IEC/TS 62607-2-1

Edition 1.0 2012-05

TECHNICAL SPECIFICATION

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Nanomanufacturing – Key control characteristics – Part 2-1: Carbon nanotube materials – Film resistance

INTERNATIONAL ELECTROTECHNICAL COMMISSION

PRICE CODE P

ICS 07.030

ISBN 978-2-83220-114-5

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NANOMANUFACTURING – KEY CONTROL CHARACTERISTICS –

Part 2-1: Carbon nanotube materials – Film resistance

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- the subject is still under technical development or where, for any other reason, there is the future but no immediate possibility of an agreement on an International Standard.

Technical specifications are subject to review within three years of publication to decide whether they can be transformed into International Standards.

IEC 62607-2-1, which is a technical specification, has been prepared by IEC technical committee 113: Nanotechnology standardization for electrical and electronic products and systems:

The text of this technical specification is based on the following documents:

Enquiry draft	Report on voting
113/118/DTS	113/131/RVC

Full information on the voting for the approval of this technical specification can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts of the IEC 62607 series, published under the general title *Nanomanufacturing – Key control characteristics,* can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- transformed into an International standard,
- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

There are two major trends in the fabrication of new materials incorporating carbon nanotubes (CNTs) for next generation of industrial applications:

a) conducting composites in field-emission displays (FEDs), flexible displays, or printed electronics; and

b) nano-composites for mechanical applications, by taking advantage of their attractive mechanical properties such as high Young's modulus, elastic behaviour and high tensile strength.

This IEC technical specification is related to a), the conducting composites application. As conducting composites using CNTs are increasingly being used in the electronics industry, it is essential to establish a standard method to evaluate their electrical properties.

Characterization of the electrical properties of CNTs used in conducting composites is important to both manufacturers and users. This IEC technical specification describes simple methods to characterize the electrical properties of CNT materials that are to be used in conducting composites.

NANOMANUFACTURING – KEY CONTROL CHARACTERISTICS –

Part 2-1: Carbon nanotube materials – Film resistance

1 Scope

This part of IEC 62607 provides a standardized method for categorizing a grade of commercial CNTs in terms of their electrical properties to enable a user to select a CNT material suitable for their application. The method is intended to assess whether the delivered materials from different production batches of the same production process are comparable regarding electrical properties of the final product which are related to electrical conductivity. The correlation between the measured parameters by the proposed method and a relevant product performance parameter has to be established for every application. This specification includes

a) definitions of terminology used in this document,

b) recommendations for sample preparation,

c) outlines of the experimental procedures to measure sheet resistance of CNTs in thin films,

d) methods of interpretation of results and discussion of data analysis,

e) case studies and,

f) references.