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

Part 28:

Implementation methods: XML representations of EXPRESS schemas and data, using XML schemas

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

*Partie 28: Méthodes d'implémentation: représentations XML de
schémas et de données EXPRESS en utilisant des schémas XML*



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ISO 10303-28 was prepared by Technical Committee ISO TC184, *Industrial automation systems and integration*, Subcommittee SC4 *Industrial data*.

ISO 10303-28 constitutes a technical revision of ISO/TS 10303-28:2003, which is provisionally retained in order to support continued use and maintenance of implementations based on it, and to satisfy the normative references of other parts of ISO 10303.

ISO 10303 is organized as a series of parts, each published separately. The structure of ISO 10303 is described in ISO 10303-1.

Each part of ISO 10303 is a member of one of the following series: description methods, implementation methods, conformance testing methodology and framework, integrated generic resources, integrated application resources, application protocols, abstract test suites, application interpreted constructs, and application modules. This part of ISO 10303 is a member of the implementation methods series.

A complete list of parts of ISO 10303 is available from the following URL:

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ISO 10303 is an International Standard for the computer-interpretable representation of product information and 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.

This part of ISO 10303 is a member of the implementation methods series. This part of ISO 10303 specifies means by which schemas specified using the EXPRESS language (defined in ISO 10303-11) and data governed by EXPRESS schemas can be represented as an XML document. This enables product data described in EXPRESS to be exchanged using XML and the many software tools developed to support XML technologies. It also permits product data sets so described to be readily incorporated into "electronic commerce" transactions represented in XML.

Readers of this part of ISO 10303 should have knowledge of the EXPRESS language, the XML Schema language, XML, and XML-related standards in order to understand its technical content.

For the representation of data corresponding to an EXPRESS schema, this part of ISO 10303 formally specifies the structure of conforming exchange documents using the XML Schema language. Some elements of those documents represent data sets conforming to EXPRESS schemas, and this part of ISO 10303 specifies the structure of those elements using XML Schema type definitions and element declarations that are derived from the EXPRESS schema declarations. This part of ISO 10303 also specifies the rules for encoding conforming data in XML to match the derived XML schema. In order to accommodate a number of conflicting requirements for the use of conforming exchange documents, this part of ISO 10303 also defines certain configuration directives that can be used to specify alternative structures in the derived XML schema and alternative encoding rules.

Several components of this part of ISO 10303 are available in electronic form. This access is provided through the specification of Universal Resource Locators (URLs) that identify the location of these files on the Internet. If there is difficulty accessing these files contact the ISO Central Secretariat, or contact the ISO TC 184/SC4 Secretariat directly at: sc4sec@tc184-sc4.org.

This part of ISO 10303 constitutes a technical revision of ISO/TS 10303-28:2003, which is provisionally retained to allow for the implementation of the Part 28 late binding. ISO/TS 10303-28:2003 was intended for trial use with emerging XML technologies, and although the fundamental capabilities remain the same, the underlying XML technologies have progressed, and this part of ISO 10303 uses technologies and features that were formerly unavailable or differently provided. This part of ISO 10303 therefore, is not "upwardly compatible" with ISO/TS 10303-28:2003. Neither a document nor a processor that conformed to ISO/TS 10303-28:2003 will conform to the specifications of this part of ISO 10303 without substantial modification.

The major technical changes from ISO/TS 10303-28:2003 are:

— This part of ISO 10303 specifies the structure of XML exchange documents using XML Schema, and specifies the mapping of the EXPRESS data model to an XML Schema data model. ISO/TS 10303-28:2003 specified the structure using Document Type Definitions (DTDs). It is expected that most future XML documents will be validated against an XML schema, instead of a DTD.

— The ISO/TS 10303-28:2003 mapping of EXPRESS schema text into a complex XML structure is no longer included in this part of ISO 10303; representation of an EXPRESS schema as a body of text is the only form retained.

— The ISO/TS 10303-28:2003 mapping of EXPRESS-modelled data sets designated the "late-binding" is not included in this part of ISO 10303.

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— The ISO/TS 10303-28:2003 mapping of EXPRESS-modelled data sets designated the "ETEB" is not included as such. The major features of that binding, as they appear in the XML form of the data, are included in the "default mapping" in this part of ISO 10303. But this part of ISO 10303 makes use of an XML Schema feature that was not available in DTDs — context names — to simplify the names for the "accessor elements".

— The ISO/TS 10303-28:2003 mapping of EXPRESS-modelled data sets designated the "OSEB" is not included as such. The major features of that binding, as they appear in the XML form of the data, are included in the "attribute-content" mapping in this part of ISO 10303. But in this part of ISO 10303, there are several changes to the representation structures for aggregation data types and SELECT data types that provide for representation options and consistency across them.

— This part of ISO 10303 permits the use of XML Schema "simple list" structures to represent many values of aggregation data types, a feature that is not standardized in XML 1.0 and could not be specified in a DTD.

— Many separate options for re-configuring the EXPRESS schema, configuring the XML schema, and configuring the XML data are now supported by a configuration language, and support for that language is a mandatory feature of conforming processors.

Warning:

This part of ISO 10303 provides a specification intended to be implemented in software. Incompatibilities may result in machine-to-machine communication in the case of software developed on the basis of translations of this part of ISO 10303 into languages other than the official ISO languages. It is accordingly strongly recommended that any implementations be developed only on the basis of the texts in the official ISO languages.