



SLOVENSKI STANDARD
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Generic specification: Cathode ray tubes

Generic Specification: Cathode ray tubes

Fachgrundspezifikation: Kathodenstrahlröhren

Spécification générique: Tubes à rayons cathodiques

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Ta slovenski standard je istoveten z: EN 111000:1991

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ICS:

| | | |
|--------|----------------------------------|----------------------------|
| 31.120 | Elektronske prikazovalne naprave | Electronic display devices |
|--------|----------------------------------|----------------------------|

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 111000

December 1991

Descriptors: Quality, electronic components, tubes

English version

Generic Specification: Cathode ray tubes

Spécification Générique:
Tubes à rayons cathodiques

Fachgrundspezifikation:
Kathodenstrahlröhren

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This European Standard was approved by CENELEC Electronic Components Committee (CECC) on 20 November 1991. The text of this standard consists of the text of CECC 11000 Issue 1 1980 (with A1 and addendum) of the corresponding CECC Specification. CENELEC members are bound to comply with CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the General Secretariat of the CECC or to any CENELEC member.

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 CECC General Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom. The membership of the CECC is identical, with the exception of the national electrotechnical committees of Greece, Iceland and Luxembourg.

CECC

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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European Committee for Electrotechnical Standardization (CENELEC)
Cenelec Electronic Components Committee



English version

Harmonized System of Quality Assessment for
Electronic Components

GENERIC SPECIFICATION:
CATHODE RAY TUBES



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Système Harmonisé d'Assurance de la Qualité
des Composants Electroniques

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SPECIFICATION GÉNÉRIQUE:

TUBES A RAYONS
CATHODIQUES

1
Issue
Edition
Ausgabe

CECC 11000

1980

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Foreword

The CENELEC Electronic Components Committee (CECC) is composed of those member countries of the European Committee for Electrotechnical Standardization (CENELEC) who wish to take part in a harmonized System for electronic components of assessed quality.

The object of the System is to facilitate international trade by the harmonization of the specifications and quality of assessment procedures for the electronic components, and by the grant of an internationally recognized Mark, or Certificate, of Conformity. The components produced under the System are thereby accepted by all member countries without further testing.

This specification has been formally approved by the CECC, and has been prepared for those countries taking part in the System who wish to issue national harmonized specifications for CATHODE RAY TUBES. It should be read in conjunction with the current regulations for the CECC System.

At the date of printing of this specification, the member countries of the CECC are Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Preface

This specification was prepared by CECC WG 11: "ELECTRO-OPTICAL DEVICES".

It is based, wherever possible, on the Publications of the International Electrotechnical Commission and in particular on IEC 151-14 "Methods of measurement of radar and oscilloscope cathode ray tubes".

The text of this specification was circulated to the CECC for voting in document(s) indicated below and was ratified by the President of the CECC for printing as a CECC Specification.

| <u>Document</u> | <u>SIST EN 111000:2002</u> | <u>Date of Voting</u> | <u>Report on the Voting</u> |
|------------------------|----------------------------|-----------------------|-----------------------------|
| CECC (Secretariat) 303 | | November 1975 | CECC (Secretariat) 459 |

This specification will be supplemented by blank detail specifications applicable to each sub-family of cathode ray tubes.

The CECC Management Committee at its meeting in Copenhagen March 1979 decided that as the German National Authorized Institution would not be implementing the requirements of this CECC generic specification, the text should be published in the English and French versions only.

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Section 1. Scope

This document applies to cathode ray tubes of assessed quality.

Section 2. General

2.1 Order of precedence

Where any discrepancies occur for any reason, documents shall rank in the following order of precedence:

- 1) the detail specification
- 2) the generic specification
- 3) document CECC 00100 or any other international (eg IEC) documents to which reference is made.

The same order of precedence shall apply to equivalent national documents.

2.2 Related documents

| | | | |
|------|--------|------|---|
| ISO | 1000 | 1973 | SI units and recommendations for the use of their multiples and of certain other units. |
| IEC | 27 | — | Letter symbols to be used in electrical technology. |
| IEC | 27-1 | 1971 | Part 1 General. |
| IEC | 50 | — | International Electrotechnical Vocabulary. |
| IEC | 67 | 1966 | Dimensions of electronic tubes and valves. |
| IEC | 68 | — | Basic environmental testing procedures (see CECC 00006). |
| IEC | 100 | 1962 | Methods for the measurement of indirect interelectrode capacitances of electronic tubes and valves. |
| IEC | 117 | — | Recommended graphical symbols. |
| IEC | 134 | 1961 | Rating systems for electronic tubes and valves and analogous semiconductor devices. |
| IEC | 139 | 1962 | Preparation of outline drawings of oscilloscope and picture tubes. |
| IEC | 151 | — | Measurements of the electrical properties of electronic tubes. |
| IEC | 151-1 | 1963 | Measurement of electrode current. |
| IEC | 151-2 | 1963 | Measurement of heater or filament current. |
| IEC | 151-8 | 1966 | Measurement of cathode heating time and heater warm-up time. |
| IEC | 151-13 | 1966 | Methods of measurement of emission current from hot cathodes for high vacuum electronic tubes and valves. |
| IEC | 151-14 | 1975 | Methods of measurement of radar and oscilloscope cathode ray tubes. |
| IEC | 151-15 | 1967 | Methods of measurement of spurious and unwanted electrode currents. |
| IEC | 151-16 | 1968 | Methods of measurement for television picture tubes. |
| IEC | 236 | 1974 | Methods for the designation of electrostatic deflecting electrodes of cathode ray tubes. |
| IEC | 410 | 1973 | Sampling plans and procedures for inspection by attributes (see CECC 00007) |
| CECC | 00100 | 1974 | Basic Rules. |
| CECC | 00006 | 1973 | Basic specification: Environmental test procedures. |
| CECC | 00007 | 1973 | Sampling plans and procedures for inspection by attributes. |

2.3 Units, symbols and terminology

Units, graphical symbols, letter symbols and terminology shall, wherever possible, be taken from the following documents:

| | | |
|----------|------|--|
| ISO 1000 | 1973 | <i>SI units and recommendations for the use of their multiples and of certain other units.</i> |
| IEC 27 | — | <i>Letter symbols to be used in electrical technology.</i> |
| IEC 50 | — | <i>International Electrotechnical Vocabulary.</i> |
| IEC 117 | — | <i>Recommended graphical symbols.</i> |

Any other units, symbols, and terminology peculiar to one of the components covered by this generic specification, shall be taken from other relevant IEC or ISO documents (to be listed under "Related documents").

2.3.1 Terminology

The following clauses contain additional terminology applicable to cathode ray tubes, and shall be included in each national harmonized specification system:

1) Colour

The colour of the display shall be defined in accordance with the Kelly chart shown in Figure 1:

2) Persistence of display:

Time to decay to 10 % of initial peak value

Less than 1 μ s

1 μ s to 10 μ s

10 μ s to 1 000 μ s

1 ms to 100 ms

100 ms to 1 s

More than 1 s

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Description

Very short

Short

Medium short

Medium

Long

Very long

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3) Average peak line luminance:

The time-averaged luminance measured at the position of maximum luminous intensity of the line.

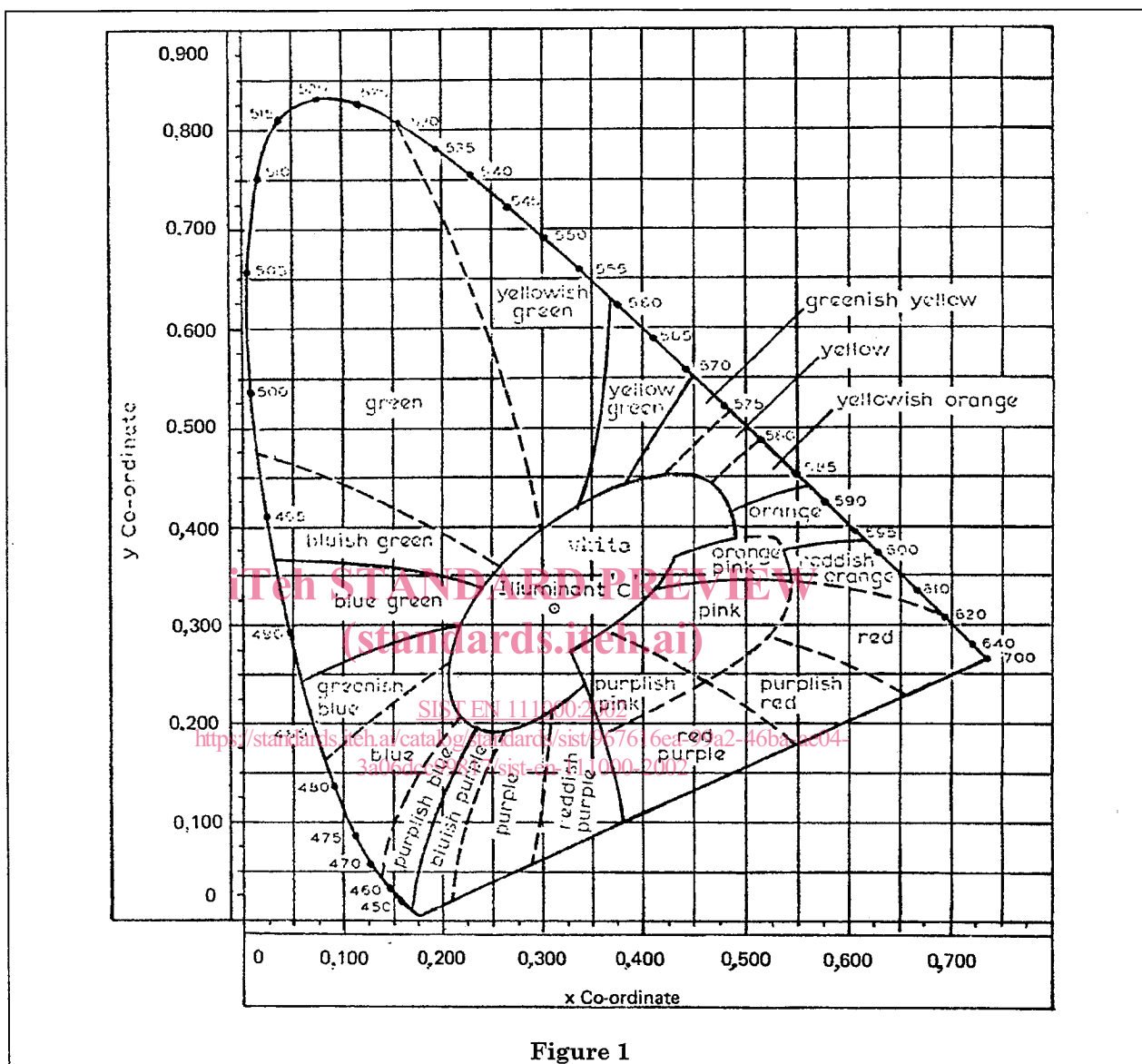


Figure 1

2.4 Marking

The detail specification shall specify the identification criteria and other information to be shown on the component and/or on the packing. Any identification code used shall be described in full or reference shall be made to the appropriate documents.

Use of potentially hazardous materials in the construction of the tube shall be specified in accordance with the national safety requirements.

Section 3. Quality assessment procedures

3.1 Primary stage of manufacture

The primary stages of manufacture are the process of deposition of the material of the viewing screen, the assembly of the electron gun structure, and the activation of the cathode.

These processes shall be under the control of the approved manufacturer but need not be carried out at the same location.

The sub-contracting of these processes is prohibited (see 7.2.2 of CECC 00107).

3.2 Structurally similar components

When simultaneous or successive production is proceeding on several approved types of tubes having common features, those common features may be sampled from the range of approved types instead of from each lot of each type.

Admissible common features and associated tests include the following as examples:

3.2.1 Envelope and terminations

- Dimensions
- Robustness of terminations
- Solderability
- Damp heat testing.

3.2.2 Electrode structure including mounting and location

- Vibration
- Shock
- Deflection sensitivity.

3.2.3 Screen phosphor

- Persistence
- Luminance.

The tests to be selected for a particular type shall be prescribed in the detail specification.

3.3 Qualification approval procedures

The manufacturer shall:

- meet the general requirements of CECC 00100 governing qualification approval
- meet the requirements for the primary stage of manufacture contained in 3.1 of this document
- produce test evidence of conformance to the specification requirements on three consecutive lots for lot-by-lot inspection and on one lot for periodic inspection.

Samples shall be taken from the lots in accordance with CECC 00007. Normal inspection shall be used, but where the sample size is that which would give acceptance on zero defectives, additional specimens shall be taken to meet the sample size to give acceptance on one defective.

3.4 Supplementary procedure for qualification approval

The following table shall supersede the normal sample size requirements for production lot size below 280 specimens. The samples may be drawn from one production lot.

A second sample, as shown in the table, shall be taken when the quantity of defectives exceeds the acceptance quality but is less than the reject quantity.

Table 1

| Group | Lot Size | Sample Size | Accept | Reject | 2nd. Sample | Total Sample | Accept | Reject |
|-------|-----------|---------------------|--------|--------|-------------|--------------|--------|--------|
| A | 1 – 7 | 100 % (see note) | 0 | 1 | | | | |
| | 8 – 280 | 5 | 0 | 2 | 3 | 8 | 1 | 2 |
| B | 1 – 7 | 100 % (see note) | 0 | 1 | | | | |
| | 8 – 820 | 5 | 0 | 2 | 3 | 8 | 1 | 2 |
| C | 1 – 4 | 100 % (see note) | 0 | 1 | | | | |
| | 5 – 280 | 3 | 0 | 2 | 2 | 5 | 1 | 2 |
| D | Up to 280 | 2 | 0 | 1 | | | | |

NOTE Qualification approval depends on a total of at least two tubes being tested.

3.5 Quality conformance inspection (See § 8 of CECC 00107)

The blank detail specification shall prescribe the minimum test schedule which shall be included in each detail specification.

This schedule shall also specify the division into subgroups for the purpose of lot-by-lot and periodic inspection.

A blank detail specification may prescribe more than one schedule which can be applied to differing assessment levels.

3.6 Sampling requirements for small lots or for more expensive devices

Where the lot size indicates that for the specified AQL and inspection level, a sampling plan with an acceptance number of zero shall be used, the Chief Inspector, at his discretion and with the approval of the National Supervising Inspectorate (ONS), may use any one of the following alternative procedures:

3.6.1 100 % inspection.

3.6.2 The plan having a larger sample with acceptance number of 1 for the specified AQL.

3.6.3 The plan indicated for the given lot size and inspection level but the next higher AQL if this leads to a plan with an acceptance number of 1.

3.6.4 The plan with acceptance number of 0. However, if a single defective is obtained, one of the following procedures shall be applied:

- 1) A second sample shall be inspected, of such a size as to bring the combined first and second samples to that given by **3.6.2** above (ie the sample for a plan to accept on 1 for the same AQL). The lot is acceptable if no further defectives are obtained in the second sample.
 - 2) If the preceding four consecutive lots were acceptable under original inspection, such a lot shall be held until the next lot has been inspected. If the sample from this next lot is acceptable, both lots shall be accepted. If the sample from this lot is not acceptable, both lots shall be rejected.
- If both lots are accepted under 2) and in a subsequent lot a single defective occurs (when accepting on zero defects) before a clear run of four lots has been accepted, then this lot shall be rejected immediately (without holding for the next lot).

EXAMPLE:

The system in **3.6.4** is best illustrated by an example:

A batch of four hundred devices is to be sample tested at AQL = 1.0 % and inspection level S4. Looking at the sampling chart, the 281 to 500 column is used for a batch of 400. S4 and the batch of 400 gives a sample size of 13. This sample of 13 and an AQL of 1 % indicate an acceptance criterion of no failures, all 400 are acceptable.