



**SLOVENSKI STANDARD**

**SIST EN 130900:2002**

**01-september-2002**

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**Sectional specification: Fixed polystyrene film dielectric metal foil d.c. capacitors**

Sectional Specification: Fixed polystyrene film dielectric metal foil d.c. capacitors

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Ta slovenski standard je istoveten z: **EN 130900:1997**  
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**ICS:**

31.060.30	Papirni kondenzatorji in folijski kondenzatorji	Paper and plastics capacitors
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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

**EN 130900**

October 1997

Supersedes CECC 30 900:1985 and its amendments

English version

**Sectional Specification:  
Fixed polystyrene film dielectric metal foil d.c. capacitors**

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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.

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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**

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## Foreword

At the request of CLC/TC CECC/SC 40XA (former WG 3), the text of CECC 30 900:1985, Issue 2, with its amendments A1 through A3 and A5 and documents CECC(Secretariat)3061 and 3075, 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)3216, was approved as EN 130900 on 1992-10-14.

Based on the positive voting results on prAB to EN 130800, assessment level EZ was accepted for introduction into EN 130900 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) 1998-04-01
  - latest date by which the national standards conflicting  
with the EN have to be withdrawn (dow) 1998-04-01
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## Section 1: General

### 1.1 Scope

This European Standard specifies requirements for fixed capacitors for direct current, for rated voltages not exceeding 6300 V, with electrodes of thin metal foils and a polystyrene film dielectric. They are intended for use in electronic equipment.

It prescribes preferred ratings and characteristics and selects from EN 130000 the appropriate quality assessment procedures, tests and measuring methods and gives general performance requirements for this type of capacitor.

Capacitors for a reactive power > 200 VAR are not covered by this specification.

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 and 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 130000:1993 Amendments 1 to 10	<i>Generic specification: Fixed capacitors</i>
IEC 60062:1974	<i>Marking codes for resistors and capacitors</i>
IEC 60063:1963 Amendment 1:1967	<i>Preferred number series for resistors and capacitors</i>
IEC 60068	<i>Basic environmental testing procedures</i>
IEC 60410:1973	<i>Sampling plans and procedures for inspection by attributes</i>
ISO 3:1973	<i>Preferred numbers - Series of preferred numbers</i>

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*Basic environmental testing procedures*

*Sampling plans and procedures for inspection by*

*attributes*

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*Preferred numbers - Series of preferred numbers*

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

#### 1.3.1 General

The detail specification 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 1.9 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 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.

#### 1.3.2 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 shall preferably 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) are 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

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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 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: 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 firms, products and services approved under the CECC system (Register of approvals) CECC 00200".

b) Particular characteristics

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.

### 1.4 Definitions

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

**1.4.1 stability class:** The stability class is defined by the tolerance on the temperature coefficient together with the permissible change of capacitance after defined tests. The stability class is stated in the detail specification. Table 1 shows the preferred stability classes.

**1.4.2 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:

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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 See 2.4 of EN 130000:1993, with the details given in 1.5.2 to 1.5.5.

1.5.2 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:

- a) rated capacitance;
- b) rated voltage; (d.c. voltage may be indicated by the symbol  $\overline{\text{---}}$  or  $\text{---}$ .);
- c) tolerance on rated capacitance;
- d) year and month (or week) of manufacture;
- e) manufacturer's name or trade mark;
- f) identification as to which termination is connected to the outside foil (if specified in the detail specification);
- g) temperature coefficient and stability class;
- h) climatic category;
- i) manufacturer's type designation;
- j) reference to the detail specification.

1.5.3 The capacitor shall be clearly marked with a), b) and c) of 1.5.2 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.

1.5.4 The package containing the capacitor(s) shall be clearly marked with all the information listed in 1.5.2., except f.

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

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## Section 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 IEC 60068-1.

The lower and upper category temperature and the duration of the damp heat steady state tests shall be chosen from the following:

lower category temperature	: - 55 °C, - 40 °C, - 25 °C, - 10 °C;
– upper category temperature	: + 70 °C, and + 85 °C;
– duration of the damp heat, steady state test	: 4 <sup>1)</sup> , 10, 21 and 56 days.

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:

1; 1, 5 ; 2, 2 ; 3, 3 ; 4, 7 and 6, 8 and their decimal multiples.

These values conform to the E6 series of preferred values given in IEC 60063.

If other values are required they shall preferably be chosen from the higher series.

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<sup>1)</sup> With assisted drying, if required. Assisted drying consists on an exposure to a temperature of  $(55 \pm 2)$  °C for 1 h to 6 h and a relative humidity  $\leq 20$  %.

### 2.2.2 Tolerance on rated capacitance

Table 1 gives the preferred series of capacitance and associated tolerances.

**Table 1: Preferred tolerances**

Preferred		Code
Series	Tolerance	
E 6	± 20 %	M
E 12	± 10 %	K
E 24	± 5 %	J
E 48	± 2 %	G
E 96	± 1 %	F
E192	± 0,5 %	D

In any case the minimum tolerance is ± 1 pF. Additional values of capacitance outside the E 192 range and additional tolerances may be specified

### 2.2.3 Rated voltage ( $U_R$ )

The preferred values of rated voltage are :

25 ; 40 ; 63 ; 100 ; 160 and their decimal multiples.

These values conform to the basic series of preferred values R5 given in ISO 3. If other values are needed they shall be taken from the R10 series.

### 2.2.4 Category voltage ( $U_C$ )

The category voltage is equal to the rated voltage (the rated temperature being defined as the upper category temperature, see 2.2.5).

### 2.2.5 Rated temperature

The rated temperature is equal to the upper category temperature (see 2.1).

**2.2.6 Preferred nominal temperature coefficients ( $\alpha$ ) with associated tolerances and preferred values of permissible change of capacitance**

Table 2 is not valid for capacitance values smaller than 50 pF.

**Table 2: Preferred nominal temperature coefficient and permissible change of capacitance**

Stability class	Temperature coefficient and tolerance ( $10^{-6}/^{\circ}\text{C}$ )				Permissible change of capacitance <sup>1)</sup>
	-80	-100	-125	-160	
1	$\pm 25$	$\pm 25$	$\pm 30$	$\pm 40$	$\pm (0,3 \% + 0,3 \text{ pF})$
2	$\pm 40$	$\pm 50$	$\pm 60$	$\pm 80$	$\pm (0,5 \% + 0,5 \text{ pF})$
3	$\pm 60$	$\pm 70$	$\pm 80$	$\pm 100$	$\pm (0,75 \% + 0,75 \text{ pF})$
4			$\pm 125$	$\pm 160$	$\pm (1,0 \% + 1 \text{ pF})$
Permissible change of capacitance after each of the following tests:					
- temperature cyclic drift (one cycle);					
- rapid change of temperature;					
- endurance.					

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