

Förderverein für Elektrotechnische Normung (FEN) e. V.
Cenelec Electronic Components Committee

CECC

Système Harmonisé d'Assurance de la Qualité
des Composants Electroniques

SPECIFICATION PARTICULIERE CADRE:

CONDENSATEURS FIXES A
DIELECTRIQUE EN CERAMIQUE,
CLASSE 2

Harmonized System of Quality Assessment for
Electronic Components

BLANK DETAIL SPECIFICATION:

FIXED CAPACITORS OF
CERAMIC DIELECTRIC,
CLASS 2

Harmonisiertes Gütebestätigungssystem für
Bauelemente der Elektronik

VORDRUCK FÜR
BAUARTSPEZIFIKATION:

FESTKONDENSATOREN MIT
KERAMISCHEM DIELEKTRIKUM,
KLASSE 2



1

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Documents

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or from the National Authorized Institutions
of the participating countries listed
who can supply copies of:

- 1 The Internal Regulations of the FEN e.V.
- 2 CECC Specifications of the FEN and National Specifications for the System
- 3 CECC 00 200: Qualified Products List (QPL)
- 4 CECC 00 300: CECC Publications and their related national documents

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 blank detail 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 OF CERAMIC DIELECTRIC, CLASS 2. 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 blank detail specification was prepared by CECC Working Group 3: "Capacitors".

The text of this blank detail specification was circulated to the CECC for voting in the document indicated 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)2098	January 1988	CECC(Secretariat)2205

KEY FOR PAGE 3

The numbers between square brackets on page 3 correspond to the following indications which should be given:

Identification of the detail specification

- [1] The name of National Standards Organization under whose authority the detail specification is drafted
- [2] The CECC Symbol and the number allotted by the CECC General Secretariat to the completed detail specification
- [3] The number and issue number of the national generic and sectional specifications
- [4] The national number of the detail specification, date of issue and any further information required by the national system.

Identification of the capacitor

- [5] A short description of the type of capacitor
- [6] Information on typical construction (see examples given on page 3)
- [7] Outline drawing with main dimensions which are of importance for interchangeability and/or reference to the national or international documents for outlines
- [8] Level of quality assessment
- [9] Quick reference data

(Information given under [5] and [6] should be suitable for an entry in CECC 00 200 and CECC 00 300.)

Specification available from: (National Standards Organization) [1]	CECC number and mark 30 702- E [2]
ELECTRONIC COMPONENTS OF ASSESSED QUALITY - DETAIL SPECIFICATION IN ACCORDANCE WITH: (Number of national generic and sectional specification) [3]	(National number of detail specification, date of issue, National type number, if any) [4]
Outline and dimensions: (First angle projection) 	DETAIL SPECIFICATION FOR FIXED CAPACITORS OF CERAMIC DIELECTRIC, CLASS 2 [5]
	TYPICAL CONSTRUCTION: (Examples) cylindrical/rectangular non-metallic/metallic case insulated/non-insulated axial/radial terminations [6]
	Assessment level P (Telecom level) [8]

QUICK REFERENCE DATA: Rated capacitance range [9]
 Capacitance tolerance
 d.c. rated voltage range
 Climatic category
 Performance grade

Information about manufacturers who have components qualified to this
 detail specification is available in the current CECC 00 200: Qualified
 Products List.

1. General data

1.1 Recommended method of mounting

See 1.3.2 of CECC 30 700 Issue 2.

1.2 DimensionsTable 1

Case size reference	Dimensions (in mm or inches and mm)						
	Ø	L	H	d	...		

Notes: 1. When there is no case size reference, Table 1 may be omitted and the dimensions shall be given in Table 2, which then becomes Table 1.

2. The dimensions shall be given as maximum dimensions or as nominal dimensions with a tolerance.

1.3 Ratings and characteristics

Capacitance range (see Table 2)
Tolerance on rated capacitance
Rated voltage (see Table 2)
Climatic category
Rated temperature
Tangent of loss angle
Insulation resistance
Temperature characteristic of capacitance

Table 2

Values of capacitance and of voltage related to case sizes

Rated voltage					
Rated capacitance (in pF and/ or nF)	Tolerance %	Case size	Case size	Case size	Case size

Table 2A

Temperature characteristic of capacitance

Temperature range	Permissible capacitance variation	
	With no voltage applied	With U_R applied
-... °C/+... °C	+... % / -... %	+... % / -... %

1.4 Related Documents

Generic specification: CECC 30 000 Issue 3, Amdt. 1 - 6
 Sectional specification: CECC 30 700 Issue 2

1.5 Marking

The marking of the capacitor and the packing shall be in accordance with the requirements of 1.5 of CECC 30 700 Issue 2.

Note: The details of the marking of the component and packing shall be given in full in the detail specification.

1.6 Ordering information

Orders for capacitors covered by this specification shall contain, in clear or in coded form, the following minimum information:

- a) Rated capacitance.
- b) Tolerance on rated capacitance.
- c) Rated d.c. voltage.
- d) Temperature characteristic of capacitance.
- e) Number and issue reference of the detail specification and style reference.

1.7 Certified records of released lots

Required/not required.

1.8 Additional information (not for inspection purposes)1.9 Additional or increased severities or requirements to those specified in the generic and/or sectional specification

Note: Additions or increased requirements should be specified only when essential.

Table 3Other characteristics

This table is to be used for defining characteristics which are additional to or tighter than those given in the sectional specification.

2. Inspection requirements

2.1 Procedures

- 2.1.1 For Qualification Approval, the procedures shall be in accordance with 3.4 of the Sectional Specification, CECC 30 700 Issue 2.
- 2.1.2 For Quality Conformance Inspection, the test schedule (Table 4) includes sampling, periodicity, severities and requirements. The formation of inspection lots is covered by 3.5.1 of the Sectional Specification.

Notes to Tables 4A and 4B

Note 1: Sub-clause numbers of tests and performance requirements refer to the Sectional Specification, CECC 30 700 Issue 2 and Section One of this specification.

Note 2: Inspection Levels and AQLs are selected from IEC 410 Sampling Plans and Procedures for Inspection by Attributes.

Note 3: In this table:

p	= periodicity (in months)
n	= sample size
c	= acceptance criterion (permitted number of defectives)
D	= destructive
ND	= non-destructive
IL	= inspection level
AQL	= acceptable quality level

) IEC 410

Note 4: Specimens having passed the Group B non-destructive tests shall still satisfy the tests of Group A.

Note 5: As required in the detail specification.

Note 6: If required in the detail specification.

Note 7: No more than one defective is permitted from any one value.

Table 4A
Lot-by-lot inspection (Group A and B)

Clause number and test (see Note 1)	Conditions of test (see Note 1)	IL (see Note 2)	AQL (see Note 2)	Performance requirements (see Note 1)
<u>Sub-group A1 (ND)</u>		II	1,0%	
4.2 Visual examination				As in 4.2 Marking legible and as specified in 1.5 of this specification
4.2 Dimensions (gauging)				As specified in Table 1 of this specification
<u>Sub-group A2 (ND)</u>		II	0,25%	
4.3.1 Capacitance	Frequency: ... kHz Measuring voltage: ... V			Within specified tolerance
4.3.2 Tangent of loss angle	Frequency and measuring voltage same as in 4.3.1			As in 4.3.2(2)
4.3.4 Voltage proof (Measuring point 1a)	Method: ...			No breakdown or flashover
4.3.3 Insulation resistance (Measuring point 1a)	Method: ...			As in 4.3.3(2)
<u>Sub-group B1 (4) (ND)</u>		S-3	1,0%	
4.7 Solderability	Method: ...			Good tinning as evidenced by free flowing of the solder with wetting of the terminations or solder shall flow within ... s, as applicable
4.16 Solvent resistance of the marking (if applicable)	Solvent: ... Solvent temperature: ... Method 1 Rubbing material: Cotton wool Recovery: ...			Marking legible

Clause number and test (see Note 1)	Conditions of test (see Note 1)	IL (see Note 2)	AQL	Performance requirements (see Note 1)
Sub-Group B2 ⁽⁺⁾ (4) (ND)		S-2	2,5%	
4.4 Temperature characteristic of capacitance	Special preconditioning as in 4.1 Capacitance			
Sub-Group B3 (D)		n = 25 1 pd		
4.14 Endurance test 168 h (lots combined over 1 week)				

(+) This sub-group may be omitted if a corresponding test is carried out on each manufacturing batch of dielectric material.

Table 4B

Periodic Tests

Clause number and test (see Note 1)	Conditions of test (see Note 1)	Sample size & criterion of accepta- bility (see Note 3)			Performance requirements (see Note 1)
		p	n	c	
<u>Sub-group ClA (D)</u>		6	9	1	
Part of sample of Sub-group Cl					
4.2 Dimensions (detail)					As specified in Table 1 of this specification
4.5 Robustness of terminations	Visual examination				No visible damage
4.6 Resistance to soldering heat	Method: ... Recovery: (24 ± 2) h				
4.6.1 Pre- conditioning	Special pre- conditioning as in 4.1				
4.6.2 Initial measurement	Capacitance				
4.15 Component solvent resistance (if applicable)	Solvent:... Solvent temperature:...				
4.6.4 Final measurements	Visual examination Capacitance				No visible damage Marking legible As in 4.6.4
<u>Sub-group ClB (D)</u>		6	18	1	
Other part of sample of Sub-group Cl					
4.8 Rapid change of temperature	T_A = Lower category temperature T_B = Upper category temperature Five cycles Duration $t = 30$ min Recovery: (24 ± 2) h				
4.8.1 Pre- conditioning	Special pre- conditioning as in 4.1				
4.8.2 Initial measurements	Capacitance				
4.8.4 Intermediate inspection	Visual examination				No visible damage

Clause number and test (see Note 1)	Conditions of test (see Note 1)	Sample size & criterion of accepta- bility (see Note 3)			Performance requirements (see Note 1)
		p	n	c	
4.9 Vibration	Method of mounting: see 1.1 of this specification Procedure B4 Frequency range: ... Hz to ... Hz Amplitude 0,75 mm or acceleration 98 m/s ² (whichever is the less severe) Total duration: 6 h	(+)			
4.9.2 Intermediate inspection	Visual examination				No visible damage
4.10 Bump (or shock, see 4.11)(5)	Method of mounting: see 1.1 of this specification Number of bumps: ... Acceleration: ... m/s ² Duration of pulse: ... ms	(+)			
4.10.3 Final measurements	Visual examination Capacitance				No visible damage Marking legible As in 4.11.3
4.11 Shock (or bump, see 4.10)(5)	Method of mounting: see 1.1 of this specification Acceleration: ... m/s ² Duration of pulse: ... ms	(+)			
4.11.3 Final measurements	Visual examination Capacitance				No visible damage Marking legible As in 4.11.3
<u>Sub-group C1 (D)</u>		6	27	2	
Combined sample of specimens of Sub- groups C1A and C1B	Special pre- conditioning as in 4.1				
4.12 Climatic sequence					
4.12.1(1) Initial measurement	Capacitance				

(+) Periodicity for vibration, bump, shock: 12 months

Clause number and test (see Note 1)	Conditions of test (see Note 1)	Sample size & criterion of accepta- bility (see Note 3)			Performance requirements (see Note 1)
		p	n	c	
4.12.2 Dry heat	Temperature: upper category temperature Duration: 16 h				
4.12.3 Damp heat, cyclic, Test Db, first cycle					
4.12.4 Cold	Temperature: lower category temperature Duration: 2 h				
4.12.4(1) Inter- mediate inspection	Visual examination				No visible damage
4.12.5 Low air pressure (6)	Air pressure: 8,5 kPa (85 mbar)				
4.12.5(2) Voltage test	U_R for 1 to 2 min				No breakdown or flashover
4.12.5(3) Inter- mediate inspection	Visual examination				No visible damage
4.12.6 Damp heat, cyclic, Test Db, remaining cycles	No voltage applied Number of cycles see 4.12.6(1) Recovery: (24 ± 2) h				
4.12.7 Final measurements	Visual examination Capacitance Tangent of loss angle Insulation resistance				No visible damage Marking legible As in 4.12.7 compared to values measured in 4.6.4 and 4.10.3 or 4.11.3 as applicable As in 4.12.7 As in 4.12.7