

# SLOVENSKI STANDARD

## SIST EN ISO 21007-2:2013

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Nadomešča:

SIST EN ISO 21007-2:2005

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**Plinske jeklenke - Prepoznavanje in označevanje s pomočjo radiofrekvenčne identifikacije - 2. del: Sistem oštevilčenja za radiofrekvenčno identifikacijo (ISO 21007-2:2013)**

Gas cylinders - Identification and marking using radio frequency identification technology - Part 2: Numbering schemes for radio frequency identification (ISO 21007-2:2013)

**iTeh STANDARD PREVIEW**

Gasflaschen - Identifizierung und Kennzeichnung mittels Hochfrequenzidentifizierungstechnologie - Teil 2: Nummerierungssysteme für die Hochfrequenzidentifizierung (ISO 21007-2:2013)

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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 (ISO 21007-2:2013)

**Ta slovenski standard je istoveten z: EN ISO 21007-2:2013**

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**ICS:**

23.020.30	Tlačne posode, plinske jeklenke	Pressure vessels, gas cylinders
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**EN ISO 21007-2**

February 2013

ICS 23.020.30

Supersedes EN ISO 21007-2:2005

English Version

**Gas cylinders - Identification and marking using radio frequency  
identification technology - Part 2: Numbering schemes for radio  
frequency identification (ISO 21007-2:2013)**

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 (ISO 21007-2:2013)

Gasflaschen - Identifizierung und Kennzeichnung mittels  
Hochfrequenzidentifizierungstechnologie - Teil 2:  
Nummerierungssysteme für die  
Hochfrequenzidentifizierung (ISO 21007-2:2013)

This European Standard was approved by CEN on 14 December 2012.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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 (EN ISO 21007-2:2013) has been prepared by Technical Committee ISO/TC 58 "Gas cylinders" in collaboration with Technical Committee CEN/TC 23 "Transportable gas cylinders" the secretariat of which is held by BSI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by August 2013, and conflicting national standards shall be withdrawn at the latest by August 2013.

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.

This document supersedes EN ISO 21007-2:2005.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: 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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**Gas cylinders — Identification and  
marking using radio frequency  
identification technology —****Part 2:  
Numbering schemes for radio frequency  
identification**

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*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 21007-2:2013(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.

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*

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## 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.

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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.

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

## Part 2: Numbering schemes for radio frequency identification

### 1 Scope

This part of ISO 21007 establishes a common framework for data structure to enable the unambiguous identification in gas cylinder (GC) applications and for other common data elements in this sector.

This part of ISO 21007 enables a structure to allow some harmonization between different systems. However, it does not prescribe any one system and has been written in a non-mandatory style so as not to make it obsolete as technology changes.

The main body of this part of ISO 21007 excludes any data elements that form any part of transmission or storage protocols such as headers and checksums.

For details of cylinder/tag operations see Annex A.

### 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 3166-1, *Codes for the representation of names of countries and their subdivisions — Part 1: Country codes*

ISO 13769, *Gas cylinders — Stamp marking*

ISO 21007-1, *Gas cylinders — Identification and marking using radio frequency identification technology — Part 1: Reference architecture and terminology*

ISO/IEC 8824-1:2008, *Information technology — Abstract Syntax Notation One (ASN.1): Specification of basic notation*

ISO/IEC 8825-2, *Information technology — ASN.1 encoding rules: Specification of Packed Encoding Rules (PER)*

### 3 Terms, definitions and numerical notations

#### 3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 21007-1 and the following apply.

##### 3.1.1

##### **bit rates**

number of bits per second, independent of the data coding

**ISO 21007-2:2013(E)****3.1.2****carrier frequency**

centre frequency of the downlink/uplink band

**3.1.3****construct**

one or more primitive constructs to form an ASN.1 message

**3.1.4****data coding**

coding that determines the baseband signal presentation, i.e., a mapping of logical bits to physical signals

Note 1 to entry: Examples are bi-phase schemes (Manchester, Miller, FM0, FM1, differential Manchester), NRZ and NRZ1.

**3.1.5****modulation**

keying of the carrier wave by coded data described in accordance with commonly understood methodologies (amplitude shift keying, frequency shift keying)

**3.1.6****octet**

set of eight binary digits (bits)

**3.1.7****power limits within communication zone**

limits that determine the minimum and maximum values of incident power referred to a 0 dB antenna in front of the tag

Note 1 to entry: These two values also specify the dynamic range of the tag receiver. Power values are measured without any additional losses due to rain or misalignment.

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**3.1.8****registration body**

organization entitled to issue and keep track of issuer identification

Note 1 to entry: For examples, see Annex A.

**3.1.9****tolerance of carrier frequency**

maximum deviation of the carrier frequency expressed as a percentage

**3.2 Numerical notations**

The numerical notations used in this part of ISO 21007 are as follows:

- Decimal (“normal”) notation has no subscript, e.g. 127;
- Hexadecimal numbers are noted by subscript 16, e.g. 7F<sub>16</sub>;
- Binary numbers are noted by subscript 2, e.g. 01111111<sub>2</sub>.

**4 Data presentation****4.1 General requirements**

The data element construct determined in this part of ISO 21007 is an “enabling” structure. It is designed to accommodate within its framework, data element constructs for a variety of GC applications, from simple GC identification to more complex transactions with a wide variety of uses, and to allow combinations of data elements to be used in a composite data construct. It is designed to allow as much interoperability of the data

elements within an electronic data interchange/electronic data transfer (EDI/EDT) environment as is possible and has to provide a capability for a significant expansion of the number of GC applications in the future.

This part of ISO 21007 takes cognizance of and accommodates the operation of systems of different capabilities and will enable within its structure the interoperability of one transponder in any country, even though the operator systems themselves may be significantly different, so long as there is a common air interface (at reference point Delta) and protocol. Even where information has to be collected by a separate interrogator because air carrier compatibility does not exist, the data once collected is in a commonly interoperable format and so may be used accurately and effectively within an EDI/EDT environment.

The data element structure defined in this part of ISO 21007 specifies the general presentation rules for transfer of ASN.1 data schemes. It is also the purpose of this part of ISO 21007 to determine how ASN.1 will be used for data transmission in GC applications.

Excluding transfers in a predefined context, the first level of identification required in ASN.1 messages identifies the context of the message. This part of ISO 21007 determines that in GC applications this is achieved by using an object identifier that shall be determined in accordance with an arc determined in Annex B of ISO/IEC 8824-1:2008.

The objective of this part of ISO 21007 is therefore to establish a basis where the message can always be identified simply by reference to the relevant standard and without the requirement of central registration authorities (except where those are specifically required in the referred to document).

## 4.2 ASN.1 messages

Where there is a simple message where no further subdivision according to ASN.1 rules is possible, the message is called an ASN.1 "primitive message". Such messages will have only one identification and length statement. The GC identification structure defined in Clause 3 of ISO 21007-1:2005 is an ASN.1 primitive message.

## 4.3 Message identification requirements

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The data constructs shall conform to ISO/IEC 8824-1:2008.

With the exception of transfers in a predetermined context (see 4.4):

- All GC standard ASN.1 messages shall commence with a unique object identifier that shall be determined in accordance with the arc 2 (joint ITU-T), followed by the object class indicating a standard arc 0, followed by the reference to the standard:

```
{ITU-T}(2) standard(0) standardxxx(yyy) }
```

- Where the data content relates to standards produced by other identified organizations, they shall commence with a unique object identifier that shall be determined in accordance with the arc 2 (joint ITU-T) followed by the identification of an identified organization arc 3, followed by the identification of the identified organization (as provided in Annex B), followed by the object class indicating a standard arc 0, followed by the reference to the standard:

```
{ ITU-T(2) identified-organization (3) organization-identity(xxx) standard(0) standardxxx(zzz) }
```

## 4.4 Predetermined context and the use of packed encoding rules

Where the context of a transfer is known, the data constructs determined in this part of ISO 21007 may be assumed to be in accordance with the rules determined in ISO/IEC 8825-2.

In respect of any identification of an item using an ISO ASN.1 message, the data necessary for unambiguous identification shall reside on the on-board equipment associated with the item being identified.