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Industrial automation systems and integration — Integration of life-cycle data for process plants including oil and gas production facilities — Part 4: Core reference data

~~DTS~~ stage

ISO/DTS 15926-4

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A model manuscript of a draft International Standard (known as "The Rice Model") is available at https://www.iso.org/iso/model_document-rice_model.pdf

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO ~~documents~~document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 184, Automation systems and integration, Subcommittee SC 4, Industrial 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.

This document was prepared by Technical Committee ISO/TC 184, *Automation systems and integration*, Subcommittee SC 4, *Industrial data*.

This third edition replaces the second edition (ISO 15926-4:2019), which has been technically revised.

The main changes ~~compared to the previous edition~~ are as follows:

— The list of spreadsheets has been updated and includes the correct address on www.standards.iso.org and with the correct version number of the spreadsheets;

— The content of the spreadsheets has been updated ~~for~~to reflect the ~~experience of~~ projects of the past years. In each spreadsheet insert, a list has been included of the changes compared to the previous version;

— The list of attributes has been aligned to ISO/TS 15926-6;

~~An~~ — Informative Annex ~~has been added~~E that describes types of libraries and collections of terms related to reference data libraries, has been added;

~~An~~ — Informative Annex F has been added that describes the application of ISO/TS 15926-4 (this document) in other parts of the ISO 15926 series, including conformance criteria and an example of integration of various reference data libraries into a specific project reference data library.

A list of all parts in the ISO 15926 series can be found on the ISO website.

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.

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Introduction

The ISO 15926 ~~is an International Standard for~~series provides the representation of process industries facility life-cycle information. This representation is specified by a generic, conceptual data model that is suitable as the basis for implementation in a shared database or data warehouse. The data model is designed to be used in conjunction with reference data, i.e. standard instances that represent information common to a number of users, production facilities, or both. The support for a specific life-cycle activity depends on the use of appropriate reference data in conjunction with the data model.

The ISO 15926 series is ~~organized as~~ a series of parts, each published separately. This ~~part of ISO 15926~~document specifies the core set of reference data items.

The ~~ISO 15926-4~~ reference data in this document have been developed since 1990 from the experience of operators, contractors and equipment suppliers operating in the plant engineering supply chain. The reference data therefore largely cover process plants installed in the oil, gas, process and power ~~industry.~~ industries. The reference data can be extended though change requests (~~CR~~CRs) with data that have not yet been covered, such as specific nuclear data and specific pulp and paper equipment data. Such ~~CR's~~CRs will be processed ~~in an~~according to the ISO ~~verification~~TC 184/SC4 N2591 procedure ~~using agreed rules from~~for maintenance of reference data. In this procedure, the ISO/TS 15926-6~~.~~ reference data are checked against the technical rules given in ISO/TS 15926-6.

Industrial automation systems and integration — Integration of life-cycle data for process plants including oil and gas production facilities — Part 4: Core reference data

1 Scope

This document specifies the set of core reference data items which can be used to record information about process plants, including oil and gas production facilities.

The following are within the scope of this document:

— core classes for process plants, including oil and gas production facilities;

— information about a reference data item.

EXAMPLE 1 The unique name of a reference data item is information about that reference data item.

EXAMPLE 2 The definition of a reference data item is information about that reference data item.

NOTE The total set of information about a reference data item can be found in Table B.1.

The following are outside the scope of this document:

— data requirements for additional reference data items;

— the procedures to be followed for registration and maintenance of additional reference data items.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 15926-2:2003, *Industrial automation systems and integration — Integration of life-cycle data for process plants including oil and gas production facilities — Part 2: Data model*

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1.1
class
category or division of things based on one or more criteria for inclusion and exclusion

Note 1 to entry: A class need not have any members (things that satisfy its criteria for membership).

Note 2 to entry: Because the spatio-temporal paradigm is used to define individuals in this document, all classes are non-well-founded sets. These are explained in ISO 15926-2:2003, D.2.4.

[SOURCE: ISO 15926-1:2004, 3.1.1, modified – — editorial updates to Note 2 to entry has been modified].]

3.1.2
commodity product class
product class that has sufficient characterization to indicate suitability for a defined use, and that is an open agreed standard

Note 1 to entry: Often a commodity product class is defined by several other standards. A piping component typically conforms to a "shape standard" and a "material standard".

Note 2 to entry: Different manufactured product classes, which are specializations of the same commodity product class, are interchangeable for the use defined by the commodity product class.

Note 3 to entry: Adapted from ISO 15926-1:2004, 3.1.2.

EXAMPLE   The type of light bulb known as 60 W 230 V E27 is a commodity class.

[SOURCE: ISO 15926-1:2004, 3.1.2, modified]

3.1.3
core class
class that is a commonly used subdivision corresponding to terms used in common language

NOTE to entry: The conditions for membership are in general often not formally defined, so understanding of the class may be conveyed by example. However in ISO/TS 15926-4 they do have a definition.

EXAMPLE   Pipe, floor, pump, and light bulb are all core classes.

[SOURCE: ISO 15926-1:2004, 3.1.4, modified] — Note 1 to entry was deleted.]

3.1.4
data
representation of information in a formal manner suitable for communication, interpretation, or processing by human beings or computers

[SOURCE: ISO 10303-1:2021, 3.5.21.29]

3.1.5

de facto class

class corresponding to common natures that are widely recognized but not formally agreed or defined

Note 1 to entry: De facto classes can be subsequently formalized by international, national, or industry agreement.

Note 2 to entry: A manufacturer can choose to make a product of similar specification to that of another manufacturer in order to compete for the market share by choosing to conform to some characteristics of the other product.

EXAMPLE   USB port and HB pencil are de facto classes.

[SOURCE: ISO 15926-1:2004, 3.1.8, modified — note— Editorial update to Note 1 to entry, EXAMPLE 1 changed to Note 2 to entry and example updated], EXAMPLE 2 is now EXAMPLE and updated.]

3.1.6
information

facts, concepts, or instructions

EXAMPLE 1   The unique name of a reference data item is information about that reference data item.

EXAMPLE 2   The definition of a reference data item is information about that reference data item.

[SOURCE: ISO 10303-1:2021, 3.2.20]1.41, modified — Examples 1 and 2 added.]

3.1.7
manufactured product class

class whose members are individuals produced by a manufacturing process

Note 1 to entry: The members of a manufactured product class can be discrete, or can be batches or continuous flows, such as process fluids.

Note 2 to entry: A manufactured product class may correspond to a specification that has not been realized, such as a product specification for which no products have been made.

EXAMPLE 1   Lightbulbs of type "60 W 230 V E27" is a manufactured product class whose members are discrete.

EXAMPLE 2   "EN 228" unleaded petrol to "EN 228" is a manufactured product class whose members are continuous.

[SOURCE: ISO 15926-1:2004, 3.1.14, modified —— Editorial update to Note 1 to entry, example updated]

3.1.8
product class

artefact that has been designed by a manufacturer and whose members may fulfil the requirements set forth in an instance of an asset requirement class.

3.1.9
proprietary class

class whose specification for membership is owned, controlled, or protected by an organization and is not generally available outside that organization

[SOURCE: ISO 15926-1:2004, 3.1.16]

3.1.10

proprietary product class

class that is a manufactured product class and a proprietary class

Note 1 to entry: Proprietary product classes are specializations that depend on rules of inclusion and exclusion some of which are controlled in a closed way. This means that some aspects of the specification can be arbitrarily changed. Many proprietary product classes are specializations of commodity product classes, de facto classes, or both, where the additional restrictions reflect design or manufacturing details that the manufacturer uses to differentiate ~~his~~its product from others of the same general type.

EXAMPLE 1   A product specification that is owned by a commercial organization, and that is marketed under and protected by a registered trade name, is the basis for a proprietary product class.

EXAMPLE 2   Lightbulbs of type "60 W 230 V E27" manufactured by Phillips are members of a proprietary product class.

[SOURCE: ISO 15926-1:2004, 3.1.17]

3.1.11
reference data
process plant life-cycle data that represents information about classes or individuals which are common to many process plants or of interest to many users

[SOURCE: ISO 15926-1:2004, 3.1.18]

3.1.12
reference data item
thing that is defined within a reference data library

Note 1 to entry: Each reference data item is an administered item.

Note 2 to entry: A registration authority can regard a reference data item as an administered item as defined in ISO/IEC 11179-6.

3.1.13
reference data library
managed collection of reference data items

[SOURCE: ISO 15926-1:2004, 3.1.19~~], — "items" added to definition.]~~

**3.1.14**
reference data library module
collection of reference data items within a reference data library that shares the same subject area

EXAMPLE   Electrical is a reference data library module, represented by a specific spreadsheet, which contains reference data library items (classes) that are of direct interest for the electrical engineering discipline, which in this case is the subject area. In the context of ISO 15926-2 the reference data library module is a class of class with as members all classes contained by the corresponding spreadsheet.

3.1.15
standard class
class whose specification for membership is owned or controlled by a standardization body and is publicly available
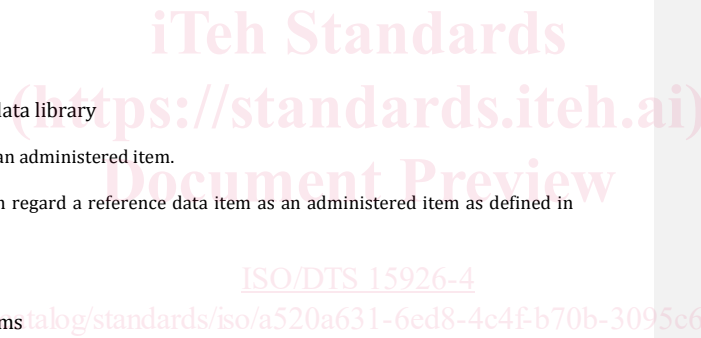
Note 2 1 to entry: Standard classes result from the work of national, international, or industry standardization bodies and cover sizes, shapes, materials, performance, and manufacturing processes of equipment and materials. The rules for exclusion and inclusion (or conformance) are agreed by an open, consensus process and are made publicly available. A standard class need only constrain one particular aspect and can often be insufficient to determine usage or be a full manufacturing specification.

EXAMPLE 1   The ASME B16.9 standard constrains the dimensions and shapes of steel buttwelding pipe fittings.

EXAMPLE 2   The IEC 60079-1 standard specifies constraints on electrical equipment to ensure standard degrees of explosion-proofness.

[SOURCE: ISO 15926-1:2004, 3.1.20], modified — Editorial update to Note 1 to entry and EXAMPLES.]

3.2 Abbreviated terms

For the purposes of this document, the following abbreviated terms apply.

ID   identifier

URI   Uniform Resource Identifier

ID   identifier

URI   Uniform Resource Identifier

4   Reference data library

The background of the principles for having a data model and reference data library is described in ISO 15926-1.

The version of the reference data library specified by this document consists of the versions of the reference data library modules listed and described in Table A.1   Reference data library module versionsAnnex A, Table A.1.

The normative representations of the versions of the reference data library modules are spreadsheets. These spreadsheets can be obtained by dereferencing the URI given in Annex C in combination with the contentcontents of Annex A, Table A.2.

The types of content in the columns of the spreadsheets are described in Table B.1   The attributes of a spreadsheet representation of a reference data library.

This document gives the content of the reference data library modules and its structure. The content itself is a result of applying the rules as defined in ISO/TS 15926-6. For this reason, ISO/TS 15926-6 is not defined as normative for this document.

Reference data items can be core classes, de facto classes, commodity classes and manufactured product classes. Reference data items can also be standard classes or proprietary classes. The terms for these different types of class are defined in Annex D. Annex D.

The basis for the core classes as defined in the reference data library modules is described in ISO 15926-2. Each reference data item that is a class shall be directly or indirectly a subclass of an entity in ISO 15926-2.

The core classes as defined reference data library modules can be used by other parts of <u>the</u> ISO 15926 <u>series</u>.

Given that there are several types of libraries and it is not always clear how they relate to each other, Annex E provides an explanation of the various libraries and their role from the perspective of the ISO 15926 series.

Annex F gives examples of how ~~ISO/TS 15926-4~~<u>this document</u> has been applied in the different parts of <u>the</u> ISO 15926<u> series</u> supporting life cycle data integration. Based on this, it can be determined how ~~ISO/TS 15926-4~~<u>this document</u> can be used on itself in a private data integration application.