WR #	GSCN Name	Effective Date
24-0157	NHRN for AIFA (Italian Medicines Agency) – GS1 Italy	Aug 2024

Associated Work Request (WR) Number:

N/A

Background:

A need for a harmonised approach for Italy to be in line with other countries who are manufacturing pharmaceutical products using the five data elements:

- GTIN – (Global Trade Item Number)
- Serial Number
- Expiration Date
- Batch Number
- NHRN - (National Healthcare Reimbursement Number)

Non NHRN use could lead to isolation of the local manufacturing plants of the multinationals who are already producing packs for other countries like Spain, Turkey, Brazil, Portugal, India and the USA.

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Rules

Not applicable.

Data carrier specification

Carrier choices

The data carriers for this element string are:

- UPC-A barcode (carrying a GTIN-12)
- EAN-8 barcode (carrying GTIN-8)
- EAN-13 barcode (carrying a GTIN-13)
- GS1 DataBar Retail POS family (carrying GTIN-12 or GTIN-13)

The GS1 DataBar symbols encode a 14-digit numeric string. When encoding GTIN-8, GTIN-12 or GTIN-13 in GS1 DataBar symbols zero-fill with six, two, or one zeroes to the left of the GTIN.

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

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

Symbol placement

There are no specified rules for symbol placement on loose produce scanned at POS.

Unique application processing requirements

Not applicable

2.1.4 Fixed measure trade items scanned in general distribution and at retail POS

Trade items intended for general distribution and retail point-of-sale scanning SHALL carry a barcode from the EAN/UPC or GS1 DataBar retail POS family.

These trade items SHALL be identified with GTIN-8, GTIN-12 or GTIN-13 (see section 2.1.3). For symbol X-dimensions, minimum symbol height and minimum symbol quality, see section 5.12.3.3, *GS1 symbol specification table 3.* During a transition period, 2D barcodes may be applied in addition to the linear barcode. For information on how to manage multiple barcodes see section 4.15. For a summary of all conformance requirements for this AIDC application standard, 2D barcodes, cross-application rules and related technical specifications, see section 8.3.

> **Note**: Allocation of GTIN-8 to new trade items for this application SHALL conform to section 4.2.7

2.1.5 Healthcare primary packaging (non-retail trade items)

Application description

Healthcare primary packaging trade items are pharmaceutical and medical products or their packages presented to support the point-of-care (direct consumption based on right product, dose and route of administration). Because the product is never scanned at retail POS, the use of symbologies beyond EAN/UPC and the use of GTIN-14 data structure is permitted.

These products, which may be packaged in a sterile packaging system or in a non-sterile packaging system, are only marked when the package is intended for dispensing to the consumer in a hospital or equivalent facility (e.g., field hospital, nursing home, home healthcare).

See section 4.15.1 *Multiple barcode management practices for consumer trade items – all sectors* and section 4.15.3 *Multiple barcode management practices for healthcare* if the product is intended for scanning at general retail and also must meet regulatory requirements for this application section based on multiple market use. If an item is a regulated healthcare retail consumer trade

item and also a non-retail trade item then the barcode marking for regulated healthcare retail consumer trade items is required at a minimum.

GS1 key

Required

The allowed key formats for this application are:

■ GTIN-8

■ GTIN-12

■ GTIN-13

■ GTIN-14

Rules

All the GTIN rules described in section 4.

If the regulated healthcare retail consumer trade item to be marked on the primary packaging does not also have secondary packaging, then the primary packaging markings in this section do not apply and are replaced by the required markings in the secondary packaging section (2.1.6).

> ***Example:*** *a bottle of 50 pharmaceutical tablets (the primary package) is not enclosed into a carton (which would represent the secondary packaging). In this instance, the secondary packaging markings are required on the primary packaging level.*

If the required AIDC marks are placed directly on the part, then those AIDC marks (e.g., barcode, human readable interpretation) satisfy the requirements for primary package marking. If those marks are functional (scannable) through the primary packaging, then no additional AIDC marks are required on the primary package.

If the product to be marked has primary packaging that is a blister pack containing several individual pharmaceutical items, for instance a blister pack of 12 pills or tablets, the following rules apply:

■ GTIN is the only required mark.

■ In addition to the GTIN rules described in section 4, see section 4.2.7 for rules on deploying GTIN-8.

Attributes

Required

Figure 2.1.5-1. Overview of required attributes

AIDC marking level for regulated healthcare trade items	Key	Batch/lot number - AI (10)	Expiration date – AI (17)	Serial number – AI (21)	Other
Minimum (pharmaceutical only)	GTIN-8, GTIN-12, GTIN-13, or GTIN-14	No	No	No	None
Enhanced (med device only)	GTIN-8, GTIN-12, GTIN-13, or GTIN-14	Yes	Yes	No	None
Highest – pharmaceutical brand owner AIDC marking	GTIN-8, GTIN-12, GTIN-13, or GTIN-14	No	No	No	None
Highest – medical device - brand owner AIDC marking	GTIN-8, GTIN-12, GTIN-13, or GTIN-14	Yes	Yes	Yes	Active potency, AI (7004), for kits with pharmaceuticals

AIDC marking level for regulated healthcare trade items	Key	Batch/lot number - AI (10)	Expiration date – AI (17)	Serial number – AI (21)	Other
Highest – hospital AIDC marking of pharmaceutical	GTIN-8, GTIN -12, GTIN -13, or GTIN -14	No	Yes, Expiration date and time, AI (7003), if needed for short life items	Yes	None
Highest – hospital AIDC marking of certain medical devices (see section 2.1.8)	GRAI, AI (8003), or GIAI, AI (8004), is optional if GTIN, AI (01), + serial number, AI (21), is not marked on the product.	No	No	GRAI, AI (8003), or GIAI, AI (8004), is optional if GTIN, AI (01), + serial number, AI (21), is not marked on the product.	

To manage healthcare data requirements within GS1 EPC/RFID tags, see section 3.11 and the most recent version of the *EPC Tag Data Standard*.

Optional

For compliance with a national/regional regulatory or industry requirement where the GTIN will not meet the need, a regulated healthcare trade item may be identified with GTIN and AI (710), AI (711), AI (712), AI (713), AI (714), and AI (715) and AI (716) National Healthcare Reimbursement Number, see section 3.8.19.

Rules

All the GTIN rules described in section 4.

National Healthcare Reimbursement Number AI (710), AI (711), AI (712), AI (713), AI (714) and AI (715) and AI (716) must always be used with the GTIN.

Human readable interpretation

For human readable interpretation rules see section 4.14. For HRI rules specific to regulated healthcare retail consumer trade items, see section 4.14.1.

Data carrier specification

Carrier choices

Figure 2.1.5-2. Carrier choices

Preferred option(s) (this is the long-term direction for AIDC marking)	GS1 DataMatrix symbology GS1-128 symbology GS1 DataBar symbology **NOTE:** If a product package serves multiple markets and in one market the specifications in section 2.1.3 apply, then the specification for 2.1.3 must be followed for encoding GTIN (at a minimum) and the rules for use of multiple symbols in section 4.15 apply.
Option in addition to the barcode	EPC/RFID tag. GS1 expects the barcode as the minimum requirement for packaging however EPC/RFID is an approved AIDC carrier which can be deployed in addition to the barcode.
Other acceptable options (GS1 strongly supports existing options for symbol marking as a	The following symbols have been permitted by GS1 and therefore could appear on some existing packages. For that reason, GS1 does not want to preclude them as an option, particularly where GTIN without additional data (Minimum ID)

guiding principle and therefore supports all previous AIDC marking specifications)	is required. With that said, symbols that allow all the data to be concatenated into one symbol are the preferred option.
	EAN/UPC symbology family (UPC-A, UPC-E, EAN-8 and EAN-13) may be used to encode the GTIN-8, GTIN-12 or GTIN-13 Identification. ITF-14 symbols may be used where printing conditions require the application of a less demanding symbology. It may not be used when attribute information is required. ITF-14 symbols can encode the GTIN-8, GTIN-12, GTIN-13, or GTIN-14 of the item. It is not used to encode attribute information.
	GS1 Composite Component is also used in combination with linear symbols by GS1 and therefore remains a legitimate option however, GS1 DataMatrix is preferred based on its ability to encode all information in one symbol and do so efficiently in terms of print speed and panel size.

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

See section 5.12.3.6, GS1 symbol specification table 6.

Symbol placement

All the symbol placement guidelines defined in section 6.

Unique application processing requirements

For a description of processing requirements, see section 7.

2.1.6 Healthcare secondary packaging (regulated healthcare retail consumer trade items)

A regulated healthcare retail consumer trade item not intended to be scanned in high volumes per consumer transaction at retail, but does require additional data beyond GTIN to support regulatory requirements. This means, these trade items support:

■ GTIN-8, GTIN-12, or GTIN-13 data structures.

■ GTIN attributes such as batch/lot number, expiration dates, or serial numbers.

They may be marked with GS1 DataMatrix that require imaging-based scanners or linear symbologies such as GS1 DataBar or GS1-128. If an item is a general retail consumer trade item and regulated healthcare retail consumer trade item, then the barcode marking for general retail is required at a minimum.

GS1 key

Required

The allowed key formats for this application are:

■ GTIN-8

■ GTIN-12

■ GTIN-13

GS1 firmly endorses the use of GTIN in all markets, however there are instances where GS1 Member Organisations have allocated a portion of their numbering capacity to identification schemes administered nationally by external agencies.

These coding schemes while recognised within the GS1 system framework by the assignment of a GS1 Prefix are defined, in Healthcare, as National Trade Items Numbers (NTINs) rather than Global Trade item Numbers (GTINs). NTINs are unique with respect to GTINs as their values are a subset of all possible values of GTIN. However, their definition, allocation and life cycle rules are defined by an organisation external to GS1.

The degree to which NTIN definitions and rules are compatible with those of GTIN is specific to each national definition. Whilst NTIN will always provide globally unique identification within the GTIN pool of numbers, this does not mean NTIN provides the same level of interoperability as GTIN with other GS1 standards, such as GDSN and ONS. In markets where NTIN is adopted exclusively of GTIN, the reciprocal nature of GTIN identification and marking across markets is lost and becomes problematic where one package which should serve multiple markets (e.g., common language) requires multiple NTINs rather than one GTIN.

Rules

See the GTIN rules in section 4.2.

Attributes

Required

Figure 2.1.6-1. Overview of required attributes

AIDC marking level for regulated healthcare trade items	Key	Batch/lot number - AI (10)	Expiration date – AI (17)	Serial number – AI (21)	Other
Minimum – Pharmaceutical & medical device	GTIN-8, GTIN-12, or GTIN-13	No	No	No	None
Enhanced – Pharmaceutical & medical device	GTIN-8, GTIN-12, or GTIN-13	Yes	Yes	No	None

AIDC marking level for regulated healthcare trade items	Key	Batch/lot number - AI (10)	Expiration date – AI (17)	Serial number – AI (21)	Other
Highest – Brand owner AIDC marking	GTIN-8, GTIN-12, or GTIN-13	Yes	Yes	Yes	Potency AI (7004) (for pharmaceutical, and for medical device kits with pharmaceuticals)
Highest – Hospital AIDC marking of pharmaceuticals	GTIN-8, GTIN-12, or GTIN-13	No	Yes, AI (7003) if needed for short life items	Yes	None
Highest - Hospital AIDC marking of certain medical devices (see section 2.1.8)	GRAI, AI (8003), or GIAI, AI (8004), is optional if GTIN, AI (01), + serial number, AI (21), is not marked on the product.	No	No	GRAI, AI (8003), or GIAI, AI (8004), is optional if GTIN, AI (01), + serial number, AI (21), is not marked on the product.	

To manage healthcare data requirements within EPC/RFID tags, see section 3.11 and the most recent version of the *EPC Tag Data Standard*.

Optional

For compliance with a national/regional regulatory or industry requirement where the GTIN will not meet the need, a regulated healthcare trade item may be identified with GTIN and AI (710), AI (711), AI (712), AI (713), AI (714), and AI (715) and AI (716) National Healthcare Reimbursement Number. See section 3.8.19 for details on the use of AI (710), AI (711), AI (712), AI (713), AI (714), and AI (715) and AI (716).

Rules

National Healthcare Reimbursement Number AI (710), AI (711), AI (712), AI (713), AI (714), and AI (715) and AI (716) must always be used with the GTIN.

Data carrier specification

Carrier choices

See the "data carrier specification carrier choices" recommendations on preferred options, options in addition to the barcode and other acceptable options found at the end of section 2.1.5.

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

For regulated healthcare consumer trade items scanned in retail pharmacy and general distribution or non-retail pharmacy and general distribution see section 5.12.3.8, *GS1 symbol specification table 8*.

For regulated healthcare retail consumer trade items not scanned in general distribution see section 5.12.3.10, *GS1 symbol specification table 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.

GS1 General Specifications Standard

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

Figure 3.2-1. 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

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AI	Data Content	Format [1]	FNC1 required [4]	Data title
712	National Healthcare Reimbursement Number (NHRN) – Spain CN: AI (712)	N3+X..20	(FNC1)	NHRN CN
713	National Healthcare Reimbursement Number (NHRN) – Brasil DRN: AI (713)	N3+X..20	(FNC1)	NHRN DRN
714	National Healthcare Reimbursement Number (NHRN) – Portugal AIM: AI (714)	N3+X..20	(FNC1)	NHRN AIM
715	National Healthcare Reimbursement Number (NHRN) – United States of America NDC: AI (715)	N3+X..20	(FNC1)	NHRN NDC
716	National Healthcare Reimbursement Number (NHRN) – Italy AIC: AI (716)	N3+X..20	(FNC1)	NHRN AIC
... [5]	National Healthcare Reimbursement Number (NHRN) – Country "A" NHRN	N3+X..20	(FNC1)	NHRN xxx
723s [6]	Certification reference: AI (723s)	N4+X2+X..28	(FNC1)	CERT # s
7240	Protocol ID: AI (7240)	N4+X..20	(FNC1)	PROTOCOL
7241	AIDC media type: AI (7241)	N4+N2	(FNC1)	AIDC MEDIA TYPE
7242	Version Control Number (VCN): AI (7242)	N4+X…25	(FNC1)	VCN
7250	Date of birth: AI (7250)	N4+N8	(FNC1)	DOB
7251	Date and time of birth: AI (7251)	N4+N12	(FNC1)	DOB TIME
7252	Biological sex: AI (7252)	N4+N1	(FNC1)	BIO SEX
7253	Family name of person: AI (7253)	N4+X..40	(FNC1)	FAMILY NAME
7254	Given name of person: AI (7254)	N4+X..40	(FNC1)	GIVEN NAME
7255	Name suffix of person: AI (7255)	N4+X..10	(FNC1)	SUFFIX
7256	Full name of person: AI (7256)	N4+X..90	(FNC1)	FULL NAME
7257	Address of person: AI (7257)	N4+X..70	(FNC1)	PERSON ADDR
7258	Baby birth sequence indicator: AI (7258)	$N4+N_1+X_1+N_1$	(FNC1)	BIRTH SEQUENCE
7259	Baby of family name: AI (7259)	N4+X..40	(FNC1)	BABY
8001	Roll products - width, length, core diameter, direction, splices: AI (8001)	N4+N14	(FNC1)	DIMENSIONS
8002	Cellular mobile telephone identifier: AI (8002)	N4+X..20	(FNC1)	CMT No.
8003	Global Returnable Asset Identifier (GRAI): AI (8003)	N4+N14[+X..16]	(FNC1)	GRAI
8004	Global Individual Asset Identifier (GIAI): AI (8004)	N4+X..30	(FNC1)	GIAI
8005	Price per unit of measure: AI (8005)	N4+N6	(FNC1)	PRICE PER UNIT
8006	Identification of an individual trade item (ITIP) piece: AI (8006)	N4+N14+N2+N2	(FNC1)	ITIP
8007	International Bank Account Number (IBAN): AI (8007)	N4+X..34	(FNC1)	IBAN
8008	Date and time of production: AI (8008)	N4+N8[+N..4]	(FNC1)	PROD TIME
8009	Optically readable sensor indicator: AI (8009)	N4+X..50	(FNC1)	OPTSEN
8010	Component/Part Identifier (CPID): AI (8010)	N4+Y..30	(FNC1)	CPID
8011	Component/Part Identifier serial number: AI (8011)	N4+N..12	(FNC1)	CPID SERIAL
8012	Software version: AI (8012)	N4+X..20	(FNC1)	VERSION
8013	Global Model Number (GMN): AI (8013)	N4+X..25	(FNC1)	GMN
8014	Highly Individualised Device Registration Identifier (HIDRI): AI (8014)	N4+X..25	(FNC1)	MUDI

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3.8.18 GS1 UIC with Extension 1 and Importer index: AI (7040)

The GS1 Application Identifier (7040) indicates that the GS1 Application Identifier data field contains the Unique Identification Code of an EU 2018/574 ID Issuer, the National Authority that appointed it (via the GS1 UIC Extension 1), and, if applicable, the Importer (via an Importer Index). The UIC begins with one numeric digit followed by one alphanumeric character from the ISO/IEC 646 invariant character set per figure 7.11-1. The GS1 UIC Extension 1 is one alphanumeric character from the ISO/IEC 646 invariant character set per figure 7.11-1. The Importer Index is one character and include A-Z, a-z, 0-9, - (hyphen) and _ (underscore). Underscore is used to indicate the importer index does not apply (null). The other characters identify up to 63 importers of a product per country of placement. This identifier is authorised for use by the ID Issuer as long as it meets minimum requirements established by GS1. The use of UIC is limited to application standard 2.1.14 European Regulation 2018/574, traceability of tobacco products. The UIC shall be used solely exclusively to facilitate identification of country level authorisation for GS1 identification keys within illicit trade surveillance systems. The UIC shall not be used with GS1 identification keys for open, supply chain systems.

Figure 3.8.18-1. Format of the element string

GS1 Application Identifier	GS1 UIC with Extension 1 and Importer index		
	GS1 UIC	Extension 1	Importer index
7 0 4 0	N_1X_2	X_3	X_4

The data transmitted from the barcode reader means that the element string denoting a Unique Identification Code has been captured.

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

3.8.19 UN/CEFACT freight unit type: AI (7041)

The GS1 Application Identifier (7041) indicates that the data field contains the type of freight of the logistic unit. The codes used for freight unit type are the UN/CEFACT alphanumeric codes. GS1 maintains a list based on the UN/ECE Recommendation 21 codes on GS1 Navigator which includes some additional GS1 code values. All codes in the UN/ECE Recommendation 21 and GS1 code list are valid codes to be used with AI (7041). A list of code values maintained by GS1 can be viewed at: https://navigator.gs1.org/edi/codelist-details?name=PackageTypeCode.

Figure 3.8.19-1. Format of the element string

GS1 Application Identifier	UN/CEFACT freight unit type code
7 0 4 1	$X_1 ... X_{i\ (2 \le i \le 4)}$

The data transmitted from the barcode reader means that the element string denoting the freight unit type has been captured. As this element string is an attribute to a logistic unit it must be processed together with the SSCC of the unit to which it relates (see section 4.13 *Data relationships*). When indicating this element string in the non-HRI text section of a barcode label, the following data title SHOULD be used: **UFRGT UNIT TYPE**.

3.8.19 3.8.20 National Healthcare Reimbursement Number (NHRN): AIs (710), (711), (712), (713), (714), and (715) and (716)

The GS1 Application Identifiers (710), (711), (712), (713), (714), and (715) and (716) indicate that the GS1 Application Identifier data field contains a National Healthcare Reimbursement Number, from the NHRN GS1 Application Identifier series, associated to the Global Trade Item Number (GTIN) of the trade item. The GS1 Application Identifiers (710), (711), (712), (713), (714), and (715) and (716) indicate a specific NHRN from within the assigned series.

Use of the NHRN GS1 Application Identifier, associated to the GTIN of the trade item, is needed for compliance with a national/regional regulatory or industry requirement where the GTIN will not meet the need.

GTIN is the GS1 identifier for pharmaceutical and medical device trade items. The GS1 Application Identifier for National Healthcare Reimbursement Number is provided to meet regulatory or industry requirements until they are amended to accept the GTIN as a compliant identifier.

Within this application are the rules and recommendations for the association of NHRNs to the Global Trade Item Number (GTIN) where regulatory requirements require an NHRN for product identification, registration or reimbursement purposes.

There are a number of known NHRNs but at this time not all are required to be encoded within the data carrier found on the trade item. Flexibility for additional assigned NHRN AIs has been provided if required.

The National Healthcare Reimbursement Number GS1 Application Identifier is an initial step in a migration path to the most efficient method to identify trade items. GS1 recommends that Healthcare stakeholders faced with national numbers:

a. Use GTIN for all supply chain and reimbursement purposes (GTIN used in the data carrier and as the NHRN) as this is the most efficient and effective way for all stakeholders to identify trade items.

b. Use GTIN, cross-referenced to an NHRN in an existing database, in the case of an existing system of NHRNs (i.e. GTIN used in the data carrier with the NHRN found via cross-reference).

c. Use GTIN with an associated NHRN (GTIN and NHRN both used in the data carrier via the NHRN AI) as an intermediate solution for those who cannot use "a" or "b". GS1 only recommends this as a migration path to noted options "a" or "b".

⚠ **Important**:

- There is a mandatory association of the National Healthcare Reimbursement Number Application Identifier with the GTIN.

- The NHRN is usually assigned by a national authority to healthcare brand owners for specific trade items and SHALL only be used for compliance to regulatory requirements where the GTIN alone will not meet the requirements.

- Additional individual NHRN AIs can only be assigned by GS1 and only in response to a work request being submitted through GSMP.

- The GTIN and all associated NHRNs SHOULD be concatenated into a single data carrier (i.e. single GS1-128, GS1 DataMatrix).

- Use of NHRN on the item is controlled by and subject to the rules and regulations of national/regional agencies. Those rules and/or regulations may supersede these recommendations.

- More than one NHRN may need to be associated with a given GTIN.

The general format of an NHRN GS1 Application Identifier is:

Figure 3.8.19-1. Format of the element string

GS1 Application Identifier	National Healthcare Reimbursement Number
n n n	X_1———variable length———>X_{20}

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When an NHRN AI is approved, the overall variable length (i.e. allowable number of characters) is specified by the national authority, with a twenty (20) character maximum as noted in the general format above if applicable.

The GS1 Application Identifiers used with this element string, their specific format and associated regulatory body or assigning organisation, are shown in the figure below:

Figure 3.8.19-2. Overview of NHRN Application Identifiers

GS1 Application Identifier	National Healthcare Reimbursement Number			Organisation
710	X_1	variable length	X_{20}	Germany IFA
711	X_1	variable length	X_{20}	France CIP
712	X_1	variable length	X_{20}	Spain National Code
713	X_1	variable length	X_{20}	Brazil ANVISA
714	X_1	variable length	X_{20}	Portugal INFARMED
715	X_1	variable length	X_{20}	United States of America FDA
716	X_1	variable length	X_{20}	Italy AIFA
nnn (*)	X_1	variable length	X_{20}	Country "A" NHRN Authority
(*) An example to illustrate future additional NHRNs. If additional NHRN AIs are required, a request for a new NHRN AI SHALL be made through GSMP.				

Companies wishing to apply one of the listed NHRN AIs will need to associate that NHRN AI to the trade item's GTIN according to the NHRN AI rules and should contact their GS1 Member Organisation for further considerations of use.

The data transmitted from the barcode reader means that the element string denoting a National Healthcare Reimbursement Number has been captured. This element string is an attribute of a trade item and must be processed together with the GTIN of the trade item to which it relates (see section 4.13 *Data relationships*).

When indicating this element string in the non-HRI text section of a barcode label, the data title listed in figure 3.2-1 SHOULD be used.

3.8.20 3.8.21 Certification reference: AI (723s)

The GS1 Application Identifier (723s) indicates that the GS1 Application Identifier data field contains a reference to a product certification. The certification reference is an attribute of a trade item or an individual asset.

As multiple certificates may be present, each with an individual certification reference, the fourth digit of the AI (s in the figure below) indicates the sequence of the certification references.

The general structure of AI (723s) is:

- Certification scheme (2 characters) defined by GS1. The following code values are currently allowed:
  - "EM" (European Marine Equipment Directive). See http://eur-lex.europa.eu/legal-content/EN/AUTO/?uri=CELEX:32018R0608 for more information.
- Certification reference (28 characters)

Figure 3.8.20-1. Format of the element string

GS1 Application Identifier	Certification scheme	Certification reference
7 2 3 s	$X_1 X_2$	X_3 ——variable length—→ X_{30}

The data transmitted from the barcode reader means that the element string denoting the certification reference has been captured. As this element string is an attribute of a trade item or an asset, it must be processed together with the GTIN of the trade item or the GIAI of the asset to which it relates (see section 4.13 *Data relationships*).

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

Invalid pairs of element strings				Rule
AI	Designation	AI	Designation	
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	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.

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.

The figure below reflects the use case requirements to date. Should future applications arise that require associations they will be added at that time.

Some explanation on figure 4.13.2-1:

- 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.

Figure 4.13.2-1. Mandatory association of element strings

If element string		Then mandatory associated element string	Rule
AI	Designation	AI	
01 with N_1 = 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 N_1 = 9, 02 with N_1 = 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.	242	The GTIN of a custom trade item 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 8006 XOR 8026 ***	Batch/lot number SHALL occur in combination with: ▪ a GTIN; or ▪ a GTIN of contained trade items; or ▪ an ITIP ▪ 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 8006 XOR 8026 ***	These dates SHALL occur in combination with: ▪ a GTIN; or ▪ a GTIN of contained trade items; or ▪ an ITIP ▪ an ITIP of contained trade item pieces
12	Due date	8020 AND 415	The due date SHALL occur in combination with the payment slip reference number and the GLN of the invoicing party
17	Expiration date (of a coupon)	255	The expiration date of a coupon SHALL occur in combination with the GCN.
20	Internal product variant	01 XOR 02 XOR 8006 XOR 8026 ***	Internal product variant SHALL occur in combination with: ▪ a GTIN; or ▪ a GTIN of contained trade items; or ▪ an ITIP ▪ an ITIP of contained trade item pieces
21	Serial number	01 XOR 8006***	The serial number SHALL occur in combination with: ▪ a GTIN; or ▪ an ITIP Note: SGTIN is a common term for the combination of GTIN and serial number.
22	Consumer product variant	01	The consumer product variant SHALL occur in combination with a GTIN of a retail consumer trade item.
235	Third Party Controlled Serialised Extension of GTIN	01	The Third Party Controlled Serialised Extension of GTIN SHALL occur in combination with a GTIN of a trade item.

If element string		Then mandatory associated element string	Rule
AI	Designation	AI	
240	Additional product identification	01 XOR 02 XOR 8006 XOR 8026 ***	The additional product identification SHALL occur in combination with: ▪ a GTIN; or ▪ a GTIN of contained trade items; or ▪ an ITIP ▪ an ITIP of contained trade item pieces
241	Customer part number	01 XOR 02 XOR 8006 XOR 8026 ***	The customer part number SHALL occur in combination with: ▪ the GTIN; or ▪ the GTIN of contained trade items; or ▪ an ITIP ▪ an ITIP of contained trade item pieces
242	Made-to-Order variation number	(01 with $N_1 = 9$) XOR (02 with $N_1 = 9$) XOR (8006 with $N_1 = 9$) XOR (8026 with $N_1 = 9$) ***	The Made-to-Order variation number SHALL occur in combination with: ▪ the GTIN; or ▪ the GTIN of contained trade items; or ▪ an ITIP ▪ an ITIP of contained trade item pieces Note: The GTIN must relate to a custom trade item. The first position of the GTIN is "9" for such trade items.
243	Packaging Component Number	01	The Packaging Component Number SHALL occur in combination with the GTIN
250	Secondary serial number	(01 XOR 8006***) AND 21	The secondary serial number SHALL occur in combination with the serial number <u>and</u>: ▪ a GTIN; or ▪ an ITIP
251	Reference to source entity	01 XOR 8006***	The reference to source entity SHALL occur in combination with: ▪ a GTIN; or ▪ An ITIP
254	GLN extension component	414	The GLN extension component SHALL occur with the Identification of a physical location (GLN).
30	Variable count of items	01 XOR 02	The variable count of items SHALL occur with: ▪ a GTIN; or ▪ a GTIN of contained trade items. Note: The GTIN must relate to a variable measure trade item.
3nnn*	Trade measures	01 XOR 02	Trade measures SHALL occur in combination with: ▪ a GTIN; or ▪ a GTIN of contained trade items. Note: The GTIN must relate to a variable measure trade item.
3nnn**	Logistic measures	00 OR 01	Logistic measures SHALL occur in combination with: ▪ an SSCC ▪ a GTIN
337n	Kilograms per square metre	01	Kilograms per square metre SHALL occur in combination with a GTIN.
37	Count of units contained	00 AND (02 XOR 8026)	The count of units contained SHALL occur in combination with the SSCC and: ▪ GTIN of contained trade items, or ▪ ITIP of contained trade item pieces.
390n	Amount payable – single monetary area	8020 AND 415	The amount payable (single monetary area) SHALL occur in combination with the payment slip reference number and the GLN of the invoicing party.

If element string		Then mandatory associated element string	Rule
AI	Designation	AI	
390n	Coupon value – single monetary area	255	The coupon value (single monetary area) SHALL occur in combination with the Global Coupon Number.
391n	Amount payable – with ISO currency code	8020 AND 415	The amount payable (with ISO currency code) SHALL occur in combination with the payment slip reference number and the GLN of the invoicing party.
392n	Applicable amount payable - single monetary unit	01 AND (30 XOR 31nn XOR 32nn XOR 35nn XOR 36nn *)	The applicable amount payable (single monetary area) SHALL occur in combination with the GTIN and either: ▪ variable count of items; or ▪ a trade measure. Note: The GTIN must relate to a variable measure trade item.
393n	Applicable amount payable – with ISO currency code	01 AND (30 XOR 31nn XOR 32nn XOR 35nn XOR 36nn *)	The applicable amount payable (with ISO currency code) SHALL occur in combination with the GTIN and either: ▪ variable count of items; or ▪ a trade measure. Note: The GTIN must relate to a variable measure trade item.
394n	Percentage of a coupon	255	The percentage of a coupon SHALL occur in combination with the Global Coupon Number.
395n	Amount payable per unit of measure single monetary area (variable measure trade item)	01 AND (30 XOR 31nn XOR 32nn XOR 35nn XOR 36nn *)	The applicable amount payable per unit of measure (single monetary area) SHALL occur in combination with the GTIN and either: ▪ variable count of items; or ▪ a trade measure. Note: The GTIN must relate to a variable measure trade item.
403	Routing code	00	The routing code SHALL occur in combination with an SSCC.
415	GLN of the invoicing party	8020	The GLN of the invoicing party SHALL occur in combination with the payment slip reference number.
422	Country of origin	01 XOR 02 XOR 8006 XOR 8026 ***	The country of origin SHALL occur in combination with: ▪ a GTIN; or ▪ a GTIN of contained trade items; or ▪ an ITIP ▪ an ITIP of contained trade item pieces
423	Country of initial processing	01 XOR 02	The country of initial processing SHALL occur in combination with: ▪ a GTIN; or ▪ a GTIN of contained trade items.
424	Country of processing	01 XOR 02	The country of processing SHALL occur in combination with: ▪ a GTIN; or ▪ a GTIN of contained trade items.
425	Country of disassembly	01 XOR 02	The country of disassembly SHALL occur in combination with: ▪ a GTIN; or ▪ a GTIN of contained trade items.
426	Country of full processing	01 XOR 02	The country of full processing SHALL occur in combination with: ▪ a GTIN; or ▪ a GTIN of contained trade items.
427	Country subdivision of origin	(01 XOR 02) AND 422	The country subdivision of origin SHALL occur in combination with the country of origin and: ▪ a GTIN; or ▪ a GTIN of contained trade items.
430N	Ship-to / Deliver-to address GS1 Application Identifiers	00	Ship-to / Deliver-to address GS1 Application Identifiers SHALL occur in combination with an SSCC

If element string		Then mandatory associated element string	Rule
AI	Designation	AI	
4303	Ship-to / Deliver-to address line 2	4302 and 00	Ship-to / Deliver-to address line 2 SHALL occur in combination with line 1 of a ship-to address and an SSCC
4309	Ship-to / Deliver-to GEO location	00	Ship-to / Deliver-to GEO location SHALL occur in combination with an SSCC
431N	Return-to address GS1 Application Identifiers	00	Return-to address GS1 Application Identifiers SHALL occur in combination with an SSCC
4313	Return-to address line 2	4312 AND 00	Return-to address line 2 SHALL occur in combination with line 1 of a return-to address
432N	Service-related GS1 application identifiers for transport process	00	Service-related GS1 application identifiers SHALL occur in combination with an SSCC
4330	Maximum temperature in Fahrenheit	00	Maximum temperature in Fahrenheit SHALL occur in combination with an SSCC
4331	Maximum temperature in Celsius	00	Maximum temperature in Celsius SHALL occur in combination with an SSCC
4332	Minimum temperature in Fahrenheit	00	Minimum temperature in Fahrenheit SHALL occur in combination with an SSCC
4333	Minimum temperature in Celsius	00	Minimum temperature in Celsius SHALL occur in combination with an SSCC
7001	NATO stock number	01 XOR 02 XOR 8006 XOR 8026 ***	The NATO stock number SHALL occur in combination with: ▪ a GTIN; or ▪ a GTIN of contained trade items; or ▪ an ITIP ▪ an ITIP of contained trade item pieces
7002	UNECE meat carcasses and cuts classification	01 XOR 02	The UNECE meats carcasses and cuts classification SHALL occur in combination with: ▪ a GTIN; or ▪ a GTIN of contained trade items.
7003	Expiration date and time	01 XOR 02	The expiration date and time SHALL occur in combination with: ▪ a GTIN; or ▪ a GTIN of contained trade items.
7004	Active potency	01 AND 10	The active potency SHALL occur in combination with the batch/lot number and the GTIN.
7005	Catch area	01 XOR 02	The catch area SHALL occur in combination with: ▪ a GTIN; or ▪ a GTIN of contained trade items.
7006	First freeze date	01 XOR 02	The first freeze date SHALL occur in combination with: ▪ a GTIN; or ▪ a GTIN of contained trade items.
7007	Harvest date	01 XOR 02	The harvest date SHALL occur in combination with: ▪ a GTIN; or ▪ a GTIN of contained trade items.
7008	Species for fishery purposes	01 XOR 02	The species for fishery purposes SHALL occur in combination with: ▪ a GTIN; or ▪ a GTIN of contained trade items.

If element string		Then mandatory associated element string	Rule
AI	Designation	AI	
7009	Fishing gear type	01 XOR 02	The fishing gear type SHALL occur in combination with: ▪ a GTIN; or ▪ a GTIN of contained trade items.
7010	Production method	01 XOR 02	The production method SHALL occur in combination with: ▪ a GTIN; or ▪ a GTIN of contained trade items.
7011	Test by date	01 XOR 02	The test by date and optional time SHALL occur in combination with: ▪ a GTIN; or a GTIN of contained trade items.
703(s)	Number of processor	01 XOR 02	The number of processor SHALL occur in combination with: ▪ a GTIN; or ▪ a GTIN of contained trade items.
710, 711, 712, 713, 714, 715, 716	National Healthcare Reimbursement Number	01	National Healthcare Reimbursement Number(s) SHALL occur in combination with the GTIN.
7020	Refurbishment lot ID	(01 XOR 8006***) AND 416	The refurbishment lot ID SHALL occur in combination with the GLN of production/service location and: ▪ a GTIN; or ▪ an ITIP
7021	Functional status	01 XOR 8006***	The functional status SHALL occur in combination with: ▪ a GTIN; or ▪ an ITIP
7022	Revision status	(01 XOR 8006***) AND 7021	The revision status SHALL occur in combination with the functional status and: ▪ a GTIN; or ▪ an ITIP
7041	UN/CEFACT freight unit type	00	The UN/CEFACT freight unit type SHALL occur with an SSCC.
723s	Certification reference	01 XOR 8004	Certification reference SHALL occur in combination with: ▪ a GTIN; or ▪ a GIAI
7240	Protocol ID	01 XOR 8006	The protocol ID SHALL occur in combination with a GTIN
7241	AIDC media type	8017 XOR 8018	The AIDC media type SHALL occur in combination with: ▪ the GSRN for the provider; or ▪ the GSRN for the recipient
7242	Version Control Number (VCN)	8017 XOR 8018	The Version Control Number SHALL occur in combination with: ▪ the GSRN for the provider; or ▪ the GSRN for the recipient
8001	Dimensions of roll products	01	Dimensions of roll products SHALL occur in combination with the GTIN. Note: The GTIN must relate to a variable measure trade item.
8005	Price per unit of measure	01 XOR 02	The price per unit of measure SHALL occur in combination with: ▪ a GTIN; or ▪ a GTIN of contained trade items. Note: The GTIN must relate to a variable measure trade item.
8007	International Bank Account Number	8020 AND 415	The International Bank Account Number SHALL occur in combination with the payment slip reference number and the GLN of the invoicing party.

Commented [DM3]: WR23-272

7.3 Validation of the electronic message regarding system consistency

The GS1 system enables system users to process scanned data without human intervention. This implies that the electronic message generated from data scanned and transmitted from data carriers needs to substitute for all human activities during a particular transaction. In other words, the transmitted data must provide all information required for its correct processing.

The GS1 system is designed to fulfil these requirements. Section 4 describes the association of element strings to form valid messages.

Validation of system consistency refers to the verification of the correct composition of the electronic message by a system processing the transaction messages. Whether the message is adequate in business application terms is dealt with by the application software.

Only messages containing a valid set of element strings defined in the GS1 system can be unambiguously processed. The processing of invalid messages may lead to data file errors because the meaning and relationship of the element strings are not defined. This is illustrated in figures 7.3-1 and 7.3-2.

Figure 7.3-1. Examples of valid messages

Element strings in message			Comment
AI 00	AI 33nn		Identification of a logistic unit + logistic weight
AI 00	AI 01		Identification of an entity as a logistic unit and as a fixed measure trade item
AI 00	AI 01 '9'	AI 31nn	Identification of an entity as a logistic unit and as a variable measure trade item
AI 00	AI 02	AI 37	Identification of a logistic unit and its contained fixed measure trade items
AI 01	AI 10	AI 15	Identification of a trade item + lot number + best before date
AI 00	AI 401		Identification of a logistic unit as part of a consignment
AI 01 '9'	AI 31nn	AI 33nn	Identification of a variable measure trade item + logistic weight
AI 00	AI 01	AI 33nn	Identification of an entity as a logistic unit and a fixed measure trade item; the logistic weight is associated with the identification number of the logistic unit
AI 01	AI 710		Identification of a trade item + National Healthcare Reimbursement Number
AI 01	AI 711		Identification of a trade item + National Healthcare Reimbursement Number
AI 01	AI 712		Identification of a trade item + National Healthcare Reimbursement Number
AI 01	AI 713		Identification of a trade item + National Healthcare Reimbursement Number
AI 01	AI 714		Identification of a trade item + National Healthcare Reimbursement Number
AI 01	AI 715		Identification of a trade item + National Healthcare Reimbursement Number
AI 01	AI 716		Identification of a trade item + National Healthcare Reimbursement Number

Figure 7.3-2. Examples of invalid messages

Element strings in message			Comment
AI 00	AI 01	AI 37	Invalid identification of an entity as a logistic unit and as a fixed measure trade item; AI 37 (quantity of items contained) must be used with AI 02 only
AI 01	AI 10	AI 33nn	Invalid identification of a fixed measure trade item + lot number; AI 33nn is incorrect because logistic measures of a fixed measure trade item are fixed attributes stored in the data file
AI 01'9'	AI 33nn		Invalid identification of a variable measure trade item + logistic weight; the mandatory element string with a trade measure is missing
AI 00	AI 11		Invalid identification of a logistic unit; AI 11 is incorrect because a production date must be associated with the identification number of a trade item
AI 00	AI 01	AI 02/37	Invalid identification of an entity as a logistic unit and as a fixed measure trade item; AI 02/37 must not be associated with AI 01
AI 01	AI 30		Invalid identification of a fixed measure trade item; AI 30 must only be associated with the identification number of a variable measure trade item
AI 02	AI 37		Invalid identification of the fixed measure trade units contained in an unidentified logistic unit; AI 00 is missing

Figure 7.8.6.3-2. Example of mixed GS1 symbologies
(GTIN encoded in UPC-E, Best before date in Composite)

0 121230 8

(15)021231

7.8.7 GS1 Application Identifiers with implied decimal point positions

For all GS1 Application Identifiers with an implied decimal point position, the following rules apply:

For predefined length AIs

■ For predefined length GS1 Application Identifiers with a data field length of 9 or less, the maximum number of decimal places is equal to the length of the AI data field as indicated in the format of the GS1 Application Identifier, minus 1. For example, for an AI with data format N8 the maximum number of decimal places is 7.

■ For predefined length GS1 Application Identifiers with a length greater than 9, the maximum number of decimal places is 9. For example, for an AI with data format N12 the maximum number of decimal places is 9.

Example for predefined length AIs:

The data field format of AI (394n) is N4, so the maximum number of implied decimal places is 3.

Element string (3943)1020 specifies that the data field includes 3 decimal places and therefore has an implied decimal point after the first digit: 1.020

For variable-length AIs

■ For variable-length GS1 Application Identifiers with encoded data of 9 digits or less, the maximum number of decimal places is equal to the length of the encoded data, minus 1. For example, for a data field containing 4 digits the maximum number of decimal places is 3.

■ For variable-length GS1 Application Identifiers with encoded data of more than 9 digits, the maximum number of decimal places is 9. For example, for a data field containing 11 digits the maximum number of decimal places is 9.

Example for variable-length AIs:

The data field format of AI (392n) is N..15, so the maximum number of implied decimal places is 9. Element string (3929)300123456789 specifies a data field of 12 digits that includes 9 decimal places and therefore has an implied decimal point after the third digit: 300.123456789.

Element string (3923)3000200 specifies a data field of 7 digits that includes 3 decimal places and therefore has an implied decimal point after the fourth digit: 3000.200

> **Note**: Consult the specific GS1 Application Identifier for additional restrictions that may apply to that GS1 Application Identifier.

7.8.8 National Healthcare Reimbursement Number (NHRN)

Some national or regional regulatory organisations may require pharmaceuticals and/or medical devices be identified with locally specific National Healthcare Reimbursement Numbers (NHRNs). For

compliance with these national/regional regulatory or industry requirements where the GTIN does not meet current need, the trade item SHALL be identified with GTIN and AIs (710), (711), (712), (713), (714), ~~and~~ (715) and (716) National Healthcare Reimbursement Number.

One or more NHRNs may be associated with a single GTIN and encoded within the appropriate GS1 Data carrier in order to meet multiple market business needs. See figure below for examples of multiple NHRNs.

Additional individual NHRN AIs can only be assigned by GS1 and only in response to a work request being submitted through GSMP.

Figure 7.8.8-1. Examples of valid messages

Element strings in message								Comment
AI 01	AI 710							GTIN Identification of a trade item + Country "A" NHRN
AI 01	AI 710	AI 711						GTIN Identification of a trade item + Country "A" NHRN + Country "B" NHRN
AI 01	AI 710	AI 711	AI 712					GTIN Identification of a trade item + Country "A" NHRN + Country "B" NHRN + Country "C" NHRN
AI 01	AI 710	AI 711	AI 712	AI 713				GTIN Identification of a trade item + Country "A" NHRN + Country "B" NHRN + Country "C" NHRN + Country "D" NHRN
AI 01	AI 710	AI 711	AI 712	AI 713	AI 714			GTIN Identification of a trade item + Country "A" NHRN + Country "B" NHRN + Country "C" NHRN + Country "D" NHRN + Country "E" NHRN
AI 01	AI 710	AI 711	AI 712	AI 713	AI 714	AI 715		GTIN Identification of a trade item + Country "A" NHRN + Country "B" NHRN + Country "C" NHRN + Country "D" NHRN + Country "E" NHRN + Country "F" NHRN
AI 01	AI 710	AI 711	AI 712	AI 713	AI 714	AI 715	AI 716	GTIN Identification of a trade item + Country "A" NHRN + Country "B" NHRN + Country "C" NHRN + Country "D" NHRN + Country "E" NHRN + Country "F" NHRN + Country "G" NHRN

7.9 Check digit/character calculations

7.9.1 Standard check digit calculations for GS1 data structures

This algorithm is identical for all fixed length numeric GS1 data structures (including GDTI, GLN, GRAI, etc.) that require a check digit.

Figure 7.9.1-1. Check digit algorithm

Digit positions																		
GTIN-8										N_1	N_2	N_3	N_4	N_5	N_6	N_7	N_8	
GTIN-12							N_1	N_2	N_3	N_4	N_5	N_6	N_7	N_8	N_9	N_{10}	N_{11}	N_{12}
GTIN-13						N_1	N_2	N_3	N_4	N_5	N_6	N_7	N_8	N_9	N_{10}	N_{11}	N_{12}	N_{13}
GTIN-14					N_1	N_2	N_3	N_4	N_5	N_6	N_7	N_8	N_9	N_{10}	N_{11}	N_{12}	N_{13}	N_{14}
17 digits		N_1	N_2	N_3	N_4	N_5	N_6	N_7	N_8	N_9	N_{10}	N_{11}	N_{12}	N_{13}	N_{14}	N_{15}	N_{16}	N_{17}
18 digits	N_1	N_2	N_3	N_4	N_5	N_6	N_7	N_8	N_9	N_{10}	N_{11}	N_{12}	N_{13}	N_{14}	N_{15}	N_{16}	N_{17}	N_{18}
Multiply value of each position by																		
x3	X1	x3	x1	x3	x1	x3	x1	x3	x1	x3	x1	x3	x1	x3	x1	x3		
Accumulated results = sum																		
Subtract sum from nearest equal or higher multiple of ten = check digit →																		