

Textiles - Determination of short-chain chlorinated paraffins (SCCP) and middle-chain chlorinated paraffins (MCCP) in textile products out of different matrices by use of gas chromatography negative ion chemical ionization mass spectrometry (GC-NCI-MS) (ISO 22818:2021)

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**Textiles - Determination of short-chain chlorinated paraffins (SCCP) and middle-chain chlorinated paraffins (MCCP) in textile products out of different matrices by use of gas chromatography negative ion chemical ionization mass spectrometry (GC-NCI-MS) (ISO 22818:2021)**

Textiles - Détermination de paraffines chlorées à chaîne courte (PCCC) et de paraffines chlorées à chaîne moyenne (PCCM) dans des produits textiles sur différentes matrices par chromatographie en phase gazeuse couplée à la spectrométrie de masse avec ionisation chimique négative (GC-NCI-MS) (ISO 22818:2021)

Textilien - Bestimmung von SCCP und MCCP in textilen Produkten aus verschiedener Matrices mittels GC-NCI-MS (ISO 22818:2021)

This European Standard was approved by CEN on 13 March 2021.

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**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

## European foreword

This document (EN ISO 22818:2021) has been prepared by Technical Committee ISO/TC 38 "Textiles" in collaboration with Technical Committee CEN/TC 248 "Textiles and textile products" the secretariat of which is held by BSI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by September 2021, and conflicting national standards shall be withdrawn at the latest by September 2021.

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

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## Endorsement notice

The text of ISO 22818:2021 has been approved by CEN as EN ISO 22818:2021 without any modification.

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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)).

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This document was prepared by Technical Committee ISO/TC 38, *Textiles*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 248, *Textiles and textile products*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

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

Short-chain chlorinated paraffins (SCCPs) ( $C_{10}$ - $C_{13}$ ; chlorine content > 48 %) are listed by the Stockholm Convention on Persistent Organic Pollutants.

In Europe, according to REGULATION (EU) 2019/1021<sup>[1]</sup> of the European Parliament and of the Council of 20 June 2019 on persistent organic pollutants alkanes  $C_{10}$ - $C_{13}$ , chloro [short-chain chlorinated paraffins (SCCPs)] (CAS no. 85535-84-8) as constituents of articles are prohibited. Articles containing SCCPs in concentrations lower than 0,15 % by weight are allowed.

Furthermore, it became industrial practice to restrict alkanes  $C_{14}$ - $C_{17}$ , known as medium-chain chlorinated paraffins (MCCPs) as well.

SCCPs and MCCPs are used as flame retardants in textiles, as plasticizers in polymers and as finishing agents in leather. SCCPs and MCCPs are an issue for textile manufacturers and retailers due to their use within fabrics, coated fabrics, plastisol prints, buttons, leather patches, etc.

The analysis of chlorinated paraffins is a great challenge. The technical compounds are always complex mixtures of substances with different chain lengths and different chlorination degrees. Gas chromatography (GC) separation of these mixtures show an overlapping part of chain length (between short and middle chained) and of chlorination degrees, too. The responses of the different chlorination degrees vary in a big range. This document describes a procedure to get comparable results for SCCPs and MCCPs with a defined calibration standard of the most typical used mixtures (59 % chlorination degree for SCCPs and 55 % chlorination degree for MCCPs) and using four ion traces for SCCPs and four ion traces for MCCPs with gas chromatography negative ion chemical ionization mass spectrometry (GC-NCI-MS).

# Textiles — Determination of short-chain chlorinated paraffins (SCCP) and middle-chain chlorinated paraffins (MCCP) in textile products out of different matrices by use of gas chromatography negative ion chemical ionization mass spectrometry (GC-NCI-MS)

**WARNING** — This document calls for the use of substances/procedures that may be injurious to the health/environment if appropriate conditions are not observed. It refers only to technical suitability and does not absolve the user from legal obligations relating to health and safety/environment at any stage.

## 1 Scope

This document specifies a chromatographic method to determine the amount of short-chain chlorinated paraffins (SCCPs: C<sub>10</sub>-C<sub>13</sub>) and middle-chain chlorinated paraffins (MCCPs: C<sub>14</sub>-C<sub>17</sub>) in textile articles, especially in polymer of the coated fabrics, prints made of polymer and buttons made of polymer (e.g. polyvinylchloride) by means of solvent extraction and gas chromatography negative ion chemical ionization mass spectrometry (GC-NCI-MS).

## 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 4787, *Laboratory glassware — Volumetric instruments — Methods for testing of capacity and for use*

## 3 Terms and definitions

No terms and definitions are listed in this document.

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/>

## 4 Principle

The test specimens are extracted with toluene, followed by a sulfuric acid clean-up. The analysis is carried out using GC-NCI-MS with a defined calibration standard and eight typical ion traces.

It shall be emphasized that this method is a method of convention. All steps shall be performed as described. Variations in procedure induce deviant results.

## 5 Reagents

Unless otherwise specified, analytical grade chemicals shall be used.

### 5.1 *n*-Hexane, CAS no. 110-54-3.