

ICS 13.180
CCS A25



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

GB/T 42395.1-2023

**Ergonomics - Sound quality limits and test methods for
household appliance noise - Part 1: Refrigerator**

人类工效学 家电噪声声品质限值和测试方法 第1部分：冰箱

Issued on: March 17, 2023

Implemented on: October 1, 2023

**Issued by: State Administration for Market Regulation;
Standardization Administration of the PRC**

Table of Contents

Foreword	3
Introduction	4
1 Scope	5
2 Normative references	5
3 Terms and definitions	5
4 Sound quality limit requirements for noise	6
5 Test methods	7

Foreword

This document was issued on 17 March 2023 by the State Administration for Market Regulation; Standardization Administration of the PRC and takes effect on 1 October 2023.

It is a GB/T standard: recommended rather than compulsory, but it is the text a Chinese reviewer applies when assessing a submission.

1 Scope

GB/T 42395.1-2023 covers the sound quality of household refrigerator noise - not how loud the appliance is, but how the noise it makes is received by the person living with it. Two refrigerators at the same measured level can be judged very differently: a steady low hum is tolerated where a tonal whine, a fluctuating compressor or a sudden click in a quiet flat at night is not, so a limit written in level alone leaves untouched the complaint that actually reaches the manufacturer. The document defines what sound quality means for this purpose, sets the limit requirements against those descriptors in clause 4, and gives the test methods in clause 5: the refrigerator is measured in a hemi-anechoic room whose background noise meets the requirement of GB/T 6882-2016, under fixed acoustic and operating conditions so that results from different laboratories can be set against each other. It is Part 1 of the series on household appliance noise, and it takes refrigerators. Written for refrigerator manufacturers and their acoustics and product planning teams, for appliance testing laboratories, and for buyers who want a quietness claim that corresponds to what a household hears.

This document gives the sound quality limit requirements and test methods for refrigerator noise.

This document applies to household refrigerators.

This document does not apply to commercial refrigerators.

2 Normative references

The contents of the following documents, through normative references in this text, constitute indispensable provisions of this document. Among them, for dated references, only the edition corresponding to that date applies to this document. For undated references, the latest edition (including all amendments) applies to this document.

GB/T 4214.1-2017 Test method for noise of household and similar electrical appliances - General requirements

GB/T 6882-2016 Acoustics - Determination of sound power levels and sound energy levels of noise sources using sound pressure - Precision methods for anechoic rooms and hemi-anechoic rooms

ISO 532-2:2017 Acoustics - Methods for calculating loudness - Part 2: Moore-Glasberg method

3 Terms and definitions

The following terms and definitions apply to this document.

3.1

Sound quality

The suitability of sound for a specific technical goal or task connotation.

3.2

Loudness

Note: If the refrigerator does not have the defrosting function, it only needs to meet the condition

a).

5 Test methods

5.1 Test acoustic environment

The sound quality test of refrigerator noise shall be carried out in a hemi-anechoic room.

The background noise shall meet the requirements in 5.2 of GB/T 6882-2016.

5.2 Measuring instruments

Measuring instruments shall comply with the requirements in Clause 5 of GB/T 4214.1-2017.

5.3 Test conditions

5.3.1 Sample machine location and installation

Place the sample machine at the geometric center of the ground of the test site; adjust the foot to the lowest level of noise generation. Movable parts (such as food racks or ice trays) in the sample machine need to be fastened in an appropriate way, to avoid additional noise caused by excited vibrations.

An acoustic reflector shall be provided at the rear of the sample machine. The acoustic reflector shall meet the following requirements:

- The reflector is (10 ± 5) mm from the rear of the sample machine; is perpendicular to the ground; see Figure 1;
- The size of the reflector shall be larger than the projected size of the rear of the sample machine;
- The sound absorption coefficient of the reflector shall be less than 0.06.

5.3.2 Operating conditions

The sample machine shall be run with no load. All doors (or covers) shall be closed.

The thermostat shall be set as follows:

- Refrigerator: 5 °C;
- Freezer: -22 °C;
- Other function rooms: System default temperature.

5.3.3 Environmental conditions

The climatic conditions of the test environment shall meet the following requirements:

- Temperature: 20 °C~26 °C;
- Relative humidity: 30%~70%;
- Atmospheric pressure: 86 kPa~106 kPa.

5.3.4 Test conditions

5.3.4.1 Daily operation mode

After the sample machine is equipped according to the requirements of 5.3.1 and 5.3.2 AND operated for at least 16 h, it is tested in a stable operation period. During the test, if the temperature in the refrigerator reaches the temperature set by the thermostat AND the machine stops, the test shall be interrupted at this time. After the compressor restarts for 2 min, the test shall be carried out again.

Note: If the sample machine is equipped with a user-operable controller, within a certain period of

time, it can control the temperature change of the sample machine; such as the switch of functions such as quick cooling, quick freezing, and holidays; so it is in an off state.

5.3.4.2 Defrost mode

After the sample machine is equipped according to the preset conditions of use AND has been running for at least 16 h, turn on the defrost mode. During the recovery period after defrosting, start the test 5 min after the compressor is started.

5.3.5 Microphone position

Place the microphone at the center of the front of the sample machine; 500 mm from the refrigerator and 1500 mm from the ground; as shown in Figure 1.

.....