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**In vitro diagnostic test systems —  
Requirements for blood-glucose  
monitoring systems for self-testing in  
managing diabetes mellitus**

*Systèmes d'essais de diagnostic in vitro — Exigences relatives aux  
systèmes d'autosurveillance de la glycémie destinés à la prise en  
charge du diabète sucré*





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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.

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 15197 was prepared by Technical Committee ISO/TC 212, *Clinical laboratory testing and in vitro diagnostic test systems*.

This second edition cancels and replaces the first edition (ISO 15197:2003), the clauses, subclauses and annexes of which have been technically revised.

## Introduction

Blood-glucose monitoring systems are *in vitro* diagnostic medical devices used predominantly by individuals affected by diabetes mellitus. Diabetes mellitus is caused by a deficiency in insulin secretion or by insulin resistance leading to abnormally high concentrations of glucose in the blood, which may result in acute and chronic health complications. When used properly, a glucose monitoring system allows the user to monitor and take action to control the concentration of glucose present in the blood.

This International Standard is intended for blood-glucose monitoring systems used by lay persons. The primary objectives are to establish requirements that result in acceptable performance and to specify procedures for demonstrating conformance to this International Standard.

Minimum performance criteria for blood-glucose monitoring systems were established from the analytical requirements (precision and trueness) for individual glucose measurement results. “System accuracy” is the term used in this International Standard to communicate the analytical capability of a blood-glucose monitoring system to the intended users (i.e. lay persons), who would not be familiar with metrological terms commonly used in laboratory medicine. System accuracy describes the ability of a glucose monitoring system to produce measurement results that agree with true glucose values when the system is used as intended. The concept of “system accuracy” includes measurement bias and measurement precision.

The requirements for system accuracy are based on three considerations:

- the effectiveness of current technology for monitoring patients with diabetes mellitus;
- recommendations of diabetes researchers as well as existing product standards and regulatory guidelines; and
- the state-of-the-art of blood-glucose monitoring technology.

In arriving at the performance requirements specified in the second edition of this International Standard, desirable goals had to be weighed against the capabilities of existing blood-glucose monitoring technology. The revised performance criteria in this edition are the result of improvements in technology since publication of the first edition. The considerations that formed the basis for the minimum acceptable analytical performance of a blood-glucose measuring device intended for self-monitoring are described in [Annex C](#).

Requirements that are unique to self-monitoring devices for blood-glucose are addressed in this International Standard. Requirements that apply in general to all *in vitro* diagnostic medical devices are incorporated by reference to other standards where appropriate.

Although this International Standard does not apply to glucose monitoring systems that provide measured values on an ordinal scale (e.g. visual, semiquantitative measurement procedures) or medical devices that measure blood-glucose continuously for self-monitoring, it may be useful as a guide for developing procedures to evaluate the performance of such systems.



# In vitro diagnostic test systems — Requirements for blood-glucose monitoring systems for self-testing in managing diabetes mellitus

## 1 Scope

This International Standard specifies requirements for *in vitro* glucose monitoring systems that measure glucose concentrations in capillary blood samples, for specific design verification procedures and for the validation of performance by the intended users. These systems are intended for self-measurement by lay persons for management of diabetes mellitus.

This International Standard is applicable to manufacturers of such systems and those other organizations (e.g. regulatory authorities and conformity assessment bodies) having the responsibility for assessing the performance of these systems.

This International Standard does not:

- provide a comprehensive evaluation of all possible factors that could affect the performance of these systems,
- pertain to glucose concentration measurement for the purpose of diagnosing diabetes mellitus,
- address the medical aspects of diabetes mellitus management,
- apply to measurement procedures with measured values on an ordinal scale (e.g. visual, semiquantitative measurement procedures), or to continuous glucose monitoring systems,
- apply to glucose meters intended for use in medical applications other than self-testing for the management of diabetes mellitus

## 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 13485, *Medical devices — Quality management systems — Requirements for regulatory purposes*

ISO 14971, *Medical devices — Application of risk management to medical devices*

ISO 17511, *In vitro diagnostic medical devices — Measurement of quantities in biological samples — Metrological traceability of values assigned to calibrators and control materials*

ISO 18113-1, *In vitro diagnostic medical devices — Information supplied by the manufacturer (labelling) — Part 1: Terms, definitions and general requirements*

ISO 18113-4, *In vitro diagnostic medical devices — Information supplied by the manufacturer (labelling) — Part 4: In vitro diagnostic reagents for self-testing*

ISO 18113-5, *In vitro diagnostic medical devices — Information supplied by the manufacturer (labelling) — Part 5: In vitro diagnostic instruments for self-testing*

ISO 23640, *In vitro diagnostic medical devices — Evaluation of stability of in vitro diagnostic reagents*

IEC 60068-2-64, *Environmental testing — Part 2-64: Tests — Test Fh: Vibration, broadband random and guidance*