



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

Like all GS1 standards and guidelines, the GDSN Validation Rules are written in UK English.

The keywords, SHALL, SHALL NOT, and MAY, when they appear in this document, are to be interpreted as described 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
- The Error message for Business Validations<sup>1</sup> SHALL contain all criteria for the impacted attribute(s) and SHOULD use business friendly language which highlights impacted: Target Market, Global Product Classification (GPC), Action Type Codes, etc.
- 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 (see Rule R09)
- Affected context categories SHALL be included for validation rules for CIN messages. 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]

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<sup>1</sup> For Technical Validation Rules the error message SHOULD include criteria. For example:

- IF documentCommandHeader type {(equals ...) OR (is not equal to ...)} - Action code type
- And IF target market country code {(equals ...) OR (is not equal to ...)} - Target market
- And If gpcCategoryCode {(equals ...) OR (is not equal to ...)} - Classification
- And if preliminaryItemStatusCode {(equals ...) OR (is not equal to ...)} - Status code
- And if isTradeItemA... {(equals ...) OR (is not equal to ...)} - Boolean types
- Then attribute XXX {(equals ...) OR (is not equal to ...)} - Validation

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: *descriptiveSizeDimension is repeatable for language only.*

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'.*

<pre>/catalogue_item_notification:catalogueItemNotificationMessage/transaction/documentCommand/catalogue_item_notification:catalogueItemNotification/catalogueItem/tradeItem/tradeItemInformation/extension/apparelInformationModule/apparelInformation/nonPackagedSizeDimension/descriptiveSizeDimension</pre>
<pre>/catalogue_item_notification:catalogueItemNotificationMessage/transaction/documentCommand/catalogue_item_notification:catalogueItemNotification/catalogueItem/tradeItem/tradeItemInformation/extension/apparelInformationModule/apparelInformation/nonPackagedSizeDimension/descriptiveSizeDimension/@languageCode</pre>
<pre>/catalogue_item_notification:catalogueItemNotificationMessage/transaction/documentCommand/catalogue_item_notification:catalogueItemNotification/catalogueItem/tradeItem/tradeItemInformation/extension/tradeItemMeasurementsModule/tradeItemMeasurements/tradeItemNonPackagedSize/descriptiveSizeDimension</pre>

**[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 utilise 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:

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 ((child item *nestingIncrement* x (*quantityOfCompleteLayers* - 1)) + *tradeItemMeasurements/height* of the child item + 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.

<i>nestingIncrement</i> (Child Item)	= 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 which SHALL appear in the structured rule.

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: If individualUnitMinimumSize and/or individualUnitMaximumSize are not empty then isTradeItemABaseUnit SHALL 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 isTradelItemAnOrderableUnit is equal to 'true' and isTradelItemNonPhysical is equal to 'false' or is empty then grossWeight SHALL be greater than '0'.

#### [R26]

Calculations: if  $A=X$  then sum of  $B+C$  SHALL equal or be greater than  $Y$

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

Example: if (isTradelItemPackedIrregularly equals 'false' or is not used) and trade item is at top level and layerHeight is used and nestingIncrement is not used then tradelItemMeasurements/height SHALL equal or be greater than ((layerHeight x quantityOfCompleteLayersContainedInATradelItem) + 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.

#### [R43]

The logical sequence of Validation Rule should be:

- Target Market
- Product (GPC or list of GPCs)



- Business context.

Example: If **targetMarketCountryCode** is equal to ('528' (Netherlands), and **isTradeItemABaseUnit** is equal to 'true' and (**gpcCategoryCode** is in GPC Family '50202200' and the **Business Context** is 'Medical Deceives' then **percentageOfAlcoholByVolume** SHALL not be empty.

### 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: [johndoe@widget.com](mailto:johndoe@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 utilise 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** SHALL equal ('NA', 'I', 'II' or 'III').*

**[R37]** Requests for new rules and modification of existing rules SHOULD 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 SHOULD 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 SHALL be after Registration Date*

**[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, or GS1 extended codes for target market.
- Target market shall be part of the structured rule where applicable.

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

Action	Structured Rule	Proposed error message	Geographic	Context: used in all or exclusions
Add	If the class of attributes ChildNutritionLabel is provided, then the class of attributes ChildNutritionQualifier must be provided.	The attributes ChildNutritionLabel is provided, therefore	Global	Only used in Healthcare.
Change	If childNutritionLabelStatement is <b>not null</b> , then childNutritionProductIdentificationAgency, childNutritionProductIdentificationValue, and childNutritionApprovalDate must not be null.	Update to current error message	Target Market (add the TMs to this list)	
Delete	<del>If the class of attributes ChildNutritionLabel is provided, then the class of attributes ChildNutritionQualifier must be provided.</del>	Not applicable		All

Trade channel	OPTIONAL: Example of data that will pass	OPTIONAL: Example of data that will fail
Free text (normally all or one or more of the drop down list)	Example of data that will pass/	
All	Same as today	
All		<div style="border: 1px solid black; padding: 5px; width: fit-content;"> <p><b>Option set (required)</b> Select a value from the drop-down list.</p> </div>