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**Vägfordon – Informationsmodell för fordonssäkerhet (VSIM)
(ISO/TS 22240:2008, IDT)**

**Road vehicles – Vehicles Safety Information Model (VSIM)
(ISO/TS 22240:2008, IDT)**

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Foreword

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ISO/TS 22240 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 12, *Passive safety crash protection systems*.

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Introduction

The vehicle safety information model (VSIM) provides a standard model for the filing and exchange of vehicle safety test data.

Figure 1 shows the many forms of data that can be exchanged from vehicle safety testing. VSIM offers a flexible structure for the filing and exchange of data.

Exchange of

- Test Information
- Test Definition
- Dummy Information
- Sensor Information
- Test Analysis Data
- Image Analysis
- Film Analysis
- etc.

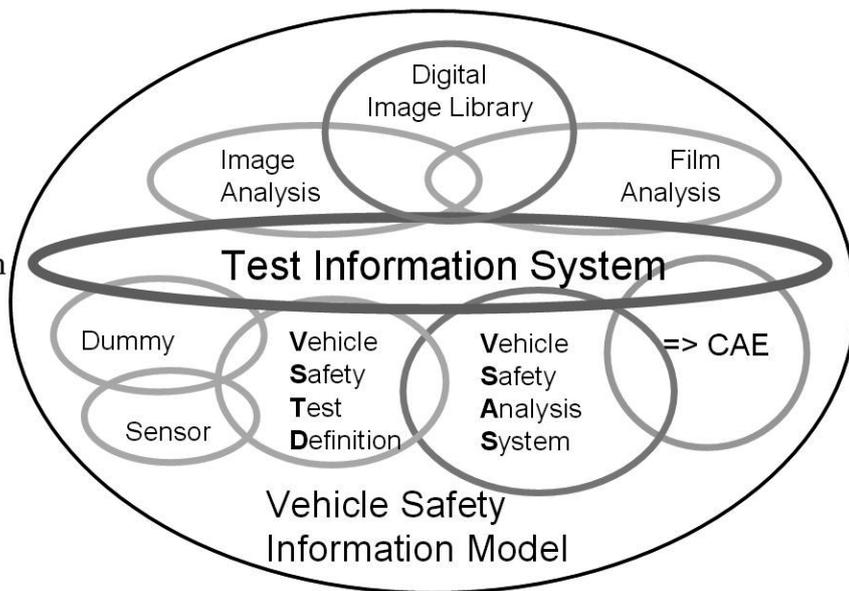


Figure 1 — Forms of data exchange

VSIM serves the already existing ASAM ODS (Association for Standardization of Automation and Measuring Systems Open Data Services) mechanisms. This provides the advantage that the data are available both in a database and a file system. In addition, the data can be exchanged in XML (eXtensible Markup Language) format.

ASAM ODS offers suitable structures for the filing of measurement data. As a result, multidimensional channels and discrete values can be continuously saved.

ASAM ODS offers one model for storing the data either in file or in database, and this method guarantees access to data even after a long period of time.

ASAM ODS is described in ISO/PAS 22720.

VSIM data exchange was developed from the following standards:

- ISO-MME (Multimedia exchange) (see ISO/TS 13499),
- ASAM ATF (ASAM Transport Format), and
- XML (ATF also available as ATF/XML).

Road vehicles — Vehicles safety information model (VSIM)

1 Scope

This Technical Specification presents an enhanced data exchange and data storage format for all data relevant for vehicle safety tests.

The underlying data model is based on ASAM ODS, and the corresponding exchange format is XML.

NOTE 1 Related electronic documents are available on the ISO website.

NOTE 2 The entities defined in Clause 3 are parts of the VSIM data model and are used in Figures 3 to 7.

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/TS 13499, *Road vehicles — Multimedia data exchange format for impact tests*

ISO/PAS 22720, *ASAM Open Data Services 5.0*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1 Tests

3.1.1

vehicle safety information model

VSIM

root of the whole data model

NOTE The entity describes the environment of the VSIM data model and holds the ISO-MME and ASAM ODS version numbers of the application model for vehicle safety.

3.1.2

Type_Of_Test

root entity of the administration of the Safety_Test, which stores a possible test type list

NOTE 1 It is advisable that the value of "Type_Of_Test" be part of a possible type list, as is the case in the existing vehicle safety analysis model defined by the German workgroup "Messdatenverarbeitung Fahrzeugsicherheit" (data processing for vehicle safety).

NOTE 2 The values of the Type_Of_Test are not standardized and depend on the customized definition.

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3.1.3

Subtype_Of_Test

specific type of test which makes it possible to enter the crash side or the legal codes of practice

NOTE The values of Subtype_Of_Test are not standardized.

3.1.4

Safety_Test

any kind of test performed in vehicle safety

EXAMPLE Crash test, sled test, component test, active safety test, biomechanical test.

3.1.5

contact

object that summarizes the contact information used for customer and laboratory contact for a safety test

NOTE A contact always refers to a person. This is identified with their email address.

3.1.6

Contact_Relation_Type

information that indicates what association the contact has to the Safety_Test.

NOTE The type could be customer, laboratory or "authorized". It belongs to the ASAM ODS base entity AoAny.

3.1.7

Test_Object

group of components with the same initial state (e.g. speed, direction of movement) at impact time

EXAMPLE Vehicles, barriers, pedestrian dummies.

3.1.8

Possible_Component

list of possible component types (e.g. door, airbag) that can be used in a test

3.1.9

Possible_Component_Attribute

list of attributes belonging to the possible components

3.1.10

Value_List

allowed values for a Possible_Component_Attribute (e.g. "left", "right")

NOTE The same list can be used for several attributes.

3.1.11

value

element used to hold values which are grouped by an instance of Value_List

NOTE An example for such groups is the content of selections lists, e.g. of "Position".

3.1.12

Test_Component

entity that contains the attributes of a component being tested

NOTE 1 The test object consists of one or more test components. For example, the door, B-pillar, airbag module and dummies are components of a vehicle safety test object.

NOTE 2 Test_Component is taken out of the Possible_Test_Components.

3.1.13

Test_Component_Attribute

entity that contains one attribute per instance of a component being tested

EXAMPLE The time to fire of airbags or type of dummy.

3.1.14

requirement

legal or customer specific requirement for the test procedure, which is related to "Safety_Test"

3.2 Measurements

3.2.1

channel

entity that describes the measured quantity within a measurement

NOTE If the measurement type is a signal measurement or a calculated channel, the name of the quantity is generated from the ISO-MME location code.

3.2.2

VSTD_Interface

entity that describes a vehicle safety test definition (VSTD) interface

3.2.3

Physical_Unit

entity that describes the physical unit

NOTE The entity belongs to the ASAM ODS base entity AoUnit.

3.2.4

Physical_Dimension

entity represented by the seven dimensional exponents of the SI base dimensions: length, mass, time, temperature, current, molar amount and light intensity

NOTE 1 The SI base dimensions are measured in the following SI base units: length (m), mass (kg), time (s), temperature (K), current (A), molar amount (Mol), light intensity (cd).

NOTE 2 Many of the exponents are usually zero. In particular, the dimensionless units (e.g. "%") all have exponents equal to zero.

NOTE 3 Several physical dimensions can exist which have the same set of exponents. The entity belongs to the ASAM ODS base entity AoPhysicalDimension.

3.2.5

Possible_Channel

entity that describes the possible channels

NOTE For the possible channels, the application attribute "default_filter_type" describes a default filtering for measured channels. Possible_Channels are named by using **channel codes** (3.2.7).

3.2.6

Possible_Channel_Group

groups used to build groups of channels that are related

3.2.7

channel code

attribute of the application elements "channel" and "possible channel", which contains the ISO-MME location code

NOTE 1 This location code has several code elements which are concatenated to the location. Figure 2 shows the convention to compose the content of this attribute.

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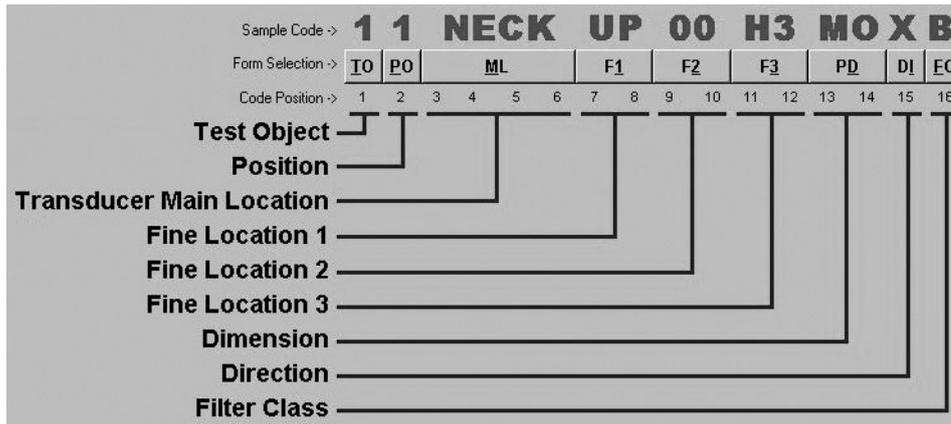


Figure 2 — ISO-MME location code

NOTE 2 ISO-MME also defines the values of code elements and describes them. There are entities defined in the VSIM application model for retaining this code element information. Their entity names are “Test_Object_Code”, “Position_Code”, “Main_Loc_Code”, “Fine_Loc_1_Code”, “Fine_Loc_2_Code”, “Fine_Loc_3_Code”, “Direction_Code”, “Filter_Cls_Code” and “Dimension_Code”. The entity “Test_Object_Code” belongs to the ASAM ODS base entity *AoUnitUnderTest*. The other entities belongs to the ASAM ODS base entity *AoAny* (see Table 1).

Table 1 — Relationship between ISO code and entity name

ISO Code	Entity name
Test Object	Test_Object_Code
Position	Position_Code
Transducer Main Location	Main_Loc_Code
Fine Location 1	Fine_Loc_1_Code
Fine Location 2	Fine_Loc_2_Code
Fine Location 3	Fine_Loc_3_Code
Dimension	Dimension_Code
Direction	Direction_Code
Filter Class	Filter_Cls_Code

NOTE 3 In channel codes, question marks (“?”) are used as placeholders, each for one DT_STRING character. These are replaced by valid combinations (see the related electronic documents).

3.3 Results

3.3.1 photo

entity that describes the photos of the test

NOTE 1 All pictures created during the test are organized in this entity.

NOTE 2 The photos are stored in the file system. The application model contains external references to the photo files and some descriptive attributes as they are given in the ISO-MME format. The photos have a relation to “Test_Object” and/or “Safety_Test”.

3.3.2

movie

entity that describes movies of the test

NOTE 1 All movies created during the test are organized in this entity.

NOTE 2 The movies are stored in the file system. The application model contains external references to the movie files and some descriptive attributes as they are given in the ISO-MME format. The movies have a relation to "Safety_Test" and/or "Test_Object".

3.3.3

Correction_Parameter

entity that contains additional information for movie analysis

3.3.4

Image_History

entity that describes the history of the images

NOTE The history of the images is a short description of the processes done by the imaging processing tools on the related image. The history of the image is logged in the instances of this entity.

3.3.5

diagram

entity that describes the attributes of a test diagram, such as the location where the diagram is stored and the channels used in the diagram, a simplified and structured visual representation of test data

NOTE Test diagrams are stored in the file system. The application model contains external references to the diagram files. The diagrams are related to "Safety_Test".

3.3.6

report

entity that describes the attributes of a test report, such as the location where the report is stored and the version of the report, a textual representation of the result of the test data

NOTE Test reports are stored in the file system. The application model contains external references to the report files. The reports are related to "Safety_Test".

4 Application model

4.1 General

The application model is divided into four parts. Each part represents a part of the entire model and has a specific focus. The first part offers an overview of the entire model. For clarity, only the entities with their relations that are necessary for display of the associations are shown. In addition, the derivation of the VSIM from the ASAM ODS basis model is displayed.

The second part goes into the test definition in greater depth. All of the entities with those relations relative to the definition data are described. The third part elaborates on the measurement data. The fourth part deals with the test results.

4.2 VSIM Overview

Figure 3 shows the most important entities with their most important relations to each other (shown by dotted lines).