

JJF

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

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**Calibration Specification for Environmental Testing Equipment
for Temperature and Humidity Parameters
(English Translation)**

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Table of Contents

Introduction...	5
1 Scope...	7
2 Normative references...	7
3 Terms...	7
4 Overview...	9
5 Metrological characteristics...	9
6 Calibration conditions...	10
6.1 Environmental conditions...	10
6.2 Load conditions...	10
6.3 Measurement standards and other equipment...	10
7 Calibration items and calibration methods...	11
7.1 Calibration items...	11
7.2 Calibration methods...	12
7.3 Data processing...	14
8 Expression of calibration results...	17
9 Interval between recalibration...	18

1 Scope

This Specification applies to the calibration of temperature and humidity parameters for environmental testing equipment - such as drying ovens, incubators, climatic aging chambers, mold test chambers, salt spray test chambers, corrosive gas test chambers, high/low-temperature test chambers, alternating damp-heat test chambers, and constant temperature and humidity chambers - operating within a temperature range of -80°C~

300°C and a humidity range of 10% RH~100% RH.

Temperature and humidity parameters of other types of environmental testing equipment may also be calibrated with reference to this Specification.

2 Normative references

This Rules refers to the following documents.

JJF 1001-2011, General Terms in Metrology and Their Definitions

GB/T 5170.1-2016, Inspection methods for environmental testing equipment for electric and

electronic products -- Part 1.General

GB/T 5170.2-2017, Inspection methods for environmental testing equipment -- Part

2.Temperature testing equipment

GB/T 5170.5-2016, Inspection methods for environmental testing equipment for electric and electronic products -- Part 5.Damp heat testing equipment

For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies to this

Specification.

3 Terms

The terms and definitions defined in JJF 1001-2011 and GB/T 5170.1-2016 apply to this Specification.

3.1

environmental testing equipment

Equipment used to conduct environmental testing on products by simulating one or more environmental conditions.

3.2

working space

The portion of the space within environmental testing equipment where specified temperature and relative humidity conditions are maintained within defined tolerance limits.

3.3

steady state

The state in which the variations in temperature and relative humidity at any point within the working space of environmental testing equipment meet the equipment's own performance specifications.

3.4

temperature deviation

For environmental testing equipment in a steady state, temperature deviation refers to the upper and lower deviations of the highest and lowest temperatures actually measured at various points within the working space over a specified period relative to the set temperature. Temperature deviation comprises both upper temperature deviation and lower temperature deviation.

[GB/T 5170.1-2016, Definition 3.2.4]

3.5

relative humidity deviation

For environmental testing equipment in a steady state, the relative humidity deviation refers to the upper and lower deviations of the highest and lowest relative humidity values - measured at various points within the working space over a specified period - relative to the set relative humidity. Relative humidity deviation comprises both the upper relative humidity deviation and the lower relative humidity deviation.

[GB/T 5170.1-2016, Definition 3.2.5]

3.6

temperature fluctuation

The variation in temperature over time at any point within the working space of environmental testing equipment, under steady-state conditions and within specified time intervals.

3.7

relative humidity fluctuation

The variation of relative humidity over time at any point within the working space of environmental testing equipment, under steady-state conditions and within specified time intervals.

3.8

temperature uniformity

The maximum temperature difference between any two points in the working space of environmental testing equipment at any given instant under steady-state conditions.

[GB/T 5170.1-2016, Definition 3.2.8]

3.9

relative humidity uniformity

The maximum difference in relative humidity between any two points in the working space of environmental testing equipment at any given instant under steady-state conditions.

[GB/T 5170.1-2016, Definition 3.2.9]

4 Overview

Environmental testing equipment is a collective term for all testing apparatus designed to simulate one or more environmental conditions. Based on the categories of environmental factors simulated, such equipment is classified into types including climatic, mechanical, electromagnetic, and combined environmental testing equipment.

It is primarily used in sectors such as electrical and electronics, chemicals, and healthcare for applications including research testing, product qualification (type) testing, production inspection, product acceptance testing, safety and reliability testing, as well as failure analysis and verification.

5 Metrological characteristics

Common technical requirements for temperature deviation, temperature fluctuation, temperature uniformity, relative humidity deviation, relative humidity fluctuation, and relative humidity uniformity of environmental testing equipment are shown in Table 1.

Table 1 -- Technical requirements for temperature and humidity in environmental testing equipment

6.1 Environmental conditions

Temperature. 15°C~35°C;

Humidity. $\leq 85\%$ RH;

Atmospheric pressure. 80 kPa~106 kPa.

The area surrounding the environmental testing equipment shall be free from strong vibrations and corrosive gases. The influence of other cold or heat sources shall be avoided. In actual operation, environmental conditions must also meet the requirements for the proper use of measurement standards.

6.2 Load conditions

Calibration is generally performed under no-load conditions; however, it can also be carried out under load conditions depending on user requirements, provided that the load conditions are specified.

6.3.1 Temperature measurement standards

For temperature measurement standards, multi-channel temperature display instruments or multi-channel temperature measurement devices shall generally be selected. Four-wire platinum resistance thermometers are the preferred choice for sensors. There shall be no fewer than nine sensors, and the setup must meet the requirements of the calibration work.

6.3.2 Humidity measurement standards

For humidity measurement standards, multi-channel temperature and humidity display instruments or multi-channel temperature and humidity measurement devices shall generally be selected. The number of sensors must be at least three and sufficient to meet calibration requirements.