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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 3241.1-2025

Replacing GB/T 3241-2010

**Electroacoustics - Octave-band and fractional-octave-band
filters - Part 1: Specifications
(English Translation)**

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Reference

Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part 1: Structure and drafting rules for standardization documents" Drafting.

This document is part 1 of GB/T 3241 "Electroacoustic octave and fractional octave filters". GB/T 3241 has been published the following parts.

--- Part 1: Specification;

--- Part 2: Type evaluation test.

This document partially replaces the relevant terms and definitions, properties and specifications in GB/T 3241-2010 "Electroacoustic octave and fractional octave filters" Compared with the relevant contents of GB/T 3241-2010, in addition to structural adjustments and editorial changes, the main changes are.

The technical changes are as follows.

- a) The scope of application has been changed (see 1.2, 1.2 of the 2010 edition);
- b) The design objectives have been changed (see 1.3, 5.2, and 3.2 of the 2010 edition);
- c) Changed the terms and definitions of "reference level range", "reference input signal level", "level linearity error" and "level range controller" (see 3.20, 3.21, 3.22, 3.24, 3.18, 3.19, 3.22, 3.24 of the 2010 edition);
- d) The temperature and relative humidity in the reference environmental conditions have been changed (see Chapter 4, 4.13 of the 2010 edition);
- e) Changed the acceptance limit of filter effective bandwidth deviation (see 5.12, 4.5 of the 2010 edition);
- f) The linear operating range of the filter has been changed (see 5.13, 4.6 of the 2010 edition);
- g) Deleted the contents of "real-time operation" and "flat frequency response" (see 4.7 and 4.10 of the 2010 edition);
- h) Added the contents of "time-invariant operation", "overload indicator" and "filter decay time" (see 5.14, 5.17 and 5.18);
- i) Changed the filter air temperature range, the temperature and relative humidity of the controllable working environment area (see 5.22.2, 2010 edition) 4.14.2).

This document is equivalent to IEC 61260-1:2014 "Electroacoustic octave and fractional octave filters Part 1: Specification".

Introduction

A filter is a device that separates the components of a signal by frequency, and octave and fractional octave filters are devices that have a single A bandpass filter with a transmission band and an upper cutoff frequency and a lower cutoff frequency ratio equal to an octave frequency ratio or a certain power thereof. Octave and fractional Octave filters are usually used in conjunction with sound measuring instruments such as sound level meters for spectral analysis of sound signals.

GB/T 3241 aims to specify the performance requirements for octave and fractional octave filters and to describe the type evaluation tests and periodic tests.

The method is planned to consist of three parts.

--- Part 1: Specification. The purpose is to specify the performance requirements for octave and fractional octave filters.

--- Part 2: Type evaluation test. The purpose is to ensure that all testing laboratories use a consistent method to perform octave and fractional Type evaluation test of octave band filters.

--- Part 3: Periodic test. The purpose is to ensure that all testing laboratories or metrology laboratories perform octave testing in a consistent manner.

and periodic experiments with fractional-octave filters.

To evaluate compliance with performance specifications, this document uses different criteria from GB/T 3241-2010.

GB/T 3241-2010 does not provide any requirements or recommendations for considering measurement uncertainty in the evaluation of conformity to performance specifications.

Due to the lack of requirements or recommendations on measurement uncertainty, when the measured deviation from the design target is close to the limit of the allowable deviation, the determination of compliance with the specification becomes ambiguous. If compliance is determined based on whether the measured deviation exceeds the limit, then the octave and the end user of the fractional-octave band filter will be subject to the risk that the actual deviation from the design target exceeds the limit.

To eliminate ambiguity, the 29th Technical Committee of the International Electrotechnical Commission (IEC) determined at its 1996 meeting that in formulating standards, Measurement uncertainty should be taken into account when evaluating the performance of the system.

This document adopts the modified criteria for compliance with the specification. Compliance is confirmed when the following conditions are met simultaneously.

- a) the measured deviation from the design target does not exceed the applicable acceptance limit;
- b) The measurement uncertainty does not exceed the corresponding maximum permissible uncertainty.

The acceptance limits are similar to the design and manufacturing tolerance limits in GB/T 3241-2010.

The actual measurement uncertainty and the maximum allowable measurement uncertainty are determined based on a coverage probability of 95%, unless there is more specific information.

Otherwise, the acceptance limits and maximum allowable uncertainties specified in this document can be used to evaluate specific octave or fractional octave filters.