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Information technology — Automatic identification and data capture techniques — Quality test specification for rewritable hybrid media data carriers

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National foreword

This British Standard is the UK implementation of ISO/IEC 29133:2010.

The UK participation in its preparation was entrusted to Technical Committee IST/34, Automatic identification and data capture techniques.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

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

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

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/IEC 29133 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 31, *Automatic identification and data capture techniques*.

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Introduction

Traditionally, linear bar codes and two-dimensional symbols have been considered as write once/read many times (WORM) technologies. The advent of Rewritable Media, which can completely change the displayed information, provides applications with an opportunity to erase previously encoded data carriers and human readable data and to overwrite this with new data. There is a requirement to ensure that Rewritable Media can be fully integrated with pre-existing WORM applications.

Additionally, Rewritable Media can be combined with rewritable RFID (radio frequency identification) technologies to create what is called a Rewritable Hybrid Media product. In this form, the characteristics of the optical data carrier and RFID data carrier can be used in an integrated manner in business applications. Because the rewriting procedure for each technology is different, there is a requirement to ensure that this data is synchronised, not necessarily to be identical, on each rewriting cycle.

Because the Rewritable Media and RFID tags can be re-used for a number of cycles, they can contribute to environmental improvement as they produce a smaller carbon footprint over their lifetime than current systems that use paper and card-based products. Also, by combining Rewritable Media with RFID, the number of single-use RFID labels can be reduced.

Manufacturers of bar code equipment and RFID equipment, and the users of both these data capture technologies, require publicly available standard test specifications for the objective assessment of the quality of Rewritable Hybrid Media and its component parts. Such standards can be referred to when developing equipment and application standards, or determining the quality of the data carriers. Such test specifications form the basis for development of measuring equipment for process control and quality assurance purposes during the rewriting process as well as afterwards. This International Standard provides requirements and guidelines to achieve a specified quality requirement for applications making use of Rewritable Hybrid Media. These requirements also address the fact that any batch of Rewritable Hybrid Media is heterogeneous, with some items that are relatively new being intermixed with other items that have been erased and re-written many times. Procedures outlined in this International Standard ensure, irrespective of the age and number of cycles achieved by an item of Rewritable Hybrid Media, that the minimum required quality output is maintained.

The bar code symbol needs to be produced in such a way as to be reliably decoded at the point of use, if it is to fulfil its basic objective as a machine-readable data carrier. Similarly, the RFID tag needs to be encoded in a correct manner to be reliably read at the point of use.

This International Standard specifies the overall quality process and associated methodology for Rewritable Hybrid Media. This International Standard determines quality characteristics to ensure that various types of product combination and integrated Rewritable Hybrid Media system can be implemented in a reliable and robust manner.

This International Standard contributes to the interoperability of data carriers and devices that support this technology. In addition, as the Rewritable Media technology develops, this International Standard will provide a benchmark to assess whether the new developments are capable of being applied in a manner compatible with existing data carriers.

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INTERNATIONAL STANDARD ISO/IEC 29133:2010(E)

Information technology — Automatic identification and data capture techniques — Quality test specification for rewritable hybrid media data carriers

1 Scope

This International Standard specifies methodologies to be used for the conformance of rewritable hybrid media data carriers, which combine RFID tag technology with linear and/or two-dimensional bar code symbologies that are written to an erasable substrate. Three main product configuration types are addressed within this International Standard:

— Rewritable Media, which supports the rewriting of linear or two-dimensional symbols;

— Rewritable Hybrid Media, which integrates the Rewritable Media with an RFID tag;

— Rewritable Media combined with RFID technology that are physically separate data carriers but still require their data encoding processes to be integrated as part of a Rewritable Hybrid Media system.

In particular, this International Standard

— defines the base requirements for Rewritable Media and Rewritable Media devices (see 6.2),

— defines additional methods for process control of the Rewritable Media over multiple erasure and rewrite cycles (see 6.4),

— defines reference standards for evaluating the RFID tag component (see 7.2 and 7.3),

— defines additional methods for process control of the RFID component over multiple erasure and rewrite cycles (see 7.4),

— provides information to ensure that the data encoded in the bar code symbology and RFID data carrier are synchronous, i.e. are derived from the same source data set (see Clause 8).

NOTE Depending on the application, the encoded data can be identical or different (e.g. one data carrier could provide additional data).

Because of the interdependency between the Rewritable Hybrid Media and the rewrite device used to create the optical image, the entire Rewritable Hybrid Media system needs to be taken into account to define conformance. Therefore, there is a requirement to define the capability of achieving a given print quality grade as defined in relevant standards. This Rewritable Hybrid Media system approach has the additional advantage of not being prescriptive on the types of media and "print" technologies that may be used now or developed in future. As long as a print technology/media combination meets the print quality grades, it can be considered conformant with this International Standard.

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2 Normative references

The following referenced documents are indispensable for the application 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/IEC 15415 *Information technology — Automatic identification and data capture techniques — Bar code print quality test specification — Two-dimensional symbols*

ISO/IEC 15416 *Information technology — Automatic identification and data capture techniques — Bar code print quality test specification — Linear symbols*

ISO/IEC 15419, *Information technology — Automatic identification and data capture techniques — Bar code digital imaging and printing performance testing*

ISO/IEC 19762-1, *Information technology — Automatic identification and data capture (AIDC) techniques — Harmonized vocabulary — Part 1: General terms relating to AIDC*

ISO/IEC 19762-2, *Information technology — Automatic identification and data capture (AIDC) techniques — Harmonized vocabulary — Part 2: Optically readable media (ORM)*

ISO/IEC 19762-3, *Information technology — Automatic identification and data capture (AIDC) techniques — Harmonized vocabulary — Part 3: Radio frequency identification (RFID)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 19762-1, ISO/IEC 19762-2, ISO/IEC 19762-3 and the following apply.

3.1
Rewritable Hybrid Media
combination of Rewritable Media and an RFID tag in an integrated product

3.2
Rewritable Media
substrate, consisting of a protective layer, optical imaging layer and base material, that enables repeated writing and erasing of optical data including bar code symbologies and eye readable data

3.3
Rewritable Hybrid Media system
system comprising the Rewritable Hybrid Media data carriers, the process control to achieve verifiable data carrier conformance, and the data integrity between the bar code and RFID components, whether these are integrated or separate data carriers

4 Symbols and abbreviations

nm nanometre

R_{max} Maximum reflectance value

R_{min} Minimum reflectance value

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