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Mechanical Safety of Cathode Ray Tubes



EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 61965:2003 sisaldab Euroopa standardi EN 61965:2001 ingliskeelset teksti. Standard on kinnitatud Eesti Standardikeskuse 15.01.2003 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas.	This Estonian standard EVS-EN 61965:2003 consists of the English text of the European standard EN 61965:2001. This standard is ratified with the order of Estonian Centre for Standardisation dated 15.01.2003 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation.		
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EUROPEAN STANDARD

EN 61965

NORME EUROPÉENNE

EUROPÄISCHE NORM

December 2001

ICS 31.100

English version

Mechanical safety of cathode ray tubes (IEC 61965:2000)

Sécurité mécanique des tubes cathodiques (CEI 61965:2000)

Mechanische Sicherheit von Kathodenstrahlröhren (IEC 61965:2000)

This European Standard was approved by CENELEC on 2001-12-04. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

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CENELEC

European Committee for Electrotechnical Standardization Comité Européen de Normalisation Electrotechnique Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

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Foreword

The text of document 39/252/FDIS, future edition 1 of IEC 61965, prepared by IEC TC 39, Electronic tubes, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61965 on 2001-12-04.

The following dates were fixed:

 latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement 	(dop)	2002-09-01
 latest date by which the national standards conflicting with the EN have to be withdrawn 	(dow)	2004-12-01

Annexes designated "normative" are part of the body of the standard. Annexes designated "informative" are given for information only. In this standard, annex ZA normative and annexes A and B are informative. Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 61965:2000 was approved by CENELEC as a European Standard without any modification.

л 965:200.

Annex ZA

(normative)

Normative references to international publications with their corresponding European publications

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

Publication	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60065 (mod)	1998	Audio, video and similar electronic apparatus - Safety requirements	EN 60065 + corr. June	1998 1999
IEC 60068-1 + corr. October + A1	1988 1988 1992	Environmental testing Part 1: General and guidance	EN 60068-1	1994
IEC 60216-1	_ 1)	Electrical insulating materials - Properties of thermal endurance Part 1: Ageing procedures and evaluation of test results	EN 60216-1	2001 ²⁾
1) Undated reference.				

¹⁾ Undated reference.

²⁾ Valid edition at time of issue.

INTERNATIONAL STANDARD

IEC 61965

First edition 2000-09

Mechanical safety of cathode ray tubes

Sécurité mécanique des tubes cathodiques



Reference number IEC 61965:2000(E)

Numbering

As from 1 January 1997 all IEC publications are issued with a designation in the 60000 series.

Consolidated publications

Consolidated versions of some IEC publications including amendments are available. For example, edition numbers 1.0, 1.1 and 1.2 refer, respectively, to the base publication, the base publication incorporating amendment 1 and the base publication incorporating amendments 1 and 2.

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Information relating to the date of the reconfirmation of the publication is available in the IEC catalogue.

Information on the subjects under consideration and work in progress undertaken by the technical committee which has prepared this publication, as well as the list of publications issued, is to be found at the following IEC sources:

- IEC web site*
- Catalogue of IEC publications Published yearly with regular updates (On-line catalogue)*
- IEC Bulletin Available both at the IEC web site* and as a printed periodical

Terminology, graphical and letter symbols

For general terminology, readers are referred to IEC 60050: International Electrotechnical Vocabulary (IEV).

For graphical symbols, and letter symbols and signs approved by the IEC for general use, readers are referred to publications IEC 60027: *Letter symbols to be used in electrical technology*, IEC 60417: *Graphical symbols for use on equipment. Index, survey and compilation of the single sheets* and IEC 60617: *Graphical symbols for diagrams.*

* See web site address on title page.

INTERNATIONAL

IEC 61965

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Mechanical safety of cathode ray tubes

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Commission Electrotechnique Internationale International Electrotechnical Commission Международная Электротехническая Комиссия



For price, see current catalogue

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

MECHANICAL SAFETY OF CATHODE RAY TUBES

FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of the IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested National Committees.
- 3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, technical reports or guides and they are accepted by the National Committees in that sense.
- 4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
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- 6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 61965 has been prepared by IEC technical committee 39: Electronic tubes.

The text of this standard is based on the following documents:

FDIS	Report on voting
39/252/FDIS	39/255/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 3.

Annexes A and B are for information only.

The committee has decided that the contents of this publication will remain unchanged until 2004. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition; or
- amended.

A bilingual version of this publication may be issued at a later date.

INTRODUCTION

This International Standard sets forth test methods and limits for cathode ray tubes (CRTs). Hitherto, the only IEC standard for the mechanical safety of CRTs has been contained within clause 18 of the equipment standard IEC 60065. Whereas that standard has been accepted and used by many countries, many others have not been able to implement its requirements because of differing local needs. This new standard aims to provide the basis for wider acceptance and use, and reflects the current IEC policy of producing separate component standards to which equipment standards can refer.

Many years of experience had been built up in the use of both the IEC 60065 test and the other commonly used national alternatives. During the development of this new standard, extensive test programmes and ballistic and statistical calculations were carried out to verify that the requirements of the standard give protection for users of CRTs when the tubes are mounted in the equipment for which they are intended. This was also done to ensure that the new standard maintains the stringent requirements of both IEC 60065 and the alternative tests in common use. These tests and calculations also confirmed

- a) the acceptability of one standard ball for the mechanical strength test, and
- b) the need for the implosion test where it is not always possible to induce rapid devacuation using the ball impact test.

As the impact tests in this standard are overstress tests, only the effect of rapid devacuation is evaluated and not subsequent relaxation of mechanical stresses in the CRT from the implosion protection system.

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MECHANICAL SAFETY OF CATHODE RAY TUBES



1 Scope

This International Standard is applicable to cathode ray tubes and cathode ray tube assemblies (hereinafter referred to as CRTs) which are intended for use as components in apparatus and which have integral protection with respect to the effects of implosion.

These requirements apply to CRTs intended for use in apparatus including electrical and electronic measuring and testing equipment, information technology equipment, medical equipment, telephone equipment, television equipment and other similar electronic apparatus.

This standard is intended to apply only to those CRTs in which the face of the CRT forms part of the enclosure for the apparatus. The test methods do not apply to CRTs which are protected by separate safety screens.

A CRT covered by this standard is intended to be installed in an enclosure designed both to protect the rear of the CRT against mechanical or other damage under normal conditions of operation and to protect the user against particles expelled in a backwards direction from the CRT face in the event of implosion.

This standard contains requirements for CRTs of 76 mm diagonal and larger that incorporate implosion protection systems providing protection against the hazards of particles expelled forwards beyond the face. There is no intended protection against particles expelled in other directions.

Compliance is tested by subjecting CRTs to the test procedures and criteria which are given in clauses 8 (large CRTs) and 9 (small CRTs) of this standard. The definitions of large and small CRTs are given in clause 3.

NOTE This set of requirements replaces the current requirements for the mechanical safety of cathode ray tubes (CRTs) as described in IEC 60065 (clause 18), which will be modified accordingly.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 60065:1998, Audio, video and similar electronic apparatus – Safety requirements

IEC 60068-1:1988, *Environmental testing – Part 1: General and guidance* Amendment 1 (1992)

IEC 60216-1, Guide for the determination of thermal endurance properties of electrical insulating materials. Part 1: General guidelines for ageing procedures and evaluation of test results