



The Global Language of Business

How to write GDSN Validation Rules

Lists the rules and conventions to be used when developing or modifying GDSN Validation Rules

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Document conventions

The keywords, SHALL, SHALL NOT, and MAY, when they appear in this document, are to be interpreted as described in in Annex G of the ISO/IEC Directives, Part 2, 2001, 4th edition, as defined here:

- **SHALL** means that all conforming implementations must do what the statement says, otherwise the implementation is not conforming. No deviation is permitted.
- **SHALL NOT** means that all conforming implementations must not do what the statement prohibits, otherwise the implementation is not conforming. No deviation is permitted.
- **MAY** (or **CAN**) means that a conformation implementation is allowed to do what the statement says, but it is not required to for conformance.

1 Introduction

GS1 Validation Rules are a part of the GS1 system of standards and SHALL be followed by all the parties that intend to conform to the GS1 standards for which the Validation Rules have been defined.

Validation Rules SHALL be developed and maintained following the GSMP process.

This document provides rules on constructing Validation Rules covering the following GS1 domains:

- GDSN (Global Data Synchronisation Network): all messages currently used within the GDS Network within the business domains of Catalogue Item Synchronisation, Price Synchronisation, Item Authorisation and Party Synchronisation
- GEPIR (Global Electronic Party Information Registry)
- GLN (Global Location Number) Registries

When new sets of Validation Rules are developed for other GS1 domains, they should follow rules provided in this document. As the GS1 standards evolve, this document may need to be revised.

2 Rules for writing GS1 Validation Rules

2.1 Validation Rule structure

[R01]

GS1 Validation Rules SHALL use the following constraint expressions (see full definitions [here](#))

- SHALL – is required
- SHALL NOT – is not permitted

Example 1: If `isTradeItemADespatchUnit` is equal to 'true' and `isTradeItemNonPhysical` is equal to 'false' or is empty then `grossWeight` **SHALL** be greater than '0'.

Example 2: If `tradeItemLicenseTitle` is not empty, then it **SHALL NOT** exceed one iteration per `languageCode`.

[R02]

GS1 Validation Rules SHALL be composed of the following components:

- Rule identifier number
- Structured rule
- Machine readable expression in Schematron syntax SHALL be included whenever possible
- Error message
- Affected attributes SHALL be listed in two separate categories
 - prerequisite attributes
 - impacted attributes
- Business problem addressed by the rule - SHALL be included
- Both pass and fail example SHALL be included
- Affected context categories SHALL be included for CIN
The full list of contexts can be found in the `TradeItemContextCode` code list:
<http://apps.gs1.org/GDD/Pages/clHome.aspx?FilterField1=codeList&FilterValue1=TradeItemContextCode>

[R03]

The Validation Rule identifier SHALL be a number assigned consecutively and SHALL NOT be reused (numbers of the deprecated rules SHALL remain unused).

[R04]

The Structured Rule MAY have a type of condition or statement.

The rules of condition type SHALL have the following structure:

- Conditional rule
 - If + [condition clause]
Example 1: *If `dataCarrierTypeCode` equals 'EAN_8'*
 - then + [constraint: SHALL or SHALL NOT] written in capital letters + [consequence clause]
Example 2: *...then the first six digits of the `TradeItem/GTIN` SHALL equal '000000'.*
 - alternative clause MAY be provided, if needed; if present, it SHALL begin with "else" followed by the alternative consequence
- Statement – requirement specification on attribute(s) - unconditional

Example 3: *There SHALL be at least one iteration of gtin, targetMarket gpcCategoryCode or dataSource/gln.*

[R05]

Every Validation Rule SHALL provide an error message to be displayed if the validation fails and explain why. The error message SHALL provide easily understandable error description and it MAY contain a placeholder where the incorrect value can be inserted.

Example 1: *If targetMarketCountryCode equals ('840' (United States) or '124' (Canada)) and uniformResourceIdentifier is used, then fileFormatName shall be used.*

Example 2: *TradeItem/gtin is <value>. If dataCarrierTypeCode equals 'EAN_8', then the first six digits of the TradeItem/GTIN SHALL equal '000000'.*

[R06]

Every Validation Rule SHALL list all the impacted attributes from all the messages affected by this rule. For every affected attribute a full X-Path SHALL be provided.

Example 1: *If isTradeItemADespatchUnit is equal to 'true' and isTradeItemNonPhysical is equal to 'false' or is empty then grossWeight shall be greater than '0'.*

/catalogue_item_notification:catalogueItemNotificationMessage/transaction/documentCommand/catalogue_item_notification:catalogueItemNotification/catalogueItem/tradeItem/tradeItemInformation/extension/tradeItemMeasurementsModule/tradeItemMeasurements/tradeItemWeight/grossWeight
/catalogue_item_notification:catalogueItemNotificationMessage/transaction/documentCommand/catalogue_item_notification:catalogueItemNotification/catalogueItem/tradeItem/isTradeItemADespatchUnit
/catalogue_item_notification:catalogueItemNotificationMessage/transaction/documentCommand/catalogue_item_notification:catalogueItemNotification/catalogueItem/tradeItem/isTradeItemNonPhysical

[R07]

If an attribute name has more than one instance possible and the rule applies only to one of them, then the distinguishing part of the x-Path SHALL be included in both rule and error message.

Example: *tradeItem/gtin*

[R08]

Validation Rules SHALL have a description of the business problem addressed by this rule, when needed.

Rationale: *Structured rules tend to be written in technical language difficult for human readability and their business advantage may not be apparent. Business problem description can make the purpose of the rule clear.*

Example: *There are changes in the definition for the isTradeItemAConsumerUnit attribute as part of the GDSN Major Release. The attribute will no longer be used to determine a POS unit. It will only refer to the unit of end consumption. As a result this may cause a change in some of validations. Review all validations which reference or utilize the attribute isTradeItemAConsumerUnit to determine if they need to be reworked, changed, or deleted.*

[R09]

Complex Validation Rule SHALL include an example of attribute values that will PASS and attribute values that will FAIL the validation

Example 1:

Structured Rule: *if (isTradeItemPackedIrregularly equals 'FALSE' or is not populated) and trade item is at top level and layerHeight is not populated and nestingIncrement is populated, then tradeItemMeasurements/height*

shall be equal to or greater than $((\text{child item nestingIncrement} \times (\text{quantityOfCompleteLayers} - 1)) + \text{tradeItemMeasurements/height of the child item} + \text{platform height})$.

Error Message: tradeItemMeasurements/height shall not be lower than the total height of the child items. layerHeight and nestingIncrement shall affect this height. If the trade item contains a platform the height of the platform is included in the height.

Example 2:

<i>nestingIncrement (Child Item)</i>	= 6 CMT
<i>quantityOfCompleteLayersContainedInATradeItem</i>	= 3 EA
<i>platform height</i>	= 6 CMT

*FAIL: tradeItemMeasurements/height = 20 CMT
because $(5 \times 3) + 6 = 21$ CMT, so it is SMALLER*

*PASS: tradeItemMeasurements/height = 21 CMT
because $(5 \times 3) + 6 = 21$ CMT, so it is EQUAL*

Rationale: Some Validation Rules related to Business Rules may require some level of interpretation. Clear examples showing attribute data which passes or fails will help consistent interpretation by Data Pools when coding the rule.

[R10]

All Validation Rules MAY be translated to pseudo-code, using the X-path for affected attributes, structured rule and the error message. See [R02]

[R11]

Validation Rules SHALL specify the Constrained Party that the rule applies to.

Example: *Source Data Pool, Recipient Data Pool, Global Registry*

[R12]

GDSN - Validation Rules SHALL specify the message name(s) the rule pertains to.

Example: *Catalogue Item Notification, All optional GDSN compliant messages*

[R13]

If the Validation Rule applies globally, the Target Market Scope SHALL equal 'Global', if the rule applies to specific Target Market or specific Target Market is excluded, the form SHALL always be ISO country code 3166-1 (3-numeric) and ISO Country names in brackets

Example: *528 (Netherlands), 056 (Belgium), Global, Global excluding 056 (Belgium)*

[R14]

Each Validation Rule SHALL be classified as:

- 'Technical' – covering restrictions for repetition of language, measurement or currency
- 'Business' – covering all rules other than 'Technical'

[R15]

Validation Rules SHALL NOT be developed for conditions that are defined in XML schemas (by XML constrained data types).

Rationale: Compliance to XSD definitions are already validated when XML instance is checked against the standard GS1 XML Schema. Additional Validation Rules checking the same conditions unnecessarily complicates the standard, without adding any value.

Example: The 13-digit GLN is defined in the GS1 schema as the `xsd:string` type with the following pattern facet: `\d{13}` It means that any element where the GLN type is applied, can only have a value that equals 13 numeric characters, no more and no less than this. Any other value will cause the XML instance to be not valid and rejected. Therefore, there is no need to create a Validation Rule stating that GLN should be 13 digits long.

2.2 Conventions for writing Validation Rules

Each Validation Rule SHALL respect the following conventions:

[R16]

Presence of a value in an attribute SHALL be referred to as 'used'. Attributes that SHALL NOT have a value, SHALL be referred to as 'not used'.

Example: *If attribute A is used, then attribute B SHALL NOT be used*

[R17]

All attributes in both a structured rule and error message SHALL be expressed in camel case and SHALL NOT be expressed as a business term. Business terms MAY be used in the business rationale section.

Example:

Correct: tradeItem/gtin

Wrong: Trade Item GTIN

[R18]

When expressing that an attribute has a certain value, the verb 'equal' SHALL be used.

Example: *...then the first six digits of the TradeItem/GTIN SHALL equal '000000'.*

[R19]

All values in both a structured rule and error message SHALL be between single quotes: ` `.

Example: *If dataCarrierTypeCode equals 'EAN_8'*

[R20]

If multiple requirements on an attribute need to be included, brackets "()" MAY be included for readability.

Example: *If the datatype of an attribute equals (Description, Description35, Description70, Description80, Description200, Description250, Description500, Description1000, Description2500 or Description5000), then the value of the associated @languageCode shall be a code from the Code List ISO 639.*

[R21]

If a choice between multiple values exists, they SHALL be separated with a comma "," and before the last value 'or' SHALL be used

Example: *If the datatype of an attribute equals (Description, Description35, Description70, Description80, Description200, Description250, Description500, Description1000, Description2500 or Description5000) then the value of the associated @languageCode shall be a code from the Code List ISO 639.*

[R22]

In the structured rule, if a choice exists between a number of values, where values either both apply or one or the other value applies, this SHALL be denoted by "and/or"

Example 1: If individualUnitMinimumSize and/or individualUnitMaximumSize are not empty then isTradeItemABaseUnit must equal 'true'..

[R23]

If the data type of an attribute contains @languageCode, @measurementUnitCode, @currencyCode then repeatability for value, language, unit of measure or currency SHALL be indicated.

Example: If maximumWeightOfAnimalBeingFed is not empty, then it shall not exceed one iteration per measurementUnitCode

[R24]

Attributes used in pair or groups:

- Attribute A and B SHALL be used together.
- Attribute A and B SHALL both not be used.

Example: grossWeight and netWeight shall be used together.

[R25]

Boolean data type SHALL be expressed as 'true' or 'false'

Example: If isTradeltemAnOrderableUnit is equal to '**true**' and isTradeltemNonPhysical is equal to '**false**' or is empty then grossWeight shall be greater than '0'.

[R26]

Calculations: if A=X then sum of B+C must equal or be greater than Y or value of D

- Multiplication SHALL be expressed using 'x'
- Division SHALL be expressed using '/'
- Addition SHALL be expressed using '+'
- Subtraction SHALL be expressed using '-'

Example: if (isTradeltemPackedIrregularly equals 'false' or is not used) and trade item is at top level and layerHeight is used and nestingIncrement is not used then tradeltemMeasurements/height shall equal or be greater than ((layerHeight x quantityOfCompleteLayersContainedInATradeltem) + platform height).

[R27]

Date time comparison: SHALL be expressed using 'before' or 'in the future'

Example: If cancelDateTime is not empty then value shall be **in the future** or equal to current date.

[R28]

Constraints on iteration of an attribute SHALL be expressed using 'maximum'

Example: There shall be a **maximum** of one iteration of totalScreenArea per measurementUnitCode.

3 Rules for submitting a Work Request for a GS1 Validation Rule

The request for a new Validation Rule SHALL contain the following information:

[R29] Submitter's name SHALL always be provided

Example: John Doe

[R30] Submitter Company SHALL always be provided

Example: *Widget Corporation*

[R31] Submitter Email SHALL always be provided

Example: johnndoe@widget.com

[R32] Line number SHALL be provided if one Work Request is submitted for multiple rules. Every requested rule SHALL be placed in a separate line.

Example: 1

[R33] Business Rational SHALL always be provided. It SHALL clearly explain the business problem to be addressed by the requested new rule or by the change in an existing rule. This business rationale will be included in the published rule, when the Work Requested is accepted (See: [R02] and [R08])

Example 1:

The rule is blocking business process

Example 2:

There are changes in the definition for the isTradeItemAConsumerUnit attribute as part of the GDSN Major Release. The attribute will no longer be used to determine a POS unit. It will only refer to the unit of end consumption. As a result this may cause a change in some of validations. Review all validations which reference or utilize the attribute isTradeItemAConsumerUnit to determine if they need to be reworked, changed, or deleted.

[R34] Action to be performed on the requested rule SHALL always be provided. One of the following values SHALL be used:

- Add – for new rules
- Delete – for existing rules that need to be removed
- Change – for existing rules that need to be modified

[R35] Rule number SHALL be provided for the requested modification or deletion of existing rules. For new rules this field SHALL be left empty.

Example: 1410

[R36] Proposed Structured Rule SHALL be provided for requested new and modified rules. For deleted rules this field SHALL be left empty. The new structured rule SHALL be consistent with [R04]

Note: The error message MAY be modified before the publication, following the WR review.

Example:

If dangerousGoodsRegulationCode equals 'ADR' and dangerousGoodsPackingGroup is not empty then dangerousGoodsPackingGroup must equal ('NA', 'I', 'II' or 'III').

[R37] Requests for new rules and modification of existing rules SHALL have example data that will pass the validation. See also [R09]

Example:

dangerousGoodsRegulationCode = 'ADR'

dangerousGoodsPackingGroup = 'I'

[R38] Requests for new rules and modification of existing rules SHALL have example data that will fail the validation. See also [R09]

Example 1:

dangerousGoodsRegulationCode = 'ADR'

dangerousGoodsPackingGroup = 'VII'

[R39] Requests for new rules and modification of existing rules SHALL have a proposed error message to be displayed if the validation fails and explain why. See also [R05]

Note: The error message MAY be modified before the publication, following the WR review.

Example:

Discontinued Date must be after Registration Date

[R40] Requests for new rules and modification of existing rules SHALL have a rule classification. See also [R14]

Note: The classification MAY be modified before the publication, following the WR review.

Example:

Technical

[R41] Requests for new rules and modification of existing rules SHALL have a geographical scope provided. See also [R13]

- Rules that are not target market specific SHALL have value 'Global'
- Rules that are target market specific SHALL have value populated according to ISO country code 3166-1 (3-numeric) and ISO Country names in brackets

Example 1:

528 (Netherlands)

Example 2:

Global

[R42] Requests for new rules and modification of existing rules related to CIN message SHALL have a context scope provided. See also [R02]

Rules that all contexts SHALL have value 'All'

Rules that affect specific contexts SHALL list all the affected context values from the TradeItemContextCode code list:

<http://apps.gs1.org/GDD/Pages/clHome.aspx?FilterField1=codeList&FilterValue1=TradeItemContextCode>

Example 1:

DP006

Example 2:

All

A Template to submit a Work Request for a GDSN Validation Rule

Submitter	Submitter Company	Submitter Email	Line Number	Business Rational for request	Action	Rule Number	Structured Rule
John Doe	Widget Corporation	johndoe@widget.com	1	The attributes in the class ChildNutritionQualifier are required to be populated when any attribute in the class ChildNutritionLabel is populated	Add		If the class of attributes ChildNutritionLabel is provided, then the class ChildNutritionQualifier shall be provided
John Doe	Widget Corporation	johndoe@widget.com	2	The attributes childNutritionProduct IdentificationAgency, childNutritionProductIdentificationValue, and childNutritionApprovalDate are required to be populated when the attribute childNutritionLabelStatement is populated	Change	1409	If childNutritionLabelStatement is used, then childNutritionProduct IdentificationAgency, childNutritionProductIdentificationValue and childNutritionApprovalDate shall be used.
John Doe	Widget Corporation	johndoe@widget.com	3	The rule is blocking business process	Delete	1410	

Example of data that will pass	Example of data that will fail	Proposed error message	Classification	Geographic	Context: use in all or exclusions
Example of data that will pass	Example of data that will fail	The attribute chgildNutritionLabel is provided, therefore childNutritionProduct IdentificationAgency,-childNutritionProductIdentificationValue, and childNutritionApprovalDate Shall be populated	Business	Global	All
Same as today	Same as today	Update to current error message	Business	Global	All
			Technical	Global	All