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

Part 12:

**Life-cycle integration ontology  
represented in Web Ontology  
Language (OWL)**

*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 —*

*Partie 12: Ontologie d'intégration de cycle de vie représentée dans le  
langage d'ontologie du Web (OWL)*



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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](http://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](http://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](http://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*.

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](http://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.

This document specifies an ontology for the integration of industrial data throughout its life-cycle. The ontology implements capabilities defined by the life-cycle integration schema of ISO 15926-2, and is represented in Web Ontology Language (OWL).

This document is complementary to ISO/TS 15926-8, as follows:

- ISO/TS 15926-8 is a direct transposition of ISO 15926-2 into OWL, in which all relationships are reified. ISO/TS 15926-8 is intended as an OWL implementation for the template methodology defined in ISO/TS 15926-7.
- This document is an implementation of ISO 15926-2 in OWL in which relationships are object properties, datatype properties or annotation properties. This document defines an ontology that is intended to be used with standard Resource Description Framework (RDF) and OWL tools. The ontology has a partition that is OWL DL and that can support reasoning.

Some of the content of ISO 15926-2 has not been included in this document, as follows:

- shape, which is within the scope of ISO/TS 15926-3;
- approval and status, which are covered by other ontologies and developments within W3C.

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

## Part 12:

# Life-cycle integration ontology represented in Web Ontology Language (OWL)

## 1 Scope

This document specifies an ontology for the integration of industrial data throughout its life-cycle. The ontology is represented in Web Ontology Language (OWL).

NOTE 1 The ontology implements capabilities of the life-cycle integration schema of ISO 15926-2.

NOTE 2 OWL has a representation in RDF. Therefore, this document provides an ability to query life-cycle integration data using Simple Protocol and RDF Query Language (SPARQL).

The following are within the scope of this document:

- fundamental subclasses of an individual that exists in an actual or possible world, including physical object, activity and event;
- relationships between physical objects, activities and events, including the creation and destruction of physical objects;
- whole-part relationships between physical objects, including temporal part relationships that implement a 4-dimensional (4D) approach to change over time;
- points and periods in time;
- points and regions in space;
- the identification of points in time by text strings in the format defined by ISO 8601.

The following are outside the scope of this document:

- definitions of physical quantities and measurement scales;
- knowledge organization and document metadata specifications;
- approval and status;
- geometry and topology, including shape.

NOTE 3 Geometry and topology are covered by ISO/TS 15926-3.

## 2 Normative references

There are no normative references in this document.