Reference number of working document: **ISO/IEC JTC 1/SC 31 N 3187**

Date: 2009-06-19

Reference number of document: **ISO/CD 15459-4**

Committee identification: ISO/IEC JTC /SC 31/WG 2

Secretariat: JISC

Information technology — Automatic identification and data capture techniques — Unique identification —Part 4: Individual products and product packages

Technologie d'information — Identification automatique et techniques de capture de données — Identification uniques — La partie 4: Produits individuels et paquets de produit

Document type: International standard - Revision
Document subtype: if applicable
Document stage: (30) Committee
Document language: E
\\lvnjus248\public\James C Info Folder\SC 31 - v1.0\Document Information\N3000 - N3999\N3187\SC031-N-3187 - FCD Text 15459-4.doc Basic template BASICEN3 2002-06-01

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Foreword

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

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

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

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 31, *Automatic identification and data capture techniques* prepared ISO/IEC 15459-4.

ISO/IEC 15459 consists of the following parts, under the general title *Information technology —Automatic identification and data capture techniques— Unique identification*:

Part 1: Individual transport units

Part 2: Registration procedures

Part 3: Common rules

Part 4: Individual products and product packages

Part 5: Individual returnable transport items (RTIs)

Part 6: Groupings

Introduction

Unique identities can occur at many different levels, at item level, on the transport unit, on the returnable transport item, at grouping levels, and elsewhere. Such entities are often handled by several parties, both public and private, throughout their lifecycle. Each of these parties must be able to identify and trace such distinct entities so that reference can be made to associated information such as quality inspection data, the chemical substance contained, the batch or lot number of parts, components or raw materials, etc.

The information is often held on computer systems, and may be exchanged between parties involved via EDI (Electronic Data Interchange) and XML (eXtensible Markup Language) messages.

There are considerable benefits if the identity of the entity is represented as a bar code or other AIDC (Automatic Identification and Data Capture) media and attached to or made a constituent part of that which is being uniquely identified so that

— it can be read electronically, thus minimising errors;

— one identity can be used by all parties;

— each party can use the identity to look up its computer files to find the data associated with the entity.

All AIDC technologies have the potential to encode an identity. It is expected that application standards, using various automatic identification technologies, will be developed based upon the identity as a prime key. These application standards, which may include additional rules for which level of identification should be used, may be made available from the Issuing Agency.

The identity for products and product packages defined in this part of ISO/IEC 15459 and represented in AIDC media attached to the product or product package meets the needs defined in ISO/IEC 15459-3, Common Rules.

Information technology — Automatic identification and data capture techniques — Unique identification — Part 4: Individual products and product packages

1 Scope

This part of ISO/IEC 15459 specifies a unique string of characters for the identification of individual products and product packages. The character string is intended to be represented in a linear bar code symbol or two-dimensional symbol or other AIDC media attached to the entity to meet management needs. To address management needs different classes of identities are recognized in the various parts of ISO/IEC 15459, which allows different requirements to be met by the identities associated with each class.

The rules for the identification of an individual occurrence of a product or product package, understood to mean the layers zero and one defined in the International Standards ISO 17367 and ISO 17366, respectively, are defined and supported by examples.

2 Normative references

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

ISO/IEC 646, *Information technology — ISO 7-bit coded character set for information interchange*

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

ISO/IEC 9834-1, *Information technology — Open Systems Interconnection — Procedures for the operation of OSI Registration Authorities: General procedures and top arcs of the ASN.1 Object Identifier tree*

ISO/IEC 15418, *Information technology — Automatic identification and data capture techniques — GS1 Application identifiers and ASC MH 10 data identifiers and maintenance*

ISO/IEC 15434, *Information technology — Automatic identification and data capture techniques — Syntax for high-capacity ADC media*

ISO/IEC 15459-2, *Information technology —Automatic identification and data capture techniques—Unique identification — Part 2: Registration procedures*

ISO/IEC 15459-3, *Information technology —Automatic identification and data capture techniques—Unique identification — Part 3: Common rules*

ISO 17366, *Supply chain applications of RFID —Product packaging*

ISO 17367, *Supply chain applications of RFID —Products*

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

GS1 General Specifications*, GS1*

3 Terms, definitions and abbreviated terms

For the purposes of this document, the terms and definitions given in ISO/IEC 19762-1 and ISO/IEC 15459-3 apply.

4 Identities for individual products and product packages

Each individual product or product package shall be unambiguously identified by a qualifier and a string as defined in Clause 5 so that individual products or product packages of a given type can be distinguished from other types. The permitted combinations of qualifier and string are determined by the Issuing Agency.

If there is only one individual product in a product package, or one individual product is seen as dominant in the product package, the product package may use the identity as the included solely or dominant individual product (see Clause 4.1). In other cases a product package shall have its own identity, making it possible to differentiate the product package from the included individual products (see Clause 4.2).

The qualifier for products and product packages may be selected from the following options as defined in ISO/IEC 15418 or ISO/IEC 9834-1.

4.1 Qualifiers for individual products

4.1.1 Identity using a serial component

- GS1 Application Identifier **8004**

  If this identification method is used, the Issuing Agency, or identity issuer if authorised by the Issuing Agency, shall select GS1 Application Identifier **8004** as the qualifier component of the identity.

- ASC MH 10 Data Identifier, as defined in ISO/IEC 15418 (ANS MH10.8.2), **25S** or **3I**

  If this identification method is used, each Issuing Agency, or identity issuer if authorised by its Issuing Agency, shall select the appropriate ASC MH10 Data Identifier as the qualifier component of the identity.

  NOTE The structure of an identity following "3I" is defined in ISO 3779, *Road vehicles — Vehicle identification number (VIN) — Content and structure*. "3I" is mentioned here to avoid multiple individual unique identities being marked on or attached to a product.

- When employing an ISO/IEC compliant high capacity AIDC data carrier an additional option is the object identifiers:

  1 0 15459 4: for a product identifier for item management defined by the IAC. This is independent of, and unlike the structures below, does not support mapping toGS1 Application Identifiers and ASC MH 10 Data Identifiers.

  1 0 15459 4 2: for a product identifier for item management equivalent to GS1 Application Identifier **8004**

  1 0 15459 4 4: for a product identifier for item management equivalent to ASC MH10 Data Identifier **25S** or **3I**

4.1.2 Identity using a separate serial component

- GS1 Application Identifiers combination **01** 'plus' **21**

If this identification method is used the Issuing Agency, or identity issuer if authorised by its Issuing Agency, shall select this combination of GS1 Application Identifiers as the qualifier component of the identity.

ASC MH 10 Data Identifiers combination **25P** 'plus' **S**, as defined in ISO/IEC 15418 (ANS MH10.8.2)

If this identification method is used each Issuing Agency, or identity issuer if authorised by its Issuing Agency, shall select this combination of ASC MH 10 Data Identifiers as the qualifier component of the identity.

When employing an ISO/IEC compliant AIDC data carrier an additional option is the object identifiers:

1 0 15459 4 3: for a product identifier for item management equivalent to a Serialised GTIN (GS1 Application Identifiers 01 'plus' 21)

1 0 15459 4 6: for a product identifier for item management equivalent to a serialised product (ASC MH 10 Data Identifiers 25P'plus' S)

4.2 Qualifiers for individual product packages

- The GS1 Application Identifier**8004**
- One of ASC MH 10 Data Identifiers, as defined in ISO/IEC 15418 (ANS MH10.8.2), **25S**
- When employing an ISO/IEC compliant high capacity AIDC data carrier an additional option is the object identifiers:

  1 0 15459 4 7: for a product package identifier for item management defined by the IAC. This is independent of, and unlike the structures below, does not support mapping toGS1 Application Identifiers and ASC MH 10 Data Identifiers.

  1 0 15459 4 2: for a product package identifier for item management equivalent to GS1 Application Identifier **8004**

  1 0 15459 4 4: for a product package identifier for item management equivalent to ASC MH10 Data Identifier **25S**

- When employing an ISO/IEC compliant high capacity AIDC data carrier an additional option is the use of Application Family Identifiers (AFIs):

  10100101: for a product package, not containing hazardous material, identifier for item management defined by the IAC. Does not support mapping toGS1 EPC (Electronic Product Code).

  10100110: for product package, containing hazardous material, identifier for item management defined by the IAC. Does not support mapping toGS1 EPC (Electronic Product Code).

5 Identity for individual products and product packages

5.1 General

An identity is assigned to an individual product or product package by an identity issuer. This shall be done in accordance with the rules established by an authorised Issuing Agency as identified in ISO/IEC 15459-3 and ISO/IEC 15459-2.

5.2 Maximum number of characters permissible in an identity

The identity for individual products and product packages shall not contain more than 50 characters.

For efficient use within various AIDC data carrier systems, it is recommended that the number of characters to be coded by one line linear bar code should not exceed 20 characters, and number of characters should be kept as short as possible regardless of the permissible maximum of 50 characters.

5.3 Permissible character sets in an identity

The identity shall only contain upper-case alphabetic characters and numeric digits of the invariant character set of ISO/IEC 646, see Annex A in ISO/IEC 15459-3.

NOTE An Issuing Agency may put additional restrictions on the repertoire for identities for products and product packages using its IAC.

Any data processing system shall be capable of processing identities using the full repertoire of characters permitted for identities for products and product packages.

6 Implementation of coding using AIDC media

All AIDC technologies have the potential to encode an identity. It is expected that application standards for entities, using various automatic identification technologies, will be developed based upon the ISO/IEC 15459 identity as a prime key. These application standards may be made available from the Issuing Agency.

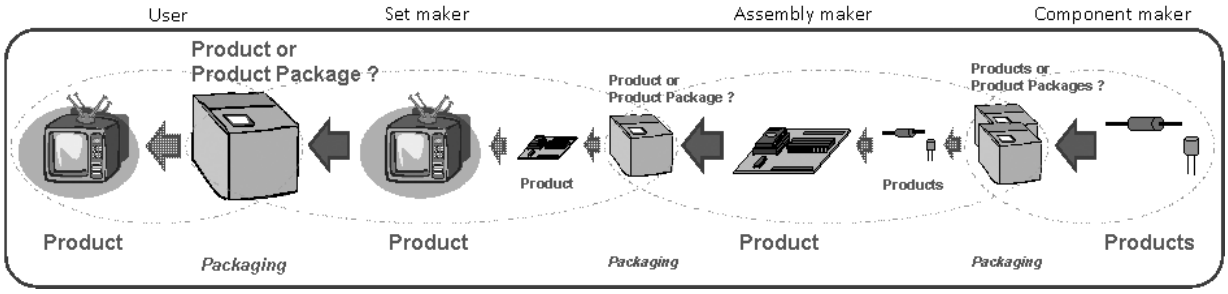
Annex A
(normative)

What is a product and/or product package?

A.1 Product or product package

It is not possible to give a precise definition of what that is to be seen as a product or product package, which also could be of a primary or secondary package, as it is based on the view of the manufacturer, seller or user.

The following illustrations want to highlight this matter and provide a base for the issuer of a identity to as accurately as possible assign the most proper identification to an entity (product or product package).



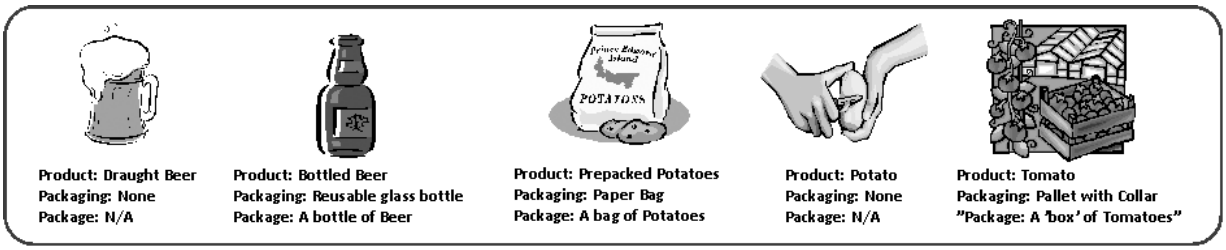


Figure A.1 —Product, packaging and package in different scenarios

Annex B
(informative)

Unique identification for product and product package management

B.1 Role of the Issuing Agency in providing application guidance for product and product package management

In addition to the requirements of an Issuing Agency outlined elsewhere in this International Standard, each Issuing Agency is expected to provide guidelines if product and product package identification management are relevant to its IAC domain.

B.2 Product and product package identification management

To illustrate the usage of an individual identity, the hypothetical example is given using the two Issuing Agencies (IAs) recognised by the Registration Authority, GS1 and NATO Allied Committee 135.

The construction of the identity minimally includes the Issuing Agency Code (IAC), Company Identification Number (CIN), and string component (ID) assuming that the ID is unambiguous within the CIN. In some cases IDs are not unambiguous within the CIN but are unambiguous within a specific asset type under the control of a company. If the ID is not unambiguous within the company, the identity must include acompany asset type code, or similar. Thus the identity established by the identity issuer cannot be the same as that established by another. Moreover, ISO/IEC 15459-2 ensures all the identities are unambiguous.

B.2.1 GS1 unique identification using a serial component

The rules of GS1, to whom the Issuing Agency Codes “0” till “9” have been allocated by the Registration Authority, are that identities consists of no more than 30alphanumeric characters, the first part of which is always numeric. The first numeric string of characters is allocated by GS1 to the issuer (Global Company Prefix) and the following characters are assigned by issuer under the rules of GS1.

EXAMPLE 1 Identity issued under the rules of GS1. In this example the Application Identifier is “8004”, the IAC is “1”,the CIN is “1098756”, and the identity issuer assigned code is “100110780”.

The example below shows a GS1 string (to be preceded by Application Identifier “8004”)

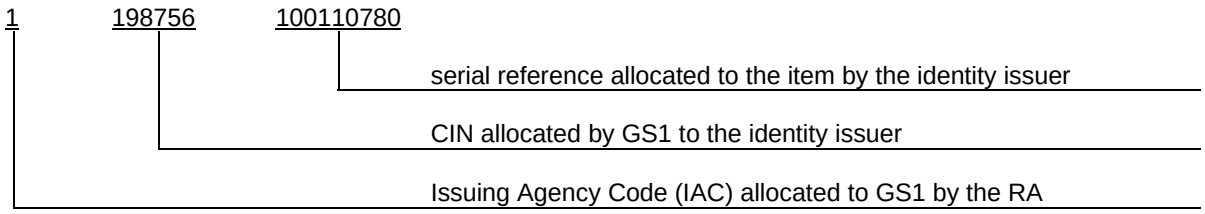


Figure B.1 —GS1 string for individual asset

This string can be contained in a GS1-128 bar code, or other AIDC media, using the GS1 Application Identifier “8004”.

The bar code when scanned can be expected to pass the following data string to the computer system:

Table A.1 — Data stream — GS1

Symbology identifier	Identity	
	Qualifier	String
]C1	**8004**	**1098756100110780**

NOTE The Application Identifier “8004” is not included in the string, but included in the identity. The symbology identifier provides information on the data carrier used.

B.2.2 GS1 unique identification using a separate serial component

The example below shows a GS1 string to be used with the combination of Application Identifier “01” and “21”

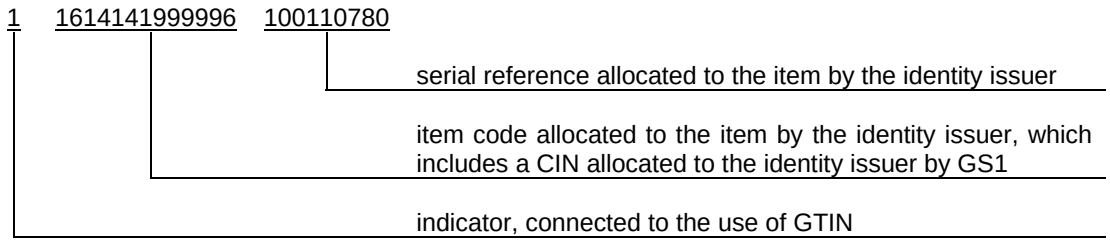


Figure B.2 —GS1 string for individual product package using serial component

This string can be contained in aGS1-128 bar code, or other AIDC media, using the GS1 Application Identifiers “01” and ”21”.

The bar code when scanned can be expected to pass the following data string to the computer system:

Table A.2 — Data stream — GS1

Symbology identifier	Identity			
	Qualifier	String	Qualifier	String
]C1	**01**	**11614141999996**	**21**	**100110780**

NOTE The Application Identifiers “01” and “21” are not included in the string, but included in the identity. The symbology identifier provides information on the data carrier used.

B.2.3 NATO Allied Committee 135unique identification

NATO Allied Committee 135, to whom the Issuing Agency Code “D” has been allocated by the Registration Authority, has issued rules for the creating identities. The characters following the Issuing Agency Code “D” are allocated by NATO Allied Committee 135 to commercial or government entities and are referred to as a CAGE/NCAGE codes. The identity issuer then assigns the remaining characters. See Figure B.2.

EXAMPLE 2 Typical identification issued under the rules of “military organization NATO ALLIED COMMITTEE 135”: In this example the Data Identifier is “25S”, the IAC is “D”, the CIN (CAGE/NCAGE) is “1U2R7”, and the serial number is “100110780”.

The example below shows an NATO Allied Committee 135 item identity (Data Identifier 25S)

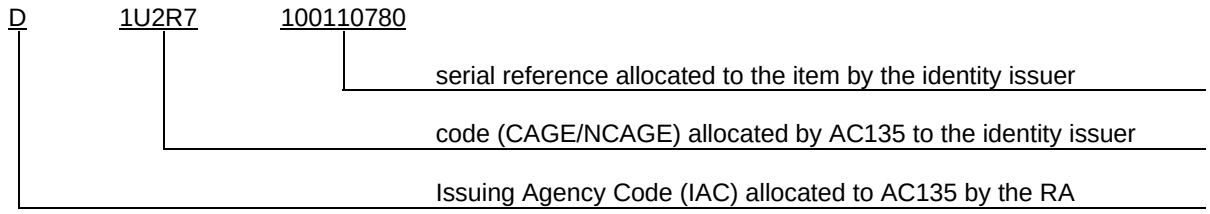


Figure A.3 — String for NATO Allied Committee 135 item identification

This string can be contained in a Code 128 bar code, or other AIDC Media, using Data Identifier “25S”.

The bar code when scanned can be expected to pass the following data string to the computer system:

Table A.1 — Data Stream — NATO Allied Committee 135

Symbology identifier	Identity	
	Qualifier	String
]C0	**25S**	**D1U2R7100110780**

NOTE The Data Identifier “25S” is not included in the string, but is included in the identity. The symbology identifier provides information on the data carrier used.

B.2.4 NATO Allied Committee 135 identification using separate serial component

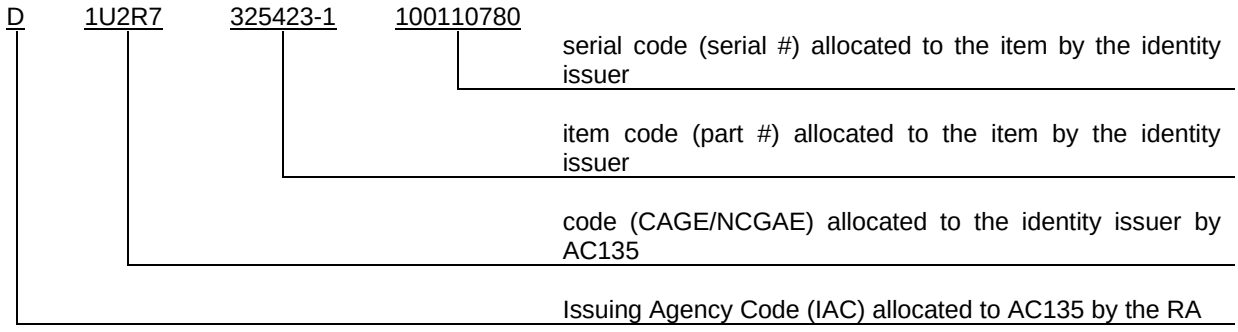


Figure A.3 —String NATO Allied Committee 135 item using separate serial component

This string can be contained in a Data Matrix symbol, or other high capacity AIDC media, using Data Identifiers as shown in Table B.2 (“17V”, “1P” and “S”) or Table B.3 (“25P” and “S”).

B.2.4.1 Using DIs “17V”, “1P” and “S”

When using data identifiers “17V”, “1P” and “S” the high capacity symbol when scanned can be expected to pass the following data string to the computer:

Table A.2 — Data Stream — NATO Allied Committee 135

Symbology identifier	Identity					
	Qualifier	String	Qualifier	String	Qualifier	String
[d1	**17V**	**1U2R7**	**1P**	**325423-1**	**S**	**100110780**

NOTE The Data Identifiers, “17P”, “1P” and “S”, are not part of the string, but are included in the identity. The symbology identifier provides information on the data carrier used.

B.2.4.2 Using DIs “25P” and “S”

When using data identifiers “25P” and “S” the high capacity symbol when scanned can be expected to pass the following data string to the computer:

Table A.3 — Data Stream — NATO Allied Committee 135 concatenation

Symbology identifier	Identity			
	Qualifier	String	Qualifier	String
[d1	**25P**	**D1U2R7325423-1**	**S**	**100110780**

NOTE The Data Identifiers, “25P” and “S”, are not part of the string, but are included in the identity. The symbology identifier provides information on the data carrier used.

Bibliography

[1] ISO/IEC Directives, Part 2: *Rules for the structure and drafting of International Standards, 2004*

[2] ISO/IEC 15424, *Information technology — Automatic identification and data capture techniques — Data Carrier Identifiers*

[3] ISO/IEC 15459-1, *Information technology — Automatic identification and data capture techniques — Unique identification — Part 1: Individual transport units*

[4] ISO/IEC 15459-5, *Information technology — Automatic identification and data capture techniques — Unique identification — Part 5: Individual returnable transport units (RTIs)*

[5] ISO/IEC 15459-6, *Information technology — Automatic identification and data capture techniques — Unique identification — Part 6: Groupings*