
**Industrial automation systems and
integration — Integration of life-cycle
data for process plants including oil
and gas production facilities —**

Part 4:

Initial reference data

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*Systèmes d'automatisation industrielle et intégration — Intégration
de données de cycle de vie pour les industries de "process", y compris
les usines de production de pétrole et de gaz —*

ISO/TS 15926-4:2019

Partie 4: Données de référence initiales

<https://standards.iteh.ai/catalog/standards/sist/90222d88-5702-4601-80e9-61da3f0d4685/iso-ts-15926-4-2019>



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Published in Switzerland

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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 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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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*.

This second edition cancels and replaces the first edition (ISO/TS 15926-4:2007), which has been technically revised. It also incorporates the Amendment ISO/TS 15926-4:2007/Amd.1:2010.

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

- revision of the units of measure module to comply with ISO 80000 and IEC 80000;
- incorporation of the amendment to the first edition.

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.

Introduction

ISO 15926 is an International Standard for 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.

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

The structure of ISO 15926 is as follows:

- ISO 15926-1 provides an overview of ISO 15926;
- ISO 15926-2 contains a generic, conceptual data model that supports representation of all life-cycle aspects of a process plant;
- ISO/TS 15926-3 contains a reference data library for geometry and topology;
- ISO/TS 15926-4 contains a reference data library for physical objects, activities, properties and other reference data necessary to record information about a process plant;
- ISO/TS 15926-6 specifies the information necessary within a reference data library used by a part of ISO 15926;
- ISO/TS 15926-7 specifies an implementation method for ISO 15926-2 using templates;
- ISO/TS 15926-8 specifies an OWL representation of the data model in ISO 15926-2 for use with templates;
- ISO 15926-10 specifies conformance requirements for process plant data according to ISO 15926-2;
- ISO/TS 15926-11 specifies a simplified implementation methodology ISO 15926-2 using RDF triples;
- ISO/TS 15926-12 contains an OWL representation of the ISO 15926-2 data model, with a direct semantics subset;
- ISO 15926-13 specifies the use of the ISO 15926-2 data model for the representation of asset planning information and contains an XML schema for the exchange of this information between systems.

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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: Initial reference data

1 Scope

This document specifies the initial 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;

NOTE 1 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 the different types of class are defined in 3.1. A discussion about the different types of classes is contained in [Annex D](#).

NOTE 2 A core class defined by this document can be used by ISO 15926-2, ISO/TS 15926-7, ISO/TS 15926-8, ISO/TS 15926-11, ISO/TS 15926-12, ISO 15926-13 and ISO 10303-221.

- the unique name for each reference data item;
- the definition of each reference data item;
- subclass and classification relationships between reference data items;
- the entity within ISO 15926-2 that can be used to record each reference data item.

NOTE 3 Each reference data item that is a class is directly or indirectly a subclass of an entity in ISO 15926-2.

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 abbreviations

3.1 Terms and definitions

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

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

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://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 — Note 2 to entry has been modified.]

3.1.2

commodity product class

manufactured product class (3.1.7) whose members conform to open agreed standards

Note 1 to entry: Commodity product classes have sufficient characterization to indicate suitability of use. They are specializations of one or more *de facto classes* (3.1.5), *standard classes* (3.1.12), or both. The resulting specification is non-proprietary, as no one organization controls it.

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

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

3.1.3

core class

class (3.1.1) that is a commonly used subdivision corresponding to terms used in common language

Note 1 to entry: The conditions for membership are often not formally defined, so understanding of the class may be conveyed by example.

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

[SOURCE: ISO 15926-1:2004, 3.1.4]

3.1.4

data

representation of *information* (3.1.6) in a formal manner suitable for communication, interpretation, or processing by human beings or computers

[SOURCE: ISO 10303-1:1994, 3.2.14]

3.1.5

de facto class

class (3.1.1) 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 — Notes to entry and Example have been modified.]

3.1.6 information

facts, concepts, or instructions

[SOURCE: ISO 10303-1:1994, 3.2.20]

3.1.7 manufactured product class

class (3.1.1) 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 Unleaded petrol to “EN 228” is a manufactured product class whose members are continuous.

[SOURCE: ISO 15926-1:2004, 3.1.14, modified — Notes to entry and Example have been modified.]

3.1.8 proprietary class

class (3.1.1) 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]

3.1.9 proprietary product class

class (3.1.1) that is a *manufactured product class* (3.1.7) and a *proprietary class* (3.1.8)

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* (3.1.2), *de facto classes* (3.1.5), or both, where the additional restrictions reflect design or manufacturing details that the manufacturer uses to differentiate his 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]

3.1.10 reference data item

reference data

process plant life-cycle *data* (3.1.4) that represents *information* (3.1.6) about *classes* (3.1.1) or individuals which are common to many process plants or of interest to many users

Note 1 to entry: A registration authority can regard a reference data item as an administered item as defined in ISO/IEC 11179-6.

[SOURCE: ISO 15926-1:2004, 3.1.18, modified — The word “item” has been added to the preferred term to remove ambiguity between singular and plural, and Note 1 to entry has been added.]

3.1.11

reference data library

managed collection of *reference data items* (3.1.10)

[SOURCE: ISO 15926-1:2004, 3.1.19, modified — The abbreviated term “RDL” has been removed and the word “items” has been added to the definition to remove ambiguity between singular and plural.]

3.1.12

standard class

class (3.1.1) whose specification for membership is owned or controlled by a standardization body and is publicly available

Note 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 may only constrain one particular aspect and often be insufficient to determine usage or full manufacturing specifications.

EXAMPLE 1 The ASME B16.9 standard constrains the dimensions and shapes of steel butt welding 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]

**3.2 Abbreviated terms iTeh STANDARD PREVIEW
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ID Identifier

URI Uniform Resource Identifier [ISO/TS 15926-4:2019
https://standards.iteh.ai/catalog/standards/sist/9022d88f-3702-4861-8be9-61da3f0d4685/iso-ts-15926-4-2019](https://standards.iteh.ai/catalog/standards/sist/9022d88f-3702-4861-8be9-61da3f0d4685/iso-ts-15926-4-2019)

4 Reference data library

The version of the reference data library specified by this document consists of the versions of the modules listed and described in [Table 1](#).

Table 1 — Reference data library module versions

Module	Version	Description of module
activity	1	activities, including physical processes carried out within process plants and engineering activities carried out by people
basics	1	generic engineering classes which are referenced by other sets, but which are not specific to an engineering discipline
class of class	1	classifications of classes for information management purposes
connection material	1	equipment items and features of equipment items which are involved in the making of process connections
electrical	1	electrical equipment items including motors, generators, uninterruptible power supplies and transmission and distribution equipment
encoded information	1	languages and formats for information
control function	1	functions implemented by automatic control systems
heat transfer	1	heat transfer equipment
information	1	document types, including documents which specify process plant operations, and identifier types
instrumentation	1	equipment items involved in monitoring, communications, recoding and control

Table 1 (continued)

Module	Version	Description of module
ISO 15926-2 superclasses	1	ISO 15926-2 entities which are superclasses of reference data items specified by this document, or which have reference data items specified by this document as instances
pipng	1	pipes and piping components
property	1	physical quantities and physical properties possessed by equipment items
protection	1	insulation (thermal and electrical) and safety systems for the protection of personnel and equipment
rotating equipment	1	rotating equipment, including pumps, compressors, expanders and mixers
solid handling	1	handling of solid objects, including billets and particulate materials
static equipment	1	static process equipment, excluding heat exchangers, valves and piping. Within scope are tanks and vessels, reactors, separators, filters and static mixers.
transport	1	vehicles, and associated civil and marine structures and facilities
uom	2	units of measure and scales
valve	1	valves (for the control or prevention of fluid flow)

The normative representations of the versions of the modules are spreadsheets. These spreadsheets shall be obtained by dereferencing the URIs given in [Annex A](#).

The content in the columns of the spreadsheet shall be interpreted as described in [Annex B](#).

The items in the module "ISO 15926-2 superclasses" shall be as defined in ISO 15926-2.

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