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Information technology — Automatic identification and data capture techniques — Unique identification —

Part 3: Common rules

Technologies de l'information — Identification automatique et techniques de capture de données — Identification unique —

Partie 3: Règles communes

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Foreword

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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 document 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).

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Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

Technical Corrigendum 1 was prepared by ISO/IEC JTC 1, *Information technology*, Subcommittee SC 31, *Automatic identification and data capture techniques*.

This second edition cancels and replaces the first edition (ISO/IEC 15459-3:2014), which has been technically revised.

This corrected version of ISO/IEC 15459-3:2014 incorporates the following corrections plus other editorial modifications. Clause 6.2 (Clause 6.3 in this edition) has been modified as follows:

6.3 Common rule for the character set of an identity

"The common rule for an identity is that it shall use alphabetic, numeric and special characters from the invariant character set ISO/IEC 646 (see Annex A).

Any data processing system shall be capable of processing identities using the full repertoire of characters permitted by ISO/IEC 646."

A list of all parts in the ISO/IEC 15459 series can be found on the ISO website.

Introduction

Unique identification 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 associated information is typically held in some kind of database. The information can be accessed using EDI exchange or another appropriate access protocol, e.g. a directory access protocol.

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 minimizing 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 can include additional rules for which level of identification should be used, are often made available from the publisher.

The common rules for how to construct an identity to achieve unique identification of an entity are defined in this part of ISO/IEC 15459.

Information technology — Automatic identification and data capture techniques — Unique identification —

Part 3: Common rules

1 Scope

This part of ISO/IEC 15459 specifies the common rules applicable for unique identification that are required to ensure full compatibility across different identities.

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

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

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

3 Terms and definitions

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

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

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at http://www.iso.org/obp

3.1
entity
anything (physical or non physical) having a distinct existence

Note 1 to entry: In the context of supply chain management it often refers to an item (product or service) which can be individually considered and identified.

3.2
string
characters assigned to an entity constructed using the specific rules of the Issuing Agency to create an unambiguous number within the context of the specific parts of ISO/IEC 15459

Note 1 to entry: The structure of the string is specified in ISO/IEC 15459-3 and begins with the IAC component in the ISO/IEC 15459 Register.

3.3
qualifier
one or more characters referring to an entity, providing the meaning of the string data

Note 1 to entry: Examples of qualifiers are DIs, AIs and OIDs.

3.4
identity
combination of qualifier and string which distinguishes an entity from other entities

Note 1 to entry: Some parts of this standard allow for multiple qualifier/string combinations as an identity.

Note 2 to entry: In other standards or documents the UII is referring to the identity.

3.5
Issuing Agency
organization entrusted by the Registration Authority to assign company identifying numbers in line with the requirements of ISO/IEC 15459-2

3.6
Issuing Agency Code
one or more characters assigned by the Registration Authority to an Issuing Agency making it recognizable and distinct from other issuing agencies

3.7
Company Identifying Number
one or more characters assigned by the Issuing Agency to an identity issuer making the issuer recognizable and distinct from other issuers

3.8
identification
process (act) of assigning an identity to an entity

3.9
identifying
process of recognizing an entity by accessing its identity

4 Abbreviated terms

AI	Application Identifier
AIDC	Automatic Identification and Data Capture
CIN	Company Identifying Number
DI	Data Identifier
IA	Issuing Agency
IAC	Issuing Agency Code
OID	Object Identifier
RA	Registration Authority

5 Distinguishing between identities

ISO/IEC 15459 recognizes types of identities, each type being used to identify a specific level, meaning, handling, role, etc. An organization may adopt the usage of one or more such types.

ISO/IEC 15459-2 requires Issuing Agencies to define rules that ensure that no identity issuer can allocate a duplicate identity within a given type. Organisations making use of an identity should ensure that identities for different types are treated as distinct references.

Mechanisms exist that distinguish between identities. The qualifier component of an identity may use any data format supported by ISO/IEC 15434 or ISO/IEC 9834-1. What formats to be used are to be specified by the Issuing Agency rules. For the purpose of this standard examples are not to be exhaustive, but rather representative of the full suite of data qualifiers possible to use and relevant to this standard.

NOTE 1 Identities always start with a qualifier (see the examples in the informative annexes of each part of ISO/IEC 15459.

NOTE 2 Qualifiers are essential distinguishing features for data capture applications.

NOTE 3 Each part of ISO/IEC 15459 specifically references the qualifiers (GS1 Application Identifiers (AI), ASC MH10 Data Identifiers (DI) and ISO/IEC 9834-1 Object Identifiers (OID)) that are used as legitimate examples within the specific identity type.

NOTE 4 Legitimate qualifier can specify a type (OID "1 0 15459 1" identifies the type "transport units") or a sub-type within the type (the DI "6J" identifies transport units consisting of identical items).

6 Identities

6.1 General

An identity is assigned to an individual entity, item, unit or grouping by an identity issuer.

The following requirements apply to identities:

a) an identity shall include a qualifier from one of the qualifier identification methods listed above.

b) the string component of an identity shall start with one or more characters for the identification of the identity issuer, i.e. Issuing Agency Code (IAC) followed by Company Identifying Number (CIN).

c) the string shall conform to the format specified for the qualifier to which it applies.

d) the string shall be unambiguous within its qualifier in the sense that no issuer re-issues the string within the qualifier over the entire life cycle for the identified entity or until a sufficient period time has passed so that the identity has ceased to be of significance to any user.

e) each qualifier shall require its own independent set of rules that enable the identities for this qualifier to be held in a separate field on a database, be defined as a separate data element in an EDI message or as a separate search criterion in a directory search. For each qualifier the rules should minimally determine (1) the maximum length of the string for that qualifier and (2) the repertoire of characters that may be used in the string following the identity issuer identification.

f) for some parts of this standard an identity may be made up from a combination of two or more qualifiers and their associated strings, according to rules defined for the qualifier identification method. This is explained in each part.

It is recommended that the Issuing Agency provide application guidance to identity issuers (e.g. check-digit algorithms, selection of GS1 Application Identifier or ASC MH10 Data Identifier, etc).

6.2 Common rule for the length of an identity

The common rule for the length of an identity is that it should be kept as short as possible, enabling coding using different AIDC techniques (e.g. one line linear bar code, 2D symbol, RFID tag, etc.) within the same or across several applications. It is especially important to keep the identity short if one line linear bar codes are to be used as the size of the bar code depends on the number of characters to be encoded.

6.3 Common rule for the character set of an identity

The common rule for an identity is that it shall use alphabetic, numeric and special characters from the invariant character set ISO/IEC 646, see Annex A.

Any data processing system shall be capable of processing identities using the full repertoire of characters permitted by ISO/IEC 646.

6.4 Compliance with ISO/IEC 15459

An organization can claim that it is compliant with ISO/IEC 15459 (all parts or a specific part) if it can allocate and process identities according to the rules defined in ISO/IEC 15459-3, Common rules, ISO/IEC 15459-2, Registration procedures and all or any other part.

Annex A
(informative)

Invariant Character Set of ISO/IEC 646

The difference between the invariant character set (table of ASCII values shared among all countries) versus national variants, i.e. Canada, China, Germany, Denmark, Great Britain, Hungary, Japan, Malta, Norway, Sweden, United States, and the former Yugoslavia can be seen in Table A.1. Those characters recommended are shown unshaded. Those characters shown unshaded or light shading represent the "invariant character set of ISO/IEC 646". Those characters shown with dark shading represent values that are made available for national variants.

Table A.1 — Invariant Character Set of ISO/IEC 646

HEX	DEC	ASCII / ISO 646	HEX	DEC	ASCII / ISO 646	HEX	DEC	ASCII / ISO 646
00	00	NUL	30	48	0	60	96	`
01	01	SOH	31	49	1	61	97	a
02	02	STX	32	50	2	62	98	b
03	03	ETX	33	51	3	63	99	c
04	04	EOT	34	52	4	64	100	d
05	05	ENQ	35	53	5	65	101	e
06	06	ACK	36	54	6	66	102	f
07	07	BEL	37	55	7	67	103	g
08	08	BS	38	56	8	68	104	h
09	09	HT	39	57	9	69	105	i
0A	10	LF	3A	58	:	6A	106	j
0B	11	VT	3B	59	;	6B	107	k
0C	12	FF	3C	60	<	6C	108	l
0D	13	CR	3D	61	=	6D	109	m
0E	14	SO	3E	62	>	6E	110	n
0F	15	SI	3F	63	?	6F	111	o
10	16	DLE	40	64	@	70	112	p
11	17	DC1	41	65	A	71	113	q
12	18	DC2	42	66	B	72	114	r
13	19	DC3	43	67	C	73	115	s
14	20	DC4	44	68	D	74	116	t
15	21	NAK	45	69	E	75	117	u
16	22	SYN	46	70	F	76	118	v
17	23	ETB	47	71	G	77	119	w
18	24	CAN	48	72	H	78	120	x
19	25	EM	49	73	I	79	121	y
1A	26	SUB	4A	74	J	7A	122	z
1B	27	ESC	4B	75	K	7B	123	{
1C	28	FS	4C	76	L	7C	124	|
1D	29	GS	4D	77	M	7D	125	}
1E	30	RS	4E	78	N	7E	126	~
1F	31	US	4F	79	O	7F	127	DEL
20	32	SP	50	80	P			
21	33	!	51	81	Q			
22	34	"	52	82	R			
23	35	#	53	83	S			
24	36	$	54	84	T			
25	37	%	55	85	U			
26	38	&	56	86	V			
27	39	'	57	87	W			
28	40	(	58	88	X			
29	41	)	59	89	Y			
2A	42	*	5A	90	Z			
2B	43	+	5B	91	[			
2C	44	,	5C	92	\			
2D	45	-	5D	93	]			
2E	46	.	5E	94	^			
2F	47	/	5F	95	_			

Values shown unshaded are specifically supported by this standard.

Annex B
(informative)

Unique identities overview

B.1 ISO/IEC 15459 overview to link the different parts

Figure B.1 below gives an overview of the different parts included in this standard with a "graphical" interpretation for the unique identification of entities of different types.

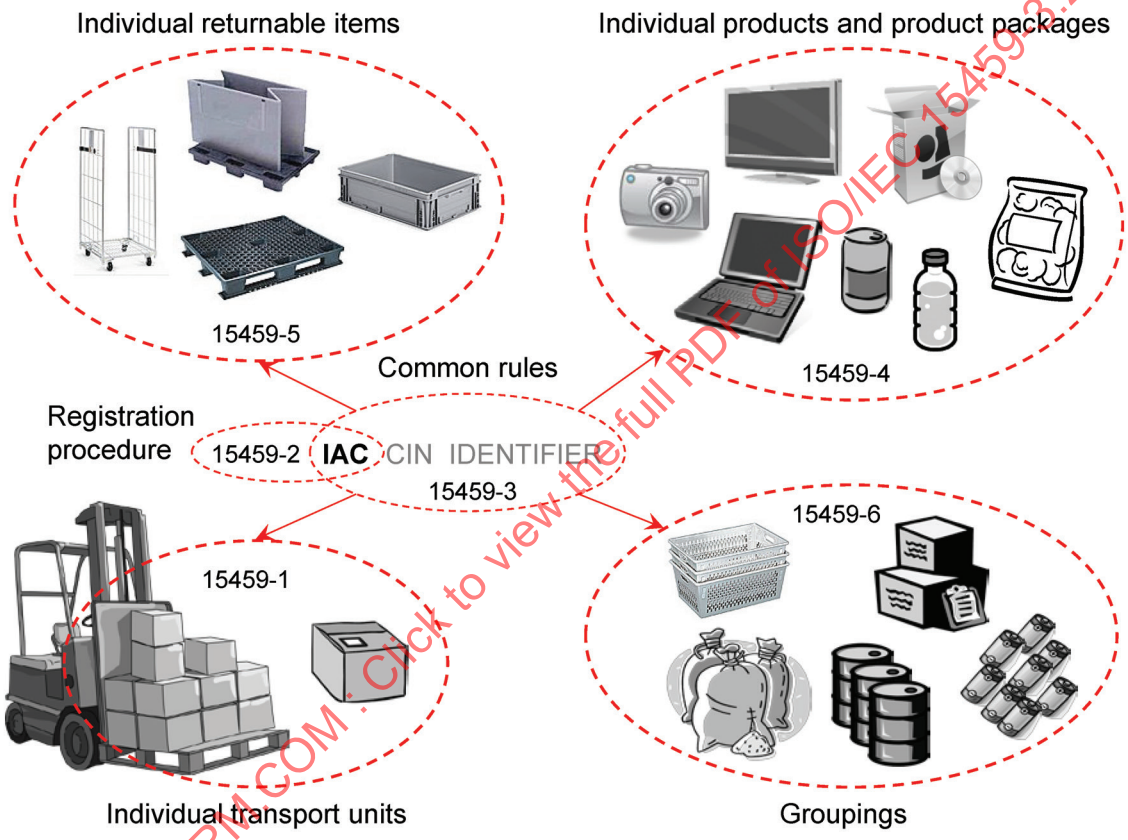

Figure B.1 — Overview of parts within ISO/IEC 15459

Annex C
(informative)

Identity constructs

NOTE The examples shown in this informative annex are illustrative of those permitted and are not exhaustive.

C.1 Ways of achieving unique identification

Entities may be assigned an identity to each instance of the same type, i.e. serialization.

When using unique identification, an identity shall only contain one company identifier (i.e. IAC + CIN) together with either

a) a serial component alone or

b) a part number or similar extended with a serial component to disambiguate the entity or

c) a part number of similar combined with a separate serial component

NOTE ANS MH10.8.2 Annex C.11 provides further guidance in how to construct a concatenated data string.

C.1.1 String using serial component

Unique identification can be achieved by using a string of a company identifier followed by one entity reference data field, i.e. use of only a serial component which is unambiguous across the enterprise for all entity types (e.g. DI "25S" or AI "8004").

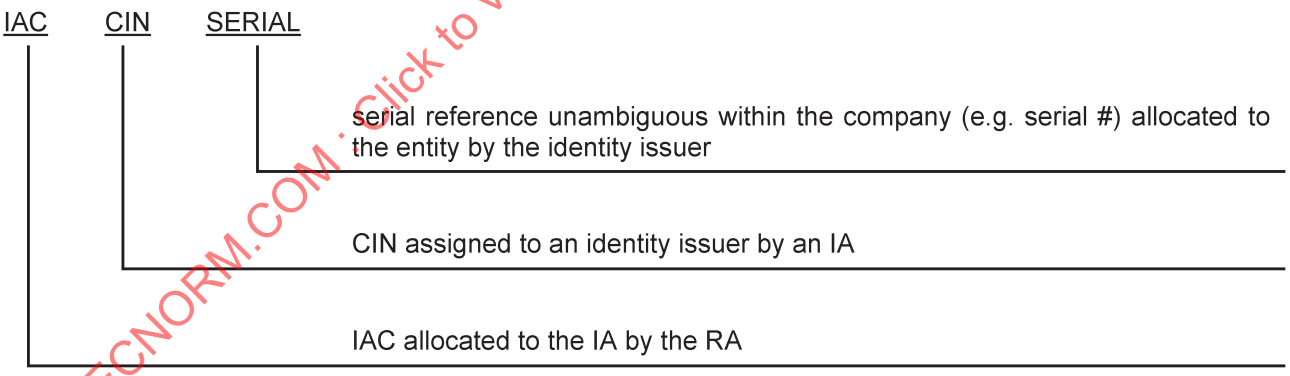

Figure C.1 — String using a single entity reference

Table C.1 is to provide an example of how a data stream, when the identity is build up by a single serial segment.

Table C.1 — Identity data stream

Identity		
Qualifier	String	
	IAC + CIN	Serial
25S	**JNLY**	**000000118**

C.1.2 String using a serial extension component

Another way of creating unique identification is to combine entity reference data fields behind a company identifier (i.e. IAC + CIN), e.g. a part number followed by a serial number (i.e. PART + SERIAL) which is unambiguous within the given part number (e.g. DI "25S" or AI "8004").

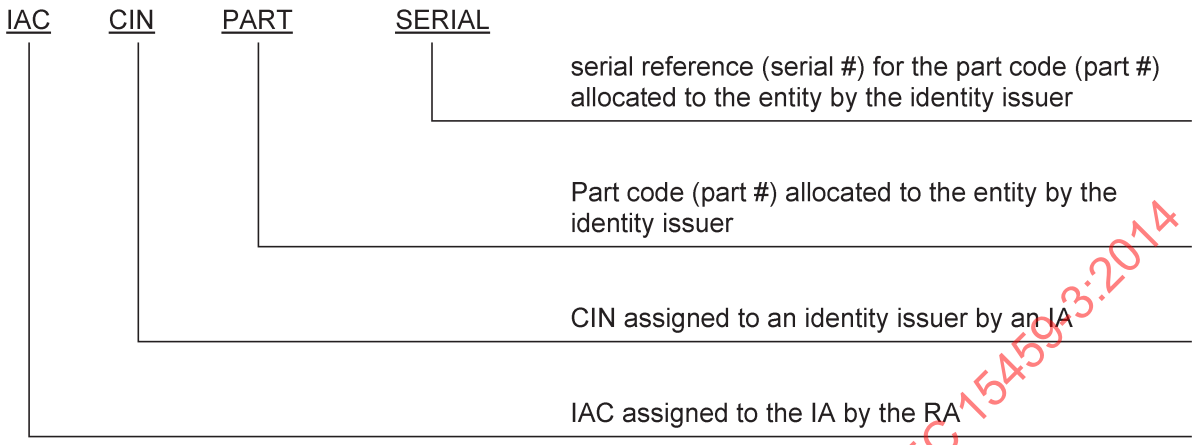

Figure C.2 — String using a serial extension

Table C.2 is to provide an example of how the concatenation would look like in an identity data stream, when the string is build up by a serial extension by the concatenation of PART and SERIAL.

Table C.2 — Identity data stream

Identity			
Qualifier	String		
	IAC + CIN	Part	Serial
25S	**JNLY**	**110987561**	**000000118**

C.1.3 String using a separate serial component

This form of unique identification is made by combining two or more entity reference data fields behind a company identifier (i.e. IAC + CIN), e.g. part number followed by one or more serial component(s) each with its qualifier (i.e. PART + SEP. + QUAL. + SERIAL) separated by a given separator where each component is unambiguous in the context of the other component(s) (e.g. DI "25P+S" or AI "01+21").

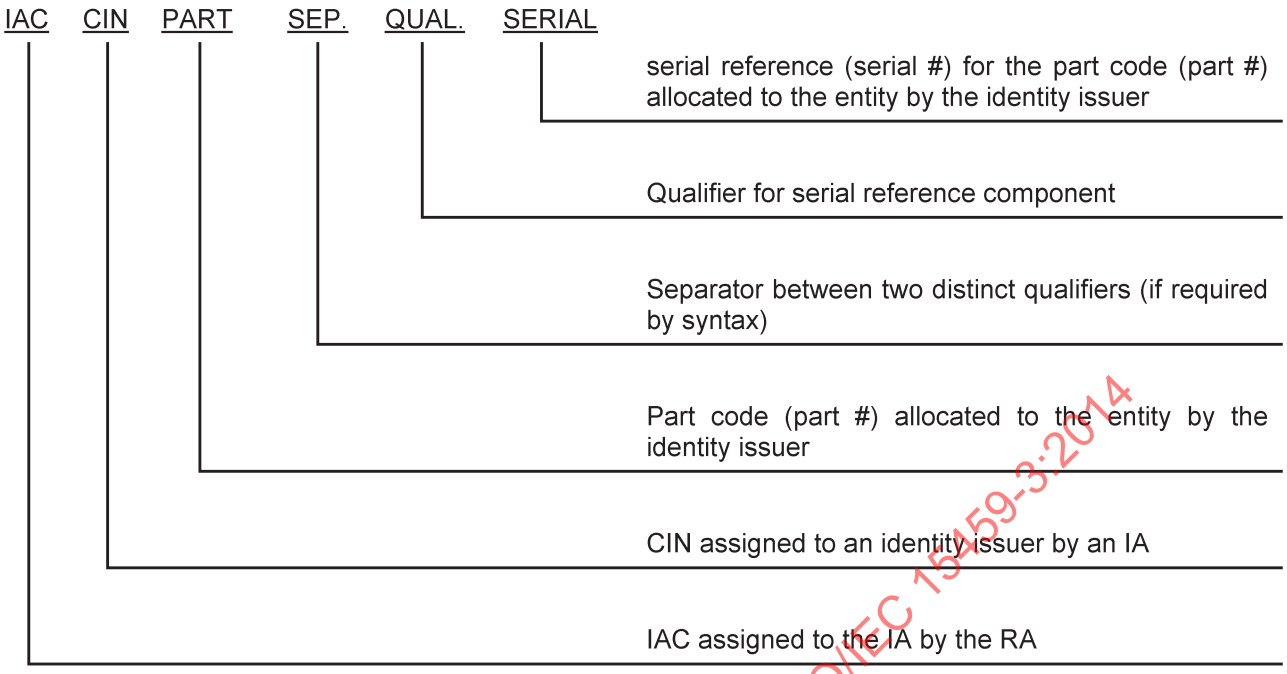

Figure C.3 — String using a separate serial component

Table C.3 is to provide an example of how the identity data stream would look like, when the unique identity is build up by concatenation of two qualifiers and strings.

Table C.3 — Identity data stream

Identity					
Qualifier	String		**Separator** (if required by syntax)	Qualifier	String
	IAC + CIN	Part			Serial
25P	**JNLY**	**110987561**	**e.g. G_S or +**	**S**	**000000118**

Annex D
(informative)

Identities on different levels

D.1 Guide to determination of identity

As it sometimes can be difficult to differentiate and classify an entity or group of entities, the following can be used as guideline when defining the level to be identified:

— Product (e.g. entity, item, etc.)	Anything that you use or sell
— Product Package	One or many products in its packaging. A package can contain other packages
— Transport Unit	Products or product packages grouped together using the same transportation packaging
— Returnable Transport Item	A packaging for transportation, storage, handling and product protection which is returned for reuse

For a level there are identities that are to be used on a single entity or group of entities and to be able to choose an appropriate qualifier the following should be considered;

— Individual	Identity assigned to an instance of a product, product package, transport unit or returnable transport unit and that remains unchanged during the life cycle of that entity
— Group	Identity assigned to a group of products, product packages, transport units or returnable transport units
— Physical group	Quantity of entities for which the identity is assigned related to physical characteristics and/or physical handling and remains unchanged during the life cycle, e.g. Type;identity assigned to identify type of product or product package, Batch; identity assigned to group a quantity of entities of same or different types
— Logical group	Quantity of entities for which the identity is assigned for a logistic purpose and can be subject for change over time/life cycle, e.g. Shipment; identity assigned to a quantity of products, products packages or transport units shipped together, Address; identity assigned to a quantity of products, products packages or transport units being at the same location

D.2 Hierarchy of identification

Identification can be done on several levels, which can be identified by the qualifier within the identity, but as the same qualifiers can be used on several levels in a hierarchy it is of importance to know and understand this implication when assigning and using identities to individual or group of entities.

Therefore it is also important to give each type of identity a title and descriptive text that explains in human readable what the identity is to identify.

Table D.1 — Qualifier, Title and Description and String

Qualifier	Title (of qualifier)	Description
String		What the identity is to identify