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## Road vehicles — Multimedia data exchange format for impacts tests

*Véhicules routiers — Format d'échange de données multimédia pour les essais de choc*

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red	proposed change or addition
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light blue	not clarified at the moment

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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 normative 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;
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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order to decide whether it will be confirmed for a further three years, revised to become an International Standard, or withdrawn.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again after a further three years, at which time it must either be transformed into an International Standard or be withdrawn.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 13499 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 12, *Passive safety crash protection systems*.

**This second edition of ISO/TS 13499 cancels and replaces the first edition of ISO/TS 13499, which has been technically revised.**

# Road vehicles — Multimedia data exchange format for impacts tests

## 1 Scope

This Technical Specification presents a simple means for the exchange of multimedia data on impact tests between different laboratories. A format has been developed which defines a directory structure and the exchange information as ASCII files. Related electronic documents are available on the ISO website.

## 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 1000, *SI units and recommendations for use of their multiples and certain other units*

ISO 6487, *Road vehicles – Measurement techniques in impact tests - Instrumentation*

ISO 8721, *Road vehicles – Measurement techniques in impact tests – Optical instrumentation*

ISO 8601, *Data elements and interchange formats information interchange Representation of dates and times.*

ISO/IEC 8859-1, *Information technology – 8-bit single-byte codes graphic character sets – Part 1 : Latin alphabet No. 1*

ISO 9660, *Information processing – Volume and file structure of CD-ROM for information interchange*

## 3 Terms and definitions

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

### 3.1 Test object

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

### 3.2 Channel code

...

### 3.3 Reference system

...

### 3.4 Media object

...

3.5 Quaternion

...

3.6 Testnumber

...

...

4 General requirements

4.1 Physical units

All data shall be expressed in SI units or in their multiples, in accordance with ISO 1000. In particular, acceleration, a, shall be given in metres per second squared (m/s²) and velocity, v, in metres per second (m/s).

4.2 Data types

The data code shall be in ASCII in accordance with ISO 8859-1 with the decimal symbol being a point (".") (ASCII 46). Valid basic data types are integer, float and string. Generic data types are date, datetime and coded. The data types are defined in RED A.

4.3 NOVALUE

For integrity, where data is unavailable, insert "-9999999.9" if the data format is float and insert the reserved word "NOVALUE" as the data value in all other cases.

4.4 Placeholder

In channel codes, question marks ("?") shall be used as placeholders, one for each alphanumeric character. These shall be replaced by valid combinations (see the related electronic documents).

4.5 Data medium

The physical data medium shall be agreed or specified by the exchanging partners. If the medium is a CD-ROM the data format shall be based on ISO 9660 with the possible extensions.

4.6 Filename convention

...

5 Directory structure

All files relating to a particular test have to be held in a standard directory structure as follows.

<b>&lt;TESTNUMBER&gt;</b>	<b>main directory</b>
----- <testnumber>.MME	test information file
----- <testnumber>.TXT	test comment file
----- <b>CHANNEL</b>	<b>subdirectory</b>
----CHANNEL.INF	channel information file

-----<Name of channel file 1>	channel data file 1
.....	
-----<Name of channel file n>	channel data file n
----CHANNEL.TXT	channel comment file
----- <b>DIAGRAM</b>	<b>subdirectory</b>
----DIAGRAM.INF	diagram information file
-----<Name of diagram file 1>	diagram file 1
.....	
-----<Name of diagram file d>	diagram file d
----DIAGRAM.TXT	diagram comment file
----- <b>DOCUMENT</b>	<b>subdirectory</b>
----DOCUMENT.INF	document information file
-----<Name of document file 1>	document file 1
.....	
-----<Name of document file d>	document file d
----DOCUMENT.TXT	document comment file
----- <b>MOVIE</b>	<b>subdirectory</b>
-----<testnumber>.MII	moving image information file
-----<Name of movie file 1>	movie file 1
.....	
-----<Name of movie file m>	movie file m
----MOVIE.TXT	movie comment file
----- <b>OBJECT</b>	<b>subdirectory</b>
-----<Code of object 1>.INF	object information file 1
.....	
-----< Code of object o>.INF	object information file o
----OBJECT.TXT	object comment file
----- <b>PHOTO</b>	<b>subdirectory</b>
-----<testnumber>.PHO	photo information file
-----<Name of photo file 1>	photo file 1
.....	
-----<Name of photo file p>	photo file p
----PHOTO.TXT	photo comment file
----- <b>REFERENCE</b>	<b>subdirectory</b>
-----<testnumber>.RSI	reference system information file
-----<testnumber>.REF	reference system data file
----REFERENCE.TXT	reference system comment file
----- <b>REPORT</b>	<b>subdirectory</b>
----REPORT.INF	report information file
-----<Name of report file 1>	report file 1

	.....	
	----<Name of report file r>	report file r
	----REPORT.TXT	report comment file
-----	<b>STATIC</b>	<b>subdirectory</b>
	----STATIC.INF	static measurement information file
	----<Code of object 1>.STA	static measurement data file for object 1
	.....	
	----<Code of object o>.STA	static measurement data file for object o
	----STATIC.TXT	static <b>measurement</b> comment file
-----	(Additional subdirectories may be added here)	

<testnumber> is an alphanumeric code specific to the test used in the test information file (see RED A). The main directory contains the test descriptor file, the test comment file and special subdirectories for the multimedia data.

For every media object type a specific subdirectory has to be used. These subdirectories are optional. Any used subdirectory has to contain an information file and shall contain a comment file in addition to the data files.

The information about test objects, occupants, restraint systems and other components have to be stored in the OBJECT subdirectory.

Any reports have to be stored in the REPORT-subdirectory, while digital film and video data are stored in the MOVIE, picture data in the PHOTO, diagrams in the DIAGRAM, static measurement data in the STATIC, channel data in the CHANNEL and reference system data in the REFERENCE subdirectories.

Additional information can be stored in further subdirectories.

## 6 File organization

### 6.1 General

The information shall be stored in the following files:

- one *test information file* for the whole test in the main directory (see ...);
- one optional *test comment file* for additional information in the main directory (see ...);
- one optional *comment file* for additional information in every subdirectory (see ...);
- one *channel information file* and all channel data in the CHANNEL subdirectory (see ...);
- one *diagram information file* and all diagrams stored in the DIAGRAM subdirectory (see ...);
- one *document information file* and all documents stored in the DOCUMENT subdirectory (see ...);
- one *movie information file* and all digital film and video files in the MOVIE subdirectory (see ...);
- all *object information files* in the OBJECT subdirectory (see ...);
- one *photo information file* and all digital photo files in the PHOTO subdirectory (see ...);
- one *report information file* and all reports stored in the REPORT subdirectory (see ...);
- one *reference system information file* stored in the REFERENCE subdirectory (see ...);
- one *reference system data file* stored in the REFERENCE subdirectory (see ...);
- one *static measurement information file* and all static data stored in the STATIC subdirectory (see ...);

— *INF files* used throughout to define the format of other files in their directory showing limitations as necessary.

## 6.2 Information files

### 6.2.1 General rules for information files

Each line shall begin with a description field having a maximum of 28 characters. Position 29 may be a colon. The test information shall start at position 30. Tabulation stops ("tabs") are not allowed. Case-sensitivity is not required for description fields.

If some information belongs to a single media object these descriptors have to be concentrated within an information block. Every block has a begin- and an end-descriptor. The general information valid for all media objects of the same type is not block structured.

Comment lines may be used at any line and shall be marked by the descriptor "Comments". Each following line of a comment shall also begin with this descriptor. Comment lines should not contain computer-readable information.

The descriptor "Data format edition number" in the test information file (see...) shall be the first descriptor. The position order of all other descriptors may be free within a block. All description fields except "Comments" shall be unique within a block.

The mandatory and optional descriptors are described in RED A. Additional partner-specific descriptors can be agreed between the transferring parties. They have to start with a "&".

### 6.2.2 Test information (MME) file

This file contains general information concerning the test. Each item shall be separated by a "carriage return" and a "line feed" (CR/LF). The descriptors are defined in RED A.

### 6.2.3 Test object information (INF) files

These files contain the information concerning test objects, occupants and restraint systems. Each item shall be separated by a "carriage return" and a "line feed" (CR/LF).

Allowed filenames are built from the first 6 characters of the channel codes defined in RED B. The descriptors are defined in RED A.

### 6.2.4 Channel information (CHN) file

This file contains the whole information concerning the test channels. Each item shall be separated by a "carriage return" and a "line feed" (CR/LF). The descriptors are defined in RED A.

### 6.2.5 Moving image information (MII) file

This file contains information concerning all digital films, videos, animations and any other moving images held in the MOVIE subdirectory. Each item shall be separated by a "carriage return" and a "line feed" (CR/LF). The descriptors are defined in RED A.

### 6.2.6 Photo information (PHO) file

This file contains information concerning all digital still photographs and single images. Each item shall be separated by a "carriage return" and "line feed" (CR/LF). The descriptors are defined in RED A.

### 6.2.7 Reference system information (RSI) files

These files contain information concerning the reference systems. Each item shall be separated by a "carriage return" and "line feed" (CR/LF). The descriptors are defined in RED A.

### 6.2.8 Media object specific information (INF) files

These files contain information concerning a specific media object type like e.g. diagrams and reports. Each item shall be separated by a "carriage return" and "line feed" (CR/LF). The descriptors are defined in RED A.

### 6.2.9 Additional information files

Additional information to specific media objects shall be summarised within information files satisfying the general rules (see 6.2.1). Examples are the *correction parameter files* for movies. Their descriptors are defined in RED A.

## 6.3 Data files

### 6.3.1 General rules for data files

Data files consist of a header block and a data block. The header block in the beginning of the file is surrounded by a 'begin header' and an 'end header' descriptor. The construction of the descriptive lines is identical to the specification of an information file. The general rules for information files (see 6.2.1) apply also to the descriptive lines of the data files.

### 6.3.2 Channel data files

These files contain measurement values from specific test channels expressed in physical units and balanced. Each item shall be separated by a "carriage return" and a "line feed" (CR/LF). A channel file may consist of one or more columns each belonging to a component of a physical quantity. The columns are separated by blanks or tabulation stops.

Allowed filenames are built by the channel codes defined in RED B. The file extension is identical to the 'Reference system Id' defined in the *reference system data file*. Examples are shown in RED A.

### 6.3.3 Reference system data (REF) file

This file contains data which describe static or dynamic relations between reference systems with six degrees of freedom. Each item shall be separated by a "carriage return" and a "line feed" (CR/LF). A reference system data file consists of ten columns separated by blanks or tabulation stops. The columns describe the name, reference system, time, the three spatial components and the four quaternions. This filetype may be also used for transformation matrices, dynamic camera positions and all other objects which can be described by a position and orientation. Examples are shown in RED A.

### 6.3.4 Static measurement data (STA) files

These files contain all data from static measurements. Each item shall be separated by a "carriage return" and a "line feed" (CR/LF). The static measurement files consist of seven columns separated by blanks or tabulation stops. The columns describe the name, reference system, grouping information, time and the three spatial components of any measurement.

Allowed filenames are built from the first 6 characters of the channel codes defined in RED B. Examples are shown in RED A.

### 6.3.5 Additional data files

Additional data shall be summarised within data files satisfying the general rules (see 6.3.1). Examples are the *camera position files* for movies. Their descriptors are defined in RED A.

### 6.4 Comment files

These optional files contain all additional information exceeding the data volumes of the information files. Comment files may be stored in the main directory or in any subdirectory. The name of the "test comment file" shall be identical to the test number, while the names of the other comment files shall be equivalent to the names of the subdirectories with the extension "TXT". All comment files contain unformatted text.

Each item shall be separated by a "carriage return" and a "line feed" (CR/LF). If information specific to an individual data channel needs to be given, the information line shall start with the **channel code**.

The comment files shall be as follows:

**File name:** <subdirectory-name>.TXT

**Location:** in every subdirectory

**Contents:**  
unformatted text

.....

**channel code:** unformatted text

.....

unformatted text

### 6.5 Additional information

**Supplementary information may be stored in additional subdirectories.** The subdirectory should be given a meaningful name that identifies the information. Only one additional subdirectory for each system should be used. It is the responsibility of the producer of the system to specify the format of any files in the directory used by **their** system.

## 7 Data formats

The first line of **each information file** / the test **information** file shall contain the descriptor "Data format edition number" as a reference to the version of the related electronic documents used to create the files.

## 8 Related electronic documents

**The name and explanation of all descriptors** are given in the related electronic document *Descriptors and Hints (RED A)*. See <http://standards.iso.org/iso/13499>. Future versions of this document will also contain the description of changes and hints for using the Technical Specification.

The related electronic document *Channel Codes (RED B)* gives the coding description, code lists and coding rules for transducer channels. See <http://standards.iso.org/iso/13499>....

The related electronic document *Figures (RED C)* presents figures of vehicles and dummies with the location of the codes and channel codes. See <http://standards.iso.org/iso/13499>....

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The related electronic document *NHTSA Compatibility* (RED D) describes the additional information needed for the data exchange with the NHTSA. See <http://standards.iso.org/iso/13499...>

The related electronic document *Calculated values codes and channels* (RED E) defines the optional descriptors for calculated values which are derived from the measurement channels. See <http://standards.iso.org/iso/13499...>

Specific translations into, and from, other formats will be added in the future.

The Bureau de Normalisation de l'Automobile (BNA) has been appointed by the ISO technical management board (TMB) as the maintenance agency responsible for regularly updating all electronic documents related to ISO/TS 13499.

A change of the related electronic documents will result in an increase of the value for the descriptor 'Data format edition number' (see 7 and RED A).