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Road vehicles — Technical documentation of electrical and electronic systems —

Part 3: **Application example**

Véhicules routiers — Documentation technique des systèmes électriques et électroniques —

Partie 3: Exemple d'application

Reference number
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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 3.

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 part of ISO 11748 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 11748-3 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 3, *Electrical and electronic equipment*.

ISO 11748 consists of the following parts, under the general title *Road vehicles — Technical documentation of electrical and electronic systems*:

— *Part 1: Content of exchanged documents*

— *Part 2: Documentation agreement*

— *Part 3: Application example*

Annex A of this part of ISO 11748 is for information only.

Road vehicles — Technical documentation of electrical and electronic systems —

Part 3: **Application example**

1 Scope

This part of ISO 11748 provides an application example of the guidelines and specifications for technical documentation given in ISO 11748-1 and ISO 11748-2. The example is based on the standard generalized markup language (SGML), which is specified in ISO 8879.

2 Terms, definitions and abbreviated terms

For the purposes of this part of ISO 11748, the following terms, definitions and abbreviated terms apply.

2.1 Terms and definitions

2.1.1
link class
hyperlinks classified according to the semantics of their links

2.1.2
document instance
SGML document matching a particular document type definition (DTD)

2.2 Abbreviated terms

SGML standard generalized markup language, ISO-standardized language for document representation (see ISO 8879 and 3.1 of this part of ISO 11748)

MSR manufacturer supplier relationship, an initiative of the German automotive industry (see 3.2)

HTML hypertext markup language, language of the World Wide Web

DTD document type definition, the part of an SGML environment defining document classes and structures

EPS encapsulated postscript

GIF graphics interchange format

XML extensible markup language, an application profile for SGML optimized for simple use on the Web

ID/IDREF SGML's method of identifying objects for linking

HyTime ISO standard for hyperlinking, part of the SGML family

MSR MEDOC working group within MSR

3 Overview

3.1 SGML

SGML is an International Standard (ISO 8879) that allows the platform- and system-independent exchange of documents and arbitrary data. It has the following basic characteristics:

— unique but customizable syntax for the data files;

— separation between content, structure and layout of documents (SGML deals primarily with document content and structure);

— definition of document and data structures carried out as document type definitions (DTD), using elements and attributes.

See annex A for an example.

3.2 MSR

MSR is an initiative of the German automotive industry to support joint development by vehicle manufacturers and their electronic control system suppliers, enabling process-synchronization and improved management of information exchange, and establishing working groups dedicated to specialized fields.

The MSR MEDOC working group develops methods and tools for information exchange in engineering. The group offers unified application profiles for both data and document exchange based on SGML and related standards (e.g. XML). The group performs data modelling for topics related to automotive electronic systems, including system specification, vehicle networks and software. The data models are implemented and validated in pilot projects as a set of SGML DTDs that builds the structure of the document base as described in ISO 11748-2. Each DTD reflects a specific domain of the data model to be implemented.

3.3 MSR DTD

3.3.1 MSR application profile

The following basic principles, which apply to all MSR DTDs, are defined in the MSR application profile.

— The same link model for all DTDs (supporting ID/IDREF, HyTime, and MSR semantic adressing simultaneously), which allows instances of the various MSR DTDs to be linked together and used as an entire database. The link classes are unambiguous across the entire set of MSR DTDs.

— Basic models: these include generic text sections, parameters and architectures.

— Configuration capabilities.

— Subclassing methods using <...class> elements.

— Administrative data applicable to implement version control even for subtrees in one instance: this is useful if an instance is built of fragments delivered by different project partners.

— The same generic approaches for constructing the DTDs (e.g. naming conventions, architectures).

A DTD’s application profile can be recognized in the first digit of its version number. This number is composed of three digits, the first referring to the application profile common to all MSR DTDs.

3.3.2 MSRSYS.DTD systems

MSRSYS.DTD is used to specify entire control systems with all their mechanical and electrical components. This DTD provides detailed structures for:

— project data (see 4.2 and 4.3 of ISO 11748-1:2001);

— parts and system decomposition (see 4.3 of ISO 11748-1:2001);

— architectures with signal, interface, port and connection specification (see 4.6 of ISO 11748-1:2001);

— connections (see 4.6 of ISO 11748-1:2001);

— electrical characteristics (see 4.7 of ISO 11748-1:2001);

— environmental characteristics (see 4.8 of ISO 11748-1:2001);

— optical and acoustical characteristics (see 4.9 of ISO 11748-1:2001);

— mechanical design (see 4.10 of ISO 11748-1:2001).

See annex A for an example of MSRSYS.DTD.

3.3.3 MSRSW.DTD software

For specifying and documenting software for electronic control units, MSRSW.DTD is used to produce

— a data dictionary,

— functional specifications, and

— calibration parameters.

3.3.4 MSRNET.DTD networks

For specifying and documenting on-board networks, MSRNET.DTD is used to produce

— general information about the network, such as the application domain,

— network architecture with connection components, network topology and network interfaces, and

— network operation covering management topics, signals and messages.

3.3.5 MSRREP.DTD arbitrary reports and change management

When MSR started to use SGML and XML for documenting its activities, it became clear that a DTD for arbitrary documents was required. MSRREP.DTD, developed for this purpose, can be used for writing reports and specifications not otherwise covered by the DTDs (e.g. test reports). It enables the definition of a generic document structure (chapters, paragraphs, etc.) and a detailed model for change management.

Annex A
(informative)

Application example

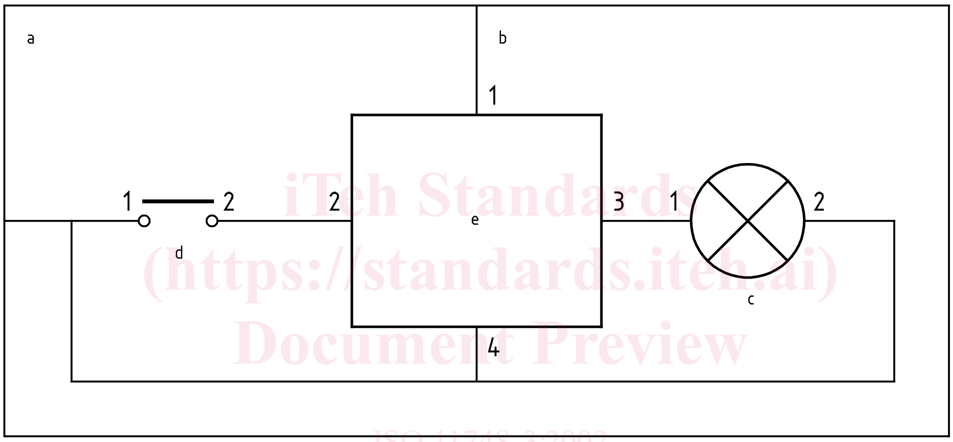
A.1 General

The example presented here consists of

— the MSRSYS.DTD as an example of a DTD,

— a partial documentation agreement based on a tutorial project, the development of a flashing system (see Figure A.1), and

— several views of a document from the same project (SGML, paper).



[a] System

[b] Power

[c] Lamp

[d] Button

[e] Electronic control unit (ECU)

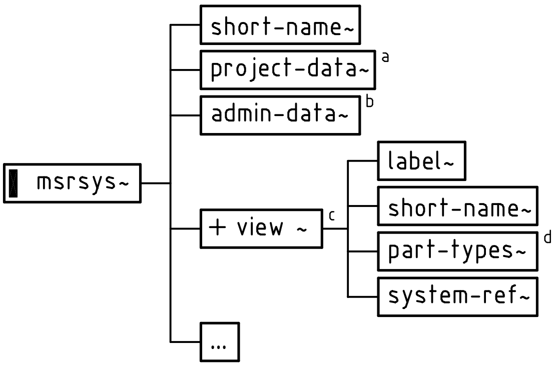
Figure A.1 — Flashing system

A.2 MSRSYS.DTD

The MSRSYS.DTD is composed of the branches shown in Figure A.2. The structure of the part-types branch is shown in Figure A.3. A part is an instantiation of a part-type that inherits all its characteristics.

EXAMPLES ECU in a car-body system, sensor of left front wheel in an ABS system.

A system is described as the root “part-type”.



[a] The project-data branch is used to give general information on the current project.

[b] Administrative data offers the possibility of entering the document name and identification, reasons for modifications, etc. It can also be used to divide a file into fragments in order to allow separate teams to work on different areas of a project, and it appears in every potential fragmentation place of the DTD.

[c] The view section allows the specification of a system that could be built up from different part types. The notion of view can be used to reflect the different views of vehicle manufacturers and suppliers as well as different development stages.

[d] A part-type is an element that can be instantiated in a system or in a higher ranking part-type (e.g. actuator, cable, sensor, ECU). This allows a components hierarchy to be built. See Figure A.3.

Figure A.2 — MSRSYS.DTD branches

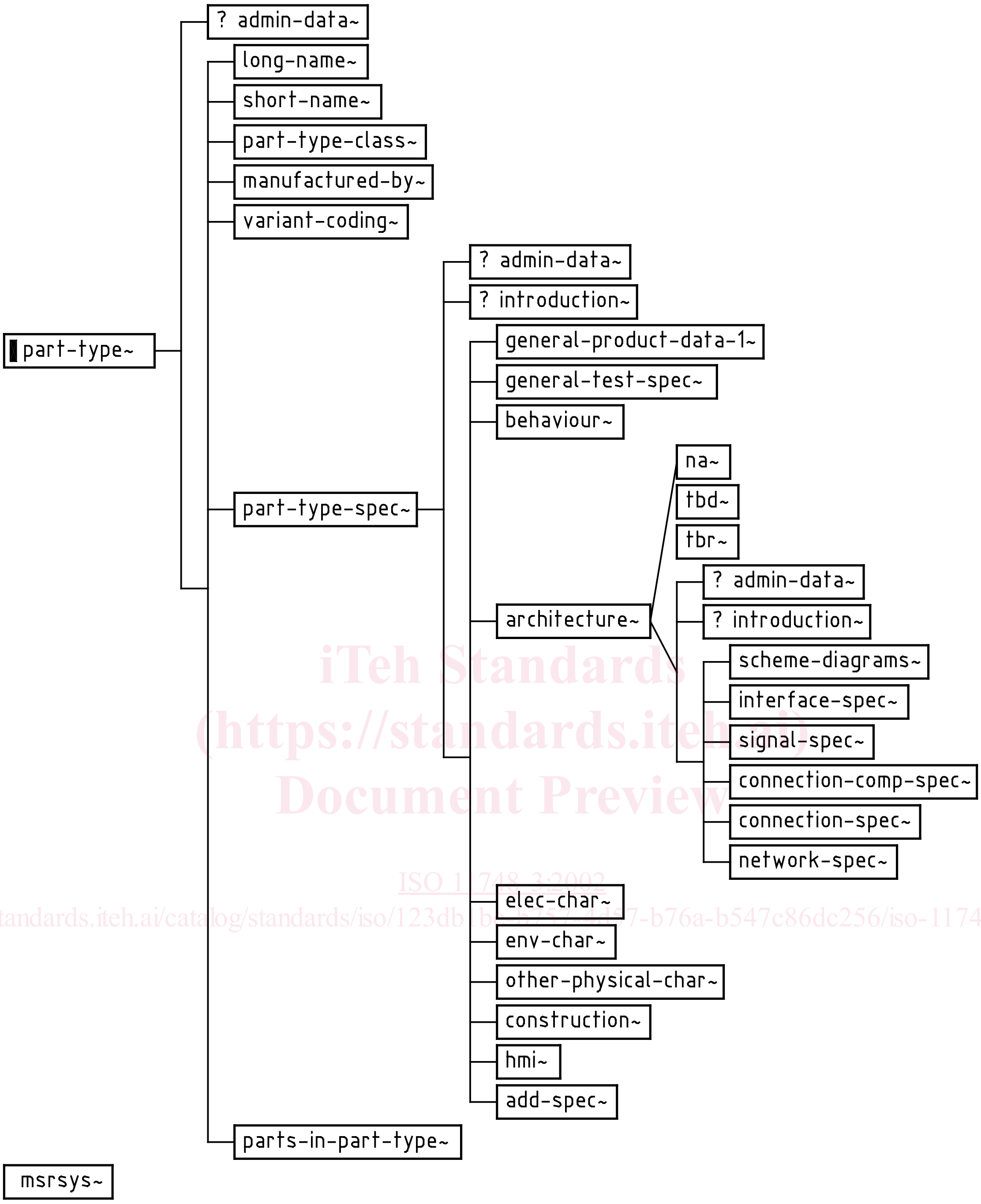


Figure A.3 — Part-type structure

The structure of the parts-in-part-type is shown in Figure A.4.

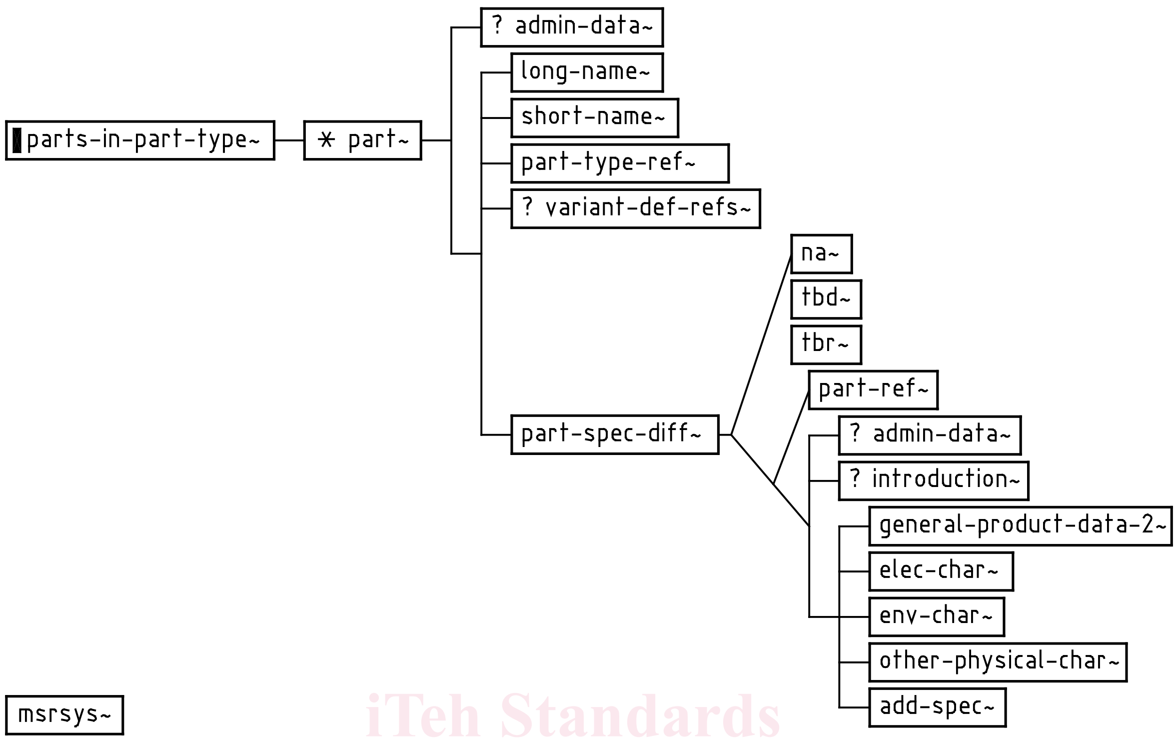


Figure A.4 — Parts-in-part-type structure

A.3 Documentation agreement

A.3.1 General

The following is an example of a documentation agreement according to the structure and with the items defined in clause 4 of ISO 11748-2:2001.

A.3.2 Subject

This documentation agreement applies to the development of a flashing system.

A.3.3 Partners

The companies involved are:

— VH, a vehicle manufacturer,

— SUP, an equipment supplier.

The partners are:

— VH/PROD (Product definition, contact person: Mr. Blue);

— VH/VALID (Validation and experimentation, contact person: Mr. Green);

— SUP/SYS (System design, contact person: Mr. Red);

— SUP/ELE (Electronics design, contact person: Mr. Yellow).