DRAFT AMENDMENT ISO 6487:2002/DAmd 2

ISO/TC **22**/SC **12** Secretariat: **AFNOR**

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Road vehicles — Measurement techniques in impact tests — Instrumentation

AMENDMENT 2: ADT temperature measurement

Véhicules routiers — Techniques de mesurage lors des essais de chocs — Instrumentation

AMENDEMENT 2: Mesurage de la température du dispositif d'essai anthropomorphe

ICS 43.020

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Foreword

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Amendment 2 to ISO 6487:2002 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 12, *Passive safety crash protection systems*.

Introduction

The temperature of the ATD used in a collision test shall be monitored to confirm that it has been used within the acceptable temperature range prescribed for the whole ATD or body segment. The objective is to prevent temperature from being a variable that will influence the ATD response. The actual ATD temperature may be influenced by various factors including the ambient air, high-speed photography lighting, sunshine, heat dissipation from transducers, and ATD in-board data acquisition systems.

In order to respond to these objectives, the present amendment to ISO 6487:2002 specifies the performance requirements for the ATD temperature measurement.

Road vehicles — Measurement techniques in impact tests — Instrumentation

Amendment 2: ATD temperature measurement

Add a new paragraph 4.11 and a new Annex C as follows:

4.11 ATD temperature measurement

Measurements shall be recorded at a rate of one reading per minute. The minimum measurement range shall be from 10°C to 40°C. The location of the measurement probe shall be according to the Technical Report: Temperature Measurement in Anthropomorphic Test Devices – Definition of the temperature sensor locations.

The accuracy tolerance of the complete measurement chain shall be three times narrower than the temperature tolerance specified for the ATD. (For example, for a Hybrid III, the specified temperature span is from 20.6°C to 22.2°C. This corresponds to a tolerance of ±0.8°C; the accuracy tolerance for the temperature measurement would then be ±0.26°C.) The error contribution of the transducer, extension wire if applicable and data acquisition equipment shall be taken into account.

Dynamic response: after a temperature step, the transducer shall indicate 90% of the new value within one minute.

The measurements shall be done according to recognized standards: see Annex C.

Annex C
(informative)

Temperature measurement systems

Notes and references on most common temperature measurement systems

Thermocouples: Accuracy tolerances of the various thermocouple types are specified in DIN/IEC 584, ISA MC 96.1-1982, or equivalent standards. Tolerances are specified for the thermocouple element as well as for any extension wire used. Thermocouples and extension wires having better accuracy tolerance than the “standard” products are available from manufacturers, calibration within limited temperature range, which results in narrower tolerances, is also available. The accuracy of the whole measurement chain should be verified before use. Periodic calibration should be done as it will change with time and use.

Thermistors: Thermistors are sensitive to small temperature change and can be made in small sizes. The most common type is the Negative Temperature Coefficient (NTC) thermistor. This type of sensor will dissipate a small amount of heat; the user should verify that this self-heating characteristic does not produce errors depending on the sensor location. Temperature/resistance characteristics are provided by each supplier. (ASTM E879-01 provides specifications although it is directed to clinical applications)

Platinum resistance thermometer: These are part of the Resistance Temperature Detectors (RTDs) family. The sensitivity of those sensors is generally stable with time. Since the resistance value of the sensor is low, the contribution of the wires to the total resistance value should be compensated. This type of sensor will dissipate a small amount of heat; the user should verify that this self-heating characteristic does not produce errors depending on the sensor location. Main specifications as well as temperature/resistance relations are provided in DIN/IEC 751, ASTM 1137-97 or equivalent standards.