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Vacuum technology -- Valves -- Leak test

真空技术 阀门 漏率测试

(English Translation)

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Foreword

This standard was drafted in accordance with the rules given in GB/T 1.1-2009.

This standard uses the translation method identical with ISO 27895:2009 "Vacuum Technology Valve Leakage Rate Test." the documents of our country that are consistent with the corresponding international documents in the normative references in this standard are as follows.

--- GB/T 18193-2000 Vacuum technology helium mass spectrometer leak detector calibration (ISO 3530:1979, IDT).

This standard is proposed by the China Machinery Industry Federation.

This standard by the National Vacuum Technology Standardization Technical Committee (SAC/TC18) centralized.

This standard was drafted unit. Beijing Satellite Environmental Engineering Institute, Hefei Zhihai Optoelectronics Technology Co., Ltd. Anhui Anhui Science and Technology Co., Ltd.

Company, Shanghai Vacuum Valve Manufacturing Co., Ltd., North Sichuan Vacuum Technology (Beijing) Co., Ltd., Hunan Yufeng Vacuum Science and Technology Co., Ltd., North Jinglang Wo Technology Co., Ltd., Weihai Mitutoyo Vacuum Technology Co., Ltd., Shenyang Institute of Vacuum Technology.

Introduction

Vacuum valves are the most commonly used components in vacuum systems and valve manufacturers provide technical parameters based on their own testing methods.

According to these technical parameters choose the valve. Valve seal leakage rate is one of the most basic technical parameters, but different test methods may lead to test results appear a big difference, such as the valve leak rate from the internal gas leak to leak test during the leak rate is constantly changing, so the leak test time the choice of the test results have a great impact, but until this standard was released, there is still no one used to regulate the vacuum valve leak rate test method the national standard There are three main forms of leakage.

- a) Real leaks, eg gas leaks through larger cracks and holes;
- b) leakage, in the system, due to the release of gas or vapor caused by increased pressure;
- c) leakage, gas from the side of the density through the solid structure material exists on the diameter of the pores can be compared with the atomic density to small One side of the infiltration, diffusion, through the process, for example, through the infiltration of rubber materials.

Spurious does not apply to the method specified in this standard test. Therefore, when the valve design and selection of valve materials, it is appropriate to leaking air Insurance to a minimum.

Vacuum technology valve leak rate test

1 Scope

This standard specifies the vacuum system used to control air flow or vacuum pressure vacuum valve leak rate test method. Apply right after closing Leakage gas leakage rate of less than $1 \times 10^{-5} \text{Pa} \cdot \text{m}^3/\text{s}$ leakage rate leak test, but also for the body's leakage rate test can be used for the vacuum valve test basis.

This standard applies to the vacuum valve allows the operating pressure range, pressure, baking temperature, operating temperature and life cycle and other provisions of the technical regulations Leakage rate test of the entire work piece under the above conditions, the test leak rate of the valve below the nominal leakage rate given by the manufacturer.

Note 1: Affected by the surface accuracy of the valve installation surface of the vacuum equipment

installed, the test leak rate and the separate test data after installing the large and valveless vacuum valve. There may be differences.

NOTE 2 The test leak rate obtained in accordance with this standard is the result of a separate test of individual vacuum valve personnel, possibly in conjunction with the number of valves installed on the vacuum equipment. There are differences.

2 Normative references

The following documents for the application of this document are essential. For dated references, only the dated version applies to this article. For undated references, the latest edition (including all amendments) applies to this document.

ISO 3530 Vacuum Technology Vacuum technology-Mass-spectrometer-type leak detector calibration

3 Terms and definitions

The following terms and definitions apply to this document.

Leak rate

< Vacuum Valve Technology > Under specified conditions, through the valve body, seat or sealing material on the cracks, holes or gaps and other parts of the leak body flow.

Notes 1. Rewrite ISO 3530:1979, definition 2.5.1.

Note 2: Leak rate is given in pascals per second.

Note 3: The leak rate of tracer gas can be measured with mass spectrometry leak detectors. The leak rate depends on the kind of gas, pressure difference and temperature.

Note 4: The definition of standard air leakage rate (3.2) and equivalent standard air leakage rate (3.3) is more detailed.

Standard air leakage standard air leak rate Under the standard conditions of inlet pressure of (100 ± 5) kPa, outlet pressure of less than 1 kPa and temperature of (23 ± 7) °C, the dew point is lower than Air at -25 °C flows through a hole, such as a slit or a small hole.

Notes 1. Rewrite ISO 3530:1979, definition 2.5.2.

Note 2: The standard status refers to ISO 3530:1979.

Equivalent standard air leakage equivalent air leak rate Molecular state, the standard air leakage rate of less than 10^{-7} Pa · m³/s leakage rate of thin-walled leaks.