

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

CECC



Système Harmonisé d' Assurance de la Qualité
des Composants Electroniques

**FEUILLE PARTICULIERE CADRE :
TUBES D'EMISSION
DE PETITE PUISSANCE
JUSQU'A 1 KW
DE DISSIPATION D'ANODE**

Harmonized System of Quality Assessment for
Electronic Components

**BLANK DETAIL SPECIFICATION :
SMALL POWER TRANSMITTING TUBES
OF ANODE DISSIPATION UP TO 1 KW**

Harmonisiertes Gütebestätigungssystem für
Baelemente der Elektronik

**VORDRUCK FÜR
BAUARTSPEZIFIKATION :
KLEINSENDERÖHREN MIT EINER
ANODENVERLUSTLEISTUNG BIS 1 KW**

CECC 45003

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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 specifications and quality assessment procedures for 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 document has been formally approved by the CECC, and has been prepared for those member countries taking part in the System who wish to prepare and issue detail specifications for SMALL POWER TRANSMITTING TUBES OF ANODE DISSIPATION UP TO 1 KW. It should be read in conjunction with document CECC 00 100 : Basic Rules (1974).

At the date of printing of this document the member countries of the CECC are Belgium, Denmark, Germany, France, Ireland, Italy, Netherlands, Norway, Sweden, Switzerland and the United Kingdom, and copies of it can be obtained from the National Committees of the CENELEC in these countries.

PREFACE

This blank detail specification was prepared by CECC Working Group 14 : "SPACE-CHARGE CONTROLLED TUBES".

It is one of a series of blank detail specifications for space-charge controlled tubes, all relating to the generic specification printed as CECC 45 000.

The text of this specification was circulated to the CECC for voting in document CECC(Secretariat)276 in June 1974 and was formally approved by the CECC for printing as a CECC Specification on 12 February 1975.

GENERAL

1. The basic data detailed in clauses 2 to 5 shall appear in the harmonized detail specification. Appendix A shows the basic layout of the front page of such a specification.
2. Identification of the harmonized detail specification
 - 2.1 Name of the National Standards Organization under whose authority the detail specification is drafted.
 - 2.2 The CECC number of the relevant CECC blank detail specification.
 - 2.3 The number and issue number of the national generic specification.
 - 2.4 The national number of the detail specification, date of issue and other information required by the national system.
3. Identification of the small power transmitting tube
 - 3.1 Brief description of the tube, type of cathode, type of heating and method of cooling and tube function.
 - 3.2 Type designation.
 - 3.3 Outline drawing giving principal dimensions.
4. Supplementary information

Detail specifications shall include supplementary information, such as:

 - 4.1 Marking.
 - 4.2 Ordering information.
 - 4.3 Related documents referred to in the detail specification.
 - 4.4 Requirements for certified test records (where certified test records are considered inappropriate, this shall be clearly indicated by the statement "not applicable").
 - 4.5 Structural similarity.
5. Data (not for inspection purposes)
 - 5.1 General and mechanical data.
 - dimensioned engineering drawing, if possible in accordance with IEC 67.
 - mass (weight).
 - mounting position and accessories.
 - cooling requirements.
 - maximum temperatures of the envelope, the seals and the terminations.

- maximum values for shock and vibration (if application requires).
- maximum altitude of operation without pressurizing or minimum air pressure (if application requires)

5.2 Electrical data - Nominal values

- capacitances.
- amplification factor.
- mutual conductance at stated anode current.
(e.g. at $\frac{\text{instantaneous peak anode current}}{2}$ or at $\frac{\text{anode max. current}}{2}$)
- characteristic curves.
 - 1) Anode current, screen grid current and control grid current as a function of anode voltage for stated values of control grid and screen grid voltages.
 - 2) Constant current diagram (control grid voltage as a function of anode voltage for stated values of screen grid voltage and anode current or screen grid current or control grid current).
 - 3) Power dissipation as a function of flow for various coolant inlet conditions (when relevant).
- operating conditions
 - 1) Below recommended highest operating frequency.
 - 2) At recommended highest operating frequency.
 - 3) Reduction of filament or heater voltage for operation at high frequencies (when relevant).

5.3 Electrical data - Limiting values

- limiting values. Absolute maximum rating system in accordance with IEC 134.
 - 1) Minimum warm-up time.
 - 2) Maximum filament or heater surge current.
 - 3) Limiting value of the filament or heater current for nominal value of filament or heater voltage.
 - 4) Maximum control grid current with stated value of grid resistors.
 - 5) Maximum control grid external resistance.
 - 6) Maximum heater to cathode peak voltage (at stated polarities) (if application requires).
- limiting values at stated frequencies. Absolute maximum rating system in accordance with IEC 134.
 - 1) Operating tolerances of filament or heater voltage or current.
 - 2) Maximum anode voltage d.c.
 - 3) Maximum screen grid voltage d.c.

- 4) Maximum negative control grid voltage d.c.
- 5) Maximum mean anode current.
- 6) Maximum mean cathode current.
- 7) Maximum peak cathode current.
- 8) Maximum mean screen grid current.
- 9) Maximum anode power dissipation.
- 10) Maximum total control grid power dissipation
(the actual grid dissipation can be much higher than the apparent value given by positive peak grid voltage x mean grid current).
- 11) Maximum mean control grid current.

6. Test schedule and performance requirements

The harmonized detail specification shall contain the following groups of tests indicated in the layout below:

GROUP A INSPECTION (Lot-by-lot)					
Examination or Test	D ND	Conditions of Test (Refer to CECC 45 000)	I L	A Q L	Performance Requirements (Refer to CECC 45 000)
<u>Sub-Group A0</u>					
- Visual examination	ND	as in 4.3	100%		
<u>Sub-Group A1</u>					
- Filament or heater current or voltage	ND	as in 4.5.1	II	1%	min/ max
- Anode current at stated anode voltage, control grid voltage and screen grid voltage	ND	as in 4.5.4	II	1%	min/ max
- Negative control grid current at stated anode voltage, control grid voltage (or anode current) and screen voltage	ND	as in 4.5.2	II	1%	max
- Screen grid current	ND	as in 4.5.5	II	1%	min/ max
<u>Sub-Group A2</u>					
- Pulse emission.	ND	as in 4.5.7	II	2,5%	min
- R.F. power output at stated conditions.	ND	as in 4.5.15	II	2,5%	min

continued on next page

GROUP A INSPECTION (Lot-by-lot)

(continued)

Examination or Test	D ND	Conditions of Test (Refer to CECC 45 000)	I L	A Q L	Performance Requirements (Refer to CECC 45 000)
<u>Sub-Group A3</u>					
- Dimensions for interchangeability	ND	as in 4.4	I	2,5%	as in 4.4
- Insulation of electrodes (leakage current)	ND	as in 4.5.13	I	4%	max

GROUP C INSPECTION (Periodic)

Examination or Test	D ND	Conditions of Test (Refer to CECC 45 000)	I L	A Q L	Performance Requirements (Refer to CECC 45 000)
Group C1 (one month intervals)					
- Control grid emission	ND	as in 4.5.8	S-3	6,5%	max
- Screen grid emission	ND	as in 4.5.9	S-3	6,5%	max
Group C2 (six months intervals)					
- Detailed dimensions for control purposes	ND	as in 4.4	S-3	6,5%	as in 4.4
- Capacitances	ND	as in 4.5.14	S-3	6,5%	min/ max

GROUP D INSPECTION (For qualification approval, to be specified in the national detail specification)

Examination or Test		Conditions of Test (Refer to CECC 45 000)	Sample size and criterion of acceptance	Performance Requirements (Refer to CECC 45 000)
Robustness of terminations (when application requires)	D	as in 4.6.1		
Shock (when application requires)	D	as in 4.6.2		
Bump (when application requires)	D	as in 4.6.3		
Vibration (when application requires)	D	as in 4.6.4		
Climatic test-damp heat (when application requires)	D	as in 4.6.5		
Endurance	D	as in 4.7		

Notes:

- For the definition of Inspection Groups, see document CECC 00 111.
- D: Destructive test
- ND: Non destructive test

7. Delayed delivery

Each tube held for a period exceeding twelve months following quality conformance inspection shall be re-examined before delivery by the following tests:

- negative control grid current
- pulse emission.

Layout for the harmonized detail specification

(1)	page of pages	(2)	
(3) Electronic component of assessed quality in accordance with	(7)		
(4)			
(5) Detail specification for			
(6)			

Note

References for the above numbers are as follows:

- (1) see 2.1
- (2) see 2.2
- (3) see 2.3
- (4) see 2.4
- (5) see 3.1
- (6) see 3.2
- (7) see 3.3