

Fixed capacitors for use in electronic equipment —

Part 13: Sectional specification — Fixed polypropylene film dielectric metal foil d.c. capacitors

ICS 31.060.30

National foreword

This British Standard is the UK implementation of EN 60384-13:2006, incorporating corrigendum November 2006. It is identical to IEC 60384-13:2006. It supersedes BS QC 301800:1991 and BS EN 131800:1998 which are withdrawn.

The UK participation in its preparation was entrusted to Technical Committee EPL/40X, Capacitors and resistors for electronic equipment.

A list of organizations represented on this committee can be obtained on request to its secretary.

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Fixed capacitors for use in electronic equipment
Part 13: Sectional specification -
Fixed polypropylene film dielectric metal foil d.c. capacitors
(IEC 60384-13:2006)

Condensateurs fixes utilisés
dans les équipements électroniques
Partie 13: Spécification intermédiaire -
Condensateurs fixes pour courant continu
à diélectrique en film de polypropylène
à armatures en feuilles métalliques
(CEI 60384-13:2006)

Festkondensatoren zur Verwendung
in Geräten der Elektronik
Teil 13: Rahmenspezifikation -
Festkondensatoren mit einem
Dielektrikum aus Polypropylen
und Belägen aus Metallfolien
für Gleichspannung
(IEC 60384-13:2006)

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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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Foreword

The text of document 40/1620/FDIS, future edition 3 of IEC 60384-13, prepared by IEC TC 40, Capacitors and resistors for electronic equipment, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60384-13 on 2006-02-01.

This European Standard supersedes EN 131800:1997.

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) 2006-11-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2009-02-01

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 60384-13:2006 was approved by CENELEC as a European Standard without any modification.

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FIXED CAPACITORS FOR USE IN ELECTRONIC EQUIPMENT –**Part 13: Sectional specification – Fixed polypropylene film dielectric metal foil d.c. capacitors****1 General****1.1 Scope**

This part of IEC 60384 is applicable to fixed direct current capacitors, using as dielectric a polypropylene film with electrodes of thin metal foils. The capacitors covered by this standard are intended for use in electronic equipment.

Capacitors for electromagnetic interference suppression are not included but are covered by IEC 60384-14.

1.2 Object

The object of this standard is to prescribe preferred ratings and characteristics and to select from IEC 60384-1, the appropriate quality assessment procedures, tests and measuring methods and to give general performance requirements for this type of capacitor. Test severities and requirements prescribed in detail specifications referring to this sectional specification shall be of equal or higher performance level, because lower performance levels are not permitted.

1.3 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60063:1963, *Preferred number series for resistors and capacitors*
Amendment No. 1 (1967)
Amendment No. 2 (1977)

IEC 60068-1, *Environmental testing – Part 1: General and guidance*

IEC 60384-1, *Fixed capacitors for use in electronic equipment – Part 1: Generic specification*

IEC 60384-14, *Fixed capacitors for use in electronic equipment – Part 14: Sectional specification: Fixed capacitors for electromagnetic interference suppression and connection to the supply mains*

IEC 60410, *Sampling plans and procedures for inspection by attributes*

ISO 3, *Preferred numbers – Series of preferred numbers*

1.4 Information to be given in a detail specification

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 1.9 of the detail specification and indicated in the test schedules, for example by an asterisk.

NOTE The information given in 1.4.1 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.

1.4.1 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 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.

1.4.2 Mounting

The detail specification shall specify the method of mounting to be applied for normal use and for the application of the vibration and the bump or shock tests. The capacitors shall be mounted by their normal means. 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 mounting fixtures and they shall be used in the application of the vibration and bump or shock tests.

1.4.3 Ratings and characteristics

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

1.4.3.1 Rated capacitance range

See 2.2.1.

NOTE When products approved to the detail specification have different ranges, the following statement should be added: "The range of capacitance values available in each voltage range is given in IEC QC 001005."

1.4.3.2 Particular characteristics

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

1.4.3.3 Soldering

The detail specification shall prescribe the test methods, severities and requirements applicable for the solderability and the resistance to soldering heat tests.

1.4.4 Marking

The detail specification shall specify the content of the marking on the capacitor and on the package. Deviations from 1.6 of this sectional specification shall be specifically stated.

1.5 Terms and definitions

For the purposes of this document, the terms and definitions of IEC 60384-1 and the following apply.

1.5.1

stability class

tolerance on the temperature coefficient together with the permissible change of capacitance after defined tests

NOTE 1 The stability class is stated in the detail specification.

NOTE 2 The table in 2.2.4 shows the preferred stability classes.

1.5.2

rated voltage

U_R

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 should not exceed the rated voltage. The value of the peak a.c. voltage should not exceed the following percentages of the rated voltage at the frequencies stated and should 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.

1.6 Marking

See 2.4 of IEC 60384-1, with the following details.

1.6.1 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:

- a) rated capacitance;
- b) rated voltage (d.c. voltage may be indicated by the symbol $\overline{\quad}$ or $\overline{\quad}$);
- c) tolerance on rated capacitance;
- d) year and month (or week) of manufacture;
- e) manufacturer's name or trade mark;
- f) temperature coefficient and stability class;
- g) climatic category;
- h) manufacturer's type designation;
- i) reference to the detail specification.

1.6.2 The capacitor shall be clearly marked with a), b) and c) above 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.

1.6.3 The package containing the capacitor(s) shall be clearly marked with all the information listed in 1.6.1.

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

2 Preferred ratings and characteristics

2.1 Preferred characteristics

The values given in detail specifications shall preferably be selected from the following.

2.1.1 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 temperatures and the duration of the damp heat steady state test shall be chosen from the following.

Lower category temperature: -55 °C; -40 °C; -25 °C and -10 °C;

Upper category temperature: +85 °C and +100 °C;

Duration of the damp-heat, steady-state test: 10, 21 and 56 days.

The severities for the cold and dry heat tests are the lower and upper category temperatures respectively.

2.1.2 Assisted drying is conditioning for a period between 1 h and 6 h at a temperature of $(55 \pm 2) ^\circ\text{C}$ and a relative humidity not exceeding 20 %.

2.2 Preferred values of ratings

2.2.1 Rated capacitance (C_R)

Preferred values of rated capacitance are to be taken from the E 6, E 12, E 24, E 48 and E 96 series of IEC 60063.

2.2.2 Tolerances on rated capacitance

The preferred tolerances on rated capacitance are given in Table 1.

Table 1 – Preferred tolerances

Preferred series	Preferred tolerance	Tolerance code
E 6	$\pm 20 \%$	M
E 12	$\pm 10 \%$	K
E 24	$\pm 5 \%$	J
E 48	$\pm 2 \%$	G
E 96	$\pm 1 \%$	F

In all cases, the minimum tolerance is $\pm 1 \text{ pF}$. Additional values of capacitance outside the E 96 range and additional tolerances may be specified.

2.2.3 Rated voltage (U_R)

The preferred values of rated voltage are: 40 – 63 – 100 – 160 – 250 V and their decimal multiples. These values conform to the basic series of preferred values R5 given in ISO 3.