

Piezoelectric filters of assessed quality —

Part 4: Sectional specification — Capability approval

The European Standard EN 60368-4:2000, including corrigendum February 2001 has the status of a British Standard

ICS 31.140; 31.160

National foreword

This British Standard is the official English language version of EN 60368-4:2000, including corrigendum February 2001. It is identical with IEC 60368-4:2000. It supersedes BS EN 167100:1996 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee EPL/49, Piezoelectric devices for frequency control and selection, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

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

From 1 January 1997, all IEC publications have the number 60000 added to the old number. For instance, IEC 27-1 has been renumbered as IEC 60027-1. For a period of time during the change over from one numbering system to the other, publications may contain identifiers from both systems.

Cross-references

Attention is drawn to the fact that CEN and CENELEC Standards normally include an annex which lists normative references to international publications with their corresponding European publications. The British Standards which implement these international or European publications may be found in the BSI Standards Catalogue under the section entitled “International Standards Correspondence Index”, or by using the “Find” facility of the BSI Standards Electronic Catalogue.

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This British Standard, having been prepared under the direction of the Electrotechnical Sector Committee, was published under the authority of the Standards Committee and comes into effect on 15 June 2001

Summary of pages

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English version

**Piezoelectric filters of assessed quality
Part 4: Sectional specification -
Capability approval
(IEC 60368-4:2000)**

Filtres piézoélectriques sous
assurance de la qualité
Partie 4: Spécification intermédiaire -
Agrément de savoir-faire
(CEI 60368-4:2000)

Piezoelektrische Filter mit
bewerteter Qualität
Teil 4: Rahmenspezifikation -
Befähigungsanerkennung
(IEC 60368-4:2000)

This European Standard was approved by CENELEC on 2000-09-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. This European Standard supersedes EN 16700:1995

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

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Foreword

The text of document 49/459/FDIS, future edition 1 of IEC 60368-4, prepared by IEC TC 49, Piezoelectric and dielectric devices for frequency control and selection, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60368-4 on 2000-09-01.

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) 2001-06-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2003-09-01

Annexes designated "normative" are part of the body of the standard.
In this standard, annexes A, B, C and ZA are normative.
Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 60368-4:2000 was approved by CENELEC as a European Standard without any modification.

CONTENTS

Clause	Page
1 General.....	5
1.1 Scope	5
1.2 Normative references	5
2 Preferred values for ratings and guidance on detail specifications.....	6
2.1 Preferred values for ratings and characteristics	6
2.2 Information to be prescribed in detail specifications	6
2.2.1 Outline drawing and dimensions	6
2.2.2 Marking.....	6
2.2.3 Ordering information	6
2.2.4 Additional information (not for inspection purposes).....	7
3 Capability approval.....	7
3.1 Eligibility for capability approval.....	7
3.2 Structural similarity	7
3.3 Procedures for capability approval.....	7
3.3.1 General.....	7
3.3.2 Application for capability approval	7
3.3.3 Granting of capability approval	7
3.4 Capability manual	8
3.5 Capability qualifying components (CQC).....	8
3.5.1 Processes.....	9
3.5.2 Boundaries.....	9
3.6 Inspection requirements for CQCs.....	10
3.7 Programme for capability approval	10
3.8 Capability approval report	10
3.9 Abstract of description of capability	10
3.10 Modifications likely to affect the capability approval	10
3.11 Initial capability approval	10
3.11.1 Procedure in the event of CQC failures.....	11
3.11.2 General plan for the selection of CQCs.....	11
3.11.3 Process CQC test plans	13
3.11.4 Process/boundary CQC test plans	16
3.11.5 Boundary CQC test plans for piezoelectric filter design and performance	17
3.12 Maintenance of capability approval.....	22
3.13 Rework and repair work	23
3.13.1 Rework	23
3.13.2 Repair work.....	23
3.14 Quality conformance inspection.....	24
3.14.1 General.....	24
3.14.2 Custom-built piezoelectric filters	24
3.14.3 Standard catalogue items	24
3.15 Screening procedures	24
4 Test and measurement procedures	24

	Page
Annex A (normative) Example layout of an abstract of description of capability.....	25
Annex B (normative) Layout of the front page of a CQC specification for process control.....	26
Annex C (normative) Layout of the front page of a CQC specification to demonstrate boundary or limit.....	27
Annex ZA (normative) Normative references to international publications with their corresponding European publications	28
Figure 1 – Selection of CQCs – All methods of construction	12
Figure 2 – Test plan for deposition of electrode material CQCs	13
Figure 3 – Test plan for bonding CQCs	14
Figure 4 – Test plan for frequency adjustment CQCs	14
Figure 5 – Test plan for frequency alignment CQCs (monolithic multiple pole resonators only)	15
Figure 6 – Test plan for component assembly CQCs	15
Figure 7 – Test plan for alignment CQCs	16
Figure 8 – Test plan for enclosure CQCs	17
Figure 9 – Test plan for mounting CQCs	17
Figure 10 – Test plan for filter design and performance.....	18
Figure 11 – Test plan for climatic performance CQCs	18
Table 1 – Test schedule for initial capability approval.....	19
Table 2 – Periodic tests for maintenance of capability approvals	23

PIEZOELECTRIC FILTERS OF ASSESSED QUALITY –

Part 4: Sectional specification – Capability approval

1 General

1.1 Scope

This part of IEC 60368 applies to piezoelectric filters as custom-built products or as standard catalogue items whose quality is assessed on the basis of capability approval.

It prescribes the preferred ratings and characteristics, with appropriate tests and measuring methods contained in the generic specification, IEC 60368-1, and gives the general performance requirements to be used in detail specifications for piezoelectric filters.

The concept of preferred values is directly applicable to standard catalogue items, but does not necessarily apply to custom-built products.

1.2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 60368-1:2000, *Piezoelectric filters of assessed quality – Part 1: Generic specification*

IEC 60368-4-1:2000, *Piezoelectric filters of assessed quality – Part 4-1: Blank detail specification – Capability approval*

IEC 61178-1:1993, *Quartz crystal units – Specification in the IEC Quality Assessment System for Electronic Components (IECQ) – Part 1: Generic specification*

IEC QC 001002-3:1998, *IEC Quality Assessment System for Electronic Components (IECQ) – Rules of Procedure – Part 3: Approval procedures*

IEC QC 001005, *Register of Firms, Products and Services approved under the IECQ System, including ISO 9000*

2 Preferred values for ratings and guidance on detail specifications

2.1 Preferred values for ratings and characteristics

The values given in detail specifications shall preferably be selected from those stated in 2.3 of IEC 60368-1.

2.2 Information to be prescribed in detail specifications

(Applies to both custom-built and standard catalogue items.)

Guidance on the preparation of detail specifications is given in the blank detail specification, IEC 60368-4-1.

Each detail specification shall state all the tests and measurements required for inspection. For standard catalogue items this shall, as a minimum, include the relevant tests given in the blank detail specification, with methods and severities.

The following information shall be given in each detail specification.

2.2.1 Outline drawing and dimensions

The detail specification shall include a dimensional drawing of the piezoelectric filter and/or reference to an appropriate international standard in order to permit easy recognition and to provide information for dimensioning and gauging procedures.

The dimensions shall include the overall dimensions of the body of the component as well as the size and spacing of the terminations. All dimensions shall be stated in millimetres.

Terminal connections shall be identified for all enclosures.

When a detail specification covers more than one enclosure, 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 piezoelectric filter.

2.2.2 Marking

The detail specification shall prescribe the content of the marking on the piezoelectric filter and on the primary package in accordance with 2.4 of IEC 60368-1.

2.2.3 Ordering information

The detail specification shall prescribe that the following information is required when ordering a piezoelectric filter:

- a) quantity;
- b) detail specification number, issue number and date, and where applicable;
- c) nominal frequency in kilohertz or megahertz;
- d) full description of any additional requirements to identify the piezoelectric filter.

2.2.4 Additional information (not for inspection purposes)

The detail specification may include information which is not normally required to be verified by the inspection procedure, such as circuit diagrams, curves, drawings and notes needed for clarification.

3 Capability approval

3.1 Eligibility for capability approval

Prior to making an application for capability approval a manufacturer shall first obtain manufacturer's approval in accordance with clause 2 of IEC QC 001002-3.

The primary stage of manufacture shall be as defined in 3.1 of IEC 60368-1.

3.2 Structural similarity

Structural similarity is not applicable to capability approval. However, it is applicable to released lots as defined in 3.14.1 of this specification.

3.3 Procedures for capability approval

3.3.1 General

Capability approval in piezoelectric filter technology covers

- the complete design, material preparation and manufacturing techniques, including control processes and tests;
- the performance limits claimed for the processes and products, that is, those specified for the capability qualifying components (CQCs);
- the range of mechanical structures for which approval is granted.

3.3.2 Application for capability approval

In order to obtain capability approval the manufacturer shall apply the rules of procedure given in clause 4 of IEC QC 001002-3.

In an application for capability approval the manufacturer shall define the boundaries of the capability for which approval is sought in accordance with 3.5 of this specification.

3.3.3 Granting of capability approval

Capability approval shall be granted when the manufacturer has

- prepared a capability manual describing the capability for which he wishes to be approved, to the satisfaction of the National Supervising Inspectorate (NSI);
- agreed with the NSI on the range of CQCs, as defined in 4.1 of IEC QC 001002-3, to be used for the assessment of the capability;
- successfully demonstrated that he can design and manufacture components which satisfy the requirements of this sectional specification, within the limits of this capability;
- prepared a capability approval test report to the satisfaction of the NSI.

3.4 Capability manual

The manufacturer shall prepare a manual describing his capability (see 4.2.5 of IEC QC 001002-3), in relation to the technologies involved.

The manual shall be approved by the NSI who shall ensure that it is a true and complete record of procedures carried out by the manufacturer during the design, production, testing, inspection, and release of its products. The manual is a confidential commercial document.

The manual shall include, as a minimum, the following:

- a general introduction and description of the technologies involved;
- aspects of customer liaison including provisions of design rules (if appropriate), and assistance to customers in the formulation of their requirements;
- a detailed description of the design rules to be used;
- the procedure for checking that the design rules are complied with for piezoelectric filters manufactured to a detail specification;
- a list of all materials used, with references to the corresponding purchasing specifications and goods inward inspection;
- a flow chart for the total process showing quality control points and permitted rework loops and containing references to all process and quality control procedures;
- a declaration of processes for which approval has been sought in accordance with 3.5.1;
- a declaration of boundaries for which approval has been sought in accordance with 3.5.2;
- a list of capability qualifying components (CQCs) used to assess the capability, with a general description of each, supported by a detailed table showing where the declared boundaries of capability are demonstrated by a particular CQC design;
- a detail specification for each CQC. These shall be produced to the satisfaction of the NSI (see annexes B and C).

3.5 Capability qualifying components (CQC)

There are basic methods of construction of piezoelectric filters which include

- a) leaded component techniques, comprising assembly of wire leaded components in printed circuit board (PCB) laminates;
- b) surface mounting techniques, comprising assembly of components designed for surface mounting;
- c) thick and thin film techniques, comprising assembly of components in either thick or thin film on substrates;
- d) monolithic techniques, comprising assembly of one or more monolithic multiple pole resonators.

These methods of construction, or combinations thereof, may incorporate either sealed crystal units or unencapsulated crystal units. These methods are not exclusive but if other methods of construction are to be used then the appropriate CQCs shall be defined in agreement with the NSI.