

आंकड़ों की गुणवत्ता

भाग 140 **प्रधान** आंकड़े — विशिष्ट आंकड़ों का
आदान-प्रदान — पूर्णता

Data Quality

Part 140 Master Data — Exchange of
Characteristic Data — Completeness

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NATIONAL FOREWORD

This Indian Standard (Part 140) which is identical to ISO 8000-140 : 2016 'Data quality — Part 140: Master data — Exchange of characteristic data — Completeness' issued by the International Organization for Standardization (ISO) was adopted by the Bureau of Indian Standards on recommendation of the Industrial Automation Systems and Robotics Sectional Committee and approval of the Production and General Engineering Division Council.

Other parts in this series are:

- Part 1 Overview
- Part 2 Vocabulary
- Part 8 Information and data quality: Concepts and measuring
- Part 60 Data quality management: Overview
- Part 61 Data quality management: Process reference model
- Part 62 Data quality management: Organizational process maturity assessment: Application of standards relating to process assessment
- Part 63 Data quality management: Process measurement
- Part 64 Data quality management: Organizational process maturity assessment: Application of the Test Process Improvement method
- Part 65 Data quality management: Process measurement questionnaire
- Part 66 Data quality management: Assessment indicators for data processing in manufacturing operations
- Part 81 Data quality assessment: Profiling
- Part 82 Data quality assessment: Creating data rules
- Part 100 Master data: Exchange of characteristic data: Overview
- Part 110 Master data: Exchange of characteristic data: Syntax, semantic encoding, and conformance to data specification
- Part 115 Master data: Exchange of quality identifiers: Syntactic, semantic and resolution requirements
- Part 116 Master data: Exchange of quality identifiers: Application of ISO 8000-115 to authoritative legal entity identifiers
- Part 120 Master data: Exchange of characteristic data: Provenance
- Part 130 Master data: Exchange of characteristic data: Accuracy
- Part 150 Data quality management: Roles and responsibilities
- Part 311 Guidance for the application of product data quality for shape (PDQ-S)

A list of all the parts in the IS/ISO 8000 series can be found on the BIS and ISO websites.

This part of IS/ISO 8000 is an optional addition to IS/ISO 8000-120 and specifies requirements for representation and exchange of information about completeness of master data that consists of characteristic data.

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Introduction

The ability to create, collect, store, maintain, transfer, process and present data to support business processes in a timely and cost effective manner requires both an understanding of the characteristics of the data that determine its quality, and an ability to measure, manage and report on data quality.

ISO 8000 defines characteristics that can be tested by any organization in the data supply chain to objectively determine conformance of the data to ISO 8000.

ISO 8000 provides frameworks for improving data quality for specific kinds of data. The frameworks can be used independently or in conjunction with quality management systems.

ISO 8000 covers industrial data quality characteristics throughout the product life cycle from conception to disposal. ISO 8000 addresses specific kinds of data including, but not limited to, master data, transaction data, and product data.

This part of ISO 8000 is an optional addition to ISO 8000-120 and specifies requirements for representation and exchange of information about completeness of master data that consists of characteristic data. ISO 8000-120 is an optional addition to ISO 8000-110 and specifies requirements for representation and exchange of information about provenance of master data that consists of characteristic data. ISO 8000-110 specifies basic requirements for representation and exchange of information about provenance of master data that consists of characteristic data, in particular, conformance to a formal syntax, semantic encoding, and conformance to a data specification.

Indian Standard

DATA QUALITY

**PART 140 MASTER DATA — EXCHANGE OF CHARACTERISTIC DATA
— COMPLETENESS****1 Scope**

This part of ISO 8000 is an optional addition to ISO 8000-120 and specifies requirements for representation and exchange of information about completeness of master data that consists of characteristic data.

NOTE 1 ISO 8000-110 specifies that such data be represented as property values. ISO 8000-120 provides additional requirements for property values when data provenance information needs to be captured.

This part of ISO 8000 does not specify a complete model for characteristic data, nor does it specify an exchange format for characteristic data with data completeness information.

NOTE 2 This is done in other standards that reference this part of ISO 8000, e.g. ISO/TS 22745-40.

The following are within the scope of this part of ISO 8000:

- requirements for capture and exchange of data completeness information in the form of statements and assertions of data completeness;
- conceptual data model for data completeness information in the form of statements and assertions of data completeness.

The following are outside the scope of this part of ISO 8000:

- requirements for data completeness;

NOTE 3 The requirements for data completeness depend on many factors, e.g. the kind of data, how the data are being used, industry, and needs of the partners exchanging the data. It is not possible to state general requirements for data completeness.

- exchange format for data completeness information;
- scheme for registering and resolving organization identifiers and person identifiers;
- completeness of data that are not characteristic data represented as property values;
- syntax of identifiers;
- resolution of identifiers.

Some of the requirements in this part of ISO 8000 can apply to exchange of data that is not master data which consists of characteristic data represented as property values.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 8000-2, *Data quality — Part 2: Vocabulary*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 8000-2 apply.

4 Abbreviated terms

- UML Unified Modeling Language
- XML Extensible Markup Language

5 General

A data provider may declare the completeness of data through either a statement (see [Clause 7](#)) or an assertion (see [Clause 8](#)).

6 Completeness data model

6.1 Referenced types and entities

The following types and entities are used by the completeness model:

- ISO_6523_identifier, defined in ISO 8000-120;
- date_and_time, defined in ISO 8000-120;
- property_value_assignment, defined in ISO 8000-120.

6.2 Diagram

The UML class diagram for the completeness model is given in [Figure 1](#).

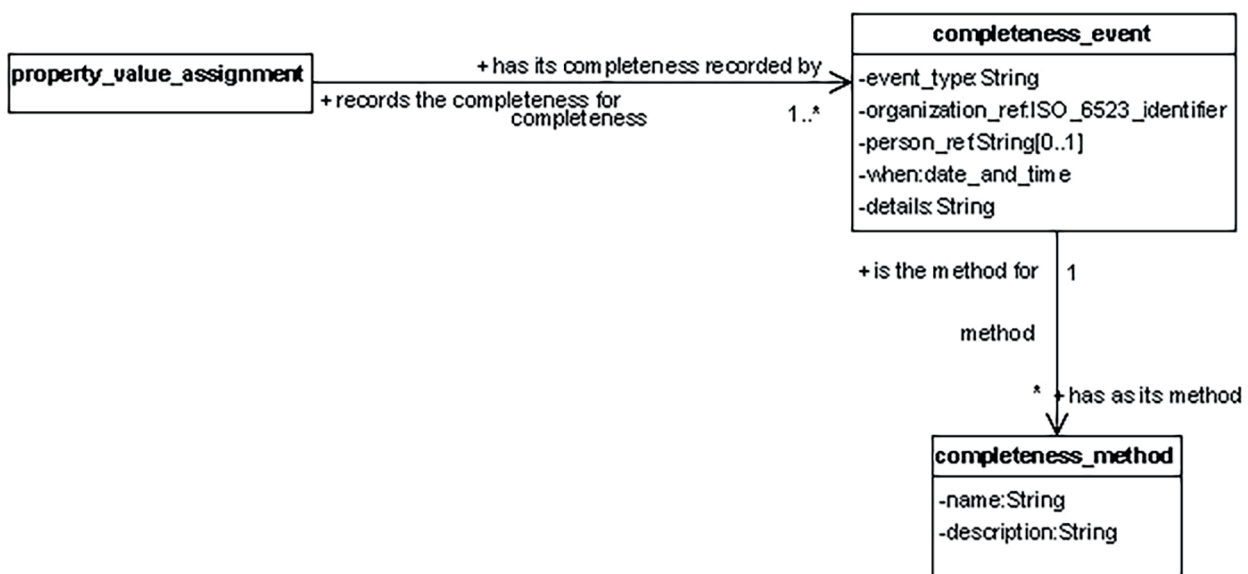


Figure 1 — UML class diagram for completeness

NOTE The entity `property_value_assignment` is the intersection point between this data model and the target data model: the model of data for which completeness information is to be recorded. When the data model in [Clause 6](#) is integrated with the target data model, this entity needs to be replaced with the appropriate entity from the target data model.

6.3 completeness_event

A `completeness_event` is an event for which data completeness information is recorded.

Attribute definitions:

details:	the details of the <code>completeness_event</code> . NOTE 1 This could include the text of the statement or assertion of completeness.
event_type:	the kind of <code>completeness_event</code> . The value shall be one of the following: — statement: a statement of completeness was provided for the property value; — assertion: an assertion of completeness was provided for the property value.
method:	<code>completeness_method</code> used to record the completeness for the <code>completeness_event</code> .
organization_ref:	the unambiguous identifier of the organization and possibly the subdivision of the organization that performed the event, conforming to the structure defined in ISO/IEC 6523-1 and assigned in accordance with ISO/IEC 6523-2.
person_ref:	the identifier assigned by the organization to the person who performed the event. NOTE 2 The identifier need only be unique within the organization. NOTE 3 The format of the identifier is not specified in this part of ISO 8000.
when:	the point in time at which the event took place.

Assertions:

Each `completeness_event` has as its method zero, one, or many `completeness_method` objects. Each `completeness_method` is the method for exactly one `completeness_event`.

Each `completeness_event` records the completeness for exactly one `property_value_assignment`. Each `property_value_assignment` has its completeness recorded by one or many `completeness_event` objects.

6.4 completeness_method

A `completeness_method` is method used to record completeness.

EXAMPLE By percent, by real number between 0 to 1,0, by qualitative statement (excellent, good, mediocre, bad).

Attribute definitions:

description:	human-readable string that characterizes the <code>completeness_method</code> .
name:	word or phrase by which the <code>completeness_method</code> is known.

Assertions:

Each `completeness_method` is the method for exactly one `completeness_event`. Each `completeness_event` has as its method zero, one, or many `completeness_method` objects.

7 Statement of data completeness

A statement of data completeness is a statement of fact that enables the recipient to make a judgement as to whether the data meets its data completeness requirements.

A statement of data completeness may include:

- the process that generated the data;

NOTE 1 This could include:

- process steps;
- environment in which the process was executed;
- equipment used;
- calibration data.

EXAMPLE 1 ISO 10303-49 contains a data model for process.

EXAMPLE 2 ISO 18629 defines a neutral representation for manufacturing processes that supports automated reasoning.

EXAMPLE 3 ISO/TS 14048 contains a data format for environmental data.

- the process used to verify the completeness of the master data message or of the underlying data from which it was extracted;

NOTE 2 See the examples under item (a) for data models and formats.

- data completeness test results;

EXAMPLE 4 ISO 10303-59 can be used to exchange information about the quality of product shape data.

EXAMPLE 5 The X12 863 transaction set can be used to exchange test results.

- known incompletenesses.

8 Assertion of data completeness

An assertion of data completeness is a declaration that a property value meets some objective measure of data completeness.

An assertion of data completeness shall be in writing.

An assertion of data completeness shall include:

- the measure of data completeness that is being claimed;
- the claim process;
- the registered address for obtaining service;
- what the provider will do if the property value fails to meet the specified measure of data completeness.

NOTE This can include providing revised data, or providing monetary compensation.

An assertion of data completeness may include limitations.

EXAMPLE Limitations on the length of the period for which service will be provided. These might include:

- date the assertion goes into effect;

- date the assertion expires.

9 Data completeness record

The data completeness record for a property value is the record of the ultimate derivation and passage of the property value through its various owners or custodians.

The data completeness record for a property value shall be either:

- included in the structure that represents property value;
- EXAMPLE 1 The following is an XML code fragment in which the data completeness record is included in the XML structure that represents property value.

Coded:

```
<property-value property-ref="0161-1#02-015007#1">
  <controlled-value value-ref="0161-1#07-000435#1"/>
  <!-- Include provenance-event elements here.
  (ISO 8000-120 requires that each property value has at least one provenance event.) -->
```

...

```
<completeness-event event-type="assertion" organization-ref="0161-ABCDE
date="2008-10-29T10:03:15.195">
  ABC Company asserts that this data is complete...
</completeness-event>
</property-value>
```

Decoded:

```
<property-value property-ref="0161-1#02-015007#1">
  <controlled-value value-ref="0161-1#07-000435#1"/>
  <!-- Include provenance-event elements here.
  (ISO 8000-120 requires that each property value has at least one provenance event.) -->
```

...

```
<completeness-event event-type="assertion" organization-ref="ABC Company
date="2008-10-29T10:03:15.195">
  ABC Company asserts that this data is complete...
</completeness-event>
</property-value>
```

- stored separately and referenced from the structure that represents property value.

EXAMPLE 2 The following is an XML code fragment in which the data completeness record is referenced from the XML structure that represents property value.

Coded:

```
<property-value property-ref="0161-1#02-015007#1" completeness-ref="p2263">
```

```
<controlled-value value-ref="0161-1#07-000435#1"/>
</property-value>
```

...

<!-- Include provenance-record element here.

(ISO 8000-120 requires that each property value has at least one provenance event. The provenance events form the content of the provenance-record.) ->

...

```
<completeness-record id="p2263">
  <completeness-event event-type="assertion" organization-ref="0161-ABCDE
    date="2008-10-29T10:03:15.195">
    ABC Company asserts that this data is complete...
  </completeness-event>
</completeness-record>
```

Decoded:

```
<property-value property-ref="0161-1#02-015007#1" completeness-ref="p2263">
  <controlled-value value-ref="0161-1#07-000435#1"/>
</property-value>
```

...

<!-- Include provenance-record element here.

(ISO 8000-120 requires that each property value has at least one provenance event. The provenance events form the content of the provenance-record.) ->

...

```
<completeness-record id="p2263">
  <completeness-event event-type="assertion" organization-ref="ABC Company
    date="2008-10-29T10:03:15.195">
    ABC Company asserts that this data is complete...
  </completeness-event>
</completeness-record>
```

NOTE 1 The above examples include data provenance records, since the requirements of ISO 8000-120 for data provenance information are incorporated by reference into this part of ISO 8000. See ISO 8000-120 for the requirements for the data provenance record.

NOTE 2 See [Annex C](#) for the meaning of the codes used in the examples above.

NOTE 3 This part of ISO 8000 does not require that a master data message use the specific structures shown in the examples above, or that it use XML syntax at all.

NOTE 4 In the examples above, data are given in coded form followed by decoded form for clarity. An actual master data message is required to be in coded form (see ISO 8000-110).

The data completeness record for a property value shall include a statement or an assertion of data completeness.

10 Conformance requirements

Any property value for which conformance to this part of ISO 8000 is claimed shall:

- conform to ISO 8000-120;

NOTE ISO 8000-120 requires conformance to ISO 8000-110.

- have a data completeness record that satisfies the requirements of [Clause 9](#).

This part of ISO 8000 provides for a number of options that may be supported by an implementation. These options have been grouped into the following conformance classes:

- free decoding;
- fee-based decoding.

Conformance to the free decoding conformance class requires conformance to the free decoding conformance class of ISO 8000-120.

Conformance to the fee-based decoding conformance class requires conformance to the fee-based decoding conformance class of ISO 8000-120.

Annex A **(normative)**

Document identification

To provide for unambiguous identification of an information object in an open system, the object identifier

{ iso standard 8000 part (140) version (1) }

is assigned to this part of ISO 8000. The meaning of this value is defined in ISO/IEC 8824-1, and is described in ISO 10303-1.

Annex B
(informative)

Information to support implementations

Additional information may be provided to support implementations.

Annex C (informative)

Codes used in examples

This annex contains codes used in examples illustrating the coding of data completeness information for property values. In accordance with ISO 8000-110, master data messages are coded using concepts from a data dictionary. [Table C.1](#) lists the concept identifiers that are used in this annex and their meanings.

Table C.1 — Concepts used

| Identifier | Type | Name |
|--------------------|-------------------|--------------------|
| 0161-1#02-015007#1 | Property | enclosure material |
| 0161-1#07-000435#1 | value of property | ceramic |
| 0161-1#07-185586#1 | value of property | resin |

NOTE 1 This annex uses concept identifiers from the ECCMA Open Technical Dictionary (eOTD). Any dictionary that met the requirements of ISO 8000-110 could have been used.

[Table C.2](#) lists the organizations that are referenced in this annex with their identifiers.

Table C.2 — Organizations referenced

| Identifier | Type | Role |
|------------|-------------|---|
| 0161-XYZQW | IM1 | Manager of catalogue of items of supply |
| 0161-ABCDE | ABC Company | Manufacturer of microcircuits |
| 0161-BCDEF | XYZ Company | Data aggregator |

NOTE 2 This annex uses organization identifiers from eOTD. Any ISO/IEC 6523 compliant organization identification scheme could have been used.

NOTE 3 See ISO/IEC 6523-1 for the specification of the elements of an organization identifier.

IM1 maintains master data for items of supply in IOS-MS (Item of Supply Management System).

[Table C.3](#) lists the persons who are referenced in this annex with their identifiers.

Table C.3 — Persons referenced

| Identifier | Name | Company | Role |
|------------|--------------------|-------------|---------------------------------|
| JPS3642 | John P. Smith | IM1 | Cataloguer |
| ROLLINS1 | William F. Rollins | ABC Company | Engineer |
| BAKER2 | Catherine A. Baker | ABC Company | Engineer |
| DOE1 | Jane E. Doe | ABC Company | Customer service representative |

NOTE 4 The codes "0161-ABCDE", "0161-BCDEF" and "0161-XYZQW" are dummy codes used for illustration purposes.

In this annex, times are given to the day, e.g. 1998-12-01, for simplicity. This part of ISO 8000 allows times to be given to any finer level of precision, e.g. 1998-12-01T08:41:36.118.

Data is given in coded and decoded form, using the notation in the Introduction. An actual master data message conforming to this part of ISO 8000 would have data in coded form.

Bibliography

- [1] ISO 3534-2, *Statistics — Vocabulary and symbols — Part 2: Applied statistics*
- [2] ISO/TS 8000-1, *Data quality — Part 1: Overview*
- [3] ISO 8000-100, *Data quality — Part 100: Master data: Exchange of characteristic data: Overview*
- [4] ISO 8000-110, *Data quality — Part 110: Master data: Exchange of characteristic data: Syntax, semantic encoding, and conformance to data specification*
- [5] ISO 10303-1, *Industrial automation systems and integration — Product data representation and exchange — Part 1: Overview and fundamental principles*
- [6] ISO 10303-49, *Industrial automation systems and integration — Product data representation and exchange — Part 49: Integrated generic resources: Process structure and properties*
- [7] ISO 10303-59, *Industrial automation systems and integration — Product data representation and exchange — Part 59: Integrated generic resource — Quality of product shape data*
- [8] ISO/TS 14048, *Environmental management — Life cycle assessment — Data documentation format*
- [9] ISO 18629 (all parts), *Industrial automation systems and integration — Process specification language*
- [10] ISO/TS 22745-40, *Industrial automation systems and integration — Open technical dictionaries and their application to master data — Part 40: Master data representation*
- [11] ISO/IEC 6523 (all parts), *Information technology — Structure for the identification of organizations and organization parts*
- [12] ISO/IEC 8824-1, *Information technology — Abstract Syntax Notation One (ASN.1) — Part 1: Specification of basic notation*
- [13] ASC X12 *Electronic data interchange standard. Data Interchange Standards Association*

[\(Continued from second cover\)](#)

The text of ISO standard has been approved as suitable for publication as an Indian Standard without deviations. Certain conventions are, however, not identical to those used in Indian Standards. Attention is particularly drawn to the following:

- a) Wherever the words 'International Standard' appear referring to this standard, they should be read as 'Indian Standard'; and
- b) Comma (,) has been used as a decimal marker while in Indian Standards, the current practice is to use a point (.) as the decimal marker.

In this adopted standard, reference appears to the following International Standard for which Indian Standard also exists. The corresponding Indian Standard which is to be substituted in its place is given below along with its degree of equivalence for the edition indicated:

| <i>International Standard</i> | <i>Corresponding Indian Standard</i> | <i>Degree of Equivalence</i> |
|---|---|------------------------------|
| ISO 8000-2 Data quality —
Part 2: Vocabulary | IS/ISO 8000-2 : 2022 Data quality —
Part 2: Vocabulary | Identical |

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 2022 'Rules for rounding off numerical values (*second revision*).' The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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