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Gas cylinders — Identification and marking using radio frequency identification technology —

Part 2: Numbering schemes for radio frequency identification

Bouteilles à gaz — Identification et marquage à l'aide de la technologie d'identification par radiofréquences —

Partie 2: Schémas de numérotage pour identification par radiofréquences

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ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

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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.

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.

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 21007-2 was prepared by Technical Committee ISO/TC 58, *Gas cylinders*, Subcommittee SC 4, *Operational requirements for gas cylinders*.

This second edition cancels and replaces the first edition (ISO 21007-2:2005). Only Annex C has been revised.

ISO 21007 consists of the following parts, under the general title *Gas cylinders — Identification and marking using radio frequency identification technology*:

— *Part 1: Reference architecture and terminology*

— *Part 2: Numbering schemes for radio frequency identification*

Introduction

Throughout industry and in commerce, trade and the domestic sector, the employment of gas cylinders (referred to as GC in this part of ISO 21007) to enable the local consumption and use of gases and liquids, without the need for in-situ high cost permanent pressure vessel installations, is an important part of modern practice.

Such cylinders provide complex gas mixes for medical, industrial or research use.

As the cylinders can contain a wide variety of gases, identification is of paramount importance. It is mandatory to be able to uniquely identify each cylinder. As many contents are of limited life, and for product quality and liability tracking and tracing, in some circumstances it could be necessary or desirable to identify not only the type of gas or liquid, but also such details as filling station, batch and date of fill.

Various methods and technologies such as physical identification through indentation; paper, card, metal, and plastic labeling; colour code identification; bar coding and, in some circumstances, vision systems are already used to make or assist such identifications.

The technology of radio frequency identification (RFID) involves a reader/interrogator station that transmits a predetermined signal of inductive, radio or microwave energy to one or many transponders located within a read zone. The transponder returns the signal in a modified form to the reader/interrogator and the data is decoded. The data component in a portable gas or liquid cylinder environment provides the basis for unambiguous identification of the transponder and also can provide a medium for a bi-directional interactive exchange of data between the host and transponder. The signal can be modulated or unmodulated according to architecture of the system.

In many cases it will be necessary or desirable to use one air carrier frequency and protocol, but this will not always be possible or even desirable in all situations, and it could be useful to separate fundamentally different cylinders by the response frequency.

However, there is benefit in using a standard common core data structure that is capable of upwards integration and expandable from the simplest low cost cylinder identification system to more complex functions. Such a structure will have to be flexible and enabling rather than prescriptive, thus enabling different systems degrees of interoperability within and between their host systems.

The use of Abstract Syntax Notation One (ASN.1, as defined in the ISO/IEC 8824 series) from ISO/IEC 8824-1 as a notation to specify data and its associated Packed Encoding Rules (PER) from ISO/IEC 8825-2 is widely used and gaining popularity. Its usage will provide maximum interoperability and conformance to existing standards and will meet the specifically defined requirements for a generic standard model for portable gas cylinder identification in that it

— enables and uses existing standard coding,

— is adaptable and expandable,

— does not include unnecessary information for a specific application, and

— has a minimum of overhead in storage and transmission.

ISO 21007-1 provides a framework reference architecture for such systems. This part of ISO 21007 is a supporting part of ISO 21007-1 and provides a standardized yet flexible and interoperable framework for numbering schemes. This part of ISO 21007 details individual numbering schemes within the framework for the automatic identification of gas cylinders.

Central to the effective use of many of the constructs is a structure to provide unambiguous identification. This part of ISO 21007 provides a standardized data element construct for the automatic identification of gas cylinders.

Where there is any conflict between this International Standard and any applicable regulation, the regulation always takes precedence.