The Global Language of Business

GSMP:
General Specifications Change Notification (GSCN)

WR #	GSCN Name	Date
26-081	Extended Packaging Application Standard and DPP	May 2026

Background:

This work request, 26-081, is the bundling of two related work requests:

WR 25-218: The current trade item extended packaging standard (GenSpecs section 2.1.13) is focused exclusively on consumer trade items and suggests, by its title and description, that the use case is only applicable for the product packaging. The Digital Product Passport (DPP) can be considered a special kind of Extended Packaging application to reach DPP information via a web-link in a data carrier. According to the Ecodesign for Sustainable Products Regulation (ESPR) the DPP will be required for many kinds of products
(including but not limited to consumer products), for example: apparel, textiles and footwear, furniture, tyres, bed mattresses, detergents, paints, lubricants, toys, energy related products, information and communication technology products and other electronics, batteries, construction products as well as intermediary products such as iron and steel, chemicals, aluminum. The data carrier to access a DPP shall be physically present on the product itself, on its packaging or on documentation accompanying the product, as specified in the applicable delegated act. These requirements cannot be fulfilled by the current GS1 Extended Packaging application standard in section 2.1.13. The introduction of the GS1 AIDC Application Standard
"Ecodesign for Sustainable Products Regulation (ESPR), products requiring a Digital Product Passport (DPP)" per WR 23-103 is based on an adjusted GS1 Extended Packaging application standard.

WR 25-219: The trade item extended packaging standard is NOT for identification/scanning purpose of trade items in the supply chain (e.g. scanning at POS and/or in general distribution), but exclusively for the purpose of accessing information that is not on the product or its package, e.g. DPP information required by ESPR, via a smart device. Therefore, the barcode used for extended packaging use cases like DPP must be IN ADDITION to the barcode for identification/scanning purposes in the supply chain unless both overlap. This is not clear enough in the current GenSpecs.

Disclaimer:

GS1 Member Organisations may choose to implement a national solution for variable measure trade items branded by the supplier for retail. Any national branded variable measure solution requires GS1 Member Organisations to manage the allocation of the item number at a national level.

GS1 key

Not applicable

Attributes

Not applicable

Data carrier specification

Carrier choices

- UPC-A (carrying RCN-12)
- EAN-13 (carrying RCN-13)

Symbol X-dimensions, minimum symbol height and minimum symbol quality

See section 5.12.3.1, *GS1 symbol specification table 1*.

Symbol placement

Not applicable

Unique application processing requirements

Not applicable

2.1.13 Trade item ~~extended packaging~~web-based information applications

~~The~~ Additional information not present on a physical trade item ~~obtained from a consumer trade item's packaging~~ can be ~~extended~~ accessed when ~~consumers using mobile devices~~ users scan or read data carriers on the ~~package~~trade item, its packaging or its documentation via mobile device, which leads them to ~~more~~ web-based information or ~~an~~ application about the trade item. This standard, formerly known as trade item extended packaging application standard, provides a standardised ~~packaging~~ solution to access~~, which will lead to~~web-based brand owner authorised information, applications or services.

~~Independent of whether a trade item is retail or non-retail, fixed or variable measure, if it is sold to the end consumer and utilises GTIN-based identification, then it is within the scope of this application~~.

This application standard has three approaches to enable ~~extended packaging~~ access to trade item web-based information:~~applications,~~

- ***GS1 Digital Link URI syntax*** *(2.1.13.1)*

~~1.~~ For new extended packaging applications, the GS1 Digital Link URI syntax is encoded in QR Code or Data Matrix and, if applicable, NFC in addition.

- ***GS1 element string (AI-based) syntax*** (2.1.13.2)

  ~~Prior to the GS1 Digital Link standard, GS1 approved two approaches to reach extended packaging applications that were available within the GS1 system of standards.~~

~~2.~~ An indirect mode of look-up via GTIN

  ~~-~~ This relies upon mobile device applications (apps) to use the GTIN encoded in EAN/UPC, GS1 DataBar, GS1 DataMatrix, or GS1 QR Code. This approach remains valid, but its implementation is limited by the lack of support for attributes of GTIN and the need to conduct a look-up to find a Web-based resource (indirect mode).

3. A direct mode of look-up utilising GS1 element string (AI-based) syntax approach that relies upon AIs (01) and (8200) to produce a product URL

    - This uses the GTIN and an additional GS1 Application Identifier (8200) to produce a product URL. This approach can be used to reach brand owner authorised information or applications via direct mode, but implementation has been limited at the global level by the need for an app to construct the URL from the decoded data.

For a summary of all conformance requirements for this AIDC application standard, cross-application rules and related technical specifications, see section 8.5.

2.1.13.1 GS1 Digital Link URI syntax for ~~extended packaging~~web-based information applications for trade items

The GS1 Digital Link standard ~~(DL~~) provides a ~~packaging~~ solution that can lead to web-based brand owner authorised information and SHALL be used for all new trade item web-based information applications. It uses a Web URI syntax to encode GS1 data, (e.g., GTIN and attribute data) in QR Code or Data Matrix barcodes and, if applicable, NFC in addition. GTIN SHALL be expressed as 14 digits, with leading zeroes serving as filler digits, as defined by the *GS1 Digital Link Standard: URI Syntax*, and shown in the examples below. The *GS1 Digital Link Standard: URI syntax* is a ratified GS1 technical standard, see https://ref.gs1.org/standards/digital-link/uri-syntax/ ~~https://www.gs1.org/standards/gs1-digital-link~~.

Although the GS1 Digital Link standard offers a compressed form of the GS1 Digital Link URI syntax, QR Code or Data Matrix SHALL encode the uncompressed form. Figure 2-3 provides examples of QR Code and Data Matrix that encode GTIN 09506000134369 to form a GS1 Digital Link URI https://example.com/01/09506000134369.

Figure 2-3 Examples of QR Code and Data Matrix with GS1 DL URI Syntax

Note: The example.com domain name (reserved in RFC 2606) is used in the example as a place holder for any domain name.

As the GS1 Digital Link encodes GS1 data in barcodes using a Web URI syntax, it differs from previous 'direct' and 'indirect' approaches described in section 2.1.13.2 because it explicitly encodes a resolvable Web URI. The GS1 Digital Link URI syntax also differs from the previous approaches in that it supports all GTIN attributes and provides standardised concatenation of multiple element strings.

Important: This standard relies upon the relevant trade item application standard including AIDC data carrier choices and symbol specification table (see section 2.1). If one of the 2D barcodes below is not included in an existing trade item application standard, it SHALL be used in addition to the existing AIDC data carrier until one of the 2D barcodes below is permitted as an alternative choice per the ASP (see section 8.5).

GS1 key

Required

The allowed key formats for this application are:

- GTIN-8
- GTIN-12
- GTIN-13
- GTIN-14 (if the trade item is also scanned at retail POS, the use of GTIN-14 is not permitted)

Rules

See the GTIN rules described in section 4.

Attributes

Required

Not Applicable

Optional

See section 3 for the overview of all GS1 Application Identifiers that may be used with trade items

Data carrier specification

Carrier choices

- QR Code
- Data Matrix

Note: During a transition period, EPC/RFID (see section 5.13 and section 4.15.2) MAY be used in addition to the 2D barcode. For a summary of all conformance requirements, refer to section 8.5. This section specifies what is conformant for current and where appropriate, future state implementations.

Note: NFC (see section 5.14 and section 4.15.3) MAY be used in addition to the 2D barcode.

Symbol X-dimensions, minimum symbol height and minimum symbol quality

To determine which symbol specification table is applicable, please refer to the relevant trade item application standard in section 2.1. If the only application is for trade item web-based information, ~~S~~see 5.12.3.1, Symbol specification table 1 addendum 2 for 2D barcodes with GS1 Digital Link URI.

Symbol placement

For additional barcodes that carry GS1 DL URIs (i.e. QR Code and Data Matrix), see section 4.15.1.

Unique application processing requirements

For a description of processing steps, see section 7 and the GS1 Digital Link standard .

2.1.13.2 GS1 element string syntax for ~~extended packaging~~web-based information applications for trade items

The GS1 element string syntax provides a~~n extended packaging~~ trade item web-based information solution that can lead to brand owner authorised information or applications, either via indirect or direct mode. This standard applies to ~~e GTIN is the primary GS1 key used to access GS1 B2C data standards and services and all GS1 application standards for consumer trade items require GTIN, therefore this standard makes normative reference to the sections in the *GS1 General Specifications* related to~~ consumer trade items referenced in Table 2-30, however it SHALL NOT be used for new trade item web-based information applications.

- Indirect mode: The GTIN encoded in the AIDC data carrier defined in the relevant application standard referenced in the figure below is used by mobile device applications (apps) to conduct a look-up to find a Web-based resource. This approach does not support GTIN attributes.

Direct mode:

- ~~In addition to using GTIN and indirect mode to reach trusted data, t~~The URL AI (8200) with GTIN can be used to reach brand owner authorised information or applications via direct mode. GTIN and AI (8200) are encoded as separate data elements in the barcode but once decoded they are processed in a standard fashion by concatenating the following three strings: the contents of AI (8200), followed by a slash (/) character, followed by the GTIN expressed as 14 numeric digits. For example, where a trade item's GTIN, when expressed as 14 digits is 01234567890128 and the URL for direct mode access to information is http://example.com/01234567890128.

When encoded in the symbol, the sequence for encoding is (01) 01234567890128 (8200) http://example.com, but when processed the URL, a slash and the GTIN are combined to arrive at http://example.com/01234567890128.

The example provided is not intended to constrain the brand owner to the use of http URL schema, the .com top-level domain, or the specific structure of URL illustrated. Any URL may be used, and in processing the slash character and 14-digit GTIN are appended.

These values are also expressed in non-HRI text on the label (see section 4.14). If GTIN attributes beyond AI (8200) are encoded together with GTIN and PRODUCT URL they are processed and expressed in text on the label as http://brandownerassignedURL.com/gtin/serialnumber where serial number equals up to 20 alphanumeric digits.

Table 2-30 Overview of related normative sections

Section	Title	General retail POS	Regulated healthcare: retail POS	Regulated healthcare: non-retail / POC
2.1.3	Fixed measure trade items scanned at retail POS	Yes		
2.1.3.6	Fixed measure fresh food trade items scanned at retail POS	Yes		
2.1.4	Fixed measure trade items scanned in general distribution and at retail POS	Yes		
2.1.5	Healthcare primary packaging (non-retail trade items)*			Yes
2.1.6	Healthcare secondary packaging (regulated healthcare retail consumer trade items)*		Yes	
2.1.7.1	Fixed measure trade items scanned in general distribution - identification of a trade item that is a single product*			Yes
2.1.12.1	Variable measure fresh food trade items scanned at retail point-of-sale using GTIN	Yes		

Section	Title	General retail POS	Regulated healthcare: retail POS	Regulated healthcare: non-retail / POC
***Important:** For healthcare applications AI (8200) will be deprecated on 31 December 2026, healthcare applications SHALL NOT utilise AI (8200) after this date				

GS1 key

Required

The allowed key formats for this application are:

- GTIN-8
- GTIN-12
- GTIN-13
- For regulated healthcare non-retail applications also: GTIN-14

Rules

All rules in the sections that appear in Table 2-30 apply as described in each section.

Attributes

Required

For the purpose of direct mode, AI (8200) must be used in combination with GTIN when brand owners provide ~~extended packaging~~web-based information or applications.

Optional

For the purpose of indirect mode, all attributes in the sections which appear in Table 2-30 as described in each section.

Rules

All rules in the sections that appear in Table 2-30 apply as described in each section.

Data carrier specification

Carrier choices

For the purpose of supporting indirect mode, all carrier choices in the sections which appear in the Table 2-30 apply as described in each section.

For the purpose of direct mode, in addition to the symbol required for indirect mode, when AI (8200) is used, GS1 DataMatrix and GS1 QR Code are the only approved data carriers. See also section 4.15.

Symbol X-dimensions, minimum symbol height and minimum symbol quality

To determine the appropriate specifications for printing and quality control, see the GS1 symbol specification table(s) referred to in each application standard shown in Table 2-30.

Symbol placement

None defined.

Unique application processing requirements

For a description of processing requirements, see section 7.

2.6.10 Internal applications

The GS1 system provides ten GS1 Application Identifiers for internal applications.

Data carrier specification

GS1 data carriers that can be used to represent GS1 Application Identifiers for internal applications are:

- GS1 DataBar Expanded Versions
- GS1-128
- GS1 DataMatrix
- GS1 QR Code
- EPC/RFID

Data carrier specifications (e.g., size, quality, placement) are to be determined internally, however GS1-128 symbols SHALL NOT be used for symbols that require more than 48 data characters and GS1 DataBar Expanded Versions SHALL NOT be used when symbols require more than 74 numeric or 41 alphabetic characters of data.

Though the definition of AIs (91) to (99) in the GS1 Tag Data Standard (TDS) allows for larger fields, to ensure compatibility with the General Specification, AI (91) to (99) character values encoded in the User Memory of an EPC/RFID tag SHOULD NOT exceed 90 characters in length.

2.6.10.1 Information mutually agreed between trading partners: AI (90)

Element string AI (90) may be used to represent any information that has been mutually agreed between two trading partners. The agreement may include the use of FACT DIs (Data Identifiers). If a FACT DI is used, it SHOULD appear immediately after the AI (90), followed by the appropriate data. The use of FACT DIs gives little security to users.

The data carrier containing this element string SHOULD be removed from any item that leaves the jurisdiction of the trading partners. Failure to remove the symbol may cause problems if another trading partner using the same AI for a separate internal application scans the item.

2.6.10.2 Company internal information: AIs (91) to (99)

Element strings AI (91) to (99) may contain any internal information relevant to a company's internal applications.

The data carrier containing these element strings SHOULD be removed from any item that leaves the jurisdiction of the company. Failure to remove the symbol may cause problems if a trading partner using the same AI for a separate internal application scans the item.

2.6.11 Consumer trade item production control

This application standard utilises GTIN and a GTIN attribute which are used by consumer trade item manufacturers to ensure the proper association of packaging components during production of a finished consumer trade item. The attribute is called a Packaging Component Number (PCN). The PCN identifies a packaging component which is used by only one manufacturer and is an attribute of the GTIN of the finished consumer trade item. For example, a bottle of cough syrup has a front and back label. It is critical the declarations on the labels match the product filled in the bottle. By using a different PCN on each label during packaging for a specific trade item identified with a GTIN, the manufacturer can ensure the right labels are used to produce the product (GTIN to PCN associations). PCN may be encoded as a standalone symbol or the PCN and GTIN may be encoded together. Package components shared between two or more manufacturers are not covered by this standard. Manufacturers and their packaging component suppliers will have to manage this situation. The PCN is assigned by the manufacturer (possibly under the direction of the brand owner).

GS1 key

Required

The following key formats are allowed in this application:

- GTIN-8
- GTIN-12
- GTIN-13
- For regulated healthcare non-retail applications: GTIN-14

Rules

GTIN of the finished consumer trade item SHALL NOT be used to identify packaging components (e.g., bottle, bottle cap, front label, back label) for the purpose of trade item production control; however GTIN is specified as the GS1 key for consumer trade item production control as the GTIN determines which packaging components are used in production.

Attributes

Required

The GS1 Application Identifier to indicate the Packaging Component Number is AI (243), see section 3.2.

Rules

PCN SHALL NOT replace GTIN for pricing, ordering, or invoicing upstream packaging components from the manufacturer's upstream suppliers. Per section 4.13, PCN has a mandatory association with one or more finished consumer trade item GTIN(s). The PCN and GTIN may or may not be encoded in the same symbol.

PCN is used only on packaging components used by one manufacturer. There may be more than one PCN associated with one GTIN. One PCN may be associated with multiple GTINs

There SHALL only be one PCN per each packaging component for the lifespan of the packaging component and one packaging component may change while another does not. For example a front and back label would each have a unique PCN and the front label may change while the back label does not.

Over a GTIN's lifespan, there may be more than one PCN per packaging component (e.g., front label).

Optional

Not applicable

Data carrier specification

Carrier choices

Table 2-33 Carrier choices

Symbol options by consumer trade item type	Type of consumer trade item		
	General retail POS	Regulated healthcare POS (retail)	Regulated healthcare POC (non-retail)
GTIN and PCN in one symbol	GS1 DataBar	GS1 DataBar or GS1 DataMatrix	GS1 DataBar, GS1 DataMatrix, GS1-128, Composite Component
PCN standalone	GS1 symbol selection/size specifications left to the manufacturer's discretion		
GTIN, PCN, & ~~Extended Packaging~~web-based information URL in one symbol	(*) GS1 DataMatrix or GS1 QR Code	GS1 DataMatrix	GS1 DataMatrix
(*) For general retail consumer trade items where PCN is combined with AI (8200) GS1 DataMatrix or GS1 QR Code may be used according to the specifications Table 5-44 and Table 5-45 *GS1 symbol specification table 1 Addendum.*			

Symbol X-dimensions, minimum symbol height and minimum symbol quality

To determine the appropriate specifications for printing and quality control, see the GS1 symbol specification table(s) referred to in each Application Standard.

Symbol placement

When the PCN is encoded together with GTIN, symbol placement rules for consumer trade item apply. If the production line scanning of the PCN prohibits use of this symbol placement, the PCN must be encoded in a separate barcode.

Unique application processing requirements

For a description of processing requirements, see section 7.

2.6.12 Component/part identification

2.6.12.1 Application description

This application is subject to the following restrictions:

- The Component & Part Identifier is available for business processes where products are identified by the buyer. The buyer instructs his suppliers on how to identify and mark the products delivered to him.
- The identifier SHALL NOT be used in open supply chains. It is restricted to use by mutual agreement. The GTIN is the only GS1 standard identifier for trade items in open supply chains.

A Component/Part (C/P) is defined as an item that is intended to undergo at least one further transformation process to create finished goods for the purpose of downstream consumption. C/P examples may include:

- Drive motor for washing machine
- Fan assembly for a jet engine
- Pipe/tube
- Printed circuit board for television
- Starter motor for vehicle
- Magnetic coil for a Magnetic Resonance Imaging (MRI) machine

Excerpts of Table 2-37 below provide relevant application standards.

Application	See section	SST(s)
Healthcare primary packaging (non-retail trade items)	2.1.5	6
Healthcare secondary packaging (regulated healthcare retail consumer trade items)	2.1.6	8 or 10

Symbol placement

All the symbol placement guidelines defined in section 6.

Unique application processing requirements

For a description of processing requirements, see section 7.

2.7 Summary of applications and operative scanning environments

Table 2-37 provides a cross-reference for all system applications defined in section 2 and the GS1 symbol specification tables (SSTs) in section 5. The application where the barcode will be used needs to be determined prior to locating the correct symbol specification table (SST) entry. Use the "SST(s)" column to find the SST appropriate for the application area. Because most application areas provide a reference to two symbol specification tables based on the operative scanning environment, a decision must be made between the two. See the decision tree in Figure 5-68 to determine the correct symbol specification table.

Table 2-37 Areas of GS1 system application

Application	See section	SST(s)
Fixed measure trade items scanned at retail POS using:	2.1.3	
GTIN-12 or GTIN-13	2.1.3.1	1
GTIN-12 carried by a UPC-E barcode	2.1.3.2	1
GTIN-8	2.1.3.3	1
Hardcover books and paperbacks scanned at retail POS using ISBN, GTIN-13, or GTIN-12	2.1.3.4	1
Serial publications scanned at retail POS using ISSN, GTIN-13, or GTIN-12	2.1.3.5	1
Fixed measure fresh food trade items scanned at retail POS	2.1.3.6	1
Fixed measure trade items scanned in general distribution and at retail POS	2.1.4	3
Healthcare primary packaging (non-retail trade items)	2.1.5	6
Healthcare secondary packaging (regulated healthcare retail consumer trade items)	2.1.6	8 or 10
Fixed measure trade items scanned in general distribution	2.1.7	2
Regulated healthcare trade items	2.1.7	8
Manufacturing, maintenance, repair and overhaul trade items	2.1.7	4
Medical devices (non-retail trade items)	2.1.8	7
Fixed measure trade items packed in several individual pieces not scanned at retail POS	2.1.9	2, 4
Healthcare trade items	2.1.9	8 or 10
Variable measure trade items scanned in general distribution	2.1.10	2
Fixed measure trade items – restricted distribution applications	2.1.11	
Company internal numbering – RCN-8 Prefix 0 or 2	2.1.11.1	1

Application	See section	SST(s)
Company internal numbering – RCN- 13 GS1 Prefix 04 (RCN-12 U.P.C. Prefix 4)	2.1.11.2	1
Company internal numbering – RCN- 12 U.P.C. Prefix 0 (LAC and RZSC)	2.1.11.3	1
GS1 Prefixes 02, 20 to 29 - Restricted Circulation	2.1.11.4	1
Variable measure fresh food trade items scanned at retail point-of-sale using GTIN	2.1.12.1	1
Variable measure trade items scanned at retail point-of-sale using Restricted Circulation Numbers	2.1.12.2	1
GS1 Digital Link URI syntax for ~~extended~~ web-based information~~packaging~~ applications for trade items	2.1.13.1	1 Addendum 2
GS1 element string syntax for web-based information ~~extended packaging~~ applications for trade items	2.1.13.2	1 Addendum 1
Regulated healthcare trade items	2.1.13.2	6, 7, 8, or 10
Regulated trade item, at unit pack level, per EU 2018/574 for tobacco traceability (GTIN + Third-Party Controlled Serialised Extension of GTIN)	2.1.14	12
Regulated trade item, at standard trade grouping level, per EU 2018/574 for tobacco traceability (SGTIN)	2.1.14	12
Regulated logistics unit per EU 2018/574 for tobacco traceability (SSCC)	2.1.14	12
Logistics units - individual logistic units (SSCC)	2.2.1	5
Logistics units - multiple logistic units (GSIN, GINC)	2.2.2, 2.2.3	5
Assets – Global Returnable Asset Identifier (GRAI)	2.3.1	9
Direct part marking	2.3.1, 2.6.14	7
Durable labelling and marking	2.3.1, 2.6.14	9, 13
Assets – Global Individual Asset Identifier (GIAI)	2.3.2	9
Direct part marking	2.3.2 2.6.14	7
Durable labelling and marking	2.3.2 2.6.14	9, 13
Identification of a physical location	2.4.2	9
Service relationships	2.5	11
Use of demographic data to support verification or validation of personal identity	2.5.5	11
Coupons identified using the Global Coupon Number	2.6.2	1
Coupon identification for restricted geographic distribution (GS1 Prefix 99) GS1 common currency coupon identification (GS1 Prefixes 981 to 983)	2.6.3.3 2.6.3.4 2.6.3.5	1
Coupon code identification for use in North America (AIs (8110), (8112))	2.6.3.6 2.6.3.7	(*)
Refund receipts	2.6.4	1
Electronic serial identifier for cellular mobile telephones (CMTI): AI (8002)	2.6.5	4
Payment slips	2.6.6	4

3 GS1 Application Identifier definitions

3.1 Introduction

This section describes the meaning, structure and function of the GS1 system element strings so they can be correctly processed in users' application programmes. An element string is the combination of a GS1 Application Identifier and a GS1 Application Identifier data field. The allowable character set to be used for GS1 Application Identifier element strings is defined in section 7.11. There are AIs that have additional syntax restrictions, e.g., numerical only; see below definition for each AI.

Automatic processing of element strings in business applications requires information about the type of transaction to which the transferred data refers. See section 7 for an explanation of this process. Element strings can be carried by GS1-128, GS1 DataBar symbology, GS1 Composite, GS1 DataMatrix and GS1 QR Code symbols. The rules for use and interrelationships between the GS1 Application Identifiers are contained in section 2 and 4.

When a predefined length GS1 key and attributes are encoded together, the GS1 key SHOULD appear before the attributes. In most cases predefined length element strings SHOULD be followed by non-predefined element strings. The sequence of predefined and non-predefined element strings should be at the discretion of the creator of the element strings.

3.2 GS1 Application Identifiers in numerical order

Table 3-1 GS1 Application Identifiers

AI	Data Content	Format (1)	FNC1 required (4)	Data title
00	Identification of a logistic unit (SSCC): AI (00)	N2+N18		SSCC
01	Identification of a trade item (GTIN): AI (01)	N2+N14		GTIN
02	Identification of trade items contained in a logistic unit: AI (02)	N2+N14		CONTENT
03	Identification of a Made-to-Order (MtO) trade item (GTIN): AI (03)	N2+N14		MTO GTIN
10	Batch or lot number: AI (10)	N2+X..20	(FNC1)	BATCH/LOT
11 (2)	Production date: AI (11)	N2+N6		PROD DATE
12 (2)	Due date for amount on payment slip: AI (12)	N2+N6		DUE DATE
13 (2)	Packaging date: AI (13)	N2+N6		PACK DATE
15 (2)	Best before date: AI (15)	N2+N6		BEST BEFORE or BEST BY
16 (2)	Sell by date: AI (16)	N2+N6		SELL BY
17 (2)	Expiration date: AI (17)	N2+N6		USE BY or EXPIRY
20	Internal product variant: AI (20)	N2+N2		VARIANT
21	Serial number: AI (21)	N2+X..20	(FNC1)	SERIAL
22	Consumer product variant: AI (22)	N2+X..20	(FNC1)	CPV
235	Third Party Controlled, Serialised Extension of Global Trade Item Number (GTIN) (TPX): AI (235)	N3+X..28	(FNC1)	TPX
240	Additional product identification assigned by the manufacturer: AI (240)	N3+X..30	(FNC1)	ADDITIONAL ID
241	Customer part number: AI (241)	N3+X..30	(FNC1)	CUST. PART No.
242	Made-to-Order variation number: AI (242)	N3+N..6	(FNC1)	MTO VARIANT
243	Packaging component number: AI (243)	N3+X..20	(FNC1)	PCN
250	Secondary serial number: AI (250)	N3+X..30	(FNC1)	SECONDARY SERIAL
251	Reference to source entity: AI (251)	N3+X..30	(FNC1)	REF. TO SOURCE

AI	Data Content	Format [1]	FNC1 required [4]	Data title
8018	Global Service Relation Number (GSRN) to identify the relationship between an organisation offering services and the recipient of services: AI (8018)	N4+N18	(FNC1)	GSRN - RECIPIENT
8019	Service Relation Instance Number (SRIN): AI (8019)	N4+N..10	(FNC1)	SRIN
8020	Payment slip reference number: AI (8020)	N4+X..25	(FNC1)	REF No.
8026	Identification of pieces of a trade item (ITIP) contained in a logistic unit: AI (8026)	N4+N14+N2+N2	(FNC1)	ITIP CONTENT
8030	Digital Signature (DigSig): AI (8030)	N4+Z..90	(FNC1)	DIGSIG
8040	International Mobile Equipment Identity (IMEI): AI (8040)	N4+N15	(FNC1)	IMEI
8041	International Mobile Equipment Identity 2 (IMEI2): AI (8041)	N4+N15	(FNC1)	IMEI2
8042	Embedded SIM: AI (8042)	N4+N32	(FNC1)	ESIM
8043	Physical SIM: AI (8043)	N4+N18+[N..2]	(FNC1)	PSIM
8110	Coupon code identification for use in North America AI (8110)	N4+X..70	(FNC1)	-
8111	Loyalty points of a coupon: AI (8111)	N4+N4	(FNC1)	POINTS
8112	Positive offer file coupon code identification for use in North America: (AI 8112)	N4+X..70	(FNC1)	-
8200	~~Extended packaging URL: AI (8200)~~Web-based information URL: AI (8200)	N4+X..70	(FNC1)	PRODUCT URL
90	Information mutually agreed between trading partners: AI (90)	N2+X..30	(FNC1)	INTERNAL
91 to 99	Company internal information: AIs (91 - 99)	N2+X..90	(FNC1)	INTERNAL

NOTES:

(1): The first position indicates the length (number of digits) of the GS1 Application Identifier. The following value refers to the format of the data content. The following convention is applied:

- n implied decimal point position
- N numeric digit
- X any character in Table 7-20~~Table 7-20~~ for GS1 AI encodable character set 82
- Y any character in Table 7-21~~Table 7-21~~ for GS1 AI encodable character set 39
- Z any character in Table 7-22~~Table 7-22~~ for (file-safe / URI-safe base64)
- N2 2 numeric digits, fixed length
- N3 3 numeric digits, fixed length
- N4 4 numeric digits, fixed length
- X3 3 characters, fixed length
- N..3 up to 3 numeric digits
- X..3 up to 3 characters in Table 7-20~~Table 7-20~~ for GS1 AI encodable character set 82
- Y..3 up to 3 characters in Table 7-21~~Table 7-21~~ for GS1 AI encodable character set 39
- Z..3 up to 3 characters in Table 7-22~~Table 7-22~~ for GS1 AI encodable character set 64 (file-safe / URI-safe base64)
- [ ] enclosed value is an optional component

(2): If only year and month are available, DD must be filled with two zeroes, except where noted.

(3): The fourth digit of this GS1 Application Identifier indicates the number of decimal places (and in that way the implied decimal point position).

Example:

- 3100 Net weight in kg without a decimal point
- 3102 Net weight in kg with two decimal places

see section 7.8.7 for further information.

The data string transmitted means that the element string denoting a positive offer file coupon code for use in North America has been captured.

3.9.27 ~~Extended packaging~~Web-based information URL: AI (8200)

The GS1 Application Identifier (8200) indicates that the GS1 Application Identifier data fields contain the identification of a brand owner authorised URL to be used in mandatory association with GTIN AI (01) encoded in one symbol.

GS1 Application Identifier	Brand owner authorised URL
8 2 0 0	X_1————variable length————›X_{70}

The data transmitted from the barcode reader means that the element string denoting the web-based information ~~Extended Packaging~~ URL for a trade item has been captured. This element string SHALL be processed as specified in section 2.1.13 to obtain one URL address associated with the trade item identified by the GTIN.

When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used: **PRODUCT URL**

3.10 GS1 Application Identifiers starting with digit 9

3.10.1 Information mutually agreed between trading partners: AI (90)

The GS1 Application Identifier (90) indicates that the GS1 Application Identifier data field contains any information mutually agreed between trading partners.

The data field shows the information agreed between the two trading partners. The field is alphanumeric and may contain all characters contained in Table 7-20~~Table 7-20~~. It may also be used to incorporate data preceded by ASC MH10 Data Identifiers.

GS1 Application Identifier	Data field
9 0	X_1———variable length———›X_{30}

The data transmitted from the barcode reader means that the element string denoting mutually agreed information has been captured. As this element string may contain any information, processing is subject to prior agreement between trading partners.

Important: The barcode carrying this element string SHOULD be removed from any item that leaves the jurisdiction of the trading partners.

When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used: **INTERNAL**

3.10.2 Company internal information: AIs (91 - 99)

The GS1 Application Identifier (A1 A2) assigned to company internal information is AI (91 to 99).

The GS1 Application Identifier data field may contain any company internal information. The field is alphanumeric and may show all characters contained in Table 7-20~~Table 7-20~~.

GS1 Application Identifier	Data field
A_1 A_2	X_1 ———variable length———› X_{90}

Note: Use of this Application Identifier for field lengths greater than 41 data characters will require the appropriate data carrier selection, see section 2.6.10.

Local, national or regional regulations may require more frequent GTIN changes. Such regulations have precedence over the rules provided within the GTIN Management Standard.

4.2.2.1 GTIN Management definitions

The following terms may be useful when reviewing the GTIN Management Standard that is published on https://www.gs1.org/1/gtinrules/en:

- **Logistic unit** – An item of any composition established for transport and/or storage that needs to be managed through the supply chain. It is identified with an SSCC (Serial Shipping Container Code).
- **Retail consumer trade item** – The trade item intended to be sold to the end consumer at retail point-of-sale. They are identified with a unique GTIN-13, GTIN-12, or GTIN-8. (See section 2).
- **Retail consumer trade item variant** – A change to a retail consumer trade item (which may itself be a homogeneous or a physical trade item assortment/bundle of other retail consumer trade items) that does not require a new GTIN, but where identification of the variation may be required.
- **Trade item** – Any item (product or service) upon which there is a need to retrieve predefined information and that may be priced, ordered, or invoiced at any point in any supply chain.
- **Trade item grouping** – A grouping of retail consumer trade items that is not intended for point-of-sale scanning. It is identified with a unique GTIN-14, GTIN-13, or GTIN-12.

Note: The GTIN Management Standard is intended for global use. Exceptions may occur only when local regulatory or legal requirements mandate otherwise.

Note: The exchange of product data across global supply chains requires compliance with rules for product identity and data attribution. It is recommended that all retail consumer trade items are registered with GS1. For more information see your GS1 Member Organisation.

4.2.2.2 Trade item declarations

Trade item declarations are the set of all information about a trade item (e.g., manufacturer warranty, ingredients, instructions for use, specifications, contents, certifications). For a trade item, this is all of the information that is on the label and in the original packaging. It also includes relevant aspects of the ~~extended packaging~~web-based information.

Although this list is not exhaustive, the basic trade items declarations are:

- The primary brand or, as may be defined by regulation, the product name and/or product description.
- The trade item type and variety.
- The net content of trade item and/or net weight, volume, or other dimension impacting trade.
- If the trade item presents a grouping, the number of elementary items contained and their subdivision in sub-packaging units.
- For a predefined trade item assortment/bundle, the composition of the trade item assortment/bundle.

A modification to any of the basic elements that characterise a trade item will usually lead to a change in the Global Trade Item Number (GTIN).

Note: These rules are intended for global use. Exceptions may occur only when local regulatory or legal requirements mandate otherwise. For example, in some industries, such as healthcare, regulations or other requirements may dictate that any trade item changes require a new GTIN.

2. Mandatory pairs of element strings, indicating which element strings must occur in combination with one or more other element strings.

Note: In both tables, the GS1 Application Identifiers (AIs) are used to indicate the element string. But when evaluating the rule the complete element string, i.e. the AI and the data field, needs to be taken into account.

Note: GTINs encoded in an EAN/UPC and ITF-14 symbols are to be regarded as element strings prefixed by an inferred AI (01).

Note: Duplicate element strings (e.g., two serial numbers, two batch/lot numbers, two ~~Extended Packaging~~web-based information URLs) MAY appear on the same physical entity (for example in multiple barcodes). In that case they SHALL have the same value in each occurrence on that entity.

4.13.1 Invalid pairs of element strings

This section defines the pairs of element strings that SHALL NOT appear together on the same physical entity. The table does not provide a finite list of all possible rules, only situations that have proven to pose difficulties in practice are included.

Some explanation on Table 4-4:

- The table is sorted by AI value, with the lowest AI value displayed in the first column.
- Multiple AIs may be listed in the first or third column, separated by commas. This means that the same rule applies to all listed AIs.
- The rules work in both directions, e.g., if it states AI (01) SHALL NOT be combined with AI (37) this implies that AI (37) SHALL NOT be combined with AI (01).
- For the purpose of this table Made-to-Stock (MtS) GTIN AI (01) and Made-to-Order (MtO) GTIN AI (03) are simply referred to as GTIN.

Table 4-4 Invalid pairs of element strings

Invalid pairs of element strings				Rule
AI	Designation	AI	Designation	
01	GTIN	01	GTIN	All occurrences of GTIN SHALL have one value. It is for example not allowed to include GTINs of other packaging levels.
01	GTIN	02	GTIN of contained trade items	GTIN of contained trade items is intended to list the trade items contained in a logistic unit and SHALL NOT be used to identify the contents of a trade item.
01	GTIN	03	GTIN	The same GTIN value SHALL NOT be used with AI (01) and AI (03) and a trade item identified with (01) GTIN SHALL NOT be identified by a MtO GTIN with AI (03).
01, 03	GTIN	37	Count of units contained	The count of units contained SHALL only be used with GTIN of contained trade items or trade item pieces.
01	GTIN	255	Global Coupon Number	A trade item SHALL NOT also be identified as a coupon.
03	GTIN	02	GTIN of contained trade items	GTIN of contained trade items is intended to list the trade items contained in a logistic unit and SHALL NOT be used to identify the contents of a MtO trade item.
03	GTIN	03	GTIN	All occurrences of a Made-to-Order (MtO) GTIN SHALL have one value

Invalid pairs of element strings				Rule
AI	Designation	AI	Designation	
4330	Maximum temperature in Fahrenheit	4331	Maximum temperature in Celsius	Only a single maximum temperature SHALL be used in combination with an SSCC
4332	Minimum temperature in Fahrenheit	4333	Minimum temperature in Celsius	Only a single minimum temperature SHALL be used in combination with an SSCC.
7240	Protocol ID	03	GTIN	A Made-to-Order (MtO) GTIN SHALL NOT be used with Protocol ID.
7250	Date of birth	7251	Date and time of birth	Only one date of birth SHALL be used
7256	Full name of person	7253, 7254, 7255, 7259	Family name of person, given name of person and name suffix of person, baby of family name	Either full name of person or a combination of family name of person, given name of person and name suffix of person SHALL be used.
7259	Baby of family name	7253, 7254, 7255, 7256	Family name of person, given name of person, name suffix of person, full name of person	Where the recipient of care identified by a GSRN is a baby, the name of the baby SHALL either be provided through AI (7259) (possibly in conjunction with AI (7258), to handle situations of multiple births) or through the combination of one or more of AIs (7253), (7254), (7255), (7256).
8006	ITIP	01	GTIN	The GTIN SHALL NOT be used in combination with the identification of an individual trade item piece. The GTIN of the trade item to which the individual trade item piece belongs is contained in the element string.
8006	ITIP	03	GTIN	A Made-to-Order (MtO) GTIN SHALL NOT be used in combination with the identification of an individual trade item piece.
8006	ITIP	37	Count of units contained	The count of units contained SHALL only be used with GTIN of contained trade items or trade item pieces.
8018	GSRN for the recipient	8017	GSRN for the provider	Only one Global Service Relation Number (recipient or provider) SHALL be applied at one time for identification of an individual in a given service relationship
8026	Identification of a trade item piece contained in a logistic unit	02, 8006	GTIN of contained trade items, Identification of an individual trade item piece	Identification of the trade item piece contained in a logistic unit SHALL NOT be used in combination with GTIN of contained trade items or identification of an individual trade item piece.
8026	Identification of a trade item piece contained in a logistic unit	03	GTIN	Identification of the trade item piece contained in a logistic unit SHALL NOT be used in combination with a Made-to-Order (MtO) GTIN.

4.13.2 Mandatory association of element strings

This section defines the element strings that mandate the appearance of another element string on the same physical entity.

Note: This does not necessarily mean that the element strings need to appear in the same data carrier. For example, multiple GS1-128 barcode symbols may be used in combination on a GS1 Logistic Label.

Table 4-5 reflects the use case requirements to date. Should future applications arise that require associations they will be added at that time.

Some explanation on Table 4-5:

- The table is sorted by AI value, with the AI that is the trigger for the rule displayed in the first column. This means that this table cannot be read in both directions. For example, a rule that states AI (17) must be used together with AI (01), does not imply that AI (01) can only be used together with AI (17), since it can also be used with other AIs.
- Multiple AIs may be listed in the first column, separated by commas. This means that the rule applies to all of the listed AIs (element strings).
- The same AI can occur in the first column multiple times, in different rows. This means that depending on the value of the element string different rules need to be applied.
- When multiple AIs are included in the third column, this is always done with an AND, OR or XOR logical operator between them:
  - AND means that all element strings SHALL appear on the physical entity
  - OR means that one or a combination of the element strings SHALL appear on the physical entity.
  - XOR means that one of the element strings SHALL appear on the physical entity and the other element string SHALL NOT.

Table 4-5 Mandatory association of element strings

If element string		Then mandatory associated element string	Rule
AI	Designation	AI	
01 with N1 = 0	GTIN of a variable measure trade item scanned at POS	30 OR 3nnn*	The GTIN of a variable measure trade item scanned at POS SHALL occur in combination with: ▪ variable count of items; or ▪ a trade measure Note: Master data will be needed to determine whether the GTIN represents a variable measure trade item scanned at POS. Also see the note below this table.
01 with N1 = 9, 02 with N1 = 9	GTIN of a variable measure trade item not scanned at POS	30 OR 3nnn* OR 8001	The GTIN of a variable measure trade item not scanned at POS SHALL occur in combination with: ▪ variable count of items; or ▪ a trade measure; or ▪ the dimensions of a roll product. Note: The first position of the GTIN is "9" for such trade items. Also see the note below this table.
01 with N1 = 9	GTIN of a custom trade item per section 2.6.8	242	The GTIN of a custom trade item using AI (01) and indicator digit "9" SHALL be used in combination with the Made-to-Order variation number. Note: The first position of the GTIN is "9" for such trade items.
02	GTIN of contained trade items	00 AND 37	The GTIN of contained trade items SHALL occur in combination with an SSCC and the count of the trade items.
10	Batch/lot number	01 XOR 02 XOR 03 XOR 8006 XOR 8026 ***	Batch/lot number SHALL occur in combination with: ▪ a GTIN; or ▪ a GTIN of contained trade items; or ▪ ~~Identification of~~ a Made-to-Order (MtO) ~~trade item (~~GTIN~~)~~: or ▪ an ITIP; or ▪ an ITIP of contained trade item pieces
11, 13, 15, 16, 17	Production date, packaging date, best before date, sell by date, expiration date (of a trade item)	01 XOR 02 XOR 03 XOR 8006 XOR 8026 ***	These dates SHALL occur in combination with: ▪ a GTIN; or ▪ a GTIN of contained trade items; or ▪ ~~Identification of~~ a Made-to-Order (MtO) ~~trade item (~~GTIN~~)~~; or ▪ an ITIP; or ▪ an ITIP of contained trade item pieces

If element string		Then mandatory associated element string	Rule
AI	Designation	AI	
8111	Loyalty points of a coupons	255	Loyalty points of a coupon SHALL occur in combination with the GCN.
8200	~~Extended packaging~~Web-based informatio URL	01	The ~~extended packaging~~web-based information URL SHALL occur in combination with the GTIN.

*	The AIs for trade measures are set out in section 3.6.2 *Trade measures: AIs (31nn, 32nn, 35nn, 36nn). Note: All AIs in* section 3.6.2 *can be used with this AI 395n.*
**	The AIs for logistics measures are set out in section 3.6.3 *Logistic measures: AIs (33nn, 34nn, 35nn, 36nn)*
***	If used in combination with the identification of trade item pieces (ITIP), the optional AIs on all individual pieces of the trade item SHALL be identical.
N	Any digit from 0 to 9

Note: Exception for point-of-sale. See Table 2-37. *Areas of GS1 system application*.

4.14 Human readable interpretation (HRI) rules

Human readable interpretation (HRI) rules are provided to standardise printing requirements and facilitate training of staff on how to deal with GS1 AIDC data carriers that fail to scan or read. There are two categories of rules:

- General rules that apply independent of sector, intended application or product category.
- Sector or application specific rules which must be aligned with the general rules and can be found in sections:
  - 4.14.1 Healthcare human readable interpretation
  - 4.14.2 General retail consumer trade item human readable text rules
  - 4.14.3 Manual date marking

There are two types of text that appear on an object: human readable interpretation (HRI) and non-HRI text.

- Human readable interpretation (HRI) represents the same data encoded in the barcode or RFID tag (see section 9 for full definition).
- Non-HRI text is all other text on the object which may or may not be encoded in the barcode or RFID tag (see section 9 for full definition).

Figure 4-3. Example of human readable text

Note: The following rules are intended for global use. Exceptions may occur only when local regulatory or legal requirements mandate otherwise.

Note: At present, HRI rules are applicable to barcodes as rules for EPC/RFID tags are under development.

Note: HRI rules for the EAN/UPC symbology and the add-on symbols are explained in section 5.2.5 *Human readable interpretation*.

General human readable text rules

1. **HRI Placement**
   a. Whether a barcode encodes a GS1 identification key, GS1 key attributes, or a combination of both, the HRI SHOULD be included and placed adjacent to the barcode. HRI SHOULD be grouped together wherever physically possible while maintaining the HRI legibility, minimum barcode height and/or Quiet Zones as specified in the appropriate symbol specification table in section 5.12.3.
   b. In cases where the HRI must be printed above, to the left, or to the right of the barcode due to packaging or space constraints, HRI SHOULD be printed adjacent so that is obviously associated with the barcode. This rule applies to all barcodes independent of printing orientation (e.g., ladder orientation).

Figure 4-4 Locations of HRI for barcode in ladder orientation

   c. When HRI is grouped together, it SHOULD be placed adjacent to the barcode and it SHALL always follow the sequence of the encoded data in the barcode.
   d. If the HRI for GS1 identification keys and GS1 key attributes is split, the GS1 identification key HRI SHOULD be placed adjacent to the barcode. For example, the GS1 identification key HRI is below the barcode and the GS1 key attributes HRI is above the barcode.

Figure 4-5 Example of split HRI placement

   e. An element string (application identifier and associated data) SHALL NOT be broken into multiple lines of HRI, for example the data for a serial number would appear on one line of HRI, e.g., (21) ABCDEF12345.
   f. When using non-HRI text, the element strings SHOULD NOT be broken into multiple lines.
   g. HRI SHALL appear except in rare circumstances for specific applications where there are extreme space constraints (e.g., direct part marking, loose fresh produce). If the barcode cannot be read or scanned and the HRI does not appear on the object, non-HRI text SHOULD be used as backup information.
2. **Font and legibility**

a. A clearly legible font SHALL be used e.g., OCR-B as defined in *ISO/IEC 30116*. Reasonable alternative fonts and character sizes are acceptable provided the interpretation is clearly legible. When applying the "clearly legible" principle, the following principles and examples separate a best practice versus below average implementation.

   i. Monospaced font types such as OCR-B or Sans serif font types such as Arial are preferred.

   ii. Bold, italics, light or narrow versions of a font SHOULD NOT be used.

   iii. The font size SHOULD be at least 2 mm (0.08 in) in height

   iv. Spaces SHALL NOT be encoded in the barcode.

   v. Spaces may be used in the HRI itself to ease manual data input.

   vi. The spaces between characters driven by the font type SHOULD NOT be reduced.

b. HRI SHALL be limited to element strings and will not include barcode overhead such as separator characters.

c. When using GS1 element string syntax, although parentheses are not encoded in the barcode, parentheses SHALL surround AIs in HRI.

3. **URL**

   a. When the GS1 Digital Link URI syntax for trade item ~~extended packaging~~web-based information applications is encoded in a barcode, it is left to the brand owner's discretion to use the GS1 Digital Link URI in non-HRI text (e.g., GTIN only 09520123456788 or URL https://brand.example.com/01/09520123456788).

   b. When AI (8200) appears on the object, the expression of the URL SHALL NOT appear in HRI. If it appears in non-HRI text, it SHALL be expressed as http://brandownerassignedURL.com/GTIN (where GTIN expressed as 14 digits).

4. **Data titles**

   As a non-HRI text option, the data title (see section 3.2) may be associated with the data instead of using the AI numbers. See Figure 4-3 which shows expiration date and lot number identified with non-HRI text and where, in the same figure, the same data is shown using the all-AI format.

5. **GS1 Logistics Label**

   a. HRI alongside a 2D barcode on a logistic label is not required if this is already present with the GS1-128 symbol, or is present as data titles and data content elsewhere on the label.

   b. When a logistic label displays a 2D barcode encoding transport process information that is otherwise represented in text or graphic on the label, HRI of this information is not required.

   c. On GS1 Logistics Labels HRI characters SHALL be no less than 3 mm (0.1181 in) high.

4.14.1 Healthcare human readable interpretation rules

The GS1 system requires printing both the GS1 AIDC data carrier and the HRI that represents all the information encoded within that GS1 AIDC data carrier.

If the GS1 AIDC data carrier cannot be read or scanned, the HRI should be used as back up information. The GS1 preferred format for HRI when applied on healthcare trade items SHALL be as noted in the general HRI rules found in section 4.14.

When considering the practical implementation and application of HRI during the creation of the product packaging, many factors must be taken into account to determine if and how HRI is included with the symbol. These factors may include the type of product being labelled or marked, product use, available space for marking, alternate data availability, regulatory or legal requirements, technical constraints, etc.

However, printing both the GS1 AIDC data carrier and the associated HRI may not be possible due to many factors such as the intended use of the item, available space for marking, etc. Deviation from the HRI format should be minimised and consider impacts to downstream trading partners and users.

Typical examples are shown the figures below.

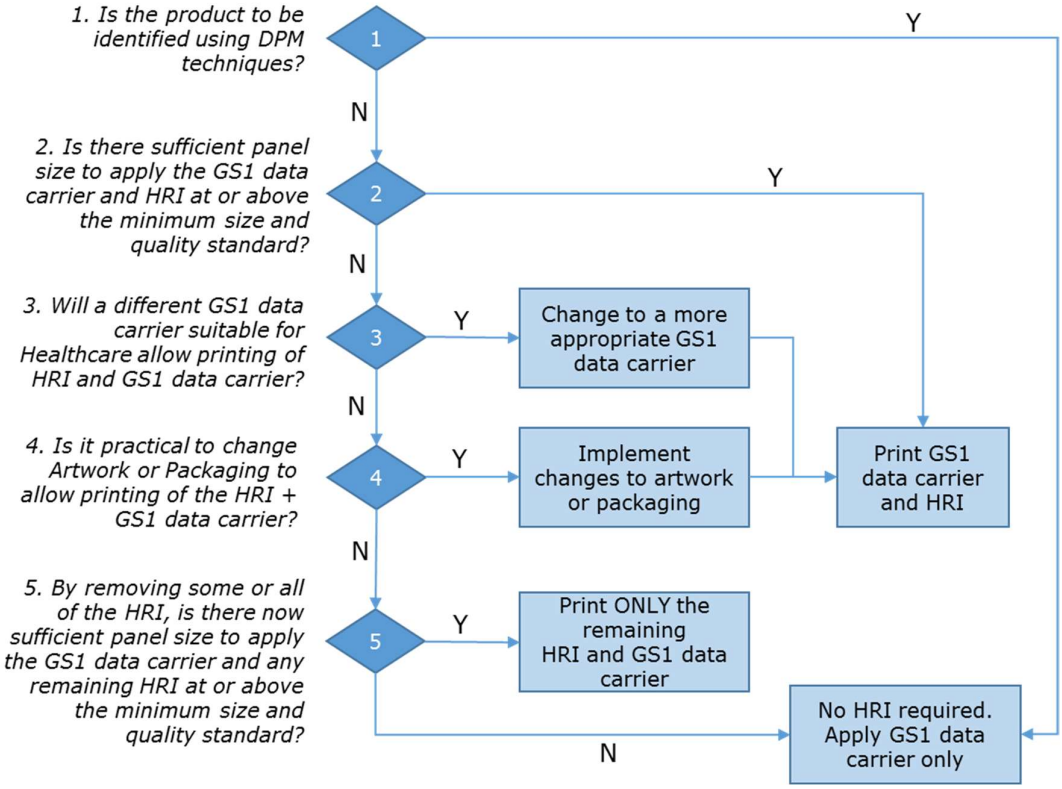

Figure 4-10 Healthcare human readable interpretation (HRI) decision tree (to be used only when limited space is available)

Note: Figure 4-10 is intended for use when there is no regulatory mandate that conflicts with this guidance and where space constraints limit the ability to provide both the GS1 AIDC marking and the associated HRI text—this document does not impact the non-HRI text that is required for compliance with labelling regulations. In all situations, applicable regulatory requirements SHALL take precedence. Brand owners are responsible to understand and comply with applicable regulations and to document deviations from those regulations and their justifications for such deviations in the product master record files or other formal document control files.

Note: Active potency, AI (7004) HRI rule. Printing of the active potency on the item is controlled by regulation. Human readable interpretation of the active potency is not required on the trade item.

4.14.2 General retail consumer trade item human readable text rules

General retail consumer trade items have specific rules that build on the general human readable interpretation (HRI) rules in section 4.14.

Note: The following rules are intended for global use. Exceptions may occur only when mandated by regulatory or legal requirements. For example, refer to the sections related to healthcare section 4.14 for regulated healthcare trade items sold in retail.

The barcodes for point-of-sale (POS) SHALL have GTIN in HRI adjacent to the barcode. HRI for any additional consumer engagement (~~extended packaging~~web-based information) barcode encoding GS1 Digital Link URI SHALL be left to the discretion of the brand owner. See Figure 4-11.

4.15.1 Multiple AIDC data carrier management practices (all sectors and applications)

1. **Barcode symbology identifiers:** All barcode scanning systems SHALL deploy symbology identifiers (see section 5.1.3) and when using GS1 Application Identifiers, process them according to GS1 rules (see section 7.8).
2. **Use of GS1 identifier:** All GS1 data carriers that are used for the same application on an entity SHALL encode the same GS1 identifier (e.g., same GTIN, same GRAI, etc.).
3. **Use of GS1 identifier attributes:** When the GS1 identifier and GS1 identifier attributes occur in multiple data carriers on a single entity, the attribute values SHALL be the same.
4. **GTIN plus attribute(s) flag:** When applications require GTIN plus additional data to be captured in multiple data carriers, modifications to systems SHOULD be made to automate this requirement.
5. **Adjacent placement of barcodes:**
    a. When two barcodes can be used for the same application (i.e., point-of-sale, point of care, general distribution) they SHOULD be placed adjacent to each other while maintaining their Quiet Zones. The orientation (stack or row of barcodes) or sequence (which barcode is placed on the left, right, top, or bottom) SHALL be determined by the brand owner.
    b. When adjacent placement on one surface of an entity is not possible, the barcodes SHOULD be placed on an adjoining surface of the entity. This practice does not supersede any section 6 barcode placement rule (e.g., 8 mm (0.3 inch) free space between barcodes and panel edge).
    c. When there is more than one barcode with a GS1 identifier on an entity, it is essential that the scanning systems will ensure:
        i. The system SHALL only process one set of the desired data.
        ii. Scanning systems SHOULD only produce one acknowledgement (e.g., beep) when multiple barcodes are scanned from the same entity.
6. **Non-adjacent placement of barcodes:** When two barcodes are used for different applications (e.g., point-of-sale, ~~extended packaging~~web-based information), they SHOULD be placed non-adjacent to one another.
7. **Obscure placement of barcodes:** When a barcode is used for production control purposes only (e.g., Data Matrix encoded with a non-GS1 syntax to match label to product), it SHOULD be made as obscure as possible or even obstructed on the trade item package.
8. **Use of GS1-128, 2D barcode, EPC/RFID or NFC tags as supplemental data carrier with EAN/UPC or ITF-14 as the main barcode:** In general retail and general distribution, where EAN/UPC or ITF-14 is used to encode the GTIN and where a GS1-128, a 2D barcode, an EPC/RFID tag or NFC tag is used to encode GTIN attributes, the same GTIN SHALL be encoded in all GS1 AIDC data carriers.
9. **GS1-128 as supplemental barcode:** When an EAN/UPC or ITF-14 is used to encode GTIN and where GS1-128 is used to encode GTIN attributes, GS1-128 SHOULD encode GTIN and the GTIN attributes in a single barcode to ensure accurate data association.
10. **Use of 2D barcode as supplemental barcode with GS1-128 as main barcode:** In general distribution, where GS1-128 is used to encode a GS1 identifier and attributes, these element strings at a minimum SHALL be encoded in the supplemental 2D barcode.

4.15.2 Use of EPC/RFID as supplemental AIDC data carrier (all sectors and applications)

An EPC/RFID data carrier can only encode globally unique instance level identifiers (see section 3.11 and the current version of the GS1 EPC Tag Data Standard (TDS)). When EPC/RFID is used as an additional data carrier, particular attention must be paid to the identifier used.

a. GTIN, AI (01): When EPC/RFID is used as in addition to a barcode that encodes a GTIN, the SGTIN EPC (SGTIN-96, SGTIN-198, SGTIN+, SGTIN++, DSGTIN+ and DSGTIN++), corresponding to a compound key of AI (01) and AI (21), SHALL be used. When the associated barcode encodes AI (21), it SHALL encode the same, brand-owner assigned

Serial Number used to encode the Serial Number component of the SGTIN EPC on the EPC/RFID tag, taking care not to change any characters and neither add nor remove any leading zeros.

b. ITIP, AI (8006): When EPC/RFID is used in addition to a barcode that encodes AI (8006), the ITIP EPC (ITIP-110, ITIP-212, ITIP+ and ITIP++), corresponding to a compound key of AI (8006) and AI (21), SHALL be used. When the associated barcode encodes AI (21), this SHALL encode the same, brand-owner assigned Serial Number used to encode the Serial Number component of the ITIP EPC on the EPC/RFID tag, taking care not to change any characters and neither add nor remove any leading zeros.

c. GRAI, AI (8003): When EPC/RFID is used in addition to a barcode that encodes AI (8003), the GRAI EPC (GRAI-96, GRAI-170, GRAI+ and GRAI++) SHALL be serialised. When there is a business need, the associated barcode can also encode a serialised GRAI. In that case the value of the serialised GRAI in the EPC/RFID and associated barcode SHALL be the same.

d. GLN, AI (414): When EPC/RFID is used in addition to a barcode that encodes AI (414), and when there is a business need, the associated barcode can also encode a GLN extension component (AI (254)). In that case, the value of AI (414) and AI (254) in the EPC/RFID tag (SGLN-96, SGLN-195, SGLN+ and SGLN++) and associated barcode SHALL be the same.

e. GDTI, AI (253): When EPC/RFID is used in addition to a barcode that encodes AI (253), the GDTI EPC (GDTI-96, GDTI-113, GDTI-174, GDTI+ and GDTI++) must be serialised. When there is a business need, the associated barcode can also encode a serialised GDTI. In that case the value of the serialised GDTI in the EPC/RFID and associated barcode SHALL be the same.

4.15.3 Use of NFC tags as supplemental AIDC data carrier (~~extended packaging~~web-based information applications)

The NFC tag SHALL carry the same hostname and GS1 identifier values in the GS1 Digital Link URI as 2D barcodes and if additional data elements appear in the GS1 Digital Link URI they also SHALL contain the same values.

The GS1 Digital Link URI SHALL be encoded in the first record of an NFC Forum NDEF message, as defined in the NFC Forum Data Exchange Format (NDEF) Technical Specification.

NFC tags SHALL encode the GS1 Digital Link URI using a Well-Known Type URI record as defined in the NFC Forum URI Record Type Definition Technical Specification. Identifier Code 2 (https://www.) or Identifier Code 4 (https://), SHALL be used as defined in the NFC Forum URI Record Type Definition Technical Specification.

The URI Identifier Code that is used SHALL ensure http protocol alignment between the NFC tag and the accompanied QR Code or Data Matrix. In other words, if `https://` is encoded in the QR Code, `https://` SHALL also be encoded on the NFC tag, using NFC Forum URI Identifier Code 4.

4.15.4 GS1 multiple barcode management practice for general retail

In addition to the requirements outlined in section 4.15.1, the following rules apply to the use of multiple barcodes for general retail.

1. **Migration to 2D barcodes:** A GS1 DataMatrix, QR Code (GS1 Digital Link URI) or Data Matrix (GS1 Digital Link URI), SHALL be used in addition to the EAN/UPC, or a GS1 DataBar retail POS family of barcodes, to ensure stakeholders that are not yet able to consistently scan 2D barcodes are not negatively impacted. Application Standard Profiles in section 8 provide information on conformance requirements for the transition period and future use of 2D barcodes at retail POS.

When there is more than one barcode with GTIN on trade items, it is essential that the POS systems will ensure:

- The system SHALL only process one set of the desired data in the final transaction.
- Scanning systems SHOULD only produce one acknowledgement (e.g., beep) when multiple barcodes are scanned from the same trade item.

Stacked must be used. The selection of one or the other depends on the width of the print head or the area available for the symbol.

When using GS1 DataBar Expanded or GS1 DataBar Expanded Stacked symbols to encode the Global Trade Item Number (GTIN), any required additional data SHOULD be included within the same symbol.

If GS1 DataBar is used on small items that do not need omnidirectional scanning capability, then GS1 DataBar Stacked, GS1 DataBar Limited, or GS1 DataBar Truncated SHOULD be used. GS1 DataBar Limited cannot be used to encode a GTIN-14 data structure with an indicator value greater than 1. Otherwise GS1 DataBar Truncated or GS1 DataBar Stacked must be used. GS1 DataBar Stacked is the smallest symbol; however, as the heights of both rows are very low, it is harder to scan and cannot be used with wand scanners. If space is available, GS1 DataBar Limited can be used for number structures that it can encode. Otherwise GS1 DataBar Truncated SHOULD be used for GTIN-14 data structures with an indicator value greater than 1.

If the symbol is a GS1 DataBar Composite symbol, then using a wider GS1 DataBar symbol such as GS1 DataBar Truncated instead of GS1 DataBar Limited may be preferable because the wider companion 2D Composite Component may result in a GS1 DataBar Composite symbol of lower overall height even though the GS1 DataBar component itself is slightly taller.

If the data capacity in a two-column or three-column CC-B 2D Composite Component is inadequate to encode the required 2D component's data message, then the linear component can be changed to increase the number of columns of the companion CC-B component. This will increase the maximum data capacity of the CC-B component as shown in the table below.

Table 5-31 Data capacity of CC-B

Number of CC-B columns	Used with	Maximum numeric characters	Maximum alpha characters
2	GS1 DataBar Stacked GS1 DataBar Stacked Omnidirectional	95	55
3	GS1 DataBar Limited	219	127
4	GS1 DataBar Omnidirectional GS1 DataBar Expanded GS1 DataBar Expanded Stacked	338	196

5.6 Two-dimensional barcodes - GS1 DataMatrix symbology

5.6.1 Introduction

This section of the *GS1 General Specifications* addresses some of the technical aspects of the two-dimensional barcode symbology called GS1 DataMatrix. GS1 DataMatrix is a standalone, two-dimensional barcode symbology that is made up of square modules arranged within a perimeter finder pattern. Unlike a Composite Component symbol (see section 5.11.1), GS1 DataMatrix does not require a linear symbol. GS1 DataMatrix has been used in the public domain since 1994.

This section provides only a brief technical description and overview of the GS1 DataMatrix symbology. A more detailed technical specification can be found in the International Standard *ISO/IEC 16022.* The GS1 system has adopted GS1 DataMatrix partly because, like GS1 QR Code, GS1 DataMatrix can encode GS1 system data structures and offers other technical advantages. Its compact design and the existence of various production methods that accommodate placing the symbology onto various substrates offer certain advantages over other symbologies currently in the GS1 system.

Data Matrix ISO version ECC 200 is the only version that supports GS1 system data structures, including Function 1 Symbol Character (FNC1). The ECC 200 version of Data Matrix uses Reed-Solomon error correction and this feature helps correct for partially damaged symbols. In the remainder of this section, the ECC 200 version of Data Matrix is assumed when the symbology is described as GS1 DataMatrix. This version of Data Matrix is similar in stability to ISO versions of current GS1 system symbologies.

Implementation of GS1 DataMatrix SHALL be done per approved GS1 system application guidelines. This section will not describe the specific applications. The user needs to refer to specific application standards and guidelines in other sections of these *GS1 General Specifications* as they are approved for use. However, some of the production processes that are used to produce GS1 DataMatrix symbols are as follows:

- Direct part marking, such as is done by dot peening on items, such as automotive, aircraft metal parts, medical instruments and surgical implants.
- Laser or chemically etched parts with low contrast or light marked elements on a dark background (e.g., circuit boards and electronic components, medical instruments, surgical implants).
- High-speed ink jet printed parts and components where the marked dots cannot form a scannable linear symbol.
- Very small items that require a symbology with a square aspect ratio and/or cannot be marked within the allocated packaging space by existing GS1 DataBar and Composite symbols.
- ~~Use with B2C Extended Packaging applications.~~

GS1 DataMatrix symbols are read by two-dimensional imaging scanners or vision systems. Most other scanners that are not two-dimensional imagers cannot read GS1 DataMatrix. GS1 DataMatrix symbols are restricted for use with applications that will involve imaging scanners throughout the supply chain.

5.6.2 GS1 DataMatrix features and symbol basics

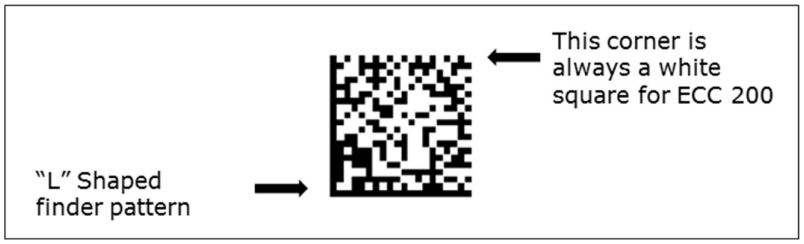

Figure 5-49 GS1 DataMatrix symbol

- Figure 5-49 represents a GS1 DataMatrix symbol with 20 rows and 20 columns (including the perimeter finder pattern but not including Quiet Zones).
- GS1 DataMatrix solid "L" shaped finder or alignment pattern is one module wide.
- GS1 DataMatrix Quiet Zone is one module wide on all four sides. As with other barcode Quiet Zones, do not print in this area.
- ECC 200 symbols can always be recognised from older versions of Data Matrix because the corner opposite the middle of the finder pattern is a zero module or white in normal print.
- For square GS1 DataMatrix symbols, only an even number of rows and columns exist. Depending on data requirements, symbols can range from 10 row by 10 columns (10 x10) to 144x144 (including finder pattern but not the Quiet Zone).
- For normal printing, a module is one X by one X in dimension. Representation of data: A dark module is a binary one and a light module is a binary zero (or a light module is a binary one and a dark module is a binary zero for a symbol with reflectance reversal).
- ECC 200 (ECC = Error Checking and Correction) that uses Reed-Solomon error correction. Table 5-32 *ECC 200 Square Symbol attributes*, shows the fixed amounts of error correction associated for each allowable Data Matrix symbol size.
- FNC1 for GS1 system compatibility SHALL be encoded at the beginning of the data string. When a separator character is needed at the end of an element string, either the Function 1 Symbol Character (FNC1) or the control character <GS> (ASCII value 29 (decimal), 1D (hexadecimal)) SHALL be used and SHALL be represented in the transmitted message by control character <GS> (ASCII value 29 (decimal), 1D (hexadecimal)).

5.12.3 GS1 symbol specification tables

In order to find the correct barcode specification, you must:

- Find the appropriate GS1 system application area using Figure 5-67.
- If the application area references two symbol specification tables, use the decision tree in Figure 5-68 to determine which one to use.

The table below provides a quick reference list of the symbol quality parameters depending on their type and their application.

Table 5-43 Quick reference on symbol quality

Symbology	Application or ID key	ISO (ANSI) symbol grade	Aperture	Wavelength
EAN/UPC	GTIN-8	1.5 (C)	See symbol specification tables 1, 2, 3, 4, 6, 8 and 10 for values	660 nm +/-10
EAN/UPC	GTIN-12	1.5 (C)	See symbol specification tables 1, 2, 3, 4, 6, 8 and 10 for values	660 nm +/-10
EAN/UPC	GTIN-13	1.5 (C)	See symbol specification tables 1, 2, 3, 4, 6, 8 and 10 for values	660 nm +/-10
GS1-128	GTIN-12, GTIN-13, GTIN-14	1.5 (C)	See symbol specification tables 2, 4, 5, 6, 8, 9 and 10 for values	660 nm +/-10
GS1-128	SSCC	1.5 (C)	10 mils	660 nm +/-10
ITF-14 (<0.635 mm (0.025 in.) X)	GTIN-12, GTIN-13, GTIN-14	1.5 (C)	See symbol specification tables 2, 4, 6, 8 and 10 for values	660 nm +/-10
ITF-14 (≥0.635 mm (0.025 in.) X)	GTIN-12, GTIN-13, GTIN-14	0.5 (D)	20 mils	660 nm +/-10
Composite	GTIN-8, GTIN-12, GTIN-13, GTIN-14 and other AIs	1.5 (C)	6 mils	660 nm +/-10
GS1 DataBar	GTIN-8, GTIN-12, GTIN-13, GTIN-14 and other AIs	1.5 (C)	See symbol specification tables 1, 2, 3, 4, 6, 8, 10 and 11	660 nm +/-10
GS1 DataMatrix	Direct part marking, regulated healthcare retail or non-retail consumer trade items, ~~extended packaging~~web-based information and logistic units	1.5 (C)	See symbol specification tables 5, 6, 7, 8, 9, 10 and 11 Table 1 Addendum 1 for AI (8200) for values.	660 nm +/-10
GS1 QR Code	Direct part marking, custom trade item, ~~extended packaging~~web-based information, GDTI, logistic units and GSRN	1.5 (C)	See symbol specification tables 1 Addendum 1 for AI (8200), 5, 7, 9 and 11 for values.	660 nm +/-10
GS1-128, GS1 DataMatrix, GS1 QR Code, GS1 DotCode	Supporting European Regulation 2018/574 *on technical standards for the establishment and operation of a traceability system for tobacco products*	3.5 (A)	See symbol specification tables 12	660 nm +/- 10

Symbology	Application or ID key	ISO (ANSI) symbol grade	Aperture	Wavelength
Data Matrix	GS1 Digital Link Standard URI syntax for ~~extended packaging~~web-based information applications	1.5 (C)	See symbol specification table 1 Addendum 2 for GS1 Digital Link for values	660 nm +/- 10
QR Code	GS1 Digital Link Standard URI syntax for ~~extended packaging~~web-based information applications	1.5 (C)	See symbol specification table 1 Addendum 2 for GS1 Digital Link for values	660 nm +/- 10

8.5 ASP 4: ~~General retail consumer t~~Trade item~~s~~ with ~~extended packaging~~web-based information

Additional i~~I~~nformation on a trade item can be ~~extended~~ accessed when the ~~consumer~~ user scans an AIDC data carrier to reach web resources online. For example, a shopper scans a box of packaged pasta to find a selection of recipes. For new ~~extended packaging~~ web-based information applications, a web-enabled approach using GS1 Digital Link URI syntax and an AIDC data carrier such as QR Code, Data Matrix, EPC/RFID or NFC tag ~~is~~ SHALL be used. For this reason, the ASP focuses solely on the forward-looking approach. Prior to the GS1 Digital Link URI standard, two approaches were available to reach ~~extended packaging~~web-based information applications that were available within the GS1 system of standards. All legacy implementations of these approaches remain conformant but new implementations SHALL use the GS1 Digital Link URI approach.

Table 8-10 ASP 4 conformance requirements

Conformance requirements	~~General retail products~~Trade items using GS1 Digital Link URI
Basis of conformance requirements	Section 2.1.13.1 GS1 Digital Link URI syntax for ~~extended packaging~~web-based information applications for trade items
Identifier choices	GTIN-8, GTIN-12, GTIN-13
Mandatory attribute(s)	N/A
Optional attribute(s)	See section 3.2 for the list of GS1 Application Identifiers that may be used with the identifier
Mandatory choices for a data carrier	QR Code (GS1 Digital Link URI), Data Matrix (GS1 Digital Link URI) For further implementation guidance on retail trade items ~~P~~please refer to the 2D Barcodes at Retail Point-of-Sale Implementation Guideline ~~for further support on implementing 2D barcodes~~.
Optional choices for additional data carriers	NFC tags MAY be used in addition to the mandatory data carrier selected and SHALL encode the GS1 Digital Link URI using a Well-Known Type URI record as defined in the NFC Forum URI Record Type Definition Technical Specification. Identifier Code 2 (https://www.) or Identifier Code 4 (https://), SHALL be used as defined in the NFC Forum URI Record Type Definition Technical Specification.
Agreement on conformant data carriers in the future	EPC/RFID tags MAY be used as an additional data carrier alongside the mandatory choices until the requirements of Policy B11 are met (e.g., 90%+ of smart devices can read EPC/RFID tags). Once these requirements are satisfied, EPC/RFID can be included among the mandatory data carrier options which means an EPC/RFID tag can be used as an alternative to the current mandatory choices.
Barcode size and quality specifications	To determine which Symbol Specification Table is applicable, please refer to the relevant trade item application standard in section 2.1. If the only application is for trade item web-based information, see Table 5-46 Symbol specification table 1 addendum 2 for 2D barcodes contains barcode quality and size specifications for 2D barcodes with GS1 Digital Link URI.
Mandatory choices of GS1 syntax	This application SHALL use the uncompressed form of GS1 Digital Link URI, see GS1 Digital Link Standard: URI Syntax for more information

9 GS1 Standards glossary of terms

9.1 GS1 glossary of terms and definitions

The glossary lists the terms and definitions that are applied in this document. Please refer to www.gs1.org/glossary for the online version.

Term	Acronym /Abbreviation	Definition
acceptance criteria		An allowance for a small measurement variation between commercial verifiers or operators during barcode verification testing.
add-on symbol		A barcode used to encode information supplementary to that in the main EAN/UPC barcode.
aggregated packaging (per EU 2018/574)		Any packaging containing more than one unit packet of tobacco products. For GS1, this may be either a trade item grouping or logistics unit.
AIDC data carrier		Generic term for a barcode, RFID tag or NFC tag; a means of physically affixing machine-readable data to a physical entity.
AIDC media		The specific form of object/entity where a GS1 AIDC data carrier is displayed.
AIDC media type		The code list for objects/entities (e.g., patient wristband or staff ID card) that displays or carries a GS1 AIDC data carrier.
AIDC media type value		A predefined two-digit numeric code list value used to signify the AIDC media type (e.g., ID = 10, patient wristband = 01).
AIM DotCode		A two-dimensional barcode symbology rendered by printing dots per the AIM DotCode Specification.
allocation		The association of an issued GS1 Prefix, GS1 Company Prefix, or GS1 identification key to its corresponding entity or object in accordance with the GS1 rules and policies.
alphanumeric		A character set that contains alphabetic characters (letters), numeric digits (numbers) and other characters, such as punctuation marks.
aperture		A physical opening that is part of the optical path in a device such as a scanner, photometer, or camera. Most apertures are circular, but they may be rectangular or elliptical.
Application Standard Profile	ASP	A template that records conformance requirements of existing and any future AIDC application standards, the normative decisions (MSWG, ISO, Regulation, …), maintains centralisation of cross-application rules and related technical specifications.
asset type		A component of the Global Returnable Asset Identifier (GRAI), assigned by the asset owner or manager, in order to create a unique GRAI.
attribute		Additional information about an entity identified with a GS1 identification key.
autodiscrimination		The capability of a reader to automatically recognise and decode multiple barcode symbologies.
automatic identification and data capture	AIDC	A technology used to automatically capture data. AIDC technologies include barcodes, smart cards, biometrics and RFID.
auxiliary patterns		Components of the EAN/UPC symbology. The centre guard bar pattern, the left guard bar pattern and the right guard bar pattern are examples of these.
bar gain/loss		The increase/decrease in bar width due to effects of the reproduction and printing processes.
barcode		A symbol that encodes data into a machine readable pattern of adjacent, varying width, parallel, rectangular or square dark and light spaces. The term barcode is inclusive of all linear and two-dimensional (2D) versions.
barcode verification		The assessment of the printed quality of a barcode based on ISO/IEC standards using ISO/IEC compliant barcode verifiers.
base unit		In a hierarchy of trade item groupings, the consumer trade item level or unit of use.

Term	Acronym /Abbreviation	Definition
dynamic assortment		A trade item that comprises a variable composition of a fixed total count of two or more different trade items, each identified with a GTIN.
EAN/UPC symbology		A family of barcodes including EAN-8, EAN-13, UPC-A and UPC-E barcodes as well as the 2- and 5-digit add-ons. See also EAN-8 barcode, EAN-13 barcode, UPC-A barcode and UPC-E barcode.
EAN-13 barcode		A barcode of the EAN/UPC symbology that encodes GTIN-13 or RCN-13.
EAN-8 barcode		A barcode of the EAN/UPC symbology that encodes GTIN-8 or RCN-8.
economic operator (per EU 2018/574)	EOID	An economic operator is a business or other organisation which supplies goods, works or services within the context of market operations. Related to requirement for EOID for each country in which a party operates a facility.
Electronic Health Record	EHR	Information relevant to the wellness, health and healthcare of an individual, in computer-processable form and represented according to a standardized information model. ISO 18308:2011 Health informatics — Requirements for an electronic health record architecture - https://www.iso.org/standard/52823.html
Electronic Medical Record)	EMR	A computerised system containing a collection of data and information related to the care rendered to an individual within a single healthcare organisation. EMR is often used interchangeably with EPR. Data contained within an EMR may be shared into an Electronic Health Record (EHR) as part of maintaining a complete record of care provided to an individual.
Electronic Patient Record	EPR	A computerised system containing a collection of data and information related to the care rendered to an individual within a single healthcare organisation. EPR is often used interchangeably with EMR. Data contained within an EPR may be shared into an Electronic Health Record (EHR) as part of maintaining a complete record of care provided to an individual.
Electronic Product Code	EPC	An identification scheme for universally identifying physical objects (e.g., trade items, assets and locations) via RFID tags and other means. The standardised EPC data consists of an EPC (or EPC Identifier) that uniquely identifies an individual object, as well as an optional filter value when judged to be necessary to enable effective and efficient reading of the EPC tags.
EPC/RFID		RFID applications in which tags carry an EPC identifier and optional supplemental data, as defined in the GS1 EPC Tag Data Standard (TDS). An EPC/RFID tag must be a Gen2 RFID tag, either High Frequency (HF) as defined in Radio-Frequency Identity Protocols EPC Class-1 HF RFID Air Interface Protocol or Ultra High Frequency (UHF) as defined in EPC Radio-Frequency Identity Generation-2 UHF RFID Standard.
element		A single bar or space of a linear barcode symbol.
EU 2018/574		A European Union Regulation on the traceability of tobacco products.
EUDAMED		European database on medical devices (EUDAMED) https://ec.europa.eu/health/medical-devices-eudamed/overview_en
even parity		A characteristic of the encodation of a symbol character whereby the symbol character contains an even number of dark modules.
~~extended packaging~~		~~An approach to giving consumers access to additional information or services about trade items through their mobile device. It is the ability to retrieve additional information about the trade item through mobile devices or, in general, to link a trade item with trusted virtual information or services.~~
extension digit		The first digit within the Serial Shipping Container Code (SSCC) which is assigned by the company that constructs the logistic unit.
facility (per EU 2018/574)		Any location, building or vending machine where tobacco products are manufactured, stored or placed on the market.
fixed length		Term used to describe a data field in an element string with an established number of characters.
fixed measure trade item		An item always produced in the same predefined version (e.g., type, size, weight, contents, design) that may be sold at any point in the supply chain.

Term	Acronym /Abbreviation	Definition
variable measure trade item		A trade item which may be traded without a predefined measure, such as its weight or length.
version control		The management of different versions of the same entity.
Version Control Number	VCN	A GS1 identification key attribute to facilitate version control, where differentiation is required for multiple occurrences of the same identification used on the same AIDC media type. For example, to ensure only the latest occurrence of access controlled AIDC media is valid upon scanning, where multiple occurrences could present risks (e.g., lost ID badge).
virtual trade item assortment/bundle		Combinations of multiple (same or different) trade items that are not physically combined into a single trade item, but that are presented in selling environments as offers of combinations of multiple trade items (e.g., products or services).
VMN-12		Deprecated in favour of: RCN-12
VMN-13		Deprecated in favour of: RCN-13
warranty		A guarantee or claim that a party makes.
web-based information		An approach to giving users access to additional information or services about trade items through their mobile device. It is the ability to retrieve additional information about the trade item through mobile devices or, in general, to link a trade item with trusted virtual information or services.
wide-to-narrow ratio		The ratio between the wide elements and the narrow elements in a barcode symbology such as ITF-14 that has two different element widths.
X-dimension		The specified width of the narrowest element of a barcode (see module).

9.2 GS1 abbreviations

Abbreviation	Term
ADC	Automatic Data Capture
aUI	aggregate Unique Identifier (per EU 2018/574)
DL	GS1 Digital Link
EDI	Electronic Data Interchange
EU	European Union
FID	Facility Identifier (per EU 2018/574)
GDSN	Global Data Synchronisation Network
GRCTI	General Retail Consumer Trade Item
GS1 DL URI	GS1 Digital Link Uniform Resource Identifier
GS1 UIC EXT	GS1 UIC Extension
ISBN	International Standard Book Number
ISO	International Organization for Standardization
ISSN	International Standard Serial Number
ITIP	Identification of Trade Item Pieces
NDEF	NFC Data Exchange Format (NFC Forum)
NHRN	National Healthcare Reimbursement Number
NTIN	National Trade Item Number
RHTI	Regulated healthcare trade item
RTD	Record Type Definition (NFC Forum)
SKU	Stock Keeping Unit
TPX	Third Party Controlled, Serialised Extension of GTIN (restricted to EU 2018/574 regulatory use)
upUI	unit pack Unique Identifier (per EU 2018/574)
UoM	Unit of Measure