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GB/T 11606-2007

Replace GB/T 11606.1~11606.17-1989

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**Methods of environmental test for analytical  
instruments**

**分析仪器环境试验方法**

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## Foreword

This standard replaces the general principles of *Methods of Environmental Test for Analytical Instruments* and the following contents: power supply frequency and voltage test, low temperature test, high temperature test, temperature variation test, constant damp heat test, cyclic damp heat test, vibration test, magnetic field test, air pressure test, sand-and-dust test, mould growth test, salt spray test, low temperature storage test, high temperature storage test, fall test and collision test.

The major changes between this standard and GB/T 11606.1~11606.17-1989 are as follows:

---Change the “test” in original GB/T 11606 to “condition test”; change the “test methods” to “test procedure”.

---Change the “subject content and application range” in original GB/T 11606.1 to “scope”, cancel the original “not applicable” part; modify the related values specified in Table 1, such as the tolerance of temperature, relative humidity, vibration and power supply frequency, as well as transportation and storage.

---Modify the tolerance of power supply frequency in original GB/T 11606.2 to  $\pm 2\%$  of rated value; add “test procedure 2” – voltage and frequency combination.

---Change the title of Chapter 2 in original GB/T 11606.3~ 11606.8, GB/T 11606.14~ 11606.15 to “test group” and the content in table shall be consistent with the provision of general principles.

---Modify the “test duration” in original GB/T 11606.3~ 11606.4, cancel 1h gear, and add 8h and 16h gears (totally two gears); cancel the original Chapter 4, and the content of which is included into Chapter 3; modify “put the instrument into the test chamber (lab) and power on, ...” in original 5.3 to “bring the pretreated instrument, under the condition of power off...”

---Change the 2h, 4h, and 8h of “test duration” in original GB/T 11606.5 to 1h, 2h, and 3h.

--Change the “resistivity” of 3.14 in original GB/T 11606.6 to conductivity, add brackets for resistivity and locate it after conductivity; add “the instrument shall not receive the direct radiation from the heating elements in test chamber (lab)” and requirements to the capacity of test chamber (lab).

--- Add 3.1.2, 3.1.3, 3.1.4 to original GB/T 11606.7; delete the original 3.1.6, add “the instrument shall not receive the direct radiation from the heating elements in test chamber (lab)” and also add the provision to recovery time, which shall generally be above 12h (or 24h).

---Add the requirements to test equipment in original GB/T 11606.8.

--Change “magnetic field strength” to “magnetic field strength requirements” in original GB/T 11606.9.

--- Change the content of 2.2 in original GB/T 11606.10 to be shown by “table”, modify the mmHg in brackets into mbar and then also increase the altitude; add “pretreatment” term; modify the start time of instrument during condition test into starting when the air pressure reaches the specified value; add “pressure variation test methods”.

---Adjust the test conditions of Chapter 2 in original GB/T 11606.11, and range these 3 conditions by procedure order; the test uses sand to wipe off Lc, which is the same with the material in original standard. Despite of different proportions, all the rest have been modified. The temperature and relative humidity of these 3 kinds of sand shall be consistent. The temperature and humidity of Lc have been changed. The temperature has been changed from the original  $55^{\circ}\text{C}\pm 2^{\circ}\text{C}$  to  $15^{\circ}\text{C}\sim 35^{\circ}\text{C}$  and the humidity have been changed from less than 50% to 46%~75%; as for the test duration, Lb has been adjusted only, which is divided into 3 gears including 6h, 12h and 24h. As for the requirements for test chamber (lab), different conditions shall be raised according to 3 different tests.

---Add methods applicable to evaluate the mould growth degree for components and parts under mould growth conditions in original GB/T 11606.12; add two strains including *paecilomyces varioti* and *penicillium funiculosum*; add necessary test and check for small samples in test procedures; cancel the provision to sample and mould growth rate

assessment in 4.3.4 and also cancel various medium cultures used for mould in Appendix A.

---Add “applicable sections” in original GB/T 11606.13; change the “ saline solution ” to “ test solution”; add “pretreatment”; considering the test for instrument, then add the content “ according to other recovery conditions and time specified by related standards” in recovery part.

---Add “requirements for test equipment” in original GB/T 11606.14~11606.15; add “ requirements for initial test”; modify “recovery conditions” and determine that “pick out the package after the temperature is in stable state, and recover to above 24h in normal environment conditions”.

---Modify Table 1 in original GB/T 11606.16, and the relative conditions have been included, cancel original 3.3.3; add “initial deflection” and “inclined and falling times”; add “condition test” and “the information shall be given by relative standards”.

---Modify the “test level” in original GB/T 11606.17 to “severity”.

This standard is put forward by China Machinery Industry Federation.

This standard is centralized management by technical sub-committee for analytical instruments subordinate to National Industrial Process Measurement and Control Technical Committee for Standardization.

The Drafting Organizations of this standard include: Beijing Analytical Instruments Institute, Beijing Beifen-Ruili Analytical Instrument (Group) Co., Ltd, INESA Scientific Instrument Co., Ltd, Analytical Instruments Central Factory, INESA Scientific Instrument Co., Ltd Rex Instrument Factory, Chongqing Chuanyi No.9 Factory, Nanjing Analytical Instruments Co., Ltd and Chengdu Instruments Factory.

Major drafters of this standard include; Zhang Xinyi, Ma Yajuan, Liu Peihua, Zhang Haibo, Wang Qiaomei, Hu Tibao, Zheng Wenping and Yu Yonghui.

The release condition for previous versions of the standards replaced by this standard is:

--- GB/T 11606.1~ 11606.17-1989.

# Methods of environmental test for analytical instruments

## 1 Scope

This standard specifies the general principles and means of methods of environmental test for analytical instruments.

This standard is applicable to the choices of the needed environmental test for all the analytical instruments (hereinafter referred to as instrument) in order to ensure product quality and set product standards during the research, development, design, manufacture and sales.

## 2 General Principles

### 2.1 Applicability

These general principles are applicable to all the instruments, which stipulate environmental conditions grouping, reference working condition, test items, the selection of environmental conditions grouping, test procedures and sequence.

### 2.2 Environmental Conditions Grouping

The instruments are divided into the following 4 basic groups according to using and transportation conditions. (See Table 1 for details):

**Group I:** The temperature and humidity of environment are controlled within the specified scope, which generally refer to the controllable environment with air conditioning equipment. This group is applicable to precision instruments.

**Group II:** Only the temperature of environment is controlled within the specified scope, which generally refers to indoor environment with thermal insulation, heating and ventilation conditions. This group is applicable to instruments for labs.

**Group III:** Both the temperature and humidity of environment are not controlled, which generally refers to indoor environment without thermal insulation, heating and ventilation

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