International Standard

# ISO/IEC 19988

# Information technology — GS1 Core Business Vocabulary (CBV)

*Technologies de l'information — Vocabulaire normatif relatif aux activités de base GS1*

Third edition
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This document was prepared by GS1 [as the Core Business Vocabulary (CBV) Standard, Release 2.0] and drafted in accordance with its editorial rules. It was adopted, under the JTC 1 PAS procedure, by Joint Technical Committee ISO/IEC JTC 1, *Information technology*.

This third edition cancels and replaces the second edition (ISO/IEC 19988:2017), which has been technically revised.

The main changes are as follows:

— support for GS1 Web Vocabulary, URI semantic equivalence by means of owl:sameAs relationships;

— new "How" event dimension;

— overview of EPCIS event "dimensions" with cross-references to relevant sections in EPCIS (ISO/IEC 19987) and CBV (this document);

— new Persistent Disposition indicating non-transient business state of an object;

— use of new prefix 952 in all examples;

— new business step values: sampling, sensor_reporting;

— clarified definitions of business step values: commissioning, encoding, inspecting, removing;

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— addition of new disposition values: available, completeness_verified, completeness_inferred, conformant, container_open, mismatch_instance, mismatch_class, mismatch_quantity, needs replacement, non_conformant, unavailable;

— clarified definition and example of disposition value in_progress, recommending omission;

— deprecated disposition value: no_pedigree_match;

— new business transaction types cert, testprd, testres, upevt;

— clarified definition of business transaction type poc to make it clear that Purchase Order Confirmation is also used to represent Sales Order;

— sensor measurement types now supported;

— clarification of HTTPS URLs as a recommended approach alongside HTTP URLs;

— introduced support for constrained set of GS1 Digital Link URIs supported alongside generic HTTP URLs for identification of object instance, class, location, business transaction, source/destination, and transformation;

— clarification preference for PGLN to identify owning and possessing parties;

— introduction of Hash URI as business transaction identifier;

— introduction of EPCIS Event Hash ID as an event Identifier;

— introduction of chemical substance identifiers;

— introduction of microorganism identifiers;

— restriction of date types to specific subset of W3C primitive datatypes;

— extended support for QNames to express master data attributes;

— incorporation of additions published previously as CBVCNs 17-339 (Tax ID), 18-108 (Fish Attributes);

— inclusion of certification attributes in Certification List;

— additionalTradeItemId now as additionalTradeItemIDList;

— deprecation of latitude and longitude from location/party master data;

— addition of geoLocation and geoFence to location/party master data;

— addition of AdditionalPartyIDList;

— example event data moved to machine-readable artefacts;

— introduction of https://ref.gs1.org/cbv namespace, to underpin CBV 2.0 support for Linked Data.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html and www.iec.ch/national-committees.

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# 1 Introduction – Core Business Vocabulary

This GS1 standard defines the Core Business Vocabulary (CBV). The goal of this standard is to specify various vocabulary elements and their values for use in conjunction with the EPCIS standard [EPCIS2.0], which defines mechanisms to exchange information both within and across organisation boundaries. EPCIS and the CBV are developed, maintained and published by GS1; EPCIS and the CBV are also published within ISO's PAS process as ISO/IEC 19987 and ISO/IEC 19988, respectively. The vocabulary identifiers and definitions in this standard will ensure that all parties who exchange EPCIS data using the CBV will have a common understanding of the semantic meaning of that data.

This standard is intended to provide a basic capability that meets the above goal. In particular, this standard is designed to define vocabularies that are *core* to the EPCIS abstract data model and are applicable to a broad set of business scenarios common to many industries that have a desire or requirement to share data. This standard intends to provide a useful set of values and definitions that can be consistently understood by each party in the supply chain.

Additional end user requirements may be addressed by augmenting the vocabulary elements herein with additional vocabulary elements defined for a particular industry or a set of users or a single user. Additional values for the standard vocabulary types defined in this standard may be included in follow-on versions of this standard.

This standard includes identifier syntax and specific vocabulary element values with their definitions for these *Standard Vocabularies*:

- Business step identifiers
- Disposition identifiers
- Business transaction types
- Source/Destination types
- Error reason identifiers
- Sensor measurement types
- Sensor alert types

This standard provides identifier syntax options for these *User Vocabularies:*

- Objects
- Locations
- Business transactions
- Source/Destination identifiers
- Transformation identifiers
- Event identifiers
- Chemical substance identifiers
- Microorganism identifiers

This standard provides *Master Data Attributes and Values* for describing Physical Locations including:

- Site Location
- Sub-Site Type
- Sub-Site Attributes
- Sub-Site Detail

Additional detailed master data regarding locations (addresses, etc.) are not defined in this standard.

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# 2 Relationship to the GS1 System Architecture

The CBV is a companion standard to the EPCIS standard. EPCIS is the standard that defines the technical interfaces for capturing and sharing event data. EPCIS defines a framework data model for event data. The CBV is a GS1 *data standard* that supplements that framework by defining specific data values that may populate the EPCIS data model. As such, the CBV exists in the "Share" group of GS1 standards.

# 3 Relationship to EPCIS

This section specifies how the CBV standard relates to the EPCIS standard.

## 3.1 EPCIS event structure

The EPCIS 2.0 standard [EPCIS2.0] specifies the data elements in an EPCIS event. The following lists these data elements, and indicates where the CBV provides identifiers that may be used as values for those data elements.

- **The "what" dimension** contains (for most event types) one or more unique identifiers for physical or digital objects or classes of physical or digital objects. Identifiers for physical or digital objects are specified in section 8.2 and 8.3. In the case of an EPCIS `TransformationEvent`, an optional `TransformationID` may be used to link together multiple events that describe the same transformation. `TransformationID`s are included in section 8.8.
- **The "when" dimension** reflects the moment in time at which an EPCIS event occurred. Event time is fully specified in the EPCIS standard.
- **The "where" dimension** consists of two identifiers that describe different aspects of where an event occurred:
  - **Read Point** (`readPoint`): The location where the EPCIS event took place. In the case of an EPCIS event arising from reading a barcode or RFID tag, the Read Point is often the location where the barcode or RFID tag was read. Identifiers for read points are specified in section 8.3.

    Example: A reader is placed at dock door #3 at the London Distribution Centre (DC). Product passed through the dock door. Read point = <The identifier that stands for London DC Dock Door #3>
  - **Business Location** (`bizLocation`): The location where the subject of the event is assumed to be following an EPCIS event, until a new event takes place that indicates otherwise. Identifiers for business locations are specified in section 8.3.

    Example: A product is read through the sales floor transition door at store #123. The product is now sitting on the sales floor. Business location = <The identifier that stands for store #123 Sales Floor>
- **The "why" dimension** provides business process information associated with the event, including the business process step that "triggered" the event's capture:
  - **Business Step** (`bizStep`): Denotes a specific activity within a business process. The business step field of an event specifies what business process step was taking place that caused the event to be captured. Identifiers for business steps are specified in section 7.1.

    Example: an EPCIS event is generated as a product departs the location identified by the Read Point. Business Step = <The identifier that denotes "shipping">
  - **Disposition** (`disposition`): Denotes the business state of an object. The disposition field of an event specifies the business condition of the subject of the event (the things specified in the "what" dimension), subsequent to the event. The disposition is assumed to hold true until another event indicates a change of disposition. Identifiers for dispositions and persistent dispositions (see below) are specified in section 7.2.

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Example: an EPCIS event is generated and afterward the products can be sold as-is and customers can access product for purchase. Disposition = <The identifier that denotes "sellable and accessible">

- **Persistent Disposition** (`persistentDisposition`): Denotes the *persistent* business state of an object. The `persistentDisposition` field of an event is used to `set` or `unset` the business condition of the subject of the event (the things specified in the "what" dimension), subsequent to the event. Unlike the disposition, the `persistentDisposition` is not overridden by subsequently set dispositions or persistent dispositions, and can only be negated or rescinded by being explicitly "`unset`". Identifiers for dispositions and persistent dispositions are specified in section 7.2.

  Example: an EPCIS event is generated to infer the presence of children still aggregated to their parent (i.e., not yet unpacked nor physically scanned). `persistentDisposition` = <The identifier that denotes "completeness inferred">

- **Business Transaction References**: An EPCIS event may refer to one or more business transaction documents. Each such reference consists of two identifiers:
  - **Business Transaction Type**: Denotes a particular kind of business transaction. *Example: the identifier that denotes "purchase order"*. Identifiers for business transaction types are specified in section 7.4.
  - **Business Transaction Identifier**: Denotes a specific business transaction document of the type indicated by the Business Transaction Type.

    Example: <The identifier that denotes Example Corp purchase order #123456> Identifiers for business transactions are specified in section 8.5.
- **Source and Destination References**: An EPCIS event may refer to one or more sources and/or destinations that describe the endpoints of a business transfer of which the event is a part. Each source or destination reference consists of two identifiers:
  - **Source or Destination Type**: Denotes a particular kind of source or destination. *Example: the identifier that denotes "owning party"*. Identifiers for source and destination types are specified in section 7.4.
  - **Source or Destination Identifier**: Denotes a source or destination of the type indicated by the Business Transaction Type. *Example: <The identifier that denotes Example Corp as an owning party>* Identifiers for sources and destinations are specified in section 8.6.

- **The "how" dimension** contains the `SensorElementList` of one or more `SensorElement`s, which is used to express conditional information about an object or physical location, as captured by associated sensors. Each `SensorElement` contains:
  - one or more **`sensorReport`** elements, including one or more attributes that pertain to a specific sensor observation;
  - an optional **`sensorMetadata`** element, including one or more meta data attributes that apply to all `sensorReport` elements within the same Sensor Element.

  The `SensorElement` provides a rich and flexible framework to convey all kind of sensor-based data, from simple physical observations via multi-dimensional observations to outputs of smart sensor devices. This can include, but is not limited to, information on the concentration of chemical substances and microorganisms.

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## 3.2 Overview of EPCIS event "dimensions" (non-normative)

| Dimension in EPCIS/CBV 1.x | Categorisation in EPCIS/CBV 2.0 | | Field | EPCIS section in which the field is defined | CBV section in which its value range is specified |
|---|---|---|---|---|---|
| WHAT | Objects in Focus (WHAT) | Instance | epcList | 7.4.2 ObjectEvent<br>7.4.4 TransactionEvent | *EPC Tag Data Standard (TDS) section 6,"EPC URI"*<br>8.2 Physical or Digital Objects (Instance) |
| | | | parentID | 7.4.3 AggregationEvent<br>7.4.4 TransactionEvent<br>7.4.6 AssociationEvent | |
| | | | childEPCs | 7.4.3 AggregationEvent<br>7.4.6 AssociationEvent | |
| | | | inputEPCList | 7.4.5 Transformation Event | |
| | | | outputEPCList | | |
| | | Class | quantityList | 7.4.2 ObjectEvent<br>7.4.5 TransactionEvent | *EPC Tag Data Standard (TDS) section 8,"URIs for EPC Pure Identity Patterns"*<br>8.3 Physical or Digital Objects (Class) |
| | | | childQuantityList | 7.4.3 AggregationEvent<br>7.4.6 AssociationEvent | |
| | | | inputQuantityList | 7.4.5 Transformation Event | |
| | | | outputQuantityList | | |

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| Dimension in EPCIS/CBV 1.x | Categorisation in EPCIS/CBV 2.0 | Field | EPCIS section in which the field is defined | CBV section in which its value range is specified |
|---|---|---|---|---|
| WHEN | Chronology (WHEN) | eventTime | 7.4.1 EPCISEvent | |
| | | eventTimeZoneOffset | | |
| | | recordTime | 7.4.1 EPCISEvent | |
| WHERE | Whereabouts (WHERE) | readPoint | 7.4.2 ObjectEvent<br>7.4.3 AggregationEvent<br>7.4.4 TransactionEvent<br>7.4.5 TransformationEvent<br>7.4.6 AssociationEvent | 8.4 Locations |
| | | bizLocation | | |
| n/a | Condition (HOW) | sensorElementList | 7.4.2 ObjectEvent<br>7.4.3 AggregationEvent<br>7.4.4 TransactionEvent<br>7.4.5 TransformationEvent<br>7.4.6 AssociationEvent | 7.6 Sensor Measurement Types<br>8.9 Chemical substance identifiers<br>8.10 Microorganism identifiers |
| WHY | Business Context (WHY) | bizStep | 7.4.2 ObjectEvent<br>7.4.3 AggregationEvent | 7.1 Business Steps |
| | | bizTransactionList | | 8.5 Business Transactions |

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| Dimension in EPCIS/CBV 1.x | Categorisation in EPCIS/CBV 2.0 | Field | EPCIS section in which the field is defined | CBV section in which its value range is specified |
|---|---|---|---|---|
| | | disposition | 7.4.4 TransactionEvent<br>7.4.5 Transformation Event<br>7.4.6 AssociationEvent | 7.1 Dispositions |
| | | persistentDisposition | | 7.1 Dispositions |
| | | sourceList | | 8.6 Source/Destination Identifiers |
| | | destinationList | | |
| | Other fields | ilmd | 7.3.7 Instance/lot master data (ILMD) | 9 Trade Item Master Data |
| (core field) | | action | 7.3.2 Action type | |
| (transformationID) | | transformationID | 7.4.5 Transformation Event | 8.7 Transformation Identifiers |
| (core field) | | eventID | 7.4.1 EPCISEvent | 8.8 Event Identifiers |
| (core field) | | errorDeclaration | 7.4.1 EPCISEvent | 7.5 Error Reason Identifiers<br>8.8 Event Identifiers |

## 3.3 Vocabulary kinds

(The material in this section is adapted directly from [EPCIS], section 6.2.)

Vocabularies are used extensively within EPCIS to model conceptual, physical, and digital entities that exist in the real world.

Examples of vocabularies defined in the EPCIS standard are business steps, dispositions, location identifiers, physical or digital object identifiers, business transaction type names, and business transaction identifiers. In each case, a vocabulary represents a finite (though open-ended) set of alternatives that may appear in specific fields of events.

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It is useful to distinguish two kinds of vocabularies, which follow different patterns in the way they are defined and extended over time:

- **Standard Vocabulary**: A Standard Vocabulary is a set of Vocabulary Elements whose definition and meaning must be agreed to in advance by trading partners who will exchange events using the vocabulary.
- **User Vocabulary**: A User Vocabulary is a set of Vocabulary Elements whose definition and meaning are under the control of a single organisation.

These concepts are explained in more detail below.

### 3.3.1 Standard Vocabulary

A Standard Vocabulary is a set of Vocabulary Elements whose definition and meaning must be agreed to in advance by trading partners who will exchange events using the vocabulary. For example, the EPCIS standard defines a vocabulary called "business step," whose elements are identifiers denoting such things as "shipping," "receiving," and so on. One trading partner may generate an event having a business step of "shipping," and another partner receiving that event through a query can interpret it because of a prior agreement as to what "shipping" means.

Standard Vocabulary elements tend to be defined by organisations of multiple end users, such as GS1, industry consortia outside GS1, private trading partner groups, and so on. The master data associated with Standard Vocabulary elements, if any master data is defined at all, are defined by those same organisations, and tend to be distributed to users as part of a standard or by some similar means. New vocabulary elements within a given Standard Vocabulary tend to be introduced through a very deliberate and occasional process, such as the ratification of a new version of a standard or through a vote of an industry group.

The Standard Vocabularies specified in the CBV are: sections 7.1 (Business steps), 7.2 (Dispositions), 7.3 (Business Transaction Types), 7.4 (Source/Destination types), 7.5 (Error reason identifiers) 7.6 (Sensor measurement types), 7.7 (Sensor alert types) and 7.8 (Sensor report component type). The elements and definitions are agreed to by parties prior to exchanging data, and there is general agreement on their meaning.

Example: the following are two different ways of expressing a business step identifier, as defined in section 7.1 :

```
urn:epcglobal:cbv:bizstep:receiving
```

```
https://ref.gs1.org/cbv/Bizstep-receiving
```

This identifier is defined by the GS1 CBV standard, and its meaning is known and accepted by those who implement the standard. For each of the identifiers defined, equivalent terms and values are also included in the GS1 Web Vocabulary published at https://www.gs1.org/voc/. Both URI structures are considered to be semantically equivalent via an owl:sameAs relationship.

While an individual end user organisation acting alone may introduce a new Standard Vocabulary element, such an element would have limited use in a data exchange setting, and would probably only be used within an organisation's four walls. On the other hand, an industry consortium or other group of trading partners may define and agree on standard vocabulary elements beyond those defined by the CBV, and these may be usefully used within that trading group.

### 3.3.2 User Vocabulary

A User Vocabulary is a set of Vocabulary Elements whose definition and meaning are under the control of a single organisation. For example, the EPCIS standard defines a vocabulary called "business location," whose elements are identifiers denoting such things as "Acme Corp. Distribution Centre #3." The location identifier and any associated master data is assigned by the user. Acme Corp may generate an event whose business location field contains the identifier that denotes "Acme Corp. Distribution Centre #3," and another partner receiving that event through a query can interpret it either because the partner recognises the identifier as being identical to the identifier received in other events that took place in the same location, or because the partner consults master data attributes associated with the location identifier, or both.

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Example:

`urn:epc:id:sgln:9521414.12345.400`

This identifier is assigned by the End User who has been assigned the GS1 Company Prefix 9521414, and the meaning of the identifier (that is, what location it denotes) is determined exclusively by that end user. Another End User can understand the meaning of this identifier by consulting associated master data.

User Vocabulary elements are primarily defined by individual end user organisations acting independently. The master data associated with User Vocabulary elements are typically defined by those same organisations, and are usually distributed to trading partners through the EPCIS Query Interface or other data exchange / data synchronisation mechanisms. New vocabulary elements within a given User Vocabulary are introduced at the sole discretion of an end user, and trading partners must be prepared to respond accordingly.

While the CBV does not (and as the discussion above makes clear, cannot) specify particular user vocabulary elements, the CBV does provide syntax templates that are recommended for use by End Users in constructing their own user vocabulary elements. See section 8.1. The user vocabularies for which templates are specified in this standard are: 8.2 (Physical or digital objects (Instance-Level Identification)) and 8.4 (Locations) which include both read points and business locations 8.5 (Business transactions), 8.7 (Source/Destination identifiers),8.8 (Transformation identifiers), 8.9 (Event identifiers), 8.10 (Chemical substance identifiers) and 8.11 (Microorganism identifiers).

# 4 Terminology and typographical conventions

Within this standard, the terms SHALL, SHALL NOT, SHOULD, SHOULD NOT, MAY, NEED NOT, CAN, and CANNOT are to be interpreted as specified in section 7 ("*Verbal forms for expressions of provisions*") of the ISO/IEC Directives, Part 2, 2018, 8th edition [ISODir2]. When used in this way, these terms will always be shown in ALL CAPS; when these words appear in ordinary typeface they are intended to have their ordinary English meaning.

All sections of this document, with the exception of sections 2, 3 and 3 are normative, except where explicitly noted as non-normative.

The following typographical conventions are used throughout the document:

- ALL CAPS type is used for the special terms from [ISODir2] enumerated above.
- `Monospace` type is used to denote programming language, UML, XML and JSON/JSON-LD identifiers, as well as for the text of XML and JSON/JSON-LD documents.

# 5 Compliance and compatibility

The CBV is designed to facilitate interoperability in EPCIS data exchange by providing standard values for vocabulary elements to be included in EPCIS data. The standard recognises that the greatest interoperability is achieved when all data conforms to the standard, and also recognises that individual End Users or groups of trading partners may need to extend the standard in certain situations.

To that end, this standard defines two levels of conformance for EPCIS documents:

- **CBV-Compliant**: An EPCIS document that only uses vocabulary identifiers specified in the CBV in the standard fields of EPCIS events.
- **CBV-Compatible**: An EPCIS document that uses a combination of vocabulary identifiers specified in the CBV and other identifiers that are outside the standard.

An EPCIS document is neither CBV-Compliant nor CBV-Compatible if it wrongly uses identifiers defined in the CBV or if it violates any other rules specified herein.

The formal definition of these terms is specified below.

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## 5.1 CBV-Compliant

A "CBV-Compliant Document" is a document that conforms to the schema and other constraints specified in [EPCIS2.0], and which furthermore conforms to all the normative language in this standard that pertains to a "CBV-Compliant Document."

A "CBV-Compliant Application" is any application for which both of the following are true:

- If it operates in a mode where it claims to accept a CBV-Compliant Document as an input, the application SHALL accept any document that is a CBV-Compliant Document according to this standard, and furthermore in processing that input SHALL interpret each CBV identifier according to the meaning specified herein.
- If it operates in a mode where it claims to produce a CBV-Compliant Document as an output, the application SHALL only produce a document that is a CBV-Compliant Document according to this standard, and furthermore in generating that output SHALL only use CBV identifiers to denote their meaning as specified herein.

The following list summarises the requirements for an EPCIS document to be a "CBV-Compliant Document," as specified elsewhere in this standard:

- A CBV-Compliant Document SHALL conform to the schema and other constraints specified in [EPCIS 2.0].
- A CBV-Compliant Document SHALL NOT use any URI beginning with `urn:epcglobal:cbv:` except as specified in this standard.
- Each EPCIS event in a CBV-Compliant Document SHALL include a `bizStep` field. The value of the `bizStep` field SHALL be a URI consisting of one of the following two prefixes:
  - `urn:epcglobal:cbv:bizstep:`
  - `https://ref.gs1.org/cbv/BizStep-`

followed by the string specified in the first column of some row of the table in section 7.1.3. These two URI structures are considered to be semantically equivalent via an owl:sameAs relationship.

- A CBV-Compliant Document MAY include a `disposition` field. If the `disposition` field is present, the value of the `disposition` field SHALL be a URI consisting of one of the following two prefixes:
  - `urn:epcglobal:cbv:disp:`
  - `https://ref.gs1.org/cbv/Disp-`

followed by the string specified in the first column of some row of the table in section 7.2.3. These two URI structures are considered to be semantically equivalent via an owl:sameAs relationship.

- A CBV-Compliant Document MAY include a `persistentDisposition` field. If the `persistentDisposition` field is present, the value of the `disposition` field SHALL be a URI consisting of one of the following two prefixes:
  - `urn:epcglobal:cbv:disp:`
  - `https://ref.gs1.org/cbv/Disp-`

followed by the string specified in the first column of some row of the table in section 7.2.3. These two URI structures are considered to be semantically equivalent via an owl:sameAs relationship.

- Each EPCIS event in a CBV-Compliant Document MAY include one or more `bizTransaction` elements. If `bizTransaction` elements are present, each such element MAY include a `type` attribute. If a given `bizTransaction` element includes a `type` attribute, the value of the `type` attribute SHALL be a URI consisting of one of the following two prefixes:
  - `urn:epcglobal:cbv:btt:`
  - `https://ref.gs1.org/cbv/BTT-`

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followed by the string specified in the first column of some row of the table in section 7.3.3. These two URI structures are considered to be semantically equivalent via an owl:sameAs relationship.

- Each EPCIS event in a CBV-Compliant Document MAY include one or more `source` or `destination` elements. The value of the `type` attribute of each such element SHALL be a URI consisting of one of the following two prefixes:
  - `urn:epcglobal:cbv:sdt:`
  - `https://ref.gs1.org/cbv/SDT-`

followed by the string specified in the first column of some row of the table in section 7.4.3. These two URI structures are considered to be semantically equivalent via an owl:sameAs relationship.

- Each EPCIS event in a CBV-Compliant Document MAY include an `ErrorDeclaration` element, and when present, the `ErrorDeclaration` element MAY include a `reason` field. When present in a CBV-Compliant Document, the value of the `reason` field of the `ErrorDeclaration` element SHALL be a URI consisting of one of the following two prefixes:
  - `urn:epcglobal:cbv:er:`
  - `https://ref.gs1.org/cbv/ER-`

followed by the string specified in the first column of some row of the table in section 7.5.3. These two URI structures are considered to be semantically equivalent via an owl:sameAs relationship.

- URIs defined in the EPC Tag Data standard SHALL only be used in a CBV-Compliant Document as specified in section 5.1.
- A CBV-Compliant document SHALL use one of the URI forms specified in section 8.2 to populate instance-level identifiers in the "what" dimension of EPCIS events (that is, the `epcList`, `parentID`, `childEPCs`, `inputEPCList`, and `outputEPCList` fields in EPCIS `ObjectEvents`, `AggregationEvents`, `TransactionEvents`, `TransformationEvents` and `AssociationEvents`), for every such field that is not null. A CBV-Compliant document SHOULD use the either the EPC URI form as specified in section 8.2.1 or the GS1 Digital Link URI form specified in section 8.2.2 unless there is a strong reason to do otherwise.
- A CBV-Compliant document SHALL NOT use an SGLN EPC (`urn:epc:id:sgln:…`) or PGLN (`urn:epc:id:pgln:…`) as an object identifier.
- A CBV-Compliant document SHALL use one of the URI forms specified in section 8.3 to populate class-level identifiers in the "what" dimension of EPCIS events (that is, the `epcClass` fields in all EPCIS event types), for every such field that is not null. A CBV-Compliant document SHOULD use the EPC URI form as specified in section 8.3.1 or the GS1 Digital Link URI form specified in section 8.7.2 unless there is a strong reason to do otherwise.
- A CBV-Compliant document SHALL use one of the URI forms specified in section 8.4 to populate the "where" dimension of EPCIS events (that is, the `readPoint` and `bizLocation` fields in all EPCIS event types), for every such field that is not null. A CBV-Compliant document SHOULD use the EPC URI form as specified in section 8.4.1 or the GS1 Digital Link URI form specified in section 8.4.2 unless there is a strong reason to do otherwise.
- When using an EPC URI as a location identifier (section 8.4.1), a CBV-Compliant document SHOULD NOT use EPC schemes other than SGLN (`urn:epc:id:sgln:…`), unless there is a strong reason to do so.
- A CBV-Compliant document SHALL use one of the URI forms specified in section 8.7 to populate the business transaction identifier field (that is, the text content of the `bizTransaction` element) of EPCIS events, for every such field that is not null.
- When using an EPC URI as a business transaction identifier, a CBV-Compliant Documents SHOULD NOT use EPC schemes other than GDTI EPCs

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(`urn:epc:id:gdti:…`) or GSRN EPCs (`urn:epc:id:gsrn:…`), unless there is a strong reason to do so. GDTI EPCs SHOULD only be used as business transaction identifiers when they have been assigned to denote a business transaction, rather than a physical document not connected with any business transaction.

- A CBV-Compliant document SHALL use one of the URI forms specified in section 8.7 to populate a source or destination identifier field (that is, the text content of a `source` or `destination` element), for every such field that is not null. A CBV-Compliant document SHOULD use the EPC URI form as specified in section 8.7.1 or the GS1 Digital Link URI form specified in section 8.7.2 unless there is a strong reason to do otherwise.
- When using an EPC URI as a source or destination identifier (section 8.7.1), a CBV-Compliant document SHOULD NOT use EPC schemes other than SGLN (`urn:epc:id:sgln:…`) or PGLN (`urn:epc:id:pgln:…`), unless there is a strong reason to do so.
- A CBV-Compliant document SHALL use one of the URI forms specified in section 8.8 to populate the transformation identifier field (that is, the text content of the `transformationID` element) of EPCIS `TransformationEvents`, for every such field that is not null.
- A CBV-Compliant document SHALL use one of the URI forms specified in section 8.9 to populate the event identifier field (that is, the text content of the `eventID` element) of an EPCIS event, whenever that field is not null.

## 5.2 CBV-Compatible

A "CBV-Compatible Document" is a document that conforms to the schema and other constraints specified in [EPCIS2.0], and which furthermore conforms to all the normative language in this standard that pertains to a "CBV-Compatible Document."

A "CBV-Compatible Application" is any application for which both of the following are true:

- If it operates in a mode where it claims to accept a CBV-Compatible Document as an input, the application SHALL accept any document that is a CBV-Compatible Document according to this standard, and furthermore in processing that input SHALL interpret each CBV identifier according to the meaning specified herein.
- If it operates in a mode where it claims to produce a CBV-Compatible Document as an output, the application SHALL only produce a document that is a CBV-Compatible Document according to this standard, and furthermore in generating that output SHALL only use CBV identifiers to denote their meaning as specified herein.

The following list summarises the requirements for an EPCIS document to be a "CBV-Compatible Document," as specified elsewhere in this standard.

- A CBV-Compatible Document SHALL conform to the schema and other constraints specified in [EPCIS2.0].
- A CBV-Compatible Document SHALL NOT use any URI beginning with `urn:epcglobal:cbv:` except as specified in this standard.
- URIs defined in the EPC Tag Data standard SHALL only be used in a CBV-Compatible Document as specified in section 5.2.
- A CBV-Compatible Document SHOULD use the EPC URI form as specified in section 8.2.1 for each instance-level object identifier unless there is a strong reason to do otherwise.
- A CBV-Compatible Document SHOULD use the EPC URI form as specified in section 8.3.1 for each class-level object identifier unless there is a strong reason to do otherwise.
- A CBV-Compatible Document SHALL NOT use an SGLN EPC (`urn:epc:id:sgln:…`) or a PGLN (`urn:epc:id:pgln:…`) as an object identifier.
- A CBV-Compatible Document SHOULD use the EPC URI form as specified in section 8.4.1 for each location identifier unless there is a strong reason to do otherwise.

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- When using an EPC URI as a location identifier (section 8.4.1), a CBV-Compatible Document SHOULD NOT use EPC schemes other than SGLN (`urn:epc:id:sgln:…`), unless there is a strong reason to do so.
- When using an EPC URI as a business transaction identifier, a CBV-Compatible Document SHOULD NOT use EPC schemes other than GDTI EPCs (`urn:epc:id:gdti:…`) or GSRN EPCs (`urn:epc:id:gsrn:…`), unless there is a strong reason to do so. GDTI EPCs SHOULD only be used as business transaction identifiers when they have been assigned to denote a business transaction, rather than a physical document not connected with any business transaction.
- When using an EPC URI as a source or destination identifier (section 8.7.1), a CBV-Compatible document SHOULD NOT use EPC schemes other than SGLN (`urn:epc:id:sgln:…`), unless there is a strong reason to do so.

In general, every CBV-Compliant Document is also a CBV-Compatible Document, though not every CBV-Compatible Document is a CBV-Compliant Document. A CBV-Compatible Document may include an identifier that is compliant with [EPCIS2.0] but which is not permitted for CBV-Compliant Documents, provided that it meets the requirements above. A CBV-Compatible Document may also include an event in which the `bizStep` field is omitted, whereas that field is always required for CBV-Compliant Documents.

# 6 Use of Uniform Resource Identifiers (URIs)

This section specifies general rules that apply to all uses of URIs in this standard.

## 6.1 URI prefix for Standard Vocabularies in the CBV

All URIs for standard vocabulary elements specified in the CBV have one of the following two syntaxes:

- `urn:epcglobal:cbv:qualifier:payload`
- `https://ref.gs1.org/cbv/qualifier-payload`

where the `qualifier` denotes the type of the vocabulary the vocabulary element belongs to and `payload` the vocabulary element unambiguously identifies an element of the vocabulary.

## 6.2 Limitation on Use of the epcglobal URN prefix

The CBV is the only GS1 standard in which URIs beginning with `urn:epcglobal:cbv:` are defined.

A CBV-Compliant or CBV-Compatible document SHALL NOT use any URI beginning with `urn:epcglobal:cbv:` or `urn:epc:` except as specified in this standard.

Both CBV-Compliant and CBV-Compatible documents MAY contain URIs that do not begin with `urn:epcglobal:cbv:`, provided that the requirements specified elsewhere in this standard are met. These SHALL be used to identify vocabulary elements not defined by the CBV standard. URIs beginning with `urn:epcglobal:` SHALL NOT be used except as specified herein or in another GS1 standard.

### 6.2.1 Example of limitation of use of epcglobal URN prefix (non-normative)

Suppose a user needs a new disposition value to stand for "quarantined." The user may NOT use the following URI:

`urn:epcglobal:cbv:disp:quarantined`

In this case the particular URI above is NOT part of this standard and therefore may not be used. Instead a URI like the following could be used and considered CBV-Compatible. However, it must be noted that this vocabulary would have limited

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meaning to supply chain participants receiving this unless a prior understanding had been established.

`https://epcis.example.com/disp/quarantined`

# 7 Standard Vocabularies

This section specifies standard vocabulary elements for four EPCIS standard vocabularies: business steps, dispositions, business transaction types, and source/destination types.

## 7.1 Business steps

This section specifies standard identifiers for the EPCIS `BusinessStepID` vocabulary. For each of the identifiers defined, equivalent terms and values are also included in the GS1 Web Vocabulary published at https://www.gs1.org/voc/.

These identifiers populate the `bizStep` field in an EPCIS event, as specified below.

### 7.1.1 URI structure

All business step values specified in this section have one of the following two forms:

- `urn:epcglobal:cbv:bizstep:payload`
- `https://ref.gs1.org/cbv/Bizstep-payload`

where the `payload` part is a string as specified in the next section. Every payload string defined here contains only lower case letters and the underscore character.

Both URI structures are considered to be semantically equivalent via an owl:sameAs relationship.

### 7.1.2 Compliant usage

Each EPCIS event in a CBV-Compliant Document SHOULD include a `bizStep` field, and the value of the `bizStep` field SHALL be a URI consisting of one of the following two prefixes:

- `urn:epcglobal:cbv:bizstep:`
- `https://ref.gs1.org/cbv/Bizstep-`

followed by the string specified in the first column of some row of the table in section 7.1.3 below. The portion following the prefix SHALL be written exactly as specified in the table below, in all lowercase letters (possibly including underscores, as indicated).

Each EPCIS event in a CBV-Compatible Document MAY include a `bizStep` field, and the value of the `bizStep` field MAY be a URI as specified above for a CBV-Compliant document, and MAY be any other URI that meets the general requirements specified in [EPCIS2.0], section 6.4, except for those URIs which in this standard are forbidden or designated for a different purpose.

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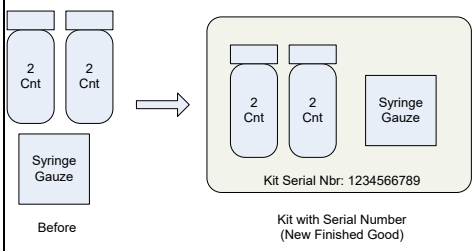
### 7.1.3 Business step values and definitions

| Value | Definition | Examples of use (non-exhaustive) |
|---|---|---|
| `accepting` | Denotes a specific activity within a business process where an object changes possession and/or ownership. | Retailer X unloads a pallet on to the receiving dock. The numbers of cases on the pallet are counted. The pallets are disaggregated from the shipping conveyance. The quantity is verified against the delivery document (Freight Bill or Bill of Lading), notating any over, short or damaged product at the time of delivery. Typically this process releases freight payment and completes the contractual agreement with the carrier of delivering the product/assets to a specified location.<br>A parcel carrier drops off five boxes at Distributor Y's DC. A person on the Receiving Dock signs that they accept the five boxes from the parcel carrier.<br>A wholesaler is assigned a lot of fish at a fish auction, verifies the quantity and acknowledges receipt.<br>A manufacturer's fork lift driver scans the IDs of components which have been removed from a consignment warehouse. In doing so, the components are added to the manufacturer's inventory |
| `arriving` | Denotes a specific activity within a business process where an object arrives at a location. | Truckload of a shipment arrives into a yard. Shipment has not yet been received or accepted. |
| `assembling` | Denotes an activity within a business process whereby one or more objects are combined to create a new finished product.<br>In contrast to transformation, in the output of `assembling` the original objects are still recognisable and/or the process is reversible; hence, `assembling` would be used preferably in an Association Event or, alternatively, an Aggregation Event, but not a Transformation Event. | Computer parts (hard drive, battery, RAM) assembled into a consumer ready computer<br>MRO processes involving components added to an assembly comprised of multiple parts.<br>Healthcare kitting: a surgical kit including drug, syringe, and gauze are combined to create a new 'product': a *kit*<br>  |
| `collecting` | Denotes a specific activity within a business process where an object is picked up and collected for future disposal, recycling or re-used. | An organisation picks up disposed consumer electronics in an end of life state from various different organisations. After the goods are picked up, they typically are brought back and received into a Collection Centre<br>Rented or leased pallets are picked up and brought to a collection centre. |

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| Value | Definition | Examples of use (non-exhaustive) |
|---|---|---|
| `commissioning` | Process of associating an instance-level identifier (such as an EPC) with a specific object, or the process of associating a class-level identifier, not previously used, with one or more objects. A tag may have been encoded and applied in this step, or may have been previously encoded.<br>`commissioning` is applied to this association of object and serialised identifier, regardless of industry/sector; it encompasses sector-specific process steps including, but not limited to:<br>▪ catching (of fish)<br>▪ harvesting (of fruit/vegetable)<br>▪ picking (of fruit/vegetables)<br>▪ producing (on an automated line)<br>▪ slaughtering (of livestock)<br>In the case of a class-level identifier, `commissioning` differs from `creating_class_instance` in that `commissioning` always indicates that this is the first use of the class-level identifier, whereas `creating_class_instance` does not specify whether the class-level identifier has been used before. | On a packaging line, an encoded EPC is applied to a case and associated to the product.<br>An individual virtual document (e.g. digital coupon, digital voucher, etc.) is assigned an EPC<br>One hundred bottles of a particular batch of pharmaceutical product are produced, those being the first bottles of that batch to be produced.<br>Sides of beef are transformed into individual packaged steaks. This may be a `TransformationEvent` if the input sides of beef are also tracked. |
| `consigning` | Indicates the overall process of `staging_outbound`, `loading`, `departing`, and `accepting`. It may be used when more granular process step information is unknown or inaccessible.<br>The use of `consigning` is mutually exclusive from the use of `staging_outbound`, `loading`, `departing`, and `accepting`.<br>Note: This business step is similar to `shipping`, but includes a change of possession and/or ownership at the outbound side. | A wholesaler comes aboard a fishing vessel, selects and buys boxes of fish, and brings them to his premises.<br>A manufacturer retrieves components from a consignment warehouse for use in its assembly line. In the logical second of leaving the consignment warehouse, the components pass into the ownership of the manufacturer.<br>A manufacturer stages products for loading, loads them into a container, the container is sealed, and the container departs. Ownership transfers to the receiver sometime during this overall process. If this is done in a single step, then business step `consigning` is used. |
| `creating_class_instance` | Denotes a step in a business process where an instance or increased quantity of a class-level identifier is produced. Unlike `commissioning`, this business step may be repeated for the same class-level identifier. | Water, sugar, and other ingredients are combined to produce a single batch of soda over a single shift on a single production line. This may be a `TransformationEvent` if the input ingredients are tracked.<br>Potatoes are sorted by size and quality, washed, and packed into cases of a single lot in a single packaging facility on a single date. |
| `cycle_counting` | Process of counting objects within a location in order to obtain an accurate inventory for business needs other than accounting purposes (e.g., replenishment and allocation). | A preselected subset of objects (for instance, all products belonging to a certain brand owner or a specific object class) within a retail store, are counted by a handheld reader.<br>All objects of a specific sub-location (sales floor or a shelf on the sales floor, e.g.) are counted by a handheld reader. |

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| Value | Definition | Examples of use (non-exhaustive) |
|---|---|---|
| `decommissioning` | Process of disassociating an instance-level identifier (such as an EPC) with an object. The object may be re-commissioned at some point in the future – however only with a new instance-level identifier. | An eSeal on a reusable container is broken when the container is opened, so that the container is no longer identified by the instance-level identifier that was in the eSeal.<br>A digital coupon or an empties refund voucher is redeemed at retail point-of-sale |
| `departing` | Denotes a specific activity within a business process where an object leaves a location on its way to a destination. | Truckload of a shipment departs a yard, typically through a gate and begins transit to another location |
| `destroying` | Process of terminating an object. For an instance-level identifier, the object should not be the subject of subsequent events; subsequent events are likely indicative of error (such as a stray read of a tag inside an incinerator). For a class level identifier, quantities are reduced; however, the class-level identifier may still be used in subsequent events (referring to different instances that were not destroyed). | Distributor or Retailer puts empty case in the incinerator or box crusher. |
| `disassembling` | Denotes a specific activity within a business process where an object is broken down into separate, uniquely identified component parts. | Before feeding a consumer electronics end of life item (a computer) into recycling operation line, it is necessary to disassemble the parts for the purpose of being recycled or disposed of in an environmentally sound manner.<br>A surgical kit (e.g. 2- 50 count bottles of medication and 1 syringe gauze) is broken down into its separate component parts |
| `dispensing` | Denotes a specific activity within a business process where a product is made available in full or part to a consumer. | A pharmacist dispenses a pharmaceutical to fill a specific prescription written by a physician, to a consumer or patient.<br>A deli manager slices a 5 pound package of turkey for sale. |
| `encoding` | Process of writing an instance-level identifier (typically an EPC) to a barcode or RFID tag, where the identifier is not yet associated with an object at this step in the process.<br>Encoding SHOULD only be used in a `TransactionEvent`. | 3rd Party writes tags and returns spool of case tags to Manufacturer |
| `entering_exiting` | Denotes a specific activity at the Entrance/Exit door of a facility where customers are either leaving with purchased product or entering with product to be returned to the facility. | Customer leaves the facility of Retailer X with their purchased items through a customer entrance/exit door. |

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| Value | Definition | Examples of use (non-exhaustive) |
|---|---|---|
| `holding` | Denotes a specific activity within a business process where an object is segregated for further review. | Retailer X unloads a second pallet on to their receiving dock, and, finding no purchase order for the pallet, moves the pallet to a holding area on the dock<br>Distributor Y obtains a shipment of pharmaceutical product. Distributor Y finds that their supplier cannot provide a complete pedigree. Distributor Y moves the shipment to a quarantine area on their dock.<br>Shipper Z is told by Customs to move a container to a special area until Customs can inspect and clear the container. |
| `inspecting` | Process of reviewing objects to address potential physical or documentation defects.<br>In contrast to *sampled* objects, *inspected* objects remain viable in the supply chain.<br>`Inspecting` is non-destructive and typically only checks the plausibility of the product packaging, security devices (e.g. holograms, watermarks, etc.) and integrity of any tamper-evident seals, whereas `sampling` is always destructive, i.e., makes the sampled product instance no longer viable for sale or onward distribution in the retail/dispensing supply chain), | Manufacturer A pulls 10 bottles from every batch to ensure that the product and pill count in the bottles match expectations<br>Distributor Y checks all returned products to designate them either as saleable or as damaged<br>Regulator R pulls 3 bottles from a shelf to determine if the bottles have a correct pedigree<br>Customs Agent C uses a machine to scan the contents of a shipping container<br>Pallet pool operator Z checks if certain pallets comply with quality standards. |
| `installing` | Denotes a specific activity within a business process where an object is put into a composite object (not merely a container).<br>In `installing` the composite object exists prior to this step, whereas in `assembling` the composite object is created during the step. | Additional memory chips and a rechargeable battery are installed within a computer<br>A duplexing unit is installed on a laser printer<br>Additional safety equipment is installed within the cabin of an aircraft or vehicle (e.g. fire extinguishers) |
| `killing` | Process of terminating an RFID tag previously associated with an object. The object and its instance-level identifier may continue to exist and be the subject of subsequent events (via a barcode, manual data entry, replacement tag, etc.). | Kill Command is issued to the tag to prevent any further reading of the tag or the information on the tag. |
| `loading` | Denotes a specific activity within a business process where an object is loaded into shipping conveyance. | Manufacturer A loads pallets into a container. The pallets are aggregated to the container.<br>Distributor Y loads racks full of totes on to a truck |
| `other` | A business step not identified by any of the values listed in the CBV. | "Other" may be used for terms that have yet to be added to the CBV from an industry or a user |
| `packing` | Denotes a specific activity within a business process that includes putting objects into a larger container – usually for shipping. Aggregation of one unit to another typically occurs at this point. | 12 packs of soda are placed into a case<br>Loose potatoes are placed into a tote. |
| `picking` | Denotes a specific activity within a business process that includes the selecting of objects to fill an order. | Distributor Y places three units into a tote to meet the requirements of a purchase order<br>Manufacturer A pulls three pallets from its racks to fulfil a purchase order |

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| Value | Definition | Examples of use (non-exhaustive) |
|---|---|---|
| `receiving` | Denotes a specific activity within a business process that indicates that an object is being received at a location and is added to the receiver's inventory.<br>The use of `receiving` is mutually exclusive from the use of `arriving` and `accepting`. | Retailer X confirms that the count of cases on the pallet equals the expected count in a purchase order. Retailer X takes the cases into inventory. Typically, this process matches the product to the purchase order for payment to the supplier.<br>A shipment from a manufacturer factory site to manufacturer distribution centre, is matched against the transaction record then added to local inventory. |
| `removing` | Denotes a specific activity within a business process where an object is taken out of a composite object.<br>Opposite of `installing`. | A defective airplane part is taken out of the engine |
| `repackaging` | Denotes a specific activity within a business process where an object's packaging configuration is changed. | Distributor Y receives one box full of batteries and another box full of laptops without batteries. Distributor Y ships out new boxes containing one laptop and one battery. |
| `repairing` | Denotes a specific activity within a business process where a malfunctioning product is repaired (typically by a post-sales service), without replacing it by a new one. | A computer is brought to a repair centre to fix a problem<br>An airplane part is in maintenance centre to diagnose an issue |
| `replacing` | Denotes a specific activity within a business process where an object is substituted or exchanged for another object. | A defective airplane part is replaced by a new part. |
| `reserving` | Process in which a set of instance-level identifiers, not yet commissioned, are provided for use by another party. | Manufacturer provides set of case EPC numbers to a 3rd Party labeller |
| `retail_selling` | Denotes a specific activity within a business process at a point-of-sale for the purpose of transferring ownership to a customer in exchange for something of value (currency, credit, etc.). | Retailer X sells a screwdriver to a customer by checking it out through a point-of-sale system. |
| `sampling` | Denotes a testing activity within a business process where one or more portions of an object are examined for quality testing, quality inspection, or customs clearance purposes.<br>In contrast to *inspected* objects, *sampled* objects are no longer viable in the supply chain.<br>`Inspecting` is non-destructive and typically only checks the plausibility of the product packaging, security devices (e.g. holograms, watermarks, etc.) and integrity of any tamper-evident seals, whereas `sampling` is always destructive, i.e., makes the sampled product instance no longer viable for sale or onward distribution in the retail/dispensing supply chain).<br>When a serialised instance undergoes `sampling`, the subsequent business step SHALL be an end-of-life event (i.e., with action DELETE), to prevent the return of the sampled object (or its identifier) into the supply chain. | Customs authority X removes a pharmaceutical product from a case for quality testing at a customs office.<br>Food laboratory Y pulls a random product sample and checks it for authenticity. |

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| Value | Definition | Examples of use (non-exhaustive) |
|---|---|---|
| `sensor_reporting` | Denotes a specific activity within a business process where sensor data, pertaining to the physical properties and condition of an object or location, is returned.<br>If an EPCIS event accommodates sensor data in conjunction with specific business process steps (e.g. sensor observations in the context of a `commissioning`, `packing`, or `sampling`), the business step value describing the process step SHOULD be used. `sensor_reporting` SHOULD only be used when no other business step is in progress. | Several packages of frozen food are kept in cold storage, with temperature monitoring. An EPCIS event is triggered once a specific, pre-set temperature threshold is reached.<br>A dust-free room is continuously checked for the presence of contaminants. An EPCIS event is captured at regular intervals for documentation purposes.<br>A wine/cheese cellar is continuously checked for humidity and temperature. Each time the door is opened or closed, an EPCIS event is captured, including the range of temperature and humidity values within the period of time since the previously captured `sensor_reporting` EPCIS event. |
| `shipping` | Indicates the overall process of `staging_outbound`, `loading` and `departing`. It may be used when more granular process step information is unknown or inaccessible. It may indicate a final event from a shipping point.<br>The use of `shipping` is mutually exclusive from the use of `staging_outbound`, `departing`, or `loading`. | Manufacturer A loads and reads product into the shipping container and closes the door. The product has been read out of the shipping facility. The shipment is immediately picked up and a BOL is associated at this point. (The shipment has left the yard)<br>At Distributor Y, the truck containing racks full of totes pulls away from the shipping dock or staging area.<br>Manufacturer A completes loading product into trailer and seals door. The trailer is ready for pickup. The generation of a Despatch Advice / ASN triggers a "shipping" event.<br>A 3PL picks and tags the product. The product is loaded into a trailer and signed over to a transportation carrier. The 3PL notifies the manufacturer who generates a "shipping" event. NOTE: This would be the case if there were NO departing step at a read point at the gate.<br>Typical Process flow:<br>`staging_outbound`<br>`loading`<br>`departing`<br>The above steps assume an organisation's ability and desire to share all steps in the process. If those process steps are not captured, the single business step of shipping would be used. |
| `staging_outbound` | Denotes a specific activity within a business process in which an object moves from a facility to an area where it will await transport pick-up. | Container is being closed and will be subsequently loaded onto a vehicle in the yard.<br>Container is being closed and seal is applied, and will be subsequently loaded onto a vehicle in the yard<br>Product has been picked and is now in a staging lane waiting for loading into a container |
| `stock_taking` | Process of counting objects within a location following established rules and/or standards to serve as a basis for accounting purposes. | All EPCs in a retail store are read by a handheld reader following a procedure accepted by the organisation's accounting firm. |

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| Value | Definition | Examples of use (non-exhaustive) |
|---|---|---|
| `stocking` | Denotes a specific activity within a business process within a location to make an object available to the customer or for order fulfilment within a DC. | Retailer X places cans from a case on to a shelf on the sales floor<br>Distributor X moves goods from a storage area to a picking area |
| `storing` | Denotes a specific activity within a business process where an object is moved into and out of storage within a location. | Manufacturer A moves a pallet from the receiving area to a rack<br>Retailer X moves a case from the receiving dock to a shelf in the backroom |
| `transporting` | Process of moving an object from one location to another using a vehicle (e.g., a ship, a train, a lorry, an aircraft). | Carrier X conveys 150 sea containers from Hong Kong seaport to Hamburg seaport with a container vessel.<br>A train with 20 goods wagons goes from one train station to another.<br>A lorry moves a swap trailer from a depot to a distribution centre. |
| `unloading` | Denotes a specific activity within a business process where an object is unloaded from a shipping conveyance. | Manufacturer A unloads pallets from a shipping conveyance. The pallets are disaggregated from the shipping conveyance.<br>Distributor Y unloads racks full of totes from a truck |
| `unpacking` | Denotes a specific activity within a business process that includes removing products (individuals, inners, cases, pallets) from a larger container – usually after receiving or accepting. Disaggregation of one unit from another typically occurs at this point. | 12 packs of soda are removed from a case<br>Loose potatoes are taken off from a tote. |
| `void_shipping` | Denotes a process of declaring that one or more objects in a prior outbound process (captured in an EPCIS event having business step `shipping`, `departing`, or `consigning`) were not shipped (or departed or consigned) as previously indicated. | A sender cancels a shipment after a prior shipping event.<br>A sender discovers, either by notification from a recipient or on their own, that a shipment they believed occurred and created a shipping event for, did not actually occur. The record is updated to reflect this.<br>A sender discovers that three out of ten items, previously believed as having been shipped, were not included in the shipment. The `void_shipping` business step indicates that those three items were not shipped. |

## 7.2 Dispositions

This section specifies standard identifier values for the EPCIS `DispositionID` vocabulary. For each of the identifiers defined, equivalent terms and values are also included in the GS1 Web Vocabulary published at https://www.gs1.org/voc/.

These identifiers populate the `disposition` and `persistentDisposition` fields in an EPCIS event, as specified below.

### 7.2.1 URI structure

All disposition values specified in this section have one of the following two forms:

- `urn:epcglobal:cbv:disp:payload`
- `https://ref.gs1.org/cbv/Disp-payload`

where the `payload` part is a string as specified in the next section. Every payload string defined herein contains only lower case letters and the underscore character.

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Both URI structures are considered to be semantically equivalent via an owl:sameAs relationship.

### 7.2.2 Compliant usage

Each EPCIS event in a CBV-Compliant Document MAY include a `disposition` field. If the `disposition` field is present, the value of the `disposition` field SHALL be a URI consisting of one of the following two prefixes:

- `urn:epcglobal:cbv:disp:`
- `https://ref.gs1.org/cbv/Disp-`

followed by the string specified in the first column of some row of the table below. The portion following the prefix SHALL be written exactly as specified in the table below, in all lowercase letters (possibly including underscores, as indicated).

Each EPCIS event in a CBV-Compatible Document MAY include a `disposition` field, and the value of the `disposition` field MAY be a URI as specified above for a CBV-Compliant document, and MAY be any other URI that meets the general requirements specified in [EPCIS2.0], section 6.4, except for those URIs which in this standard are forbidden or designated for a different purpose.

### 7.2.3 Disposition values and definitions

| Value | Definition | Examples of use (non-exhaustive) |
|---|---|---|
| `active` | A commissioned object has just been introduced into the supply chain. | Manufacturer A commissions tags for 10 cases of product.<br>A virtual document has been assigned an EPC<br>Business step:<br>`commissioning` |
| `available` | Object has been returned to service or to the supply chain (e.g., following a successfully completed `repairing` step). | A mechanical component has been serviced and made available for use. |
| `completeness_inferred` | Applied as `persistentDisposition` of an `AggregationEvent` or `ObjectEvent` with action `OBSERVE` to indicate the inferred integrity of that aggregation (without unpacking the aggregated children from the parent) on the basis of aggregation information (e.g., earlier EPCIS packing event data and/or ASN/DESADV) provided by an upstream supplier.<br>Inferred children SHALL be explicitly listed when captured in an `AggregationEvent`, but SHALL NOT be listed when captured in an `ObjectEvent`. | A downstream recipient infers that the contents of a shipment below the outer packing layer are complete, as indicated in EPCIS packing and shipping events provided by the upstream supplier. |

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| Value | Definition | Examples of use (non-exhaustive) |
|---|---|---|
| completeness_verified | Applied as Disposition of an AggregationEvent with action DELETE and business step unpacking to explicitly indicate the verified integrity of that aggregation when the aggregated children are unpacked from their parent.<br>Applied as persistentDisposition of an ObjectEvent with business step inspecting, if the inspection has verified the presence of each of the aggregated children. | A downstream recipient verifies that the contents of a shipment below the outer packing layer are complete, by means of unpacking and scanning the barcodes or EPC/RFID tags of the contents. |
| conformant | Outcome of a successful/passed inspection in an inspecting or repairing step. | A mechanical component has been successfully tested for conformity to safety or performance requirements. |
| container_closed | Object has been loaded onto a container, the doors have been closed and the shipment sealed. | Container is being closed and will be awaiting pickup in the yard.<br>Container is being closed and electronic seal is applied.<br>Business step (non-exclusive example):<br>staging_outbound |
| container_open | A container's doors have been opened; or a seal of a shipment has been broken.<br>This disposition makes no indication as to whether the act of opening was authorised. | Container has been opened in the normal process of unloading,<br>Container has been opened unexpectedly, with no apparent reason. |
| damaged | Object is impaired in its usefulness and/or reduced in value due to a defect. | Pallet pool operator P notices that a plank of a pallet is broken and records this incident by scanning the EPC of the pallet.<br>Retailer R receives a shipment where the product packages on the pallet have been dented.<br>Business steps:<br>accepting<br>inspecting<br>receiving<br>removing<br>repairing<br>replacing<br>Note:<br>"damaged" can also apply to non-apparent (physical) damage determined by means of sensor data. For example, product pH has dropped beyond a minimum acceptable threshold for viability. |
| destroyed | Object has been fully rendered non-usable. | Incinerator Operator B indicates that product and packaging have been incinerated<br>Business step:<br>destroying |

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