TECHNICAL SPECIFICATION

ISO/TS 21308-4

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Road vehicles — Product data exchange between chassis and bodywork manufacturers (BEP) —

Part 4: Mapping to STEP application protocol 239

Véhicules routiers — Échange de données de produit entre les fabricants de châssis et de carrosseries (BEP) —

Partie 4: Élaboration en accord avec le protocole d'application 239 de STEP

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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.

In other circumstances, particularly when there is an urgent market requirement for such documents, a technical committee may decide to publish other types of document:

— an ISO Publicly Available Specification (ISO/PAS) represents an agreement between technical experts in an ISO working group and is accepted for publication if it is approved by more than 50 % of the members of the parent committee casting a vote;

— an ISO Technical Specification (ISO/TS) represents an agreement between the members of a technical committee and is accepted for publication if it is approved by 2/3 of the members of the committee casting a vote.

An ISO/PAS or ISO/TS is reviewed after three years in order to decide whether it will be confirmed for a further three years, revised to become an International Standard, or withdrawn. If the ISO/PAS or ISO/TS is confirmed, it is reviewed again after a further three years, at which time it must either be transformed into an International Standard or be withdrawn.

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/TS 21308-4 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 6, *Terms and definitions of dimensions and masses*.

ISO/TS 21308 consists of the following parts, under the general title *Road vehicles — Product data exchange between chassis and bodywork manufacturers (BEP)*:

— *Part 1: General principles* [Publicly Available Specification]

— *Part 2: Dimensional bodywork exchange parameters*

— *Part 3: General, mass and administrative exchange parameters*

— *Part 4: Mapping to STEP application protocol 239* [Technical Specification]

Introduction

0.1 General

Truck chassis manufacturers deal with the configuration of chassis in infinite numbers of possible combinations, and bodywork manufacturers produce highly customized superstructures on these chassis. Bodywork manufacturers build their superstructures on chassis of several different truck brands.

The production efficiency of a specific truck chassis and its body combinations can be greatly improved by ensuring that the correct technical and commercial information about the specific chassis is communicated with the bodywork manufacturer in advance. The information needs to be reliable such that the bodywork manufacturer has sufficient confidence to prefabricate the body or the superstructure before the chassis is delivered. With uniform conditions, unambiguous dimensions and supplementary information can be established, transferred and correctly interpreted by the receiver. Increased information efficiency improves quality and reduces lead times.

The ISO 21308 series specifies a system of codes to exchange specific data between chassis and bodywork manufacturers, providing a platform for efficient communication between the parties. The process of exchanging data according to the ISO 21308 series is not dependent on the degree of IT sophistication. Any medium can be used, from fax or e-mail to a STEP (standard for the exchange of product model data) protocol.

Exchanging codes in accordance with the ISO 21308 series is useful in various situations, e.g. for design and manufacturing, technical specifications, technical drawings and leaflets.

The codes provide the basic information level, and are also the basic input parameters for a data exchange system based on the STEP protocol. This Technical Specification covers the mapping of these data to STEP application protocol 239 (STEP AP 239).

0.2 Intentions of this Technical Specification

This Technical Specification is aimed at those parties interested in using STEP for their transmission of product data. STEP can be implemented in different ways when used for the exchange of BEP (bodywork exchange parameter) data. The intention with this Technical Specification is to create a basis for compatible STEP applications when used for exchanging BEP data. In order to achieve this, it is necessary to map the BEP properties to the STEP application in a uniform way. This Technical Specification specifies the general principles of this mapping and shows examples of mapping of specific properties, as well as a complete STEP file for the transmission of data.

This Technical Specification is intended for use by implementation and software design experts with in-depth knowledge of the ISO 10303 series on STEP product data. Special knowledge of object-oriented syntaxes and the data descriptive language of STEP, EXPRESS and EXPRESS-G (the graphical notation) is necessary for the understanding and assimilation of this Technical Specification.

0.3 Relationship with STEP

The product data model schema of main interest is the ARM (application reference model) contained in STEP application protocol 239 (ISO 10303-239), published in 2005.

In addition, complementary standards and documentation are developed within OASIS (a part of W3C) to further assist in a successful usage and implementation of STEP AP 239 based solutions, referred to as data exchange sets (DEXs).

Road vehicles — Product data exchange between chassis and bodywork manufacturers (BEP) —

Part 4: Mapping to STEP application protocol 239

1 Scope

This Technical Specification describes the mapping to STEP application protocol 239 for the exchange of dimensional data between truck chassis manufacturers and bodywork manufacturers. It applies to commercial vehicles, as defined in ISO 3833, which have a maximum gross vehicle mass greater than 3 500 kg.

The process of exchanging the above information can involve

— the chassis manufacturer,

— the chassis importer,

— the chassis dealer,

— one or more bodywork manufacturers, and

— bodywork component suppliers, e.g. manufacturers of demountable bodies, cranes and loading equipment, tipping equipment.

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

ISO 10303-239, *Industrial automation systems and integration — Product data representation and exchange — Part 239: Application protocol: Product life cycle support*

ISO 21308-2, *Road vehicles — Product data exchange between chassis and bodywork manufacturers (BEP) — Part 2: Dimensional bodywork exchange parameters*

ISO 21308-3, *Road vehicles — Product data exchange between chassis and bodywork manufacturers (BEP) — Part 3: General, mass and administrative exchange parameters*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 10303-239, ISO 10303-11 and the following apply.

3.1
product type
type
typical (generic) description of a product

NOTE Types are usually described by part definitions.

3.2
product individual
individual
individual with given characteristics specified from the type description

NOTE Individuals are typically defined by a specific combination (configuration) of parts and components.

3.3
STEP file
data file
import file
file package containing the truck descriptive data in accordance with ISO 10303-239 and this Technical Specification

3.4
Reference Data Library
RDL
mechanism to allow dynamic semantic interpretation of data content in a STEP file at run-time

3.5
instance
individual object of a certain entity or class

4 Abbreviated terms

BEP Bodywork Exchange Parameter

DEX Data Exchange Set

OASIS Organisation for the Advancement of Structured Information Standards

PLCS Product Life Cycle Support

STEP STandard for the Exchange of Product model data

URN Uniform Resource Name

5 Overview

5.1 General

Figure 1 illustrates the information exchange model and scope of this Technical Specification.

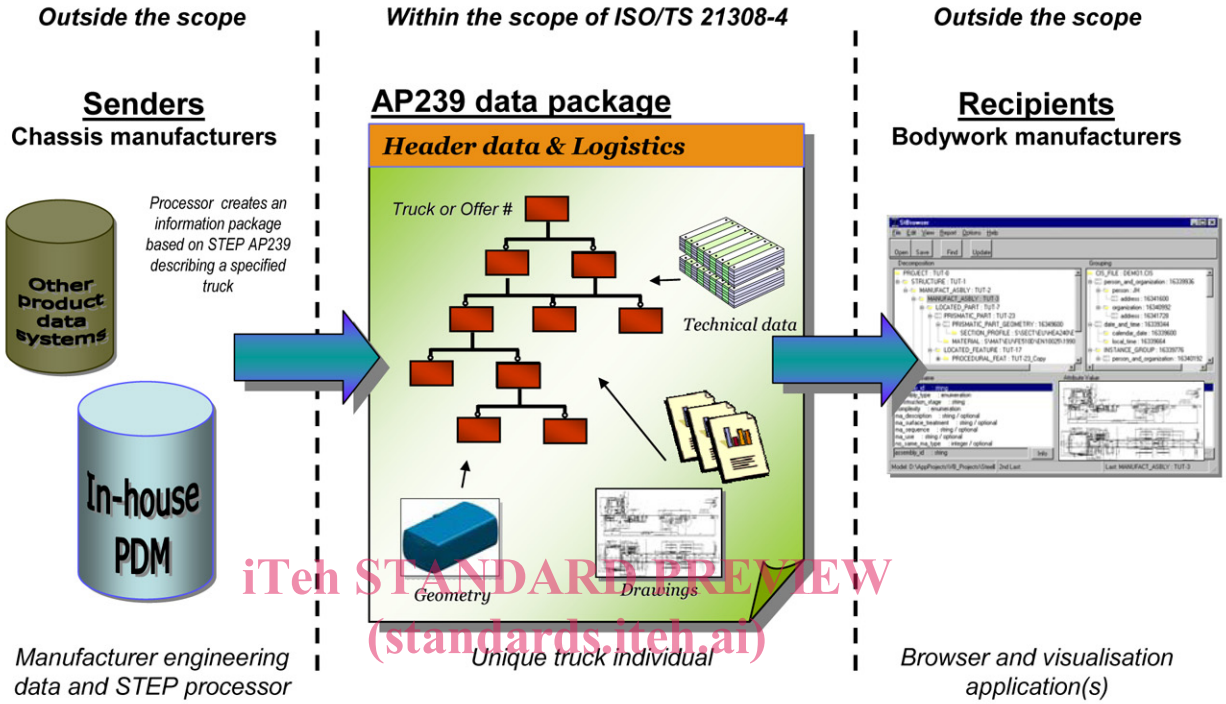

Figure 1 — Information exchange model and scope of this Technical Specification

Clauses 6 and 7 specify how exchange parameters defined in ISO 21308-2 and ISO 21308-3 should be mapped against STEP AP 239.

NOTE 1 In this Technical Specification, the term “STEP” refers to the STEP AP 239 model.

Table 2 identifies how the information entities defined in the Information Content document are generally mapped against the corresponding STEP AP 239 entity.

Subclauses 7.1 to 7.12 include an instantiation example diagram with explanatory text, where applicable.

NOTE 2 In case of doubt, it is advisable always to refer to the STEP AP 239 documentation and the corresponding DEX capabilities documentation.

The instantiation example diagrams show EXPRESS-G instantiation charts providing an overview of how a cluster of data should be instantiated and grouped.

Compulsory relationships may or may not be shown, if relevant in the context.

Optional attribute values are typically omitted, e.g. with description attributes that are usually optional and of a descriptive nature (in comparison with data that has a defined semantic meaning in the STEP standard, e.g. the name of a product class).

The STEP standard has many file representation formats (of the same data), the most common being a binding called “Part 21” (ISO 10303-21), which is a plain text file format. XML (Extensible Markup Language) is also available, referred to as "Part 28" (ISO 10303-28).

NOTE 3 Examples using Part 21 and Part 28 are used in this Technical Specification. Annex B summarizes the examples given in this Technical Specification as a complete Part 21 text file. Annex C summarizes in the same way the examples as a complete Part 28 XML file.

For complete scheme definitions and descriptions, the ISO 10303-239 documentation should be consulted.

5.2 Mapping techniques and instantiation diagrams

This Technical Specification relies heavily on instantiation diagrams to portray how the BEP data (and additional truck chassis data) is carried in the STEP file. All examples are DEX compliant as far as possible.

The model and instantiation diagrams used are in accordance with ISO 10303-11, STEP EXPRESS-G (see Figure 2).

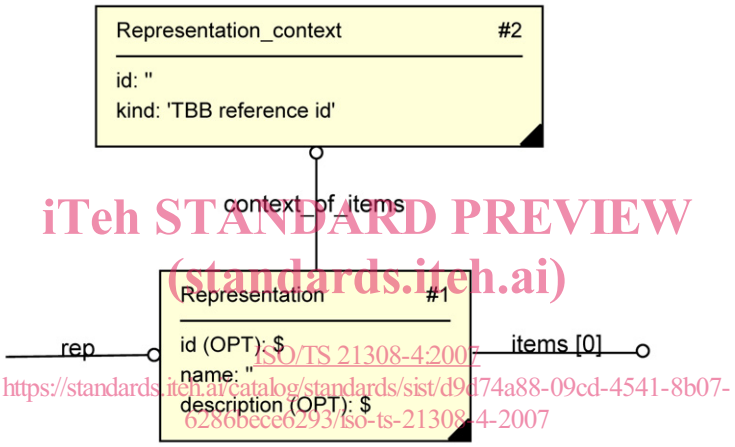

Figure 2 — Explanation of instantiation diagrams used in this Technical Specification

6 Exchange specification

6.1 General

The exchange data package consists of a core STEP file designated PRODUCT_DATA_239. All relevant information about structure, identification data and technical data information is contained here. From here, other information entities, such as external geometry documents or drawings, are referenced. See Figure 3.

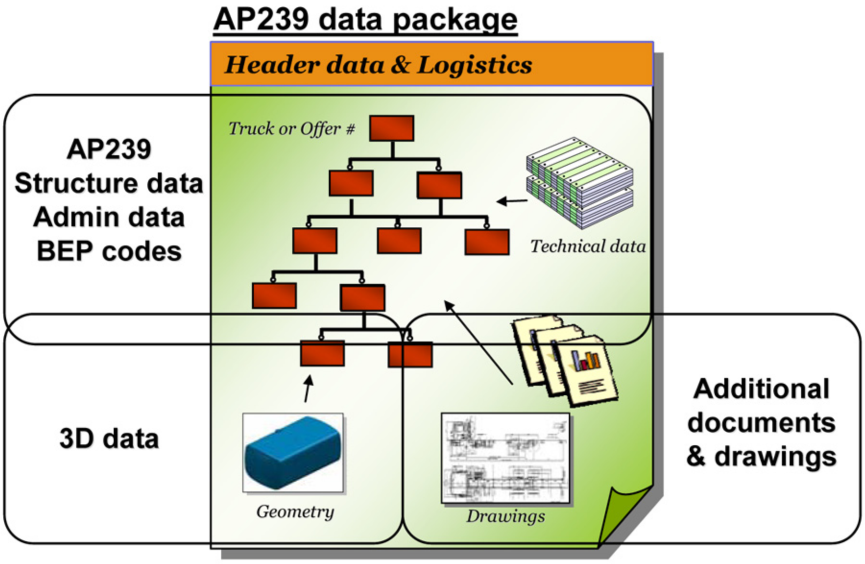

Figure 3 — Overview of STEP AP 239 data package and formats

Table 1 provides an overview of the information package physical structure and content.

Figure 4 provides an overview of the logical structure.

Table 1 — Overview of the information package physical structure

Information package envelope directory	Content overview	Format	Optional
Chassis technical data, preferably using BEP codes defined in ISO 21308-2 and ISO 21308-3	Purchase order or offer information Logistics information Chassis identity number Chassis structure (optional) Technical data References to other information items	STEP AP 239	No [a]
Chassis individual drawing	Two-dimensional drawing of chassis individual (alternatively chassis family type)	PDF, DXF [b c]	Yes
Chassis three-dimensional mock-up data	Three-dimensional geometry of the individual chassis, either complete chassis or per component	STEP AP214 cc1/2 AIM [d], STEP AP203 [e], STL [f c]	Yes
Other documentation of relevance	Document of interest to the truck body-builder, e.g. mounting instructions	MS Word, PDF [c]	Yes

[a] There are optional data entities and structures within the STEP data.

[b] PDF = Portable Document Format; DXF = Data Exchange Format.

[c] Or any other format agreed on bilaterally.

[d] AIM = Application Interpreted Model; see ISO 10303-214.

[e] See ISO 10303-203.

[f] STL = Standard Template Library.

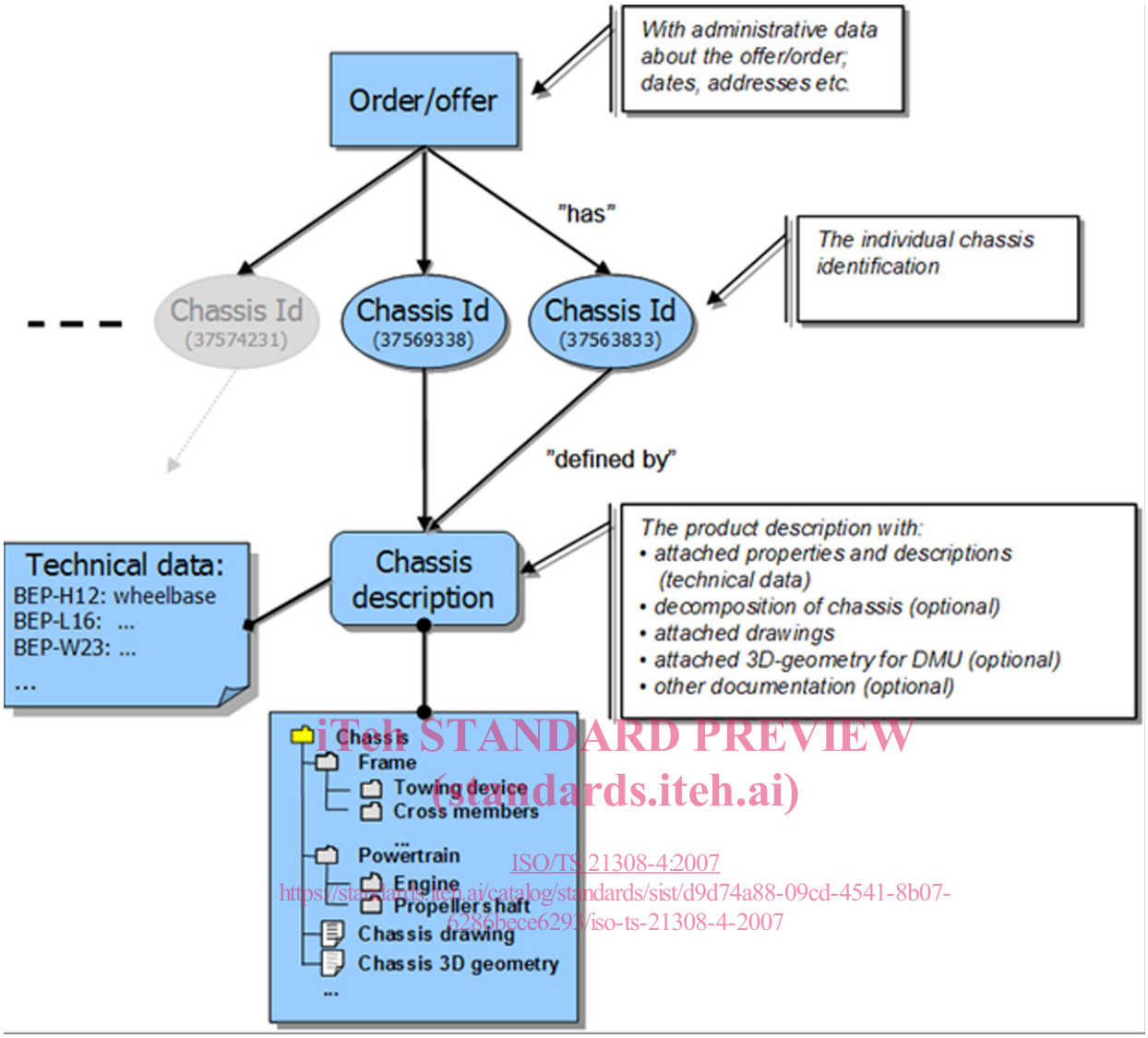

Figure 4 — Overview of logical build-up of STEP data structure

6.2 Data exchange sets and capabilities

Data exchange sets (DEXs) are OASIS standards that identify a subset of STEP AP 239 PLCS to be used to support a particular business process. Capabilities are the building blocks for DEXs. The following capabilities have been used when developing this Technical Specification:

— Capability (C001): assigning_identifiers

— Capability (C002): representing_parts

— Capability (C005): representing_documents

— Capability (C010): assigning_reference_data

— Capability (C010): assigning_reference_data

— Capability (C016): representing_person_organization

— Capability (C036): assigning_date_time

— Capability (C045): representing_product_as_individual

— Capability (C060): referencing_product_as_individual

— Capability (C079): representing_properties_numerically

— Capability (C080): representing_properties_textually

6.3 Type and individual data

In STEP AP 239, both a type of truck and a specific individual (planned or already produced) can be represented. Properties, represented by the “BEP codes” can be attached (associated) with both kinds of representation, and from the perspective of the recipients there should not be any difference.

Certain properties should however always be associated with the truck individual.

A data transfer file should always contain data for at least one individual vehicle.

6.4 External_class_library

External_class_library is a central part of STEP AP 239. It is used to reference external libraries for data definition.

This allows for dynamic configuration and a continued life-cycle for the definitions of BEP codes and other data references. External class libraries are identified by a name that uniquely specifies the library, typically a uniform resource name (URN) or similar.

NOTE In this Technical Specification, the following (fictitious) external libraries are used:

— “urn:iso:std:iso:21308” and “urn:iso:std:iso:10303-239” are used as library references;

— “urn:iso:std:iso:21308” corresponds to the URN of the BEP codes (name and description for the BEP codes);

— “urn:iso:std:iso:10303-239” corresponds to the URN of the PLCS reference data (information about classes and usage of STEP AP 239 PLCS).

6.5 Attributes

In STEP AP 239, the attributes are seldom used to represent any information. Instead, identification_assignment and classification_assignment are used in accordance with the usage guidelines developed within OASIS. To avoid data inconsistency, the rules below are used in this Technical Specification.

a) Mandatory attributes:

   — /IGNORE means value represented in another way, i.e. through identification_assignment and classification_assignment;

   — “ ”(empty string) means not used.

b) Optional attributes:

   — /IGNORE means value represented in another way, i.e. through identification_assignment and classification_assignment;

   — $ means not used.