
**Motorcycles — Test and analysis
procedures for research evaluation of rider
crash protective devices fitted to
motorcycles —**

Part 3:

Anthropometric impact dummy

*Motorcycles — Méthodes d'essai et d'analyse de l'évaluation par la
recherche des dispositifs, montés sur les motos, visant à la protection
des motocyclistes contre les collisions —*

Partie 3: Mannequin anthropométrique



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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.

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.

This part of ISO 13232 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 22, *Motorcycles*.

At the request of the United Nations Economic Commission for Europe, Group for Road Vehicle General Safety (UN/ECE/TRANS/SCI/WP29/GRSG), this International Standard has been prepared by ISO/TC 22/SC 22, *Motorcycles*, as eight interrelated parts, on the basis of original working documents submitted by the International Motorcycle Manufacturers Association (IMMA).

This is the first version of the standard.

ISO 13232 consists of the following parts, under the general title *Motorcycles — Test and analysis procedures for research evaluation of rider crash protective devices fitted to motorcycles*:

- *Part 1: Definitions, symbols and general considerations*
- *Part 2: Definition of impact conditions in relation to accident data*
- *Part 3: Anthropometric impact dummy*
- *Part 4: Variables to be measured, instrumentation and measurement procedures*
- *Part 5: Injury indices and risk/benefit analysis*
- *Part 6: Full-scale impact-test procedures*
- *Part 7: Standardized procedures for performing computer simulations of motorcycle impact tests*
- *Part 8: Documentation and reports*

Annex A forms an integral part of this part of ISO 13232. Annex B is for information only.

Introduction

This International Standard has been prepared on the basis of existing technology. Its purpose is to define common research methods and a means for making an overall evaluation of the effect that devices which are fitted to motor cycles and intended for the crash protection of riders, have on injuries, when assessed over a range of impact conditions which are based on accident data.

It is intended that the methods and recommendations contained in this International Standard should be used in all basic feasibility research. However, researchers should also consider variations in the specified conditions (for example, rider size) when evaluating the overall feasibility of any protective device. In addition, researchers may wish to vary or extend elements of the methodology in order to research issues which are of particular interest to them. In all such cases which go beyond the basic research, if reference is to be made to this International Standard, a clear explanation of how the procedures used differ from the basic methodology should be provided.

In order to apply this International Standard properly, it is strongly recommended that all eight parts be used together, particularly if the results are to be published.

To the extent, if any, that any products identified in this International Standard may be subject to patent rights, and to the extent, if any, that licenses may be available relative to such patents, potential manufacturers of such products are advised that individual patent inquiries should be made and alternative products considered. A record of patent holders' statements, if any, regarding their willingness to negotiate licenses under patent and like rights with applicants throughout the world under reasonable terms and conditions, is on file with the ISO Central Secretariat.

Motorcycles — Test and analysis procedures for research evaluation of rider crash protective devices fitted to motorcycles —

Part 3:

Anthropometric impact dummy

1 Scope

This International Standard specifies minimum requirements for research into the feasibility of protective devices fitted to motor cycles, which are intended to protect the rider in the event of a collision.

This International Standard is applicable to impact tests involving

- two wheeled motor cycles;
- the specified type of opposing vehicle;
- either a stationary and a moving vehicle or two moving vehicles;
- for any moving vehicle, a steady speed and straight line motion immediately prior to impact;
- one helmeted dummy in a normal seating position on an upright motor cycle;
- the measurement of the potential for specified types of injury, by body region;
- evaluation of the results of paired impact tests (i.e., comparisons between motor cycles fitted and not fitted with the proposed devices).

This part of ISO 13232 specifies the minimum requirements for the

- biofidelity of the motor cyclist anthropometric impact dummy;
- compatibility of the dummy with motor cycles, helmets, multi-directional impacts, and the instrumentation;
- repeatability and reproducibility of the dummy properties and responses.

This International Standard does not apply to testing for regulatory or legislative purposes.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 13232 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 13232-1: 1996, Motor cycles - Test and analysis procedures for research evaluation of rider crash protective devices fitted to motor cycles - Part 1 - Definitions, symbols and general considerations.

ISO 13232-4: 1996, Motor cycles - Test and analysis procedures for research evaluation of rider crash protective devices fitted to motor cycles - Part 4 - Variables to be measured, instrumentation and measurement procedures.

ISO 13232-6: 1996, Motor cycles - Test and analysis procedures for research evaluation of rider crash protective devices fitted to motor cycles - Part 6 - Full-scale impact test procedures.

ISO 13232-8: 1996, Motor cycles - Test and analysis procedures for research evaluation of rider crash protective devices fitted to motor cycles - Part 8 - Documentation and reports.

ISO 6487: 1987, Road vehicles - Measurement techniques in impact-tests - Instrumentation.

49 CFR Part 572, subpart E: 1993, Anthropomorphic test dummies, United States of America Code of Federal Regulations issued by the National Highway Traffic Safety Administration (NHTSA). Washington, D.C.

3 Definitions

For the purposes of this part of ISO 13232, the definitions given in ISO 13232-1 apply, of which the following are of particular relevance to this part of ISO 13232.

- abdominal foam insert;
- alternative products;
- certification, compliance;
- knee compliance element;
- load cell simulator;
- lot;
- specimen.

4 Mechanical requirements for the motor cyclist anthropometric impact dummy

The manufacturers of dummies or dummy components which are intended to meet this International Standard, shall provide with the supplied dummies or dummy components, certification that the dummies or dummy components meet the requirements specified below.

4.1 Basis dummy

The basis dummy shall be the Hybrid III 50th percentile male dummy¹⁾. The dummy shall be equipped with

- the sit/stand construction²⁾;
- the head/neck assembly which is compatible with the six axis upper neck load cell which is specified in 4.4.1.2 of ISO 13232-4²⁾;
- standard, non-sliding knees²⁾.

1) Basis dummy as specified in 49 CFR Part 572, subpart E, or equivalent.

2) A list describing one or more example products which meet these requirements is maintained by the ISO Central Secretariat and the Secretariat of ISO/TC 22/SC 22. The list is maintained for the convenience of users of this International Standard and does not constitute an endorsement by ISO of the products listed. Alternative products may be used if they can be shown to lead to the same results.