
**Industrial automation systems and
integration — Industrial manufacturing
management data —**

**Part 43:
Manufacturing flow management data:
Data model for flow monitoring and
manufacturing data exchange**

*Systèmes d'automatisation industrielle et intégration — Données de
gestion de fabrication industrielle —*

*Partie 43: Données de gestion des flux de fabrication: Modèle de
données pour suivi des flux et échange des données de fabrication*



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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.

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 the 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.

ISO 15531-43 was prepared by Technical Committee ISO TC184/SC4, *Industrial automation systems and integration*, Subcommittee SC4, *Industrial data*.

A complete list of parts of ISO 15531 is available from the Internet:

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

Introduction

The information generated about the manufacturing process of an industrial product is very important for the life cycle of this product, notably in a context of sustainable development. Manufacturing may be defined as the transformation of raw material or semi-finished components leading to goods production. Manufacturing management is the function of directing or regulating the flows of goods through the entire production cycle from requisitioning of raw materials to the delivery of the finished product, including the impact on resources management.

A manufacturing management system manages the flow of information and materials through the whole production chain, from suppliers, through to manufacturers, assemblers, distributors, and sometimes customers.

The relations among those partners may be identified and structured in an electronic form with a view to facilitating electronic exchanges. Information handled during these exchanges is identified, modelled and represented in such a way that may be shared by a maximum of partners through the usage of standards for product and manufacturing data modelling.

The production planning functions within the supplier plants are assumed to have strong relationships with the master production scheduling functions of the main plant, which shares information with them, on the likely pattern of the future demands to allow suppliers to plan in turn their production. On a day-to-day basis, the operational planning system of the main plant sends orders to the suppliers to ensure the availability of components, sub-assemblies and others, such as resources needed for its manufacturing and assembly process.

ISO 15531 addresses the type of information described above. It does not standardise the model of the manufacturing process. The aim of ISO 15531 is to provide a standardised data model for representing manufacturing management data. Its purpose is to facilitate the integration between the numerous industrial applications by means of common standardised software that is able to represent these three sets of data.

ISO 15531 is organised as a series of parts, each published separately. The parts of ISO 15531 fall into the following series: production data for external exchange, manufacturing resources usage management data, time model management and manufacturing flow management data.

This part of ISO 15531 addresses the representation of data related to manufacturing flow and process management, through the development of a data model of the manufacturing flows and processes. Particular attention has been paid in the development of this part of ISO 15531 to the relation with the other standards developed in ISO TC184/SC4, such as ISO 10303, ISO 13584, ISO 15926. In addition to the fact that this part of ISO 15531 is developed using EXPRESS language (see ISO 10303-11: 2004) Edition 2, it makes extensive use of several constructs of ISO 10303-41, and references ISO 13584 dictionaries.

Industrial automation systems and integration — Industrial manufacturing management data — Part 43:

Manufacturing flow management data: Data model for flow monitoring and manufacturing data exchange

1 Scope

This part of ISO 15531 provides a data model for flow management, and a related set of building blocks, from which are specified standardized data models and representations for the planning, scheduling, controlling and monitoring of material and informational flows. This is in contrast with ISO 15531-42, which provides a time model only.

Consequently this part of ISO 15531 provides a representation of data related to flow control and management in manufacturing, through the development of a conceptual flow model.

The following are within the scope of this part of ISO 15531:

— representation of data related to the management and control of manufacturing flows.

NOTE – This information is usually provided within the main plant, and exchanged among the different machine tools, or production cells.

The following are outside the scope of this part of ISO 15531:

- modelling of information related to the external exchanges;
- modelling of information related to the resource usage made during the manufacturing processes;
- modelling of the information related to the representation of the time.

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 10303-11: 2004, *Industrial automation systems and integration – Product data representation and exchange – Part 11: Description methods: The EXPRESS language reference manual*

ISO 15531-43 : 2006 (E)

ISO 10303-41, *Industrial automation systems and integration – Product data representation and exchange – Part 41: Integrated generic resources: Fundamentals of product description and support*

ISO 10303-49, *Industrial automation systems and integration – Product data representation and exchange – Part 49: Integrated generic resources: Process structures and properties*

ISO 13584-1, *Industrial automation systems and integration – Parts library – Part 1: Overview and fundamental principles*

ISO 13584-24, *Industrial automation systems and integration – Parts library – Part 24: Logical resource: Logical model of supplier library*

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

ISO 15531-31: 2004, *Industrial automation systems and integration – Industrial manufacturing management data – Part 31: Resource information model*

ISO 15531-32, *Industrial automation systems and integration – Industrial manufacturing management data: Resources usage management – Part 32: Conceptual model for resources usage management data*

ISO 15531-42, *Industrial automation systems and integration – Industrial manufacturing management data – Part 42 : Time model*

IEC 62264-1 : 2003, *Enterprise-control system integration – Part 1 : Models and terminology*

3 Terms, definitions, and abbreviations

3.1 Terms and definitions

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

3.1.1

capability

quality of being able to perform a given activity

NOTE The capability is defined by a group of characteristics that describes functional aspects of manufacturing resources or system.

[ISO 15531-1]

3.1.2

capacity

capability of a system, sub-system or resource to perform its expected function from a quantitative point of view

EXAMPLE The capacity of a system or a resource to produce a given quantity of output in a particular time period.

NOTE For a given system or resource the distinction between capacity available and capacity requested may be