
British Standard

**Harmonized system of quality
assessment for electronic components
Sectional specification: Fixed capacitors for
direct current with electrodes of thin metal
foils and a polycarbonate film dielectric**

Système harmonisé d'assurance de la qualité des composants électroniques
Spécification intermédiaire: Condensateurs fixes pour courant continu à diélectrique
en film de polycarbonate à armatures en feuilles métalliques

Harmonisiertes Gütebestätigungssystem für Bauelemente der Elektronik
Rahmenspezifikation: Gleichspannungs — Festkondensatoren mit einem Dielektrikum
aus Polycarbonat-Folien und Belägen aus dünnen Metallfolien (KC)

National foreword

This British Standard has been prepared under the direction of the Electronic Components Standards Committee. It is identical with CENELEC Electronic Components Committee (CECC) 31700 : 1985 'Harmonized system of quality assessment for electronic components : Sectional specification : Fixed capacitors for direct current with electrodes of thin metal foils and a polycarbonate film dielectric'.

This standard is a harmonized specification within the CECC system.

Terminology and conventions. The text of the CECC specification has been approved as suitable for publication as a British Standard without deviation. Some terminology and certain conventions are not identical with those used in British Standards; attention is drawn especially to the following.

The comma has been used throughout as a decimal marker. In British Standards it is current practice to use a full point on the baseline as the decimal marker.

Cross-references. The British Standard which implements CECC 00100 is BS 9000 'General requirements for a system for electronic components of assessed quality' Part 2 : 1983 'Specification for national implementation of CECC basic rules and rules of procedure'.

International standards	Corresponding British Standards
CECC 30000 : 1983	BS CECC 30000 : 1984 Harmonized system of quality assessment for electronic components. Generic specification: fixed capacitors (Identical)
ISO 3-1973	BS 2045 : 1965 Preferred numbers (Technically equivalent)
IEC 62 : 1974	BS 1852 : 1975 Marking codes for resistors and capacitors (Identical)
IEC 63 : 1963	BS 2488 : 1966 Schedule of preferred numbers for the resistance of resistors and the capacitance of capacitors for telecommunication equipment (Technically equivalent)
IEC 68-1 : 1982	BS 2011 Basic environmental testing procedures Part 1.1 : 1983 General and guidance (Identical)
IEC 384-14 : 1981	BS 6201 Fixed capacitors for use in electronic equipment Part 3 : 1982 Specification for fixed capacitors for radio interference suppression. Selection of methods of test and general requirements. (Identical)
IEC 410 : 1973	BS 6001 : 1972 Sampling procedures and tables for inspection by attributes (Technically equivalent)

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Amendment No. 1
published and effective from 15 March 1993
to BS CECC 31700 : 1986

**Harmonized system of quality assessment for electronic
components**

**Sectional specification: Fixed capacitors for direct
current with electrodes of thin metal foils and a
polycarbonate film dielectric**

NOTE. This amendment implements Amendments 1, published in 1988, 2, published in 1989, 5, published in 1992, and 6, published in 1991, to CECC 31700 (Issue 1). Amendments 3 and 4 to CECC 31700 (Issue 1) have not yet been published.

Revised text

AMD 7405
March 1993

National foreword

In paragraph 1, line 4, after 'dielectric' , insert ', including Amendments 1 (1988), 2 (1989), 5 (1992) and 6 (1991)'.

Instructions for the insertion of new and revised text

AMD 7405
March 1993

Pages 2 and 3. Delete these pages and substitute the revised pages 2 and 3 attached.

NOTE. In 1.1, capacitors for radio interference suppression have been excluded.

Pages 4 and 5. Delete these pages and substitute the revised pages 4 and 5 attached.

NOTE. 1.3.2 has been amended.

Page 14. Delete this page and substitute the revised page 14 attached.

NOTE. In table 3, for group C1b, a periodicity of 12 months has been introduced for the tests
Fc: Vibration and Ea: Shock.

Page 26. Delete this page and substitute the revised page 26 attached.

NOTE. In group 4, subclause 4.2.5, '(if required)' has been added.

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 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 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 FIXED CAPACITORS FOR DIRECT CURRENT WITH ELECTRODES OF THIN METAL FOILS AND A POLYCARBONATE FILM DIELECTRIC. 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. Copies of it can be obtained from the addresses shown on the blue fly-sheet.

PREFACE

This sectional specification was prepared by CECC Working Group 3: "Capacitors".

It is based, wherever possible, on the Publications of the International Electrotechnical Commission and in particular on IEC 384-12: Part 12: Sectional specification: Fixed polycarbonate film dielectric metal foil capacitors for direct current.

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

<u>Document</u>	<u>Voting Date</u>	<u>Report on the Voting</u>
CECC(Secretariat)1385	June 1983	CECC(Secretariat)1525

SECTION 1 - GENERAL

1.1 Scope

This specification applies to fixed capacitors for direct current with electrodes of thin metal foils and a polycarbonate film dielectric.

It prescribes preferred ratings and characteristics and selects from the specification CECC 30 000 the appropriate quality assessment procedures, tests and measuring methods and gives general performance requirements for this type of capacitor.

Capacitors for direct connection to the supply mains to provide radio interference suppression are not included.

1.2 Related documents

ISO 3	(1973)	Preferred numbers - Series of preferred numbers
IEC 62	(1974)	Marking codes for resistors and capacitors
IEC 63	(1963)	Preferred number series for resistors and capacitors
Amendment No. 1	(1967)	
Amendment No. 2	(1977)	
IEC 68		Basic environmental testing procedures
CECC 30 000 Issue 3	(1983)	Generic specification: Fixed capacitors
IEC 410	(1973)	Sampling plans and procedures for inspection by attributes

Note: The above references apply to the current editions except for IEC 68.

1.3 Information to be given in a detail specification

The detail specification shall be derived from the relevant blank detail specification.

Detail specification shall not specify requirements inferior to those of the generic, sectional or blank detail specification. When more severe requirements are included, they shall be listed in 1.9 of the detail specification and indicated in the test schedules for example by an asterisk

Note: The information given in 1.3.1 may for convenience, be presented in tabular form.

The following information shall be given in each detail specification and the values quoted shall preferably be selected from those given in the appropriate clause of this sectional specification.

1.3.1 Outline drawing and dimensions

There shall be an illustration of the capacitor as an aid to easy recognition and for comparison of the capacitor with others. Dimensions and their associated tolerances, which affect interchangeability and mounting, shall be given in the detail specification. All dimensions shall preferably be stated in mm.

Normally the numerical values shall be given for the length, the width and height of the body and the wire spacing or for cylindrical types the body diameter, and the length and diameter of the terminations. When necessary, for example when a number of case sizes is covered by a detail specification, the dimensions and their associated tolerances shall be placed in a table below the drawing.

When the configuration is other than described above, the detail specification shall state such dimensional information as will adequately describe the capacitor. When the capacitor is not designed for use on printed boards, this shall be clearly stated in the detail specification.

1.3.2 Mounting

The detail specification shall specify the method of mounting to be applied for the application of the vibration and the bump or shock tests. The design of the capacitor may be such that special mounting fixtures are required in its use. In this case the detail specification shall describe the mounting fixtures and they shall be used in the application of the vibration and bump or shock tests.

Note: If recommendations for mounting for "normal" use are made, they shall be included in the detail specification under "1.8 Additional information (Not for inspection purposes)". If they are included a warning can be given that the full vibration, bump and shock performance may not be available if mounting methods other than those specified in sub-clause 1.1 of the detail specification are used.

1.3.3 Ratings and characteristics

The ratings and characteristics shall be in accordance with the relevant clauses of this specification, together with the following:

(1) Rated capacitance range

See 2.2.1.

Note: When products approved to the detail specification may have different ranges, the following statement should be added:
"The range of values available in each voltage range is given in the Qualified Products List".

(2) Particular characteristics

Additional characteristics may be listed, when they are considered necessary to specify adequately the component for design and application purposes.

1.3.4 Marking

The detail specification shall specify the content of the marking on the capacitor and on the package. Deviations from 1.5 of this sectional specification, shall be specifically stated.

1.4 Terminology

In addition to the applicable terms and definitions of CECC 30 000 the following definitions apply:

1.4.1 Rated voltage

The rated voltage is the maximum d.c. voltage which may be applied continuously to a capacitor at the rated temperature.

Note: The sum of the d.c. voltage and the peak a.c. voltage applied to the capacitor shall not exceed the rated voltage. The value of the peak a.c. voltage shall not exceed the following percentages of the rated voltage at the frequencies stated and shall be not greater than 280 V:

50 Hz	: 20 %
100 Hz	: 15 %
1 000 Hz	: 3 %
10 000 Hz	: 1 %

unless otherwise specified in the detail specification.

1.5 Marking

1.5.1 The information given in the marking is normally selected from the following list; the relative importance of each item is indicated by its position in the list:

- 1) Rated capacitance
- 2) Rated voltage; (d.c. voltage may be indicated by the symbol ----- or -----.)
- 3) Tolerance on rated capacitance
- 4) Category voltage
- 5) Year and month (or week) of manufacture
- 6) Manufacturer's name or trade mark
- 7) Climatic category
- 8) Manufacturer's type designation
- 9) Reference to the detail specification.

Table 3

Periodic Tests

(Other assessment levels may be included later)

Group	Periodicity (months)	Test	Sub- clause No.	Total sample size	Permitted defectives
C1a	6	<u>Part of sample</u> U : Robustness of terminations Tb: Resistance to soldering heat	4.3 4.4	9	1
C1b		<u>Other part of sample</u> Na: Rapid change of temperature ~~Pc: Vibration~~ Ea: Shock	4.6 ~~4.7~~ 4.8	18	1
C1	6	<u>Whole sample</u> Climatic sequence	4.9	27	2
C2	6	Damp heat, steady state	4.10	15	1
C3	3	Endurance	4.11	21	1
C4	12	Variation of capacitance with temperature (1)	4.2.5	9	1

(1) If required in the detail specification.

SECTION 4 - TESTS AND MEASURING METHODS

This section supplements the information given in CECC 30 000, Section 4.

4.1 Visual examination and check of dimensions

See 4.4 of CECC 30 000.

4.2 Electrical tests

4.2.1 Voltage proof

See 4.6 of CECC 30 000 with the following details:

(1) Test circuit

The product of R_1 and $C_1 + C_2$ shall be smaller than or equal to 1 s and greater than 0,01 s.

R_1 includes the internal resistance of the voltage source.
 R_2 shall limit the discharge current to a value equal or less than 1 A.

- (2) The following voltages shall be applied between the measuring points of Table I in 4.5.2 of CECC 30 000 for a period of 1 min for qualification approval testing and for a period of 1 s for the lot-by-lot quality conformance testing.

Test point	Test voltage
1a)	$2 U_R$
1b), 1c) and 1d)	$2 U_R$ with a minimum of 200 V

4.2.2 Capacitance

See 4.7 of CECC 30 000 with the following details:

- (1) The capacitance shall be measured at, or corrected to, a frequency of 1 000 Hz. For rated capacitance values $> 10 \mu\text{F}$, 50 Hz to 120 Hz may be used.

The applied peak voltage at 1 000 Hz shall not exceed 3 % of the rated voltage, and the applied peak voltage at 50 Hz to 120 Hz shall not exceed 20 % of the rated voltage with a maximum of 100 V (70 V r.m.s.).

- (2) The capacitance shall be within the specified tolerance.

Clause number and test (See Note 1)	D or ND	Conditions of test (See Note 1)	Performance requirements (See Note 1)
<u>GROUP 2</u>	D		
4.10 Damp heat, steady state			
4.10.1 Initial measurements		Capacitance Tangent of loss angle	
4.10.2 Voltage proof		As in 4.2.1 with U_R	
4.10.3 Final measurements		Visual examination Capacitance Tangent of loss angle Insulation resistance	No visible damage Legible marking $\left \frac{\Delta C}{C} \right \leq 3 \% \text{ of value measured in 4.10.1}$ $\tan \delta:$ $\leq 0,002 \text{ or } 1,2 \text{ times values measured in 4.10.1, whichever is greater}$ $\geq 50 \% \text{ of values in 4.2.4 (2)}$
<u>GROUP 3</u>	D		
4.11 Endurance		Duration: 1000 h	
4.11.1 Initial measurements		Capacitance Tangent of loss angle	
4.11.5 Final measurements		Visual examination Capacitance Tangent of loss angle Insulation resistance	No visible damage Legible marking $\left \frac{\Delta C}{C} \right \leq 3 \% \text{ compared to values measured in 4.11.1}$ $\tan \delta:$ $\leq 0,002 \text{ or } 1,2 \text{ times values measured in 4.11.1, whichever is greater}$ $\geq 50 \% \text{ of values in 4.2.4 (2)}$
<u>GROUP 4</u>	ND		
4.2.5 Variation of capacitance with temperature (If required)			as in 4.2.5

English version

Harmonized System of Quality Assessment for
Electronic Components

SECTIONAL SPECIFICATION:

**FIXED CAPACITORS
FOR DIRECT CURRENT
WITH ELECTRODES
OF THIN METAL FOILS
AND A POLYCARBONATE FILM
DIELECTRIC**

Système Harmonisé d'Assurance de la Qualité
des Composants Electroniques

SPECIFICATION INTERMEDIAIRE:

**CONDENSATEURS FIXES
POUR COURANT CONTINU
A DIELECTRIQUE EN FILM
DE POLYCARBONATE
A ARMATURES EN FEUILLES
METALLIQUES**

Harmonisiertes Gütebestätigungssystem für
Bauelemente der Elektronik

RAHMENSPEZIFIKATION:

**GLEICHSPANNUNGS-
FESTKONDENSATOREN
MIT EINEM DIELEKTRIKUM
AUS POLYCARBONATFOLIEN
UND BELÄGEN AUS DÜNNEN
METALLFOLIEN (KC)**



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Issue
Edition
Ausgabe

CECC 31700



Documents

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