भारतीय मानक
Indian Standard

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सूचना और प्रलेखन — पुस्तकालयों में आरएफआईडी

भाग 1 कार्यान्वयन के लिए डेटा एलिमेंट्स और सामान्य दिशानिर्देश

Information and Documentation — RFID in Libraries

Part 1 Data Elements and General Guidelines for Implementation

ICS 35.240.30; 35.040

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Documentation and Information Sectional Committee, MSD 05

FOREWORD

This Indian Standard (Part 1) which is identical with ISO 28560-1:2014 'Information and documentation — RFID in libraries — Part 1: Data elements and general guidelines for implementation' issued by the International Organization for Standardization (ISO) was adopted by the Bureau of Indian Standards on the recommendation of the Documentation and Information Sectional Committee and approval of the Management and Systems Division Council.

This standard is published in three parts. The other parts in this series are:

Part 2   Encoding of RFID data elements based on rules from ISO/IEC 15962
Part 3   Fixed length encoding

The text of ISO Standard has been approved as suitable for publication as an Indian Standard without deviations. Certain conventions and terminologies are, however, not identical to those used in Indian Standards. Attention is particularly drawn to the following:

a)   Wherever the words 'International Standard' appear referring to this standard, they should be read as 'Indian Standard'.

b)   Comma (,) has been used as a decimal marker while in Indian Standards, the current practice is to use a point (.) as the decimal marker.

In this adopted standard, references appear to certain International Standards for which Indian Standards also exist. The corresponding Indian Standards which are to be substituted in their respective places are listed below along with their degree of equivalence for the editions indicated:

International Standard	Corresponding Indian Standard	Degree of Equivalence
ISO 28560-2 Information and documentation — RFID in libraries — Part 2: Encoding of RFID data elements based on rules from ISO/IEC 15962	IS 16602 (Part 2) : 2017 Information and documentation — RFID in libraries: Part 2 Encoding of RFID data elements based on rules from ISO/IEC 15962	Identical with ISO 28560-2 : 2014
ISO 28560-3 Information and documentation — RFID in libraries — Part 3: Fixed length encoding	IS 16602 (Part 3) : 2017 Information and documentation — RFID in libraries: Part 3 Fixed length encoding	Identical with ISO 28560-3 : 2014

The technical committee has reviewed the provisions of the following International Standard referred in this adopted standard and has decided that it is acceptable for use in conjunction with this standard:

International Standard	Title
ISO/IEC 15961-3	Information technology — Radio frequency identification (RFID) for item management: Data protocol — Part 3: RFID data constructs

Annex C is an integral part of this standard and Annexes A, B, D and E are for information only.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*). The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Introduction

Libraries are implementing radio frequency identification (RFID) as item identification to replace bar codes. RFID streamlines applications like user self-service, security, and materials handling. A standard data model for encoding information on RFID tags could increase the cost-effectiveness of the technology within libraries, particularly through greater interoperability of RFID tags and equipment, and enhance support for resource sharing between libraries.

Tags that are currently used in libraries use proprietary rules adopted by vendors or follow the rules of historic national RFID models. In general, there is interoperability between tags with a data model compliant with this International Standard and tags that carry a non-ISO 28560-compliant data model.

Several countries have undertaken preliminary work on standardization. The Netherlands developed a data model for public libraries and in Denmark "RFID Data Model for Libraries" has been published. Finland has adopted the Danish model, but with a few changes. There is a French data model that differs from the Danish and Dutch models. Other libraries in different parts of the world have installations based on various proprietary systems offered by technology and library system suppliers. All of these constitute the installed base of RFID systems, but only account for a small minority of the total of libraries globally.

There is an opportunity to develop a standard data model, taking into account the lessons learned from the national schemes and vendor solutions, and provide migration options for those libraries that have already invested in the technology. Because new items are continually being purchased, a number of migration options can be adopted based on factors relevant to each library.

This part of ISO 28560 deals with data elements and provides general guidelines for implementation. Other parts of ISO 28560 describe encodings and choice of frequency.

Communication between the RFID reader and the library system (or other applications) is handled by, for example, SIP-2 and NCIP (see Bibliography).

This International Standard provides essential standards-based information about RFID in libraries. Ongoing advice needs to be provided because of the evolving nature of RFID technology and the opportunities to migrate between different types of legacy system and encoding rules of this International Standard.

Indian Standard

INFORMATION AND DOCUMENTATION — RFID IN LIBRARIES

PART 1 DATA ELEMENTS AND GENERAL GUIDELINES FOR IMPLEMENTATION

1 Scope

This part of ISO 28560 specifies a model for the use of radio frequency identification (RFID) tags for items appropriate for the needs of all types of libraries, including national, academic, public, corporate, special, and school.

This part of ISO 28560 provides the framework to ensure interoperability between libraries that exchange library items with RFID tags, the freedom of the library to acquire or renew equipment or library items from different vendors, and interoperability of a single RFID application from the vendor's perspective.

This part of ISO 28560 specifies a set of data elements and general guidelines for implementation, to meet the needs for:

— circulation of library items;

— acquisition of library items;

— interlibrary loan processes;

— data requirements of publishers, printers, and other suppliers of library items;

— inventory and stock checking of items.

This part of ISO 28560 gives guidelines for item security, profiles, privacy, implementation, migration, label design, and location of the RFID label.

This part of ISO 28560 specifies the data model, system data elements, and user data elements to be used in conjunction with ISO 28560-2, ISO 28560-3, and any future parts of ISO 28560.

A source of additional information about implementation issues is provided in 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/IEC 15961-3, *Information technology — Radio frequency identification (RFID) for item management: Data protocol — Part 3: RFID data constructs*

ISO 28560-2, *Information and documentation — RFID in libraries — Part 2: Encoding of RFID data elements based on rules from ISO/IEC 15962*

ISO 28560-3, *Information and documentation — RFID in libraries — Part 3: Fixed length encoding*

3 Terms and definitions

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

3.1
distributor
wholesaler that purchases products from manufacturers and sells them to retailers or other wholesalers

Note 1 to entry: In the context of this International Standard, a distributor is a wholesaler that purchases library materials such as books or audiovisual materials from publishers and sells them to libraries or retailers.

3.2
interlibrary loan
ILL
service where a library borrows an item from another library

3.3
item
unit tracked in a library system

Note 1 to entry: An item, which can be a *set* (3.7), can be loanable or non-circulating, but is always loaned in its entirety.

3.4
jobber
specialized distributor of library items that provides services such as the attachment of labelling and electronic information to items to make them ready for immediate shelving upon arrival at the destination library

3.5
library management system
enterprise resource planning system for a library, used to track items owned, items loaned, orders made, bills paid, and patrons

Note 1 to entry: In some countries, this is known as an integrated library system.

3.6
part
individual physical entity included in an item

Note 1 to entry: A part can be a library material or a container for the library materials in a *set* (3.7).

3.7
set
item consisting of a number of parts, all identified by the same item identifier and loaned in one transaction as a unit

3.8
supply chain
series of entities, typically beginning with a publisher and ending with a library, through which library materials flow as they are acquired by that library

4 User data elements

4.1 Overview of user data elements

Libraries can choose which data elements they want to store on the tag. It is unlikely that a library places all the listed data elements on the tag. A number of data elements are reserved for local use. They should be ignored where the processing institution is not the owner of the item (as in ILL).

Table 1 lists the user data elements that are defined in this International Standard.

Table 1 — User data elements

N[a]	Name of the data element[b]	Description[c]	Ref [d]	ISO 8459 mapping[e]	Status[f]	Relationship[g]
1	Primary item identifier	Unique identification of an item at least inside the library	4.2.1	Piece identifier	Mandatory for circulated items	None
2	Content parameter	Specifies the structure of the tag data	4.2.2	None	Can be mandatory as specified in other parts of ISO 28560	None
3	Owner institution (ISIL)	The ISIL code for the institution that owns the item	4.2.3	Party identifier; Participant's function	Strongly recommended to create interoperability	Elements 3 and 23 are mutually exclusive
4	Set information	Number of parts in item and ordinal part number	4.2.4	Number of volumes; Component	Optional	None
5	Type of usage	Additional qualifying information about the item or part of a set	4.2.5	None	Optional	None
6	Shelf location	Code for location of the item	4.2.6	Copy shelf locator	Optional	None
7	ONIX media format	ONIX media descriptor	4.2.7	Record content type	Optional	Data elements 7, 8, and 19 should be consistent
8	MARC media format	MARC 21 category of material descriptor	4.2.8	Record content type	Optional	Data elements 7, 8, and 19 should be consistent
9	Supplier identifier	Code for identification of supplier of the item	4.2.9	Party identifier; Participant's function	Optional	None
10	Order number	Number meaningful to the library and to the supplier of the item	4.2.10	Request identifier	Optional	None
11	ILL borrowing institution (ISIL)	ISIL code for the institution borrowing the item	4.2.11	Party identifier; Participant's function	Optional	Data elements 11 and 25 are mutually exclusive
12	ILL borrowing transaction number	Number identifying an interlibrary loan transaction	4.2.12	None	Optional	None
13	GS1 product identifier	GTIN-13 code of GS1	4.2.13	Resource identifier code	Optional	Data elements 13 and 18 should be consistent
14	Alternative unique item identifier	Possibly encoding in new tag architectures	4.2.14	None	Reserved for future use	
15	Local data A	Any locally defined purpose	4.2.15	None	Optional	None
16	Local data B	Any locally defined purpose	4.2.16	None	Optional	None
17	Title	The title/titles of the library item	4.2.17	Title	Optional	None

Table 1 — (*continued*)

*N*a	Name of the data elementb	Descriptionc	Ref d	ISO 8459 mappinge	Statusf	Relationshipg
18	Product identifier local	Product identifier not based on GTIN-13	4.2.18	Resource identifier code	Optional	Data elements 13 and 18 should be consistent
19	Media format (other)	Media descriptor other than ONIX or MARC	4.2.19	Record content type	Optional	Data elements 7, 8, and 19 should be consistent
20	Supply chain stage	The stage of the supply chain in which the item currently resides	4.2.20	None	Optional	None
21	Supplier invoice number	Invoice number meaningful to the library and to the supplier of the item	4.2.21	Invoice identifier	Optional	None
22	Alternative item identifier	Optional identifier for an item	4.2.22	Piece identifier	Optional	None
23	Alternative owner institution	Code for the library institution other than ISIL	4.2.23	Party identifier; Participant's function	Optional	Data elements 3 and 23 are mutually exclusive
24	Subsidiary of an owner institution	Internal code defined within a library institution	4.2.24	Party identifier; Participant's function	Optional	None
25	Alternative ILL borrowing institution	Code for the ILL borrowing institution other than ISIL	4.2.25	Party identifier; Participant's function	Optional	Data elements 11 and 25 are mutually exclusive
26	Local data C	Any locally defined purpose	4.2.26	None	Optional	None
27	Not defined		4.2.27		Reserved for future use	
28	Not defined		4.2.28		Reserved for future use	
29	Not defined		4.2.29		Reserved for future use	
30	Not defined		4.2.30		Reserved for future use	
31	Not defined		4.2.31		Reserved for future use	
a	This column specifies the data element number (*N*), i.e. the number identifying the data element.
b	This column specifies the data element name (name of data element), i.e. the name identifying the data element.
c	This column specifies the data element description, i.e. a brief description about the purpose of the data element.
d	This column contains a reference to the clause where the data element is described.
e	This column contains the mapping to the corresponding data elements in ISO 8459. The mapping is for information.
f	This column classifies the data elements into categories (status).
g	This column specifies possible relationships to other data elements (relationship).

4.2   Use of user data elements

4.2.1   Primary item identifier

The library's unique identification of an item shall be used as the primary item identifier. This data element is required for circulation. It can be absent in the acquisition process.

The primary item identifier can be, but need not be, equivalent to the (former) bar code. It can be decided at a local or national level if the identifier should be unique outside the library and how this is to be achieved.

Annex B illustrates how the primary item identifier can be combined with other data to achieve increasing levels of uniqueness, ultimately global uniqueness.

4.2.2 Content parameter

The content parameter data element specifies the structure of the tag data. The parameter can have different forms for the various possible encoding methodologies specified in other parts of ISO 28560.

4.2.3 Owner institution (ISIL)

The owner institution (ISIL) data element is used for the ISIL code for the institution that owns the item.

The ISIL code shall be as defined in ISO 15511.

The list of ISIL agencies that are responsible for the issuing process of ISIL codes can be found at http://biblstandard.dk/isil/.

In exceptional cases, the ISIL code, or parts of the ISIL code, can be stored in data element 23 (alternative owner institution).

4.2.4 Set information

4.2.4.1 General

If the set information data element is encoded, it shall consist of two components, which are

a)   the "number of parts in item", followed by

b)   the "ordinal part number",

as specified in 4.2.4.2 and 4.2.4.3. These two component parameters are used to identify various permutations relating to sets.

A single part item is the default case. A system reading a tag that does not contain the set information data element can assume that the item has only a single part.

4.2.4.2 Numbers of parts in item

For sets with only a single part, the "numbers of parts in item" component shall take the value "1".

For sets with more than a single part, the "numbers of parts in item" component shall take a value in the range 0 to 255, where a positive number indicates the total number of parts in the set, and 0 that the total number is not known.

4.2.4.3 Ordinal part number

For sets with only a single part, the "ordinal part number" component shall take the value "1".

For sets with more than a single part, the "ordinal part number" component shall take a value in the range 0 to 255, under one of the following two conditions.

—   If all parts in the set carry an RFID tag, a positive ordinal part number corresponding to the placement of the part in the set shall be assigned to each part.

— If only some of the parts in the set carry an RFID tag, the first part shall be assigned the ordinal part number 0, and the following parts an ordinal part number corresponding to the placement of the part in the set. As a consequence, no part shall be assigned the ordinal part number 1.

4.2.4.4 Examples

EXAMPLE 1   A set with three parts, all with their own RFID tags:

— Number of this part = 1 (first RFID tag):   code = 31

— Number of this part = 2 (second RFID tag):   code = 32

— Number of this part = 3 (third RFID tag):   code = 33

EXAMPLE 2   A set consisting of a single part with one RFID tag:

— Number of this part = 1:   code = 11 (if present)

EXAMPLE 3   A set consists of 12 parts, and this is the fourth part:

— Number of this part = 4 (fourth RFID tag):   code = 1204

EXAMPLE 4   A set having four parts but one part does not carry an RFID tag:

— Number of this part = 1 (first RFID tag):   code = 40

— Number of this part = 2 (second RFID tag):   code = 42

— Number of this part = 3 (third RFID tag):   code = 43

— Number of this part = 4 (no RFID tag)

NOTE 1   The "0" of the first part serves two functions:

a)   it indicates that not all parts have an RFID tag;

b)   it indicates that this is the first part.

EXAMPLE 5   A set having an unknown number of parts or increasing in number of parts over time.

— Number of this part = 1 (first RFID tag):   code = 01

— Number of this part = 2 (second RFID tag):   code = 02

— Number of this part = 3 (third RFID tag):   code = 03

— Number of this part = 4 (fourth RFID tag):   code = 04

NOTE 2   The initial "0" indicates that the number of parts is not fixed.

4.2.5 Type of usage

4.2.5.1 General

The type of usage data element provides additional qualifying information about the item or part of a set, for example, the type of material and its use within the library. As synergies between RFID-enabled devices become more common, this data element can be set dynamically by one RFID device for the benefit of another. Individual parts of a set can have different values for the type of usage data element. If this data element is encoded, it shall use the values specified in Annex C.

4.2.5.2 Examples

EXAMPLE 1   An acquisition item that arrives at a library can be processed automatically if it has the following type of usage parameters:

— Main qualifier = 0 (Class = acquisition item)

— Sub-qualifier = 1 (Sub-class = for automated processes)

EXAMPLE 2   If a similar acquisition item is only parameterized by a main qualifier, it can have the following type of usage parameters:

— Main qualifier = 0 (Class = acquisition item)

— Sub-qualifier is absent means that the sub-class is unspecified (identical to sub-qualifier value zero)

EXAMPLE 3   An item for circulation that has to be handled with care and is not suited for automatic sorting has the following type of usage parameters:

— Main qualifier = 1 (Class = item for circulation)

— Sub-qualifier = 2 (Sub-class = not for automatic sorting)

EXAMPLE 4   A discarded item that is offered for sale has the following type of usage parameters:

— Main qualifier = 7 (Class = discarded item)

— Sub-qualifier = 1 (Sub-class = for sale)

4.2.6   Shelf location

The shelf location data element holds the location of the item.

The data element can take any value the library decides to use. The values reflect the library's shelf location system and are only intended for use in the library owning the item.

Automatic sorting systems can use this data element for sorting purposes.

4.2.7   ONIX media format

The ONIX media format data element shall, if encoded, represent an ONIX media descriptor of two alphabetic characters.

These media descriptors are based on the ONIX Books Product Form Code List, published and maintained by EDItEUR. Use the latest product form code from the ONIX Books Code Lists (see http://www.editeur. org).

NOTE   EDItEUR is the international group coordinating development of the standards infrastructure for electronic commerce in the book and serials industries.

4.2.8   MARC media format

The MARC media format data element shall, if encoded, represent a MARC 21 category of material descriptor.

This media descriptor is a compound of two letters defined by positions 6 and 7 in the leader of a MARC 21 record. See http://www.loc.gov/marc/bibliographic.

4.2.9   Supplier identifier

The supplier identifier data element is used for identification of the supplier of the item.

If a supplier code is determined by the purchasing library or its owner body (e.g. university, city, government) there might be structure rules already in place. If not, it is recommended to define a unique list on a national level. Annex D indicates a method using a country prefix.

4.2.10 Order number

The order number data element is used for an order number meaningful to the library and to the supplier of the item.

4.2.11 ILL borrowing institution (ISIL)

The ILL borrowing institution (ISIL) data element is used for identification of an institution borrowing the item.

When using this data element, the borrowing institution shall be represented by the ISIL code according to ISO 15511. The data element is formatted according to similar rules as defined for the owner institution (ISIL) data element (4.2.3). The ILL borrowing institution (ISIL) data element and the alternative ILL borrowing institution data element (4.2.25) are mutually exclusive.

4.2.12 ILL borrowing transaction number

The ILL borrowing transaction number data element is used to identify an ILL transaction.

The ILL borrowing transaction number is assigned by the ILL transaction processing system and encoded by the lending institution to identify an interlibrary loan transaction. The structure of the number is locally defined.

4.2.13 GS1 product identifier

The GS1 product identifier data element shall, if encoded, be used to store the GTIN-13 code of GS1.

NOTE 1   GS1 is a global organization for standards and solutions to supply and demand chains globally and across sectors.

The Global Trade Item Number (GTIN) is a code that identifies the product and not the individual item.

The GTIN-13 has 13 digits and is commonly seen on retail products in a bar code format and is (without the check digit) also an element of tags used in retail that follow the electronic product code scheme of GS1/EPC Global. The GTIN-13 code is commonly called the UPC code in the United States, and in other parts of the world, it is known as the EAN-13 code.

NOTE 2   The Universal Product Code (UPC) is a specific type of bar code used for tracking trade items.

NOTE 3   The EAN-13 code is the European Article Number (EAN) 13 digit code.

The GTIN-13 code includes the encoding of:

— the ISBN, with the prefixes "978" and "979";

— the ISSN with the prefix "977";

— the ISMN with the prefix "979".

The code structure for CDs, DVDs, and other products without formal registration codes follows conventional GS1 rules. This means that for many products that originate in the United States, the code shall be expanded with leading zeros to conform to the 13-digit structure. Codes on products from most other countries use the full 13-digit structure. Encoding everything in a 13-digit structure is important because the final digit is a check digit that can be used for validation processes in some systems.

4.2.14 Alternative unique item identifier

This data element is reserved for possibly encoding in new tag architectures.

4.2.15 Local data A

The local data A data element is used for any locally defined purpose. The structure and formatting is locally defined.

4.2.16 Local data B

The local data B data element is used for any locally defined purpose. The structure and formatting is locally defined.

4.2.17 Title

The title data element holds the title or titles of the library item.

4.2.18 Product identifier local

The product identifier local data element is used for a product code not based on the GTIN-13 codes.

This data element can be used for items that do not have a GTIN-13 code, or for which the GTIN-13 code is not known or not adequate. This enables information systems linked to various code structures to be supported by the RFID system.

4.2.19 Media format (other)

The media format (other) data element represents any media descriptor other than ONIX or MARC.

Table 2 — Media format (other)

Code Value (Decimal)	Code Value (Hexa-decimal)	Description
0	00	Undefined
1	01	Book
2	02	CD/DVD
3	03	Magnetic tape
4	04	Other
5	05	Other, careful handling is required
6	06	Very small item, special handling is required
7 to 127	07 to 7F	Reserved for ISO TC 46 SC4
128 to 255	80 to FF	Free use by the library

4.2.20 Supply chain stage

The supply chain stage data element is used to identify the stage of the supply chain in which the item currently resides. While current practice is for individual library institutions to add RFID tags to their own material, this data element might become significant if tagging becomes more common at "upstream" stages of the library material supply chain.

Table 3 lists the supply chain stage code decimal values that shall be used if this data element is encoded.

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Table 3 — Supply chain stage code

Supply chain stage code		Supply chain stage
Decimal (as in ISO 28560-1)	Hexadecimal (as input)	
0	00	Used as null value
16	10	Manufacturer
24	18	Publisher
32	20	Distributor
48	30	Jobber
64	40	Library

Other values for supply chain stage are reserved for future use and can only be encoded once they have been defined in future editions of this part of ISO 28560. For this specific data element, the value "0" indicates "undefined".

4.2.21 Supplier invoice number

The supplier invoice number data element is used for a locally designated invoice number meaningful to the library and to the supplier of the library material.

This data element can be left permanently written to the tag or it can be used only temporarily during an acquisitions process.

4.2.22 Alternative item identifier

The alternative item identifier data element is used for a locally designated optional identifier.

This data element can be temporary and have only local meaning as during an acquisitions process or it can contain other identifiers as deemed necessary.

4.2.23 Alternative owner institution

The alternative owner institution data element is used for an alternative identification of the library institution (i.e. not ISIL).

The data element can be used, for example, where a library identifier scheme pre-dates the ISIL and cannot easily be converted into an ISIL-compliant scheme. This data element can be used in exceptional cases for the ISIL code, or parts of the ISIL code (see 4.2.3).

4.2.24 Subsidiary of an owner institution

The subsidiary of an owner institution data element is used to refine the identity to a level lower than the ISIL, e.g. a branch or collection. As such it is an internal code defined within a library institution.

4.2.25 Alternative ILL borrowing institution

The alternative ILL borrowing institution data element is used for an alternative code for the ILL borrowing institution (i.e. not ISIL).

This data element and the ILL borrowing institution (ISIL) data element (4.2.11) are mutually exclusive and only one of them shall be encoded on the tag.

4.2.26 Local data C

The local data C data element is used for any locally defined purpose. The structure and formatting is locally defined.

4.2.27 Reserved data element

Data element reserved for future use.

4.2.28 Reserved data element

Data element reserved for future use.

4.2.29 Reserved data element

Data element reserved for future use.

4.2.30 Reserved data element

Data element reserved for future use.

4.2.31 Reserved data element

Data element reserved for future use.

4.3 Maintenance of the list of data elements used

Pending proposals for additional data elements and planned allocations for reserved data elements should be published on the website given in Annex A.

5 System data elements

5.1 System data versus user data

Many tags have organized their memory in such a way that the user and the system data are stored in different memory compartments. Other parts of ISO 28560 provide the details of all the system data that play a crucial role in the system architecture. 5.2 describes the most important system data.

5.2 System data elements for identification and item security in libraries

5.2.1 General

ISO/IEC 15961-3 defines the rules for the application family identifier (AFI), the data format and the object identifiers for RFID for item management.

The AFI, the data format and the object identifiers for RFID for item management shall be in accordance with ISO/IEC 15961-3.

5.2.2 Application family identifier (AFI)

The AFI is a single-byte code, often in the system memory of the tag, used as a tag selection mechanism across the air interface to minimize the extent of communication transaction time with tags that do not carry the relevant AFI code.

The hexadecimal value $C2_{HEX}$ for AFI has been assigned by the Registration Authority for ISO/IEC 15961-2 explicitly for library use.

A library can use the AFI in one of the following two ways.

— It can use a single AFI, the value $C2_{HEX}$ assigned under the registration of ISO/IEC 15961-2. This distinguishes library items from all others, and avoids the risk of an RFID reader in another domain reading the RFID tag on a loan item and confusing its encoded content with data in an application

outside the library domain. It also enables a library system to reject items that carry a different AFI code, possibly from another domain visited by a client.

— The AFI can additionally be used as part of an "item security system" where the AFI value $C2_{HEX}$ is written to tags for items that are on loan to a client. When the books are returned, an in-stock AFI (07_{HEX}, as defined in ISO/IEC 15961-3) is written to the tag.

RFID tags that comply with this International Standard have a mandatory AFI system data element and should only use one of the two AFI values that are listed above. The AFI together with the primary item identifier and owner institution (ISIL) guarantee global uniqueness of the item (see Annex B).

The AFI has a feature that enables the application to specify that the AFI is to be locked, or to be left unlocked. Once locked, the AFI cannot be unlocked. The AFI shall not be locked if it is used as part of an item security system where two values of the AFI are used, one for on-loan items and one for in-stock items. If other security mechanisms are used, then the AFI can be locked at the individual library's discretion. Before locking, libraries should give consideration to the item's use in other libraries through cooperative arrangements or interlibrary loans (for example, if the recipient library wanted to use the AFI for security while the item was in its possession even though the donor library did not).

Various approaches can be used for securing library items against unauthorized removal. The choice of an item security system is outside the scope of this International Standard and it is the responsibility of solution providers to develop particular schemes for libraries to choose. Some options are discussed in Annex E, without any comment on their particular merits. Combinations of these options can also be provided in particular systems.

5.2.3 Data storage format identifier (DSFID)

The DSFID can be present in certain types of tags as a system data element. If the DSFID is hard-coded, in other words has a specific memory allocation, then the write-DSFID command in the air interface protocol is usually supported by a lock-DSFID command.

For tags encoded in accordance with ISO 28560-2, the value of DSFID comprises two components:

— the access method defined in this International Standard of 00_{BINARY};

— the data format of 00110_{BINARY} assigned by the Registration Authority for ISO/IEC 15961-2 explicitly for library use.

When these are combined, they produce a DSFID value of 06_{HEX} to be used for tags encoded in accordance with ISO 28560-2.

The DSFID value $3E_{HEX}$ is used for tags encoded in accordance with ISO 28560-3.

Two DSFID values ($1E_{HEX}$ and $5E_{HEX}$) can be used for migration purposes for tags that are not compliant with this International Standard.

Other DSFID values shall not be used until assigned for use in this part of ISO 28560.

5.2.4 Unique tag ID

All compliant ISO/IEC 18000-3 Mode 1 tags have a unique tag ID programmed by the integrated circuit manufacturer in a non-volatile memory. One of the options for item security uses this system data field. Further information is given in Annex E.

5.2.5 Electronic article surveillance (EAS)

Some tags have a system data field that is dedicated to item security, the EAS field. The technologies for these EAS item security systems are proprietary. The use of EAS is described in Annex E.

6   Tools for data security and integrity

When data elements are not programmed in a non-volatile memory or are not locked, they can be modified by unauthorized persons. This part of ISO 28560 does not specify methods for maintaining the integrity of the data. However, as described for AFI values in 5.2.2, locking of the data stored in the tag user memory is a possible method. Some types of tag hardware can provide additional (often proprietary) security tools such as the following.

— System, or user data fields, or both, can be protected by passwords. Initial writing or modifying the data requires knowing a password.

— Access to most of the data is blocked when the item is on loan. This is often called the "privacy mode" of a tag. There is a command to "wake up" the tag.

7   Regional and business profiling

7.1   Elements for profiles

This part of ISO 28560 provides an abstract list of data elements and leaves a degree of freedom to libraries or to their vendors when implementing an RFID system. A group of libraries can define profiles in which the degree of freedom becomes more restricted. One or more of the following restrictions can be part of the profile.

— A set of data elements can be made mandatory in a profile. In many cases, this can consist of or include the owner institution (ISIL) data element because adding the ISIL code is the only method to guarantee global uniqueness.

— The list of user data elements contains alternatives. A profile can exclude certain (alternative) data elements and can then mandate the use of a related data element. The exclusion of non-ISIL forms for the owner institution and for the ILL borrowing institution are examples. Another example is that one of the three media formats is mandated when information on the media type is stored on the tag.

— A profile can forbid the use of certain data elements, for example, the title data element. Or, it can forbid the use of a data element unless special data protection methods have been implemented, like the tag being blocked for an item on loan.

— A profile can contain rules to guarantee data security. A requirement can be that certain data elements are locked, or are ready to be locked. This is especially relevant for the data elements that identify the item uniquely. Password protection of data elements can also be an option, but this is likely a proprietary feature which is beyond the scope of this part of ISO 28560.

— A profile can contain guidance on privacy. For instance, in certain regions, it might be unacceptable to include the title of an item or its product identifier information beyond the point in the supply chain where the item is added to the collection.

— A profile can define, for a regional or national jurisdiction, the usage of a local data element.

7.2   Regional profiles

Regional profiling means that the profile is agreed among libraries on a regional basis, where "regional" can refer to a city, region, nation, or (small) language area.

7.3   Business profiles

Groups of libraries can also agree on a profile in order to support certain business models. These libraries are not necessarily grouped on a regional basis. International ILL schemes of academic libraries are an

example. Regional profiles can also have the character of business profiling when they support certain business processes, for example, automatic processing of acquisition items.

EXAMPLE 1   For interlibrary loans (ILL), in most cases a set is required with:

— Primary item identifier

— Owner institution (ISIL)

This is required to make the item globally unique and recognizable as not belonging to the library's own collection by the receiving ILL institution.

EXAMPLE 2   For interlibrary loans, an even larger set can be agreed:

— Primary item identifier

— Owner institution (ISIL)

— ILL borrowing institution (ISIL), for item on loan via ILL

— ILL borrowing transaction number, for item on loan via ILL

EXAMPLE 3   When new acquisitions are tagged by the jobber, the set of data elements agreed between jobber and library can be:

— Supplier identifier

— Order number

An automatic system in the library recognizes that the item is a new item, for example, because the primary identifier element is still empty. The primary item identifier is added to the tag and if desirable, the data elements that relate to the acquisition process are removed.

EXAMPLE 4   For these new acquisitions tagged by the jobber, the set can be larger:

— Supplier identifier

— Order number

— GS1 product identifier

— Supply chain stage

The website given in Annex A can provide more detailed examples of profiles that have been implemented, including some profiles in systems not conforming to this International Standard.

8 Privacy issues

Because this International Standard is likely to be implemented in different legal domains, it is not possible to provide detailed advice about privacy with respect to national laws. Also, the nature of the relationship between the patron and the library can have implications for the application of privacy laws. For example, employees in a company-based library have different privacy concerns than citizens using a public library.

As a general rule, no personal data (either direct or indirect) that identifies an individual patron should be encoded on the RFID tag affixed to a library item.

If there is concern that identifying the item has privacy implications, then explicit identifiers such as the title, the GS1 product identifier, or product identifier local should not be encoded on the RFID tag. This concern for privacy needs to be balanced by the fact that other RFID applications might well provide such codes on products purchased through retail outlets.

9 Implementation and migration

9.1 New RFID implementations

Any library that has yet to introduce RFID and that is not subject to any regional RFID implementation strategy or advice should give consideration to the use of this International Standard. Depending on the time that the implementation is being considered, particularly immediately after publication of this International Standard, vendors might be at incomplete stages of their development and support for this International Standard. In situations where not all features are supported but are considered essential for the library system, the institution should seek a development path and timetable from the vendor.

Once this International Standard becomes widely adopted, there will be an increasing choice particularly of RFID devices that are compliant with this International Standard. New devices should be interoperable with any existing devices installed in accordance with this International Standard.

9.2 Migration for regional models

Before the publication of this International Standard, some implementations of RFID item management in libraries were subject to regional implementation strategies. It might be expected that in this case, the decision or advice to migrate to this International Standard should not be taken by an individual library, but on the basis of a regional implementation strategy. This is certainly needed when tagging of new acquisitions is not executed by an individual library but by one or more jobbers with a large-scale impact in the region.

The decision to migrate to a data model based on this International Standard depends on many economic and operational considerations that are beyond the scope of this International Standard. Some of the factors that influence change are whether vendors are offering features in applications that are considered beneficial, or whether jobbers are prepared to supply items with RFID labels fixed and even encoded.

9.3 Use of the correct AFI value

Even if a decision is taken to postpone migration to a system compliant with this International Standard, the correct AFI value should be used, especially for new acquisitions. As many libraries introduced RFID tags before an AFI value for libraries was allocated, the existing RFID tags have an incorrect AFI value. The AFI value was usually set to the default value of zero (00_{HEX}). If the AFI value was used for security purposes, it would have a pair of incorrect AFI values.

9.4 Discrimination between ISO 28560-compliant and non-compliant tags

During a changeover or when items from non-compliant libraries mix with those of compliant ones, there is a need to discriminate between a non-compliant RFID tag and one that is compliant with this International Standard. The DSFID value of a non-compliant RFID tag is also likely to be zero (00_{HEX}). There is also the possibility that no DSFID field exists on the non-compliant RFID tags as not all tags have this system data.

Thus, the AFI and DSFID values make it possible to differentiate non-compliant from compliant RFID tags as follows:

— tags that were distributed before correct AFI values were allocated;

— non-compliant tags with correct AFI values;

— tags compliant with this International Standard.

Table 4 indicates the system data for AFI and DSFID on non-ISO 28560-compliant tags and ISO 28560-compliant tags.

Table 4 — AFI and DSFID values on non-ISO 28560-compliant tags

Type of tag	AFI value	DSFID value
Non-ISO 28560-compliant tag distributed before AFI value was allocated and without a dual AFI value for item security	Likely to be zero	Likely to be zero or absent
Non-ISO 28560-compliant tag distributed before AFI value was allocated and with a dual AFI value for item security	Any pair of AFI values is possible	Likely to be zero or absent
Non-ISO 28560-compliant tag with correct AFI value and without a dual AFI value for item security	$C2_{HEX}$ (possibly locked)	Likely to be zero or absent
Non-ISO 28560-compliant tag with correct AFI value and with a dual AFI value for item security	$C2_{HEX}$ (out on loan) and 07_{HEX} (in stock)	Likely to be zero or absent
Tags compliant with ISO 28560	$C2_{HEX}$ (out on loan) and 07_{HEX} (in stock)	As defined in other parts of ISO 28560

In many cases, it is possible to use one or both of these system data elements for the discrimination process during a changeover period within a library. There are other mechanisms that could be used and implemented in software, but these will be less generic.

9.5 Migrations of ISO/IEC 18000-3 Mode 1 RFID tags

Most regional or proprietary vendor implementations made before this International Standard are based on RFID tags that are compatible with ISO/IEC 18000-3 Mode 1. RFID products can also be defined as "ISO/IEC 15693-conformant", because these are based on integrated circuits that were originally used for smart card technology. Especially for these ISO/IEC 18000-3 Mode 1 tags, a discrimination method between ISO 28560-compliant tags and non-compliant tags should be defined.

When a migration strategy is designed for the installed base of tags, discussions should take place with the RFID tag supplier, and supplier of printer encoders and RFID readers. The specific features of the products already installed should be defined and compared with the RFID tag requirement of this International Standard. Although the air interface protocol is the same, the detailed features can differ between tags and devices from different vendors.

9.6 Migrations of other RFID tag technologies

Where RFID tags do not conform to the requirements of ISO/IEC 18000-3 Mode 1, there are still possibilities for a migration with reuse of the installed base of tag hardware and RFID equipment.

If the RFID tag operates at 13,56 MHz, it might be possible to utilize the ISO/IEC 18000-3 Mode 1 tag for new acquisitions or tag replacements, because some aspects of the air interface protocol are similar. Effectively, what is required is to introduce a system that supports multiple air interface protocols. This would probably require an upgrade and installation of components for interrogators and printer encoders, with the latter type of device probably presenting a more complex challenge.

If the vendor of the RFID equipment can support migration through the installation of upgraded components and possibly devices, then the advice provided in 9.5 is generally applicable.

If an RFID system is operating at a different frequency (for example, 125 kHz to 135 kHz or 2,45 GHz), then a significantly more complex challenge exists with radio frequency. RFID systems that operate at frequencies other than 13,56 MHz have significantly different operational features, and the library system is likely to require a significant upgrade of devices to ensure that the system operates on a dual-frequency basis. Such technological developments are possible, and some are taking place for particular frequencies and particular air interface protocols. Addressing this challenge is beyond the scope of this International Standard.

9.7 Conversion methodologies

The simplest plan to convert the data on an existing tag to be compliant with this International Standard is to erase all the data on the RFID tag and overwrite according to this International Standard. This

procedure is not possible if any of the data are locked on the existing tag. The option then exists to maintain both systems in parallel, at least for RFID tags with locked data elements until the number of legacy tags is relatively small to cost-justify a replacement RFID tag.

The changeover process can be managed in a number of ways from a gradual changeover, possibly as items are returned, to a more accelerated programme. This choice is left to the discretion of the individual library, given that however short the changeover programme, there can be a requirement to maintain in parallel both the previous system and the system compatible with this International Standard.

9.8 Preservation of business profiles during migration

A particular business profile can be in place in the previous system, and discussions should take place with vendors to ensure that these business functions are also supported in the new system compliant with this International Standard. There are no features in this International Standard that can impede particular business operations as existing data elements in the previous systems can have their equivalent in this International Standard.

10 Label design and location of the label

10.1 Label design

This International Standard places no constraints on the size, or design, of the label associated with the RFID tag. Individual institutions should take into account that:

— suppliers might impose some constraints on the label size and design options, including the choice of bar code symbology and the placement of this and any eye-readable information;

— the amount and detail of information that should be encoded on the label is primarily subject to local requirements, which might include taking into account privacy concerns.

From a design perspective, care should be taken when over-printing RFID labels so as not to damage the chip or bonding that joins the chip and the antenna. In addition to this being an ongoing design consideration, it also needs to be taken into account when considering a change of media or suppliers. There can be differences in the capabilities of different suppliers to meet particular design requirements, and so some flexibility is called for on the design side.

10.2 Location of the RFID label

Different types of loan item are constructed of different media. For example, books are constructed mainly of organic material and CDs and DVDs have a metal content. The location of a tag should not impede the playing of CDs and DVDs. This International Standard places no constraints on the location of RFID tag labels on different types of product, because different vendors might have developed solutions, some of which are proprietary, that meet performance requirements. As there are ongoing developments of the technology, this could result in new form factors of RFID tags and labels that are suitable for particular types of loan item and improved performance.

Annex A
(informative)

Information about ISO 28560 RFID in libraries

A.1 Informational website

The Danish Agency for Culture hosts a website with additional information about this International Standard:

http://biblstandard.dk/rfid

Danish Agency for Culture
Copenhagen,
Denmark

Email: rfid@bs.dk

A.2 Types of support information

At the time of publication of this International Standard, two items of information have been identified. These are listed below, together with the URL of the continually updated material.

— RFID in libraries. Links to external materials http://biblstandard.dk/rfid/docs/RFID-in-libraries-Links-external

— RFID in libraries. Q&A http://biblstandard.dk/rfid/docs/RFID-in-libraries-q-and-a

Other material can be published in future, and this can be publicized and made available at http://biblstandard.dk/rfid.

Annex B
(informative)

Uniqueness of RFID tags

Figure B.1 shows four sets of tagged items relevant for the issue of uniqueness.
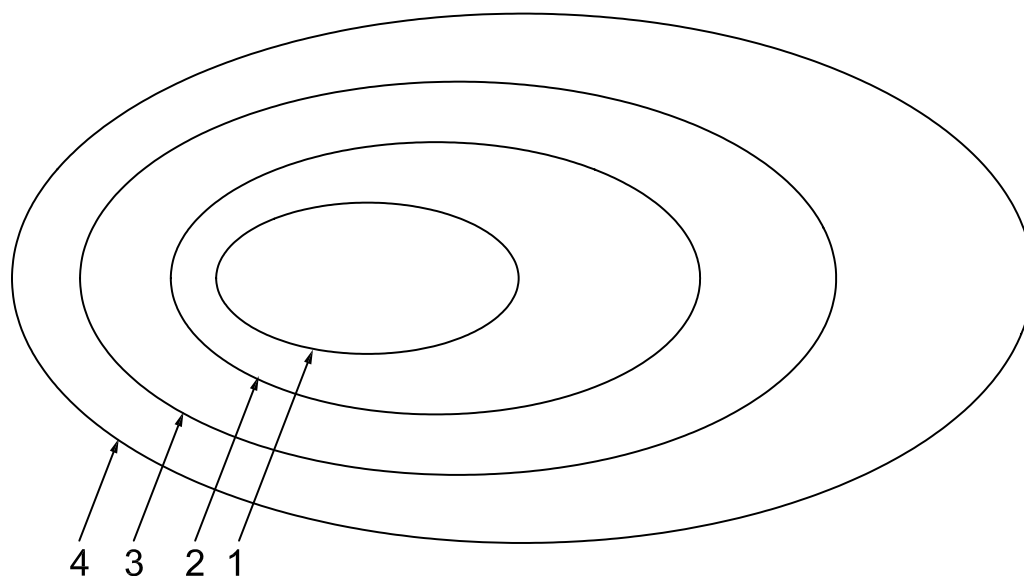
Key

1   all tagged items within a specific library or group of libraries
2   all tagged items in the library domain
3   all item with tags based on International Standards
4   the universe of all items with RFID tags

Figure B.1 — A Venn diagram indicating restricted versus global uniqueness

If each of the sets in Figure B.1 was closed in the sense that no tagged item from outside could enter, the uniqueness issue would only need to consider the tags in this specific set. But, this is normally not the case. Even in a specific library, tagged items from outside could enter. It could be interlibrary-loaned items, books tagged from the publisher, and it could even be a non-book object bought in a store. Therefore, the addition of necessary information on the library item tags to secure global uniqueness should be given, i.e. the AFI (as defined in 5.2.2) and the user data elements primary item identifier (see 4.2.1) and owner institution (ISIL) (see 4.2.3).

Annex C
(normative)

Type of usage code values (hexadecimal)

The type of usage data element can be a one-digit hexadecimal code (main qualifier) or it can be a two-digit hexadecimal code (main qualifier and sub-qualifier).

The main qualifier specifies a primary usage class and the sub-qualifier specifies a more detailed usage within the primary usage class.

An ISO 28560-compliant system shall be able to support values 0 to 9 of the main qualifier. Support of other main qualifier values and support of the sub-qualifier values are optional.

The maximum number of main qualifiers is 16. For each main qualifier, the maximum number of sub-qualifiers is 16. Values can be indicated "for future use". These are reserved for future assignment by ISO. The use of values proposed after the publication of this International Standard can be found on the website given in Annex A.

The list of values for the main qualifier and the sub-qualifier is provided in Table C.1.

Table C.1 — Usage code values

Main qualifier hex	Class	Sub-qualifier hex	Usage
0	Acquisition item	0	Acquisition item, unspecified
		1	Acquisition item, for automated process
		2	Acquisition item, for manual process
		3 to F	For future use within the class
1	Item for circulation	0	Circulating item, unspecified
		1	Circulating item, for automatic sorting
		2	Circulating item, not for automatic sorting
		3	Circulating item, not for issue while offline
		4	Circulating item, not for return while offline
		5	Circulating item, not for issue or return while offline
		6 to F	For future use within the class
2	Item not for circulation	0	Non-circulating item, unspecified
		1 to F	For future use within the class
3 to 4	For local use	0	For local use, unspecified sub-class
		1 to F	For local use within the class
5	For future use	0	For future use, unspecified sub-class
		1 to F	For future use within the class

Table C.1 — (*continued*)

Main qualifier hex	Class	Sub-qualifier hex	Usage
6	No information about usage on the tag	0	If the type of usage data element is locked, with a type of usage which can change over time, it should be encoded as a 6.
		1 to F	Not to be used
7	Discarded item	0	Discarded item, unspecified
		1	Discarded item, for sale
		2	Discarded item, sold
		3	Discarded item, for disposal
		4 to F	For future use within the class
8	Patron card	0	Patron card, unspecified
		1	Patron card, adult borrower
		2	Patron card, young adult borrower
		3	Patron card, standard child borrower
		4 to F	For future use within the class
9	Library equipment	0	Library equipment, unspecified
		1	Personal computer
		2	Video projector
		3	Overhead projector
		4	Whiteboard
		5 to F	For future use within the class
A to F	For future use	0	For future use, unspecified sub-class
		1 to F	For future use within the class

Annex D
(informative)

Country prefixes for supplier identifier

When tagging occurs by the supplier and not by the library, automatic handling of new acquisitions becomes possible. In this case, it is recommended to identify the supplier in the following form:

— the alpha-2 country code (two Latin characters) as defined in ISO 3166-1 for the supplier's country of origin;

— one or more characters to identify the supplier.

In each country, an organization can be made responsible for the administration of this ordering. This could be the same organization as in the national structure to administer the national ISIL codes.

Annex E
(informative)

Interoperability characteristics of security systems

E.1 Three options to handle item security

E.1.1 General

This Annex describes options to handle item security. It is assumed that item security and item identification is realized with a single tag, and it is assumed that there is interoperability for the data in the user memories

— because libraries follow the same part of ISO 28560,

— because interoperability exists between the various parts of ISO 28560, or

— because interoperability exists between legacy systems or a legacy system and an ISO 28560 system.

The question addressed in this Annex is whether there is also interoperability for the system data that support a given security implementation. All the options use system data as described in 5.2.

E.1.2 Use of the dual AFI system

Security implementations based on a dual AFI require that value 07_{HEX} be programmed as the AFI code for library items that are checked into the collection. It also requires that AFI code $C2_{HEX}$ be encoded on items that are checked out and on loan.

The portal at the library exit interrogates any tag with AFI code 07_{HEX}. RFID tags with this AFI code value respond with their unique tag ID, while all other tags with different AFI codes (including the authorized on-loan code value of $C2_{HEX}$) are ignored.

If this security system is used, the AFI code is not locked.

E.1.3 Use of the unique tag ID

All ISO/IEC 18000-3-compliant Mode 1 tags have a unique tag ID programmed by the integrated circuit manufacturer in a non-volatile memory. A database lookup system requires a database to be compiled with the tag IDs of items that are checked out of the library, usually for a given defined period of time. The security system is programmed to read all tag ids, look them up in the database and, if they are not in the database of authorized checked-out items, the assumption is that they have been removed in an unauthorized manner.

Any borrowing library using this security system can implement this system for interlibrary loan items without the need for compatibility with the owner library's security system.

E.1.4 Use of the EAS features

Electronic article surveillance (EAS) features have been added by some manufacturers of ISO/IEC 18000-3 Mode 1 tags as a proprietary feature. As such, the operation of this feature is outside the scope of the ISO/IEC 18000-3 Mode 1. It is included here because a number of vendors offer this as a feature of their system. Interoperability between different EAS systems cannot be assumed.

E.2 Interoperability issues in interlibrary loan

E.2.1 Interoperability issues

Table E.1 shows the interoperability issues between the owner library and the borrowing library, depending on the compatibility of their security systems.

Table E.1 — Interoperability in ILL based on security characteristics

ILL example		Borrowing library equipment uses			
		AFI used for security	EAS vendor 1 (also supports AFI for application separation)	EAS vendor 2 (also supports AFI for application separation)	Database lookup (also supports AFI for application separation)
Owning library tag and equipment uses	Tag supports AFI (no tag support for EAS)	Seamless interoperable security	EAS feature does not work for this tag. Item security is not available at borrowing library.	EAS feature does not work for this tag. Item security is not available at borrowing library.	Interoperable security after database update adds borrowed item at borrowing library
	EAS vendor 1 (tag also supports AFI)	Seamless interoperable security, unless AFI is locked	Seamless interoperable security.	EAS feature does not work for this tag. Item security is not available at borrowing library.	Interoperable security after database update adds borrowed item at borrowing library
	EAS vendor 2 (tag also supports AFI)	Seamless interoperable security, unless AFI is locked	EAS feature does not work for this tag. Item security is not available at borrowing library.	Seamless interoperable security.	Interoperable security after database update adds borrowed item at borrowing library
	Database lookup (tag also supports AFI)	Seamless interoperable security, unless AFI is locked	EAS feature can work for this tag, if the tag supports vendor 1 EAS. Otherwise, item security is not available at borrowing library.	EAS feature can work for this tag, if the tag supports vendor 2 EAS. Otherwise, item security is not available at borrowing library.	Interoperable security after database update adds borrowed item at borrowing library
NOTE EAS vendor 1 and EAS vendor 2 are assumed to use incompatible and proprietary EAS designs. If two EAS vendors use a compatible EAS design, then libraries using systems from these two vendors are interoperable for security.					

E.2.2 Seamless security interoperability

In the following cases, there is seamless security interoperability.

— The owner library uses AFI for security, and the borrowing library uses AFI for security as well. As the RFID tag is required to support AFI, this provides security at the borrowing location.

— The owner library uses EAS from vendor 1 for security and the borrowing library also uses EAS from vendor 1. A tag that supports this method of EAS provides security at either location.

— The owner library uses EAS from vendor 2 for security and the borrowing library also uses EAS from vendor 2. A tag that supports this method of EAS provides security at either location.

Table E.2 — Interoperability in ILL: seamless security operability

ILL example		Borrowing library equipment uses			
		AFI used for security	EAS vendor 1 (also supports AFI for application separation)	EAS vendor 2 (also supports AFI for application separation)	Database lookup (also supports AFI for application separation)
Owning library tag and equipment uses	Tag supports AFI (no tag support for EAS)	X			
	EAS vendor 1 (tag also supports AFI)		X		
	EAS vendor 2 (tag also supports AFI)			X	
	Database lookup (tag also supports AFI)				
NOTE The cells marked "X" characterize the cases of seamless security operability. The marked cells indicate that there are compatible security mechanisms, where the borrowing library uses precisely the same RFID security technology as the owner library.					

E.2.3   Seamless security interoperability provided that AFI is unlocked

In the following cases, there is only security interoperability if AFI is unlocked.

— The owner library uses EAS from vendor 1 or vendor 2 for security, but the borrowing library uses AFI for security. As the RFID tag is required to support AFI, security is provided at the borrowing location.

— The owner library uses database lookup for security, and the borrowing library uses AFI for security. As the RFID tag is required to support AFI, security is provided at the borrowing location.

Table E.3 — Interoperability in ILL: seamless security operability if AFI is unlocked

ILL example		Borrowing library equipment uses			
		AFI used for security	EAS vendor 1 (also supports AFI for application separation)	EAS vendor 2 (also supports AFI for application separation)	Database lookup (also supports AFI for application separation)
Owning library tag and equipment uses	Tag supports AFI (no tag support for EAS)	X			
	EAS vendor 1 (tag also supports AFI)	X			
	EAS vendor 2 (tag also supports AFI)	X			
	Database lookup (tag also supports AFI)	X			
NOTE The cells marked "X" characterize the cases of seamless security operability when AFI is unlocked. The marked cells indicate that there are compatible security mechanisms where the borrowing library uses a security method that is supported by the RFID tag on the borrowed item provided that AFI is unlocked. If AFI is locked, there is no interoperability.					

E.2.4   Interoperable security with operator intervention

In the following cases, there is interoperability with operator intervention.

— If the owner library and the borrowing library both utilize a database lookup system and if the database information for an item in the lending library can then be sent to the borrowing library, the borrowing library is able to secure the item.

— If the owner library uses AFI or any tag-based EAS method (i.e. relies on an EAS function built into the RFID tag design), it is still possible to use the database lookup method to provide security for the item at the borrowing library. In this case, the borrowing library can achieve this by adding relevant information from the lending library to its own database.

Table E.4 — Interoperability in ILL: interoperability with operator intervention

ILL example		Borrowing library equipment uses			
		AFI used for security	EAS vendor 1 (also supports AFI for application separation)	EAS vendor 2 (also supports AFI for application separation)	Database lookup (also supports AFI for application separation)
Owning library tag and equipment uses	Tag supports AFI (no tag support for EAS)				X
	EAS vendor 1 (tag also supports AFI)				X
	EAS vendor 2 (tag also supports AFI)				X
	Database lookup (tag also supports AFI)				X
NOTE The cells marked "X" characterize the security technologies that require some kind of operator intervention to interoperate.					

E.2.5   Interoperable security for some but not all libraries

In the following cases, there is interoperability for some but not all libraries.

— If the owner library uses database lookup for security and uses tags from EAS vendor 1, and if the borrowing library uses EAS from vendor 1 for security, the tag will then provide security in the borrowing library. If, on the other hand, the lending library uses tags from EAS vendor 2, then the security system at the borrowing library does not function with the tags.

— Likewise, if the lending library uses database lookup for security and uses tags from EAS vendor 2, then if the borrowing library uses EAS from vendor 2 for security, the tag will provide security in the borrowing library. If, on the other hand, the lending library uses tags from EAS vendor 1, then the security system at the borrowing library does not function with the tags.

Table E.5 — Interoperability in ILL: interoperability for some but not all libraries

ILL example		Borrowing library equipment uses			
		AFI used for security	EAS vendor 1 (also supports AFI for application separation)	EAS vendor 2 (also supports AFI for application separation)	Database lookup (also supports AFI for application separation)
Owning library tag and equipment uses	Tag supports AFI (no tag support for EAS)				
	EAS vendor 1 (tag also supports AFI)				
	EAS vendor 2 (tag also supports AFI)				
	Database lookup (tag also supports AFI)		X	X	
NOTE The cells marked "X" characterize the situations where the viability of providing item security in the borrowing library depends on the particular tag technology used.					

E.2.6   Systems that are incompatible for security

In the following cases, there is no interoperability:

— If the owner library uses AFI for security and uses RFID tags that do not include an EAS function, then an EAS-based security system at the borrowing library does not provide security for an item tagged by the owner library.

— Additionally, if the owner library uses RFID tags that include an EAS feature from vendor 1, but the borrowing library uses incompatible EAS-based security systems from vendor 2, then the system at the borrowing library does not provide security for an item tagged by the owner library.

— Likewise, if the owner library uses RFID tags that include an EAS feature from vendor 2, but the borrowing library uses incompatible EAS-based security systems from vendor 1, the system at the borrowing library does not provide security for an item tagged by the owner library.

Table E.6 — Interoperability in ILL: incompatible security

<table>
<tr><td rowspan="2" colspan="2" align="center">ILL example</td><td colspan="4" align="center">Borrowing library equipment uses</td></tr>
<tr><td align="center">AFI used for security</td><td align="center">EAS vendor 1 (also supports AFI for application separation)</td><td align="center">EAS vendor 2 (also supports AFI for application separation)</td><td align="center">Database lookup (also supports AFI for application separation)</td></tr>
<tr><td rowspan="4">Owning library tag and equipment uses</td><td>Tag supports AFI (no tag support for EAS)</td><td></td><td align="center">X</td><td align="center">X</td><td></td></tr>
<tr><td>EAS vendor 1 (tag also supports AFI)</td><td></td><td></td><td align="center">X</td><td></td></tr>
<tr><td>EAS vendor 2 (tag also supports AFI)</td><td></td><td align="center">X</td><td></td><td></td></tr>
<tr><td>Database lookup (tag also supports AFI)</td><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="6">NOTE   The cells marked "X" characterize the cases where the security system at the borrowing library does not secure the RFID tag.</td></tr>
</table>

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Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected