
**Industrial automation systems and
integration - Product data
representation and exchange -**

Part 242:

**Application protocol: Managed model-
based 3D engineering**

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

Partie 242: Protocole d'application: Gestion des modèles 3D



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Abstract

ISO 10303-242 specifies the application protocol for Managed model based 3d engineering.

The following are within the scope of ISO 10303-242:

- products of automotive, aerospace and other mechanical manufacturers and of their suppliers, including parts, assemblies of parts, tools, assemblies of tools, and raw materials;
- engineering and product data for the purpose of long-term archiving and retrieval;
- product data management
 - breakdown data representing a parent-child structures, such as functional, physical, system or zonal breakdowns. A breakdown is made of breakdown element;
 - product definition data and configuration control data for managing large numbers of variants of products during the design phase;
 - data describing the changes that have occurred during the design phase, including tracking of the versions of a product and of the data related to the documentation of the change process;
 - delta change: data describing the exchange of differences with respect to a set of data previously sent;
 - identification of standard parts, based on international, national, or industrial standards;
 - release and approval data for product data;
 - data that identify the supplier of a product and related contract information;
 - properties of parts or of tools;
 - references to product documentation represented in a format other than those specified by ISO 10303;
 - product manufacturing information, covering the design and manufacturing planning phase;
 - identification of physically realized parts or of tools, including assembly of physically realized products and recording of test results.
- process planning
 - process plan information describing the relationships between parts and the tools used to manufacture them and to manage the relationships between intermediate stages of part or tool development.

- mechanical design
 - different types of geometry models, including:
 - 2D- and 3D-wireframe geometry model;
 - geometrically bounded surface geometry model;
 - topologically bounded surface geometry model;
 - faceted-boundary geometry model;
 - boundary geometry model;
 - compound shape geometry model;
 - constructive solid geometry model;
 - parametric and constrained geometry model;
 - 2D-sketch model;
 - 3D tessellated geometry model;
 - 3D scan data;
 - curved triangles.
 - representation of the shape of parts or tools that is a combination of two or more of different types of geometry models;
 - data that pertains to the presentation of the shape of the product;
 - representation of portions of the shape of a part or a tool by manufacturing features;
 - data defining surface conditions;
 - dimensional and geometrical tolerance data;
 - quality criteria and inspection results of given three dimensional product shape data;
 - product documentation as annotated 3D models and as drawings.
- message
 - data that identify a message and an envelope.
- interface
 - data representing the interfaces with version management mechanism and the definition of connection with connectors.
- mating
 - data representing the detailed assembly information on how the involved part occurrences are mated together and which constraints apply.
- kinematics
 - simulation data for the description of kinematic structures and motion.
- analysis management
 - data representing an analysis, managed in versions and the link to the result of the analysis.
- composite design
 - definition of composite structural parts;
 - the association of the constituents of composite and metallic parts with the constituent shape model;
 - the depiction of composite laminate tables describing the material, stacking sequence and ply orientation;
 - constituents of the composite or a portion of the composite with a defined shape;
 - the identification of material specifications from internal and external sources and their properties for a specific operating environment.
- electrical harness assembly design
 - electrical wire harnesses design;
 - physical electrical harness model for design and construction;
 - electrical connectivity information in multilevel assemblies;
 - wire and cable list data;
 - definition of wire, cable and connector features.
- additive manufacturing part design
 - build information.
- requirements management
 - verification and validation.