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Industrial automation systems and integration — Product data representation and exchange —

Part 1: Overview and fundamental principles

Systèmes d'automatisation industrielle et intégration — Représentation et échange de données de produits —

Partie 1: Aperçu et principes fondamentaux

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

This third edition cancels and replaces the second edition (ISO 10303-1:2021), which has been technically revised.

The main changes are as follows:

— all terms removed, and included in ISO 10303-2;

— inclusion of STEP extended architecture.

A list of all parts in the ISO 10303 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 10303 series of International Standards describe the computer-interpretable representation of product information for the exchange of product data. The objective is to provide a neutral mechanism capable of describing products throughout their life cycle. This mechanism is suitable not only for neutral file exchange, but also as a basis for implementing and sharing product databases, and as a basis for archiving.

The information generated about a product during its design, manufacture, use, maintenance, and disposal is used for many purposes. The use can involve many information systems, including some that can be located in different organizations. In order to support such uses, organizations need to be able to represent their product information in a common computer-interpretable form that is required to remain complete and consistent when exchanged among different information systems.

This document is an overview of the ISO 10303 series. It specifies the overall scope of the ISO 10303 series and describes the ISO 10303 series architectures and structure. It describes the various parts of the ISO 10303 series and the relationships among them.

The ISO 10303 series is organized as a series of parts, each published separately.

Each part of the ISO 10303 series is a member of one of the following series: description methods, implementation methods, conformance testing methodology and framework, integrated generic resources, integrated application resources, Core model, application protocols (APs), abstract test suites (ATSs), application interpreted constructs (AICs), application modules (AMs) and application domain models (ADMs).

There is a set of standing documents that provide guidelines for developing International Standards produced by ISO/TC 184/SC 4. These are listed in the SC 4 organization handbook[1].

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Industrial automation systems and integration — Product data representation and exchange —

Part 1: Overview and fundamental principles

1 Scope

This document provides an overview of the ISO 10303 series.

This document defines the architectural principles of product information representation and exchange used in the ISO 10303 series. It specifies the characteristics of the various sets of parts in the ISO 10303 series and the relationships among them.

The following are within the scope of this document:

— scope statement for the ISO 10303 series as a whole;

— overview of the ISO 10303 series;

— architectures of the ISO 10303 series;

— structure of the ISO 10303 series;

— overview of data specification methods used in the ISO 10303 series;

NOTE This includes the EXPRESS data specification language and graphical presentation of product information models.

— introduction to the ISO 10303 series:

  — integrated resources (IRs);

  — application interpreted constructs (AICs);

  — application modules (AMs);

  — application domain models (ADMs);

  — Core model;

  — business object models (deprecated);

  — application protocols (APs);

  — implementation methods;

  — usage guides;

  — conformance testing methodology and framework;

  — abstract test suites (ATSs);

— scheme for identification of schemas and other information objects defined in the ISO 10303 series.

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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 10303-2, *Industrial automation systems and integration — Product data representation and exchange — Part 2: STEP Vocabulary*

ISO/IEC 8824-1, *Information technology — Abstract Syntax Notation One (ASN.1) — Part 1: Specification of basic notation*

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 10303-2 apply.

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

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

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

3.2 Abbreviated terms

AO application object

CTC core technical capability

DTD document type definition

HDF hierarchical data format[2]

SDAI standard data access interface[3]

URL uniform resource locator

UML unified modeling language

XMI XML metadata interchange[4]

XML extensible mark-up language

XLSX Microsoft Excel open XML spreadsheet

4 Overview of the ISO 10303 series

4.1 Purpose

The purpose of the ISO 10303 series is to specify a form for the unambiguous representation and exchange of computer-interpretable product data throughout the life of a product. This form is independent of any specific computer system. This form enables consistent implementations across multiple applications and systems. The ISO 10303 series architecture permits different implementation methods to be used for storing, accessing, transferring, and archiving product data. The ISO 10303 series define a rigorous process for testing implementations for conformance.

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