

ISO-~~TS~~ 7352

Date: 2023-01-10

ISO TC 104/SC 4/WG 2

Secretariat: AFNOR

Freight ~~Container~~ Containers — NFC or/and QR code seals

~~WD~~ stage

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Published in Switzerland

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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.

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](http://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](http://www.iso.org/patents)).

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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](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC-104, *Freight containers*, Subcommittee SC-4, — *Identification and communication*.

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](http://www.iso.org/members.html).

## Introduction

This ~~technical specification document~~ proposes a specification for freight container NFC or/and QR code seals, including clear and unique identification and status of NFC or/and QR code seals. It ~~willis intended to~~ greatly improve container transportation security and transparency with the advantages of low cost, easy to promote and apply.

The main body of implementation of this ~~technical specification document~~ is users, producers and information platform operators of container NFC or/and QR code seals, including cargo owners, shipping companies, logistics companies, agents, customs, inspection and quarantine, port tally, NFC or/and QR code seal manufacturers and information management platform operators.

The anticipated effects and benefits are as follows:

- ~~—~~ To facilitate quick access to the Internet for container sealing information;
- ~~—~~ To improve the safety of freight container transportation and reduce theft, smuggling and illegal immigration;
- ~~—~~ To improve the transparency of freight container transportation and facilitate the accountabilities partition in multimodal transport of containers;
- ~~—~~ To facilitate the supervision by such national institutions as customs, and inspection and quarantine bureaus;
- ~~—~~ To facilitate the manufacturers' upgrading of products and expanding of the NFC or/and QR code seal market.

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## Freight Container—Containers — NFC or/and QR code seals

### 1 Scope

This ~~technical specification document~~ specifies the system composition, data format (storage data of the seal, interaction data and format between seal and APP, interaction data and format between smartphone APP and information platform, data exchanged between platforms), technical requirements, data communication requirements and operational requirements for freight container NFC seals, QR code seals, NFC and QR code seals.

This ~~technical specification document~~ applies to the design, manufacture and application of freight container NFC seals, QR code seals, NFC and QR code seals.

### 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 6346, Freight containers—Coding, identification and marking~~

~~ISO 17712, Freight containers—Mechanical seals~~

~~ISO 18185-3, Freight containers—Electronic seals~~

~~ISO 6709, Standard representation of geographic point location by coordinates~~

~~ISO 17712, Freight containers — Mechanical seals~~

~~ISO/IEC 7816-6, Identification cards—Integrated circuit cards—Part 6: Interindustry data elements for interchange~~

~~ISO/IEC 14443-2:2020, Cards and security devices for personal identification—Contactless proximity objects—Part 2: Radio frequency power and signal interface~~

~~ISO/IEC 14443-3, Cards and security devices for personal identification—Contactless proximity objects—Part 3: Initialization and anticollision~~

~~ISO/IEC 18092, Information technology — Telecommunications and information exchange between systems - Near Field Communication - Interface and Protocol (NFCIP-1)~~

~~ISO/IEC 21481, Information technology - Telecommunications and information exchange between systems —Near Field Communication Interface and Protocol - 2 (NFCIP-2)~~

~~ISO/IEC-ISO 18185-3, Freight containers — Electronic seals — Part 3: Environmental characteristics~~

~~ISO/IEC 7816-6, Identification cards -Integrated circuit cards-Part 6: Interindustry data elements for interchange~~

ISO/IEC 14443-2:2020, Cards and security devices for personal identification — Contactless proximity objects — Part 2: Radio frequency power and signal interface

ISO/IEC 14443-3, Cards and security devices for personal identification — Contactless proximity objects — Part 3: Initialization and anticollision

ISO/IEC 18004:2015, Information technology — Automatic identification and data capture techniques — QR Code bar code symbology specification

NFC Data Exchange Format (NDEF) Technical Specification 1.0

## **7.3 Terms and definitions**

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at <https://www.iso.org/obp>

— IEC Electropedia: available at <https://www.electropedia.org/>

### **3.1**

#### **NFC seal**

~~a non-reusable~~, anti-counterfeiting electronic seal embedded NFC tag with a globally unique identifier (UID) that records seal ID and manufacturer information, etc.

Note 1 to entry: Its mechanical part shall comply with the ISO 17712 related requirements for freight container seals. It can provide evidence of tampering or intrusion through the container doors by appearance or information management system.

### **3.2**

#### **QR code seal**

~~a non-reusable~~ mechanical seal printed on the surface containing seal ID, manufacturer information and produce date, to form a globally unique QR code.

Note 1 to entry: It shall comply with the ISO 17712 requirements for freight container seals. It can provide physical evidence of tampering or intrusion of the container door.

### **3.3**

#### **NFC and QR code seal**

~~an~~ electronic NFC seal with a QR code printed on the surface.

Note 1 to entry: The information in it includes the NFC UID, seal ID, seal manufacturer information, etc.

### **3.4**

#### **NFC read/write device**

a-process device for NFC reading and writing, location uploading, picture shooting, and access to internet, such as smartphones, which has an operating system and running space where software can be installed.

### 3.5

#### QR code read device

a-process device for QR code reading, location uploading, picture shooting, and access to internet, such as smartphones, which has an operating system and running space where software can be installed.

## 9.4 Freight ~~Container-container~~ — NFC or/and QR code ~~Seals~~seals

### 9.14.1 General requirements

**4.1.1** The type, technical requirements, test methods, and external identification of the mechanical part of the container NFC or/and QR code seal shall comply with ISO\_17712.

**4.1.2** The environmental requirements for NFC seal shall comply with ISO\_18185-3.

**4.1.3** The data character encoding method, symbol format, size characteristics, error correction rules, reference decoding algorithm, and production quality requirements of QR code seal, etc. shall comply with ISO/IEC\_18004.

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### 9.54.2 Data format and content of NFC seal

The data of NFC seal shall include chip UID, NFC seal ID, seal manufacturer ID and container number. NFC seal ID and seal manufacturer ID shall be written onto an NFC seal during production and set to be read-only. The container number ~~may~~can be written by the sealing operator. The data format and content of the NFC seal are shown in Table\_1.

Table\_1 — Data ~~Format~~format and ~~Content~~content of NFC Sealseal

Field name	Identifier	Type	Size	Description
Chip UID	ChipID	Hexadecimal	8-bytes	Required. The unique identification serial number for the chip built in the NFC seal. It shall comply with the UID-related regulations in ISO/IEC_7816-6.
NFC seal ID	SealID	Character string	14-bytes	Required. The external identifier for the NFC seal. It shall comply with ISO_17712_.
Seal manufacturer ID	ManufacturerID	Character string	18-bytes	Required. For identification of seal manufacturer.