INTERNATIONAL STANDARD

ISO 18629-42

First edition
2006-08-15

Industrial automation systems and integration — Process specification language —

Part 42: Definitional extension: Temporal and state extensions

Systèmes d'automatisation industrielle et intégration — Langage de spécification de procédé —

Partie 42: Extension de définition: Extensions temporelle et d'état

Reference number
ISO 18629-42:2006(E)

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Published in Switzerland

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Foreword

The International Organisation for Standardisation (ISO) 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 organisations, 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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75% of the member bodies casting a vote.

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.

This part of ISO 18629 was prepared by the Technical committee ISO/TC184 *Industrial automation systems and integration,* Subcommittee SC4, *Industrial data.*

A complete list of parts of ISO 18629 is available from the Internet:

http://www.tc184-sc4.org/titles/

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Introduction

ISO 18629 is an International Standard for the computer-interpretable exchange of information related to manufacturing processes. Taken together, all the parts contained in the ISO 18629 Standard provide a generic language for describing a manufacturing process throughout the entire production process within the same industrial company or across several industrial sectors or companies, independently from any particular representation model. The nature of this language makes it suitable for sharing process specifications and properties related to manufacturing during all the stages of a production process.

This part of ISO 18629 provides a description of the definitional extensions of the language related to activity extensions defined within ISO 18629.

All parts of ISO 18629 are independent of any specific process representation model used in a given application. Collectively, they provide a structural framework for improving the interoperability of these applications.

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Industrial automation systems and integration — Process specification language —

Part 42:
Definitional extension: Temporal and state extensions

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1 Scope

This part of ISO 18629 provides a specification of non-primitive concepts of the language, using a set of definitions written in the language of ISO 18629. These definitions provide axioms for terminology in this part of ISO 18629.

The following is within the scope of this part of ISO 18629:

— definitions of state and time-related concepts specified using concepts of ISO 18629-11 and ISO 18629-12;

— constraints on the occurrences of activities that are expressed using time relations from ISO 18629-11 and state relations from ISO 18629-12.

The following is outside the scope of this part of ISO 18629:

— definitions of concepts specified using concepts of ISO 18629-11 and ISO 18629-12 that are independent of state and time relations.

NOTE: state and time-related concepts are concepts that are related to the time and the status of any entity related to manufacturing process and needed to specify it.

2 Normative References

The following referenced documents are indispensable for the application 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/IEC 8824-1, *Information technology - Abstract Syntax Notation One (ASN.1) - Part 1: Specification of basic notation*

ISO 10303-1, *Industrial automation systems and integration - Product data representation and exchange - Part 1: Overview and fundamental principles*

ISO 15531-1, *Industrial automation systems and integration - Industrial manufacturing management data - Part 1: General overview*

ISO 18629-1: 2004, *Industrial automation systems and integration – Process specification language – Part 1: Overview and basic principles*

ISO 18629-11: 2005, *Industrial automation systems and integration – Process specification language – Part 11 : PSL core*

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ISO 18629-12, *Industrial automation systems and integration – Process specification language – Part 12 : Outer core*

3 Terms, definitions and abbreviations

3.1 Terms and definitions

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

3.1.1
axiom
well-formed formula in a formal language that provides constraints on the interpretation of symbols in the lexicon of a language

[ISO 18629-1]

3.1.2
defined lexicon
set of symbols in the non-logical lexicon which denote defined concepts

NOTE Defined lexicon is divided into constant, function and relation symbols.

EXAMPLE terms with conservative definitions

[ISO 18629-1]

3.1.3
definitional extension
extension of PSL-Core that introduces new linguistic items which can be completely defined in terms of the PSL-Core

NOTE: Definitional extensions add no new expressive power to PSL-Core but are used to specify the semantics and terminology in the domain application.

[ISO 18629-1]

3.1.4
extension
augmentation of PSL-Core containing additional axioms

NOTE 1 The PSL-Core is a relatively simple set of axioms that is adequate for expressing a wide range of basic processes. However, more complex processes require expressive resources that exceed those of the PSL-Core. Rather than clutter the PSL-Core itself with every conceivable concept that might prove useful in describing one process or another, a variety of separate, modular extensions need to be developed and added to the PSL-Core as necessary. In this way a user can tailor the language precisely to suit his or her expressive needs.

NOTE 2 All extensions are core theories or definitional extensions.

3.1.5
grammar
specification of how logical symbols and lexical terms can be combined to make well-formed formulae

[ISO 18629-1]

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