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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 19902.1-2005

**Industrial automation systems and integration -- Manufacturing
software capability profiling for interoperability -- Part 1:
Framework**

工业自动化系统与集成 制造软件互操作性能力建规 第1部分：框架

(English Translation)

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Foreword

GB/T 19902 "Industrial Automation Systems and Integrated Manufacturing Software Interoperability Capability Regulations" consists of the following components.

- Part 1. Frame;
- Part 2. Methodology of construction;
- Part 3. Interface protocols and templates;
- Part 4. Conformance test methods, standards and reports.

This part is the first part of GB/T 19902.

This part is equivalent to ISO 16100-1:2002 "Industrial Automation System and Integrated Manufacturing Software Interoperability Capability Specification No. 1 Part. Framework, whose technical content and structure are consistent with ISO 16100-1:2002.

Appendix A, Appendix B, Appendix C and Appendix D of this part are informative annexes.

This part was proposed by the China Machinery Industry Federation.

This part is under the jurisdiction of the National Industrial Automation System Standardization Technical Committee.

This section is mainly drafted by. Beijing Machinery Industry Automation Research Institute.

This section participates in the drafting unit. Southeast University.

Introduction

The motivation for the preparation of GB/T 19902 (ISO 16100, IDT) comes from the International Organization for Standardization of Industrial Automation Systems and Integration Technology Industrial and economic environment proposed by the Technical Committee of the Conference/Architecture, Communications and Integration Framework (ISO/T C184/SC5). Especially at the expertise of application software and software

applications has been widely recognized in the industry as part of corporate assets. Industry feedback form it is clear that there is a need to improve and continue to develop current design and manufacturing standards that make software interoperable.

GB/T 19902 specifies a manufacturing information model that describes the requirements of the software interface. Have a clear statement of interface requirements Clearly, standard interfaces can be opened more easily and quickly using Interface Definition Language (IDL) or appropriate programming languages (such as Java and C).

hair. These standard interfaces are expected to enable interoperability in manufacturing software tools (blocks or systems).

These interfaces are modeled in Unified Modeling Language (UML) in GB/T 19902. At the same time, using an extensible markup language in languages like (XML), the manufacturing information model can also be used to develop a universally shareable database schema.

Manufacturing industries - such as automotive, aerospace, machine tool manufacturing, computer peripheral manufacturing and mold and die manufacturing, these large Computer Aided Design (CAD), Computer Aided Manufacturing (CAM), Numerical Control (NC), Computer Aided Engineering (CAE), Product Data the industry of management (PDM) and manufacturing execution systems (MES) will directly benefit from this standard. The software interface requirements in this standard will be promoted the following developments.

- a) Interoperable design and manufacturing software tools that reduce product development time;
- b) new software tools that are easily integrated with existing technologies that diversify the market;
- c) new application software that reduces the cost of replacing the original system (ie reusing the original system to reduce costs);
- d) Universal program interface and database schema, saving money by eliminating the need to develop a dedicated peer-to-peer software integration interface.

The end result will be reduced production and manufacturing information management costs and reduced product costs.

The standard enables manufacturing software to be integrated by providing the following aspects.

- a) Standard interface specifications enable information exchange between industrial automation system software units developed by different vendors;
- b) software capability specification is to use a standard method to enable users to select software units that meet their functional requirements;

c) Conformance testing to ensure software integration integrity.

GB/T 19902 consists of four parts. Part 1 describes the framework for manufacturing software product interoperability, which is used in software products.

Manufacturing field and integrated into manufacturing applications. Part 2 describes the methodology for establishing a proprietary software manufacturing capability, which includes both the methodology also includes how to use these rules during the development of the manufacturing application phase. Part 3 describes the interfaces for various manufacturing applications.

Agreements and templates. Section 4 describes the concepts and rules for the consistency assessment of sections 1-3.

GB/T 19902.1-2005/ISO 16100-1:2002 Industrial automation systems and integrated manufacturing software Operational Capability Building Part 1. Framework

1 Scope

This part of GB/T 19902 details a framework for the interoperability of software products in the manufacturing sector, which promotes software production.

Integration of products and manufacturing applications (see Appendix A for a discussion of manufacturing applications). This framework focuses on information exchange models and software pairs.

Models, interfaces, services, competency and conformance test methods.

2 Normative references

The terms in the following documents become the provisions of this part by reference to this part of GB/T 19902. Quotations with dated , all subsequent amendments (not including errata content) or revisions do not apply to this section, however, encouragement is achieved under this section the parties to the agreement study whether the latest versions of these documents can be used. For undated references, the latest edition applies to this section.

GB/T 18757-2002 Industrial automation system enterprise reference architecture and methodology needs (idt ISO 15704:2000) ISO 15745-1:2003 Industrial automation systems and integrated open systems application integration framework Part 1. General/general reference Test description ISO/IEC 19501-1 Information Technology Unified Modeling Language (UML) Part 1. Specification ISO/IEC 62264-1:2003 Enterprise Control System Integration Part 1. Models and Terminology IEEE 1320.1-1998 American Institute of Electrical and Electronics Engineers (IEEE) Functional Modeling Language Standard IDEF0 syntax and Semantics

3 Terms and definitions

The following terms and definitions apply to this part of GB/T 19902.

A production plan for the month or year period made with a constraint model that processes materials and capabilities.

Note: In some cases, the planning system includes a master production plan, a material requirements plan, or a capacity plan.

Computer systems for product design and modeling, engineering, product data management, and process data management.

The capabilities and services that a capability provider can provide and a set of criteria for performance evaluation.

Note: This definition is different from the definitions in ISO 15531-1:2004 and ISO/DIS19439. In ISO 15531-1:2004 and ISO/DIS19439, Force is defined as the ability to perform the quality of a given activity. See IEC 62264-1.

Select a set of provided services defined by the specified interface in the software interoperability framework.

GB/T 19902.1-2005/ISO 16100-1:2002