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TECHNICAL SPECIFICATION
 SPÉCIFICATION TECHNIQUE
 TECHNISCHE SPEZIFIKATION

CEN ISO/TS 16179

August 2012

ICS 61.060

English Version

**Footwear - Critical substances potentially present in footwear
 and footwear components - Determination of organotin
 compounds in footwear materials (ISO/TS 16179:2012)**

Chaussures - Substances critiques potentiellement
 présentes dans les chaussures et les composants de
 chaussures - Détermination des composés
 organostanniques dans les matériaux de chaussures
 (ISO/TS 16179:2012)

Schuhe - Möglicherweise in Schuhen und
 Schuhbestandteilen vorhandene kritische Substanzen -
 Bestimmung zinnorganischer Verbindungen in
 Schuhwerkstoffen (ISO/TS 16179:2012)

This Technical Specification (CEN/TS) was approved by CEN on 6 August 2012 for provisional application.

The period of validity of this CEN/TS is limited initially to three years. After two years the members of CEN will be requested to submit their comments, particularly on the question whether the CEN/TS can be converted into a European Standard.

CEN members are required to announce the existence of this CEN/TS in the same way as for an EN and to make the CEN/TS available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force (in parallel to the CEN/TS) until the final decision about the possible conversion of the CEN/TS into an EN is reached.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



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Foreword

This document (CEN ISO/TS 16179:2012) has been prepared by Technical Committee CEN/TC 309 "Footwear", the secretariat of which is held by AENOR, in collaboration with Technical Committee ISO/TC 216 "Footwear".

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

According to the CEN/CENELEC Internal Regulations, the national standards organisations of the following countries are bound to announce this Technical Specification: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

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TECHNICAL SPECIFICATION

ISO/TS 16179

First edition
2012-08-15

Footwear — Critical substances potentially present in footwear and footwear components — Determination of organotin compounds in footwear materials

Chaussures — Substances critiques potentiellement présentes dans les chaussures et les composants de chaussures — Détermination des composés organostanniques dans les matériaux de chaussures

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ISO/TS 16179:2012(E)

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

In other circumstances, particularly when there is an urgent market requirement for such documents, a technical committee may decide to publish other types of document:

- an ISO Publicly Available Specification (ISO/PAS) represents an agreement between technical experts in an ISO working group and is accepted for publication if it is approved by more than 50 % of the members of the parent committee casting a vote;
- an ISO Technical Specification (ISO/TS) represents an agreement between the members of a technical committee and is accepted for publication if it is approved by 2/3 of the members of the committee casting a vote.

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An ISO/PAS or ISO/TS is reviewed after three years in order to decide whether it will be confirmed for a further three years, revised to become an International Standard, or withdrawn. If the ISO/PAS or ISO/TS is confirmed, it is reviewed again after a further three years, at which time it must either be transformed into an International Standard or be withdrawn.

SIST-TS CEN ISO/TS 16179:2012

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.

ISO/TS 16179 was prepared by the European Committee for Standardization (CEN) Technical Committee CEN/TC 309, *Footwear*, in collaboration with ISO Technical Committee ISO/TC 216, *Footwear*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

Footwear — Critical substances potentially present in footwear and footwear components — Determination of organotin compounds in footwear materials

1 Scope

This Technical Specification specifies a test method for determining the presence of organotin compounds. This test method is applicable to all types of footwear materials.

NOTE ISO/TR 16178 defines which materials are concerned by this determination.

2 Normative references

ISO 3696, *Water for analytical laboratory use — Specification and test methods*

3 Principle

The organotin substances are extracted from the footwear material with a methanol-ethanol mixture, in a medium-strength acidic condition, using tropolone as a complexant agent.

The polar and high-boiling organotin is then converted to the corresponding volatile tetra-alkyl derivative, by reaction with sodium tetraethylborate, $\text{NaB}(\text{Et})_4$. Finally, it is detected by a gas chromatograph fitted with a mass selective detector (GC-MS).

Table 1 indicates the list of target compounds which can be analysed with this Technical Specification.

Table 1 — List of target compounds which can be analysed with this Technical Specification

Type of compound	Compound	CAS ^a
Monosubstituted	n-butyltin trichloride	1118-46-3
	n-octyltin trichloride	3091-25-6
Disubstituted	Di-n-butyltin dichloride	683-18-1
	Di-n-octyltin dichloride	3542-36-7
Trisubstituted	Tri-n-butyltin chloride	1461-22-9
	Triphenyltin chloride (or fentin chloride)	639-58-7
	Tricyclohexyltin chloride	3091-32-5
Tetrasubstituted	Tetra-n-butyltin	1461-25-2

^a Chemical Abstract Service.

4 Reagents

Unless otherwise specified, use only reagents of recognized analytical grade.

4.1 Water, grade 3 according to ISO 3696.

4.2 Ethanol, GPR grade or industrial methylated spirit (IMS), CAS number: 64-17-5.

4.3 Glacial acetic acid, CAS number: 64-19-7.