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**Agricultural engineering — Electrical  
and electronic equipment — Testing  
resistance to environmental conditions**

*Génie agricole — Matériel électrique et électronique — Essais de  
résistance aux conditions environnementales*



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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 15003 was prepared by Technical Committee ISO/TC 23, *Tractors and machinery for agriculture and forestry*, Subcommittee SC 19, *Agricultural electronics*.

# Agricultural engineering — Electrical and electronic equipment — Testing resistance to environmental conditions

## 1 Scope

This International Standard provides design requirements and guidance for the manufacturers of electrical and electronic equipment for use in all kinds of mobile (including hand-held) agricultural machinery, forestry machinery, landscaping and gardening machinery [referred to hereafter as machine(s)]. It gives tests for specific environmental conditions and defines severity levels for tests which relate to the environmental extremes that can be experienced in practical operation of the equipment.

The standard is intended to be used in determining the suitability of the equipment of these machines, for use in a specified range of environmental conditions.

NOTE The severity levels given are general guidelines and not guaranteed worst-case exposure levels.

## 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.

IEC 60068-1:1988, *Environmental testing — Part 1: General and guidance*

IEC 60068-2-5:1975, *Basic environmental testing procedures — Part 2: Tests — Test Sa: Simulated solar radiation at ground level*

IEC 60068-2-6:1995, *Environmental testing — Part 2: Tests — Test Fc: Vibration (sinusoidal)*

IEC 60068-2-9: 1975, *Basic environmental testing procedures — Part 2: Tests — Guidance for solar radiation testing*

IEC 60068-2-11:1981, *Basic environmental testing procedures — Part 2: Tests — Test Ka. Salt mist*

IEC 60068-2-13:1983, *Basic environmental testing procedures — Part 2: Tests — Test M: Low air pressure*

IEC 60068-2-14:1984, *Basic environmental testing procedures — Part 2: Tests — Test N: Change of temperature*

IEC 60068-2-27:1987, *Basic environmental testing procedures — Part 2: Tests — Test Ea and guidance: Shock*

IEC 60068-2-30:1980, *Basic environmental testing procedures — Part 2: Tests — Test Db and guidance: Damp heat, cyclic (12 + 12-hour cycle)*

IEC 60068-2-47:2005, *Environmental testing — Part 2: Tests — Mounting of specimens to vibration, impact and similar dynamic tests*

IEC 60068-2-64:1993, *Environmental testing — Part 2: Test methods — Test Fh: Vibration, broad-band random (digital control) and guidance*

IEC 60068-2-78:2001, *Environmental testing — Part 2-78: Tests — Test Cab: Damp heat, steady state*

IEC 60512-1:2001, *Connectors for electronic equipment — Tests and measurements — Part 1: General*

IEC 60529:1989, *Degrees of protection provided by enclosures (IP Code)*

ISO 14982:1998, *Agricultural and forestry machinery — Electromagnetic compatibility — Test methods and acceptance criteria*

ISO 16750:2003, *Road vehicles — Environmental conditions and testing for electrical and electronic equipment*

### 3 Terms and definitions

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

- 3.1**  
**display device**  
device displaying alpha-numeric characters or graphical symbols designed to be read by operative or service personnel
- 3.2**  
**equipment**  
self-contained electronic system containing electric, electronic and mechanical components which is electrically connected to other machinery (including power sources) by means of connectors
- 3.3**  
**impaired function**  
state in which one or more of the functions of the equipment as stated by the manufacturer are not operative or do not conform to the manufacturer's specification
- 3.4**  
**location**  
position within machines where the equipment will normally be operating
- 3.5**  
**normal mounting configuration**  
orientation of the equipment when in normal use
- 3.6**  
**severity level**  
severity of the conditions under which an environmental test is undertaken, selected according to the intended location and application of the equipment
- 3.7**  
**portable equipment**  
equipment that can be battery operated and that a person can carry