



BSI Standards Publication

# Fixed capacitors for use in electronic equipment

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Part 1: Generic specification

## National foreword

This British Standard is the UK implementation of EN IEC 60384-1:2021. It is identical to IEC 60384-1:2021. It supersedes BS EN 60384-1:2016, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee W/-, Consumer Products and Services Sector Policy and Strategy Committee.

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EUROPEAN STANDARD

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EUROPÄISCHE NORM

August 2021

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Supersedes EN 60384-1:2016 and all of its amendments  
and corrigenda (if any)

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(IEC 60384-1:2021)**Condensateurs fixes utilisés dans les équipements  
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(IEC 60384-1:2021)Festkondensatoren zur Verwendung in Geräten der  
Elektronik - Teil 1: Fachgrundspezifikation  
(IEC 60384-1:2021)

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

**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

## European foreword

The text of document 40/2848/FDIS, future edition 6 of IEC 60384-1, prepared by IEC/TC 40 “Capacitors and resistors for electronic equipment” was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 60384-1:2021.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2022-05-20
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2024-08-20

This document supersedes EN 60384-1:2016 and all of its amendments and corrigenda (if any).

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Any feedback and questions on this document should be directed to the users' national committee. A complete listing of these bodies can be found on the CENELEC website.

## Endorsement notice

The text of the International Standard IEC 60384-1:2021 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60027 (series)	NOTE Harmonized as EN 60027 (series)
IEC 60384-2	NOTE Harmonized as EN IEC 60384-2
IEC 60384-3	NOTE Harmonized as EN 60384-3
IEC 60384-3-1	NOTE Harmonized as EN 60384-3-1
IEC 60384-26	NOTE Harmonized as EN IEC 60384-26
IEC 60469:2013	NOTE Harmonized as EN 60469:2013 (not modified)
ISO 80000-1	NOTE Harmonized as EN ISO 80000-1
ISO 9000	NOTE Harmonized as EN ISO 9000

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**FIXED CAPACITORS FOR USE IN ELECTRONIC EQUIPMENT –****Part 1: Generic specification**

## FOREWORD

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IEC 60384-1 has been prepared by IEC technical committee 40: Capacitors and resistors for electronic equipment. It is an International Standard.

This sixth edition cancels and replaces the fifth edition published in 2016. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) The document has been completely restructured to comply with the ISO/IEC Directives, Part 2; a new technical categorization of test methods has been introduced and the test methods have been reorganized according to these new categories; tables, figures and references have been revised accordingly.
- b) Annex X has been added for comparison with the previous edition.



The text of this International Standard is based on the following documents:

FDIS	Report on voting
40/2848/FDIS	40/2859/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at [www.iec.ch/members\\_experts/refdocs](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/standardsdev/publications](http://www.iec.ch/standardsdev/publications).

A list of all parts in the IEC 60384 series, published under the general title *Fixed capacitors for use in electronic equipment*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under [webstore.iec.ch](http://webstore.iec.ch) in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

## INTRODUCTION

The specification system for fixed capacitors for use in electronic equipment is structured in a hierarchical system consisting of the following specification types. See Figure 1.

### **Generic specification**

The generic specification covers all subjects mainly common to the family of fixed capacitors for use in electronic equipment, such as terminology, methods of measurement and tests. Where the individual subjects require the conditions or parameters for provisions specific to the particular subfamily or type of fixed capacitor, such are required to be given by one of the subordinate specifications.

For the scope of fixed capacitors, the numeric reference to the generic specification is IEC 60384-1.

### **Sectional specification**

Sectional specifications cover all subjects additional to those given in the generic specification, which are specific to a defined subgroup of fixed capacitors. These subjects normally are preferred values for dimensions and characteristics, additional test methods and relevant provisions for test methods given in the generic specification, requirements for sampling and for the preparation of specimen, recommended test severities and preferred acceptance criteria. The sectional specification also outlines the structure and scope of the test schedules which are to be applied in all subordinate detail specifications.

For the scope of fixed capacitors, the numeric references to the sectional specifications reach from IEC 60384-2 for polyester film capacitors to currently IEC 60384-26 for aluminum electrolytic capacitors with conductive polymer solid electrolyte. The variety of sectional specifications may be adapted to the portfolio of different technologies of fixed capacitors.

### **Detail specification**

Detail specifications give directly, or by referring to other specifications, all information necessary to completely describe a given type and range of fixed capacitors, including requirements of all values for dimensions and characteristics. They also give all information required for the quality assessment of the covered type and range of fixed capacitors within a suitable quality assessment system, including requirements for all applied test severities and acceptance criteria, and the completed test schedules.

Detail specifications can be either specifications within the IEC system, another specification system linked to IEC, or specified by the manufacturer or user.

For the scope of fixed capacitors, the numeric references to detail specifications are for example IEC 60384-3-101, if related to the sectional specification IEC 60384-3 and to the ancillary blank detail specification IEC 60384-3-1.

### **Blank detail specification**

The hierarchical system of specifications is supplemented by one or more blank detail specifications to a sectional specification, which are used to ensure a uniform presentation of detail specifications.

The blank detail specifications provide the specification writer with a template on the layout to be adopted and on the information to be given and with guidance for the preparation of detail specifications in line with the requirements of the superior generic or sectional specifications.

Blank detail specifications are not considered as relevant specifications since they do not themselves describe any particular component.

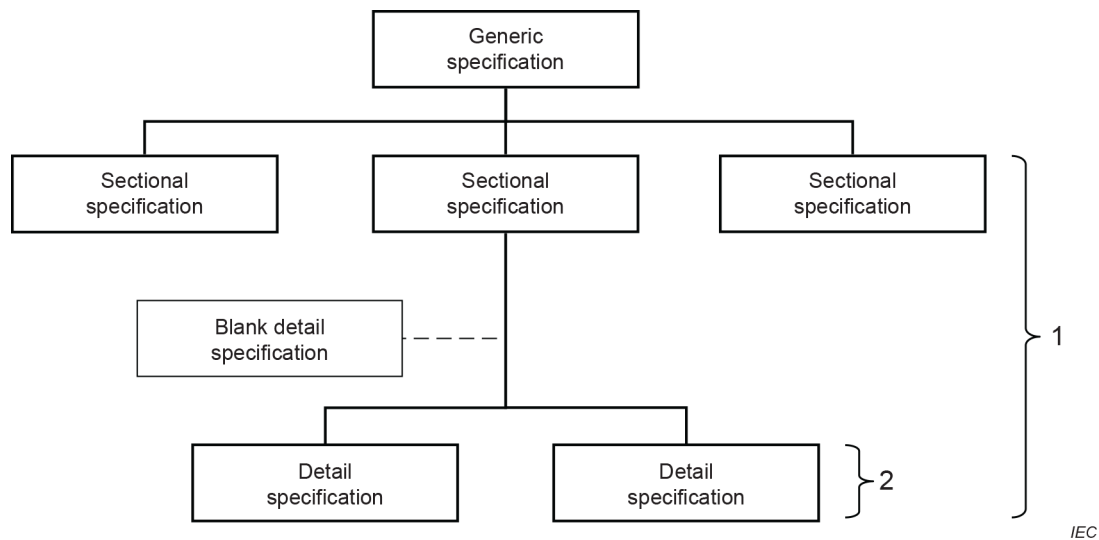
The presence of an established hierarchical specification system with blank detail specifications permits the preparation of detail specifications even outside of the relevant IEC technical committee.

For the scope of fixed capacitors, the numeric references to blank detail specifications are, for example, IEC 60384-3-1, if related to the sectional specification IEC 60384-3.

### Relevant specification

In this system the term "relevant specification" addresses subordinate specifications containing specific requirements, where applicable.

Any generic or sectional specification may use abstract and universal references to subordinate specifications of either hierarchical level by use of the expression "relevant specification".



### Key

- 1 Indicates the range of "*Relevant specifications*" to the superior generic specification, where applicable.
- 2 Indicates the range of "*Relevant specifications*" to the superior sectional specification, where applicable.

**Figure 1 – Specification system for fixed capacitors**

# FIXED CAPACITORS FOR USE IN ELECTRONIC EQUIPMENT –

## Part 1: Generic specification

### 1 Scope

This part of IEC 60384 is a generic specification and is applicable to fixed capacitors for use in electronic equipment.

It establishes standard terms, inspection procedures and methods of test for use in sectional and detail specifications of electronic components for quality assessment or any other purpose.

### 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 60062, *Marking codes for resistors and capacitors*

IEC 60063, *Preferred number series for resistors and capacitors*

IEC 60068-1:2013, *Environmental testing – Part 1: General and guidance*

IEC 60068-2-1, *Environmental testing – Part 2-1: Tests – Tests A: Cold*

IEC 60068-2-2:2007, *Environmental testing – Part 2-2: Tests – Tests B: Dry heat*

IEC 60068-2-6, *Environmental testing – Part 2-6: Tests – Test Fc: Vibration (sinusoidal)*

IEC 60068-2-13, *Environmental testing – Part 2-13: Tests – Test M: Low air pressure*

IEC 60068-2-14, *Environmental testing – Part 2-14: Tests – Test N: Change of temperature*

IEC 60068-2-17, *Basic environmental testing procedures – Part 2-17: Tests – Test Q: Sealing*

IEC 60068-2-20, *Environmental testing – Part 2-20: Tests – Test Ta and Tb: Test methods for solderability and resistance to soldering heat of devices with leads*

IEC 60068-2-21, *Environmental testing – Part 2-21: Tests – Test U: Robustness of terminations and integral mounting devices*

IEC 60068-2-27, *Environmental testing – Part 2-27: Tests – Test Ea and guidance: Shock*

IEC 60068-2-30, *Environmental testing – Part 2-30: Tests – Test Db: Damp heat, cyclic (12 h + 12 h cycle)*