of target sequences for use in polymerase chain reaction (PCR)-based detection methods for cotton genetically modified (GM) events**

*Biomarqueurs moléculaires — Détection d'ADN dans le coton utilisé pour la production textile —*

*Partie 2: Présentation des séquences cibles à utiliser dans les méthodes de détection reposant sur une réaction de polymérisation en chaîne (PCR) des événements de coton génétiquement modifié (GM)*

First edition  
2024-04

This document is a preview generated by EMS



**COPYRIGHT PROTECTED DOCUMENT**

© ISO 2024

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office  
CP 401 • Ch. de Blandonnet 8  
CH-1214 Vernier, Geneva  
Phone: +41 22 749 01 11  
Email: [copyright@iso.org](mailto:copyright@iso.org)  
Website: [www.iso.org](http://www.iso.org)

Published in Switzerland

**Contents**

Page

<b>Foreword</b> .....	<b>iv</b>
<b>Introduction</b> .....	<b>v</b>
<b>1 Scope</b> .....	<b>1</b>
<b>2 Normative references</b> .....	<b>1</b>
<b>3 Terms and definitions</b> .....	<b>1</b>
<b>4 Abbreviated terms</b> .....	<b>2</b>
<b>5 GM element screening</b> .....	<b>2</b>
5.1 Principle.....	2
5.2 Procedure.....	3
5.3 Primers and probes.....	3
5.4 Reference materials.....	6
5.5 GM cotton events.....	6
5.6 Validation.....	9
5.7 Interpretation and expression of results.....	9
5.8 Results.....	9
5.9 Reporting.....	9
<b>6 Test report</b> .....	<b>9</b>
<b>Bibliography</b> .....	<b>11</b>

## 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 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](http://www.iso.org/directives)).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at [www.iso.org/patents](http://www.iso.org/patents). ISO shall not be held responsible for identifying any or all such patent rights.

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 34, *Food products*, Subcommittee SC 16, *Horizontal methods for molecular biomarker analysis*.

This first edition, along with ISO 5354-1, cancels and replaces IWA 32:2019, which has been technically revised throughout.

A list of all parts in the ISO 5354 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](http://www.iso.org/members.html).

## Introduction

Detection and identification of genetically modified (GM) cotton materials are typically accomplished using polymerase chain reaction (PCR) based screening methods followed by more specific event-based analyses of the materials. Based on targets that are detected or not-detected during screening, the presence or absence of specific cotton GM events can be determined and confirmed with event-specific methods. Target sequences used with screening and event-based methods can provide reproducible data across a variety of equipment, chemistries, and reagents. In this way, DNA sequences associated with GM events can be assessed in order to economically and reliably determine whether GM material is present.

This document provides examples of screening and event-based target sequences that are found in GM cotton. PCR methods that amplify these target sequences for detection and identification can be used to determine the presence of GM events in cottonseed and some cotton products. Six primer and probe pairs are recommended for determining the presence of most GM cottons events. Only those elements for which a detection method is available are listed.

ISO 5354-1<sup>1)</sup>[\[1\]](#) describes methods for extraction of PCR amplifiable DNA from cotton matrices that can subsequently be analysed for the target sequences described within this document and a taxon specific PCR reference detection method for cotton.

---

1) Under preparation. Stage at the time of publication: ISO/DIS 5354-1:2023



# Molecular biomarkers — Detection of DNA in cotton used for textile production —

## Part 2:

# Overview of target sequences for use in polymerase chain reaction (PCR)-based detection methods for cotton genetically modified (GM) events

## 1 Scope

This document provides a list of target sequences that can be used to screen for the presence of genetically modified (GM) material in cotton and cotton products.

This document is applicable to cottonseed, cotton leaf, cotton fibre and cotton fibre-derived materials from which sufficiently high-quality PCR amplifiable DNA can be extracted.

Methods describing the extraction of DNA from different cotton samples can be found in ISO 5354-1<sup>[1]</sup>.

NOTE 1 The list of target sequences provides guidance for the screening of all currently known GM cotton events and GM cotton events that contain the same DNA sequences. Further guidance on screening of foodstuffs is provided in CEN/TS 16707<sup>[2]</sup>.

NOTE 2 Sampling is outside of the scope of this document. Information on sampling cotton products can be found in ISO 1130:1975<sup>[3]</sup> and in ASTM D1441-12<sup>[4]</sup>.

## 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 16577, *Molecular biomarker analysis — Vocabulary for molecular biomarker analytical methods in agriculture and food production*

ISO 21569 (all parts), *Horizontal methods for molecular biomarker analysis — Methods of analysis for the detection of genetically modified organisms and derived products*

ISO 21570, *Foodstuffs — Methods of analysis for the detection of genetically modified organisms and derived products — Quantitative nucleic acid based methods*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 16577 and the following 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/>