
**Nanotechnologies — Method to
quantify air concentrations of carbon
black and amorphous silica in the
nanoparticle size range in a mixed
dust manufacturing environment**

*Nanotechnologies — Quantification du noir de carbone et de la silice
amorphe nanométriques en suspension dans l'air en ambiance de
production*

(<https://standards.iteh.ai>)
Document Preview

ISO/TS 21361:2019

<https://standards.iteh.ai/catalog/standards/iso/95bd3e38-e7ee-4081-be4b-85bb99e9bbbf/iso-ts-21361-2019>



iTeh Standards
(<https://standards.iteh.ai>)
Document Preview

[ISO/TS 21361:2019](https://standards.iteh.ai/catalog/standards/iso/95bd3e38-e7ee-4081-be4b-85bb99e9bbbf/iso-ts-21361-2019)

<https://standards.iteh.ai/catalog/standards/iso/95bd3e38-e7ee-4081-be4b-85bb99e9bbbf/iso-ts-21361-2019>



COPYRIGHT PROTECTED DOCUMENT

© ISO 2019

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
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Principle	2
5 Abbreviations	3
6 Reagents	3
7 Apparatus	4
7.1 Air sampling — Equipment and consumable supplies	4
7.1.1 Electrical low cascade pressure impactor (ELPCI)	4
7.1.2 Limit of Detection	4
7.1.3 Real-time aerosol monitor	5
7.1.4 Vacuum pump	5
7.1.5 Polycarbonate substrate	5
7.1.6 Hydrocarbon grease	5
7.2 Analytical/microscopy laboratories	6
7.3 Sample analysis — Equipment and consumables	6
7.3.1 Transmission electron microscope (TEM)	6
7.3.2 Energy dispersive spectrometry (EDS)	6
7.3.3 Computer	6
7.3.4 TEM Grid	6
8 Air sample collection	6
8.1 Preparation for sampling	6
8.2 Determination of sampling time	7
8.3 Sample collection procedure	7
9 Procedure for analysis	7
9.1 General	7
9.2 Preparation of substrates	8
9.3 Sample analysis	8
9.3.1 Instrument conditions	8
9.3.2 Data collection	8
9.4 Calculation of air concentration	9
10 Uncertainties and performance criteria	10
10.1 Particle counting with the ELPCI	10
10.2 Particle analysis with TEM/EDS	11
11 Test report	11
Annex A (informative) Case study overview	12
Bibliography	13

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.

This document was prepared by Technical Committee ISO/TC 229, *Nanotechnologies*.

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.

ISO/TS 21361:2019

<https://standards.iteh.ai/catalog/standards/iso/95bd3e38-e7ee-4081-be4b-85bb99e9bbbf/iso-ts-21361-2019>