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**Sectional Specification: Fixed capacitors with metallized electrodes and polypropylene dielectric**

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Rahmenspezifikation: Festkondensatoren mit metallisierten Polypropylenfolien als Dielektrikum

Spécification intermédiaire: Condensateurs fixes à électrodes métallisées et à diélectrique en polypropylène

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**Ta slovenski standard je istoveten z: EN 131200:2002**

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**ICS:**

31.060.30

Papirni kondenzatorji in  
folijski kondenzatorji

Paper and plastics capacitors

**SIST EN 131200:2003**

**en**

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EUROPEAN STANDARD

**EN 131200**

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**Sectional Specification:  
Fixed capacitors with metallized electrodes  
and polypropylene dielectric**

Spécification intermédiaire:  
Condensateurs fixes à électrodes  
métallisées et à diélectrique en  
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Polypropylenfolien als Dielektrikum

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Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat 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 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**

**Foreword**

The text of CECC 31 200:1981, Issue 1, with its amendments A1 through A3 and documents CECC(Secretariat)2492, 3061, 3078, 3079 and 2874 was submitted to the formal vote for conversion into a European Standard.

The text of the draft, together with the voting report, circulated as document CECC(Secretariat)3220, was approved as EN 131200 on 1992-10-14.

Based on the positive voting results on prAB to EN 130800, assessment level EZ was accepted for introduction into EN 131200 on 1997-03-11.

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) 2002-12-01
- latest date by which the national standards  
conflicting with the EN have to be withdrawn (dow) 2002-12-01

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## 1 General

### 1.1 Scope

This European Standard specifies requirements for fixed capacitors with metallized electrodes and polypropylene dielectric. It specifies preferred ratings and characteristics and selects from EN 130000 the appropriate quality assessment procedure, tests and measuring methods, and gives general performance requirements for this subfamily of capacitors.

These capacitors may have “self-healing properties” depending on conditions of use. They are mainly intended for use with direct voltage. Capacitors for alternating voltage and pulse applications will be covered by supplements to this document or a separate document.

The maximum power to be applied is 500 var at 50 Hz and the maximum peak voltage is 2 500 V. Two performance grades of capacitors are covered by this specification, grade 1 for long-life application and grade 2 for normal application.

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

### 1.2 Normative references

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.

EN 60062:1993	Marking codes for resistors and capacitors
Amendment A1:1997	<a href="https://standards.iteh.ai/catalog/standards/sist/a49a2bcc-153a-4eb0-a379-0e84f6eb4021/sist-en-131200-2003">https://standards.iteh.ai/catalog/standards/sist/a49a2bcc-153a-4eb0-a379-0e84f6eb4021/sist-en-131200-2003</a>
EN 60068 Series	Environmental testing
EN 130000:1993	General specification: Fixed capacitors
Amendments A1 to A10	
IEC 60063:1963	Preferred number series for resistors and capacitors
Amendment 1:1967	
Amendment 2:1977	
ISO 3:1973	Preferred numbers - Series of preferred numbers

### 1.3 Information to be given in a detail specification

#### 1.3.1 General

Detail specifications shall be derived from the relevant blank detail specification.

Detail specifications 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 clause 10 of the detail specification and indicated in the test schedules, for example by an asterisk.

NOTE The information given in 1.3.2. may, for convenience, be presented in tabular form.

The information given in 1.3.2 to 1.3.5 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.

### 1.3.2 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 are preferably to be stated in millimetres.

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 items (capacitance values/voltage ranges) 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.

### 1.3.3 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.

If recommendations for mounting for "normal" use are made, they shall be included in the detail specification under "9 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 1.1 of the detail specification are used.

### 1.3.4 Ratings and characteristics

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

- a) rated capacitance range;  
see 2.2.1

NOTE 1 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 Register of approvals CECC 00200".

- b) particular characteristics.

NOTE 2 Additional characteristics may be listed, when they are considered necessary to specify adequately the component for design and application purposes.

### 1.3.5 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 Definitions

For the purposes of this standard the definitions given in EN 130000 apply, together with the following:

### 1.4.1

#### performance grade 1 capacitors

capacitors intended for long-life applications with stringent requirements for the electrical parameters

**1.4.2****performance grade 2 capacitors**

capacitors for general applications where the stringent requirements of performance grade 1 are not necessary

**1.4.3****stability grade**

a grade which is defined by the capacitance drift after climatic and mechanical tests and after endurance tests

NOTE The performance grade and the stability grade shall be given in the detail specification.

**1.4.4****performance grade and stability grade combinations**

Table 1 shows the combinations of the performance grade and the stability grade

**Table 1 — Combinations of performance grade and stability grade**

Performance grades	Stability grades	Combination designations
1	1	1.1
	2	1.2
2	2	2

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The three combinations of performance grades and stability grades concern capacitance stability and  $\tan \delta$  values. Distinction in performance of the three combinations are shown in final requirements after tests.

**1.4.5****rated voltage**

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, peak a.c. voltage and peak pulse voltage applied to the capacitors shall not exceed the d.c. rated voltage. The value of the peak a.c. voltage allowed at different frequencies is under consideration.

**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:

- rated capacitance (may be indicated by the code given in EN 60062);
- rated voltage: (d.c. voltage may be indicated by the symbol \_\_\_\_\_ or \_\_\_\_\_);
- tolerance on rated capacitance (may be indicated by the code given in EN 60062);
- year and month (or week) of manufacture (may be indicated by one of the codes given in EN 60062);
- manufacturer's name or trade mark;
- climatic category;
- manufacturer's type designation;



h) national number of the DS, date of issue and any further information required by the national system, together with any amendment numbers, if issued.

**1.5.2** The capacitor shall be clearly marked with a), b) and c) of 1.5.1 and with as many as possible of the remaining items as is considered necessary. Any duplication of information in the marking on the capacitor should be avoided.

**1.5.3** The package containing the capacitor(s) shall be clearly marked with all the information listed in 1.5.4.

**1.5.4** Any additional marking shall be so applied that no confusion can arise.

## 2 Preferred ratings and characteristics

### 2.1 Preferred climatic categories

The capacitors covered by this specification are classified into climatic categories according to the general rules given in EN 60068-1.

The lower and upper category temperature and the duration of the damp heat, steady state test shall be within the following ranges:

- Lower category temperature: - 55 °C to - 10 °C
- Upper category temperature: + 70 °C to + 100 °C
- Duration of the damp heat, steady state test: 04 days to 56 days.

Values selected within these ranges shall be chosen from those listed in EN 60068-2. The severities for the cold and dry heat tests are the lower and upper category temperatures respectively.

### 2.2 Preferred values of ratings

#### 2.2.1 Rated capacitance ( $C_R$ )

Preferred values of rated capacitance are values chosen from the E series of preferred values given in IEC 60063.

#### 2.2.2 Tolerance on rated capacitance

The preferred tolerances on the rated capacitance are:

$\pm 20 \%$ ;  $\pm 10 \%$ ;  $\pm 5 \%$ ;  $\pm 2 \%$ ;  $\pm 1 \%$ .

### 2.2.3 Rated capacitance with associated tolerance values

Preferred tolerances on the rated capacitance are given in Table 2.

**Table 2 — Preferred combinations**

Capacitance series	Tolerances
E 6	$\pm 20 \%$
E 12	$\pm 10 \%$
E 24	$\pm 5 \%$
E 48	$\pm 2 \%$
E 96	$\pm 1 \%$

### 2.2.4 D.C. rated voltage ( $U_R$ )

The preferred values of d.c. rated voltage are:

40; 63; 100; 160; 250; 400; 630; 1000; 1600; 2500 V. These values conform to the basic series of preferred values R5 given in ISO 3.

### 2.2.5 Category voltage ( $U_C$ ) (standards.iteh.ai)

The category voltage is:

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$U_R$  for upper category temperatures up to 85 °C.

0,7  $U_R$  for upper category temperature of 100 °C.

### 2.2.6 Rated temperature

For upper category temperatures  $\geq 85$  °C the rated temperature is 85 °C and for an upper category temperature  $< 85$  °C the rated temperature is equal to the upper category temperature.

## 3 Quality assessment procedure

### 3.1 Primary stage of manufacture

The primary stage of manufacture is the winding of the capacitor element or the equivalent operation.

### 3.2 Structurally similar components

Capacitors considered as being structurally similar are capacitors produced with similar process and materials, though they may be of different case sizes and values.

### 3.3 Certified test records

The information required in 3.6 of EN 130000:1993 shall be made available when prescribed in the detail specification and when requested by a purchaser. After the endurance test the parameters for which variables information is required are the capacitance change,  $\tan \delta$  and the insulation resistance.

### 3.4 Qualification approval

#### 3.4.1 Sampling

The sample shall be representative of the range of capacitors for which approval is sought. This may or may not be the complete range covered by the detail specification.

The sample shall consist of specimens having the lowest and highest voltages, and for these voltages the lowest and highest capacitances. When there are more than four rated voltages an intermediate voltage shall also be tested. Thus for the approval of a range, testing is required of either four or six values (capacitance/voltage combinations). When the range consists of less than four values the number of specimens to be tested shall be that required for four values.

The test plan and the samples required for qualification approval are given in A.1. The headings of columns No. 4 to 10 have the following significance:

3	This is the number of specimens to be tested per value for each group or subgroup
4	This is the total number of specimens required when four or less values are to be tested
7	This is the total number of specimens required when six values are to be tested
5 and 8	These are the numbers of permissible non conforming items in any group or subgroup with reference to columns 5 and 8 respectively.
6 and 9	These are total number of permissible non conforming items for all groups (other than group 0) and subgroups combined with reference to columns 4 and 7 respectively.

Spares are permitted as follows:

- one per value which may be used to replace the permitted defective in group 0;
- one per value which may be used as replacement for specimens lost due to incidents not attributable to the manufacturer.

#### 3.4.2 Tests

The complete series of tests specified for the test plan for the selected assessment level given in annex A are required for the approval of capacitors covered by one detail specification. The tests of each group shall be carried out in the order given.

The whole sample, with the exception of those specimens to be submitted to the tests of group 5, shall be subjected to the tests of group 0 and then divided for the other groups.

Specimens found defective during the tests of group 0 shall not be used for the other groups.

One nonconforming item is counted when a capacitor has not satisfied the whole or a part of the tests of a group.

The approval is granted when the number of nonconforming items does not exceed the number of permissible nonconforming items specified.

### 3.5 Quality conformity inspection

#### 3.5.1 Formation of inspection lots

##### a) Groups A and B inspection

These tests shall be carried out on a lot-by-lot basis according to the test plan for the selected assessment level in annex A.

A manufacturer may aggregate the current production into inspection lots subject to the following safeguards:

- 1) The inspection lot shall consist of capacitors produced with similar processes and materials, though they may be of different case sizes and values.
- 2) The sample tested shall comprise capacitors of each of the values and dimensions contained in the inspection lot:
  - in relation to their number;
  - with a minimum of five of any one value.
- 3) If the strict application of the sampling plan requires less than five of any one value in the sample, the basis for the drawing of samples shall be agreed between the manufacturer and the National Supervising Inspectorate.

##### b) Group C inspection

These tests shall be carried out on a periodic basis according to the test plan for the selected assessment level in annex A.

Samples shall be representative of the current production of the specified periods and shall be divided into high, medium and low voltage ratings. In order to cover the range of approvals in any period one case size shall be tested from each voltage group. In subsequent periods other case sizes and/or voltage ratings in production shall be tested with the aim of covering the whole range.

#### 3.5.2 Delayed delivery

When according to the procedures (see 3.7 of EN 130000:1993) re-inspection has to be made, capacitance and solderability shall be checked as specified in group A or B Inspection (lot-by-lot) only after two years storage.

## 4 Test and measurement procedures

NOTE This section supplements the information given in section 4 of EN 130000:1993.

### 4.1 Visual inspection and check of dimensions

See 4.4 of EN 130000:1993.