

E C M A

EUROPEAN COMPUTER MANUFACTURERS ASSOCIATION

STANDARD ECMA - 166

INFORMATION TECHNOLOGY EQUIPMENT

-

**ROUTINE ELECTRICAL SAFETY TESTING
IN PRODUCTION**

June 1992

Free copies of this document are available from ECMA,
European Computer Manufacturers Association,
114 Rue du Rhône - CH-1204 Geneva (Switzerland)

Phone +41 22 735 36 34 Fax: +41 22 786 52 31

E C M A

EUROPEAN COMPUTER MANUFACTURERS ASSOCIATION

STANDARD ECMA - 166

INFORMATION TECHNOLOGY EQUIPMENT

-

**ROUTINE ELECTRICAL SAFETY TESTING
IN PRODUCTION**

June 1992

Brief History

Standard IEC 950: Safety of Information Technology Equipment (ITE) prescribes type tests only.

These type tests may not be suitable as routine tests to be carried out on equipment during the manufacturing process or at the end of the production line. Nevertheless it is recognized that some safety tests are necessary in order to guarantee an acceptable level of production uniformity, which is also a requirement for certified products.

This Standard defines tests to measure the resistance of the earthing circuit and to check the insulation between the power wires and secondary circuits and accessible conductive parts. In addition, it defines the documentation to be maintained by the manufacturer.

Table of Contents

	Page
1 Scope	1
2 Conformance	1
3 References	1
4 Definitions	1
4.1 Routine electrical safety testing	1
5 Tests	1
5.1 Resistance of earthing circuit	1
5.2 Electric strength	1
6 Calibration of test equipment	2
7 Documentation of tests	2

1 Scope

This ECMA Standard is aimed at defining the safety tests and their procedures to be applied during the production process of the equipment.

In all cases the application of the tests detailed in this Standard are design dependent and need to be defined by the manufacturer.

This ECMA Standard applies to Information Technology Equipment during production. Manufacturers can apply this standard also to sub-assemblies and components, which would not otherwise be tested as part of the complete equipment.

2 Conformance

In order to conform to this ECMA Standard an equipment shall pass the tests of Clauses 5.1 and 5.2.

3 References

IEC 950 (1991) Safety of Information Technology Equipment (ITE)

EN 60950 Safety of Information Technology Equipment

4 Definitions

The definitions of IEC 950 apply.

In addition, for the purpose of this Standard the following definition applies:

4.1 Routine electrical safety testing

A test to which each individual device is subjected during or after production, to ascertain whether it complies with electrical safety criteria.

5 Tests

5.1 Resistance of earthing circuit

This test applies to Class I and, under certain conditions, to Class II equipment.

The purpose of this test is to check that the resistance between the parts required to be reliably earthed for safety reasons and the mains earthing contact is not higher than 0,1 Ω .

The test shall be carried out by circulating a test current 1,5 times the current capacity of any hazardous voltage circuit, but not more than 25 A (a.c. or d.c.) for the time required to obtain a meaningful reading through the parts to be tested and the mains earthing contact.

The resistance of the protective earthing conductor of the power supply cord (detachable or not) shall not be included in the measurement.

5.2 Electric strength

This test consists of applying to the equipment a sinusoidal waveform (50 Hz or 60 Hz) or an equivalent d.c. voltage between the power wires (short-circuited) and accessible conductive parts and secondary circuits.

The test voltage shall be selected and applied in accordance with table 18 of 5.3 of IEC 950, and shall be maintained for at least 1 s. The tolerance on the voltage shall be +100 V, -0 V.

No insulation breakdown shall occur during the test.

For the purpose of this Standard, an insulation breakdown, as indicated by a trip current, is defined as any departure from the steady state current measured during the electric strength test.

The test equipment shall be provided with two independent indications of dielectric breakdown, e.g. visible and audible. The trip current level shall be determined by the manufacturer. The trip current shall be set at the minimum possible value.

NOTE

As a reference this value is usually in the order of a few μA for d.c. measurements. For a.c. measurements the current flowing through the RFI filter capacitors has to be taken into account.

6 Calibration of test equipment

Equipment used for the tests shall be periodically tested and calibrated.

Calibration records shall be kept by the organization responsible of the test equipment.

7 Documentation of tests

The test results shall be kept available.

The choice of support and format for reports is left to the manufacturers: separate forms (one for each equipment) or lists of equipment, grouped according to the most suitable parameters (periods of time, model, etc) are equally accepted.

The only obligation is the availability of data and their immediate interpretability for all equipment leaving the production.

For every piece of equipment tested, the following data have to be filed:

- date of the test;
- model of the equipment;
- serial number of the equipment or another identifier permitting the identification without ambiguities;
- value of earthing circuit resistance with the corresponding current value (*);
- value of voltage applied during the electric strength test (*);
- quick-reference information that the whole set of tests has/has not been successful.

As an alternative to the values referred with an (*) above, the information of the accomplishment of each test (OK/not OK) is permitted.

