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Calibration Specification for Vacuum Helium Leaks

真空氦漏孔校准规范

(English Translation)

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Introduction

JJF 1071-2010 "Rules for the Compilation of National Metrology and Calibration Specifications", JJF 1001-2011 "General Metrology Terms and Definition", JJF 1059.1-2012 "Evaluation and Expression of Measurement Uncertainty" and GB/T 3163-2007 "Vacuum Technology Terminology together constitute the basic series of documents formulated by this specification.

This specification refers to BSEN20486:2018 "Non-destructive testing leak detection gas reference leak calibration" (NonDestructiveTesting-LeakTesting-CalibrationofReferenceLeaksforGases), ASTME908:1998 (2012) "Standard Practice for Calibration Gas Reference Leaks" (Standard Practicefor CalibratingGaseousReferenceLeaks) was formulated, using the basic principles, and specific methods and technical indicators have been refined, supplemented and modified.

Compared with JJG793-1992, except for editorial changes, the main technical changes of this specification are as follows.

---The scope of application is expanded from standard leaks to all vacuum helium leaks, and the measurement range is extended downward by two numbers Magnitude

---The standard device adds a flowmeter method calibration device and a relative comparison method calibration device;

---The calibration method adds the flowmeter method and the relative comparison method;

--- Increase the uncertainty evaluation method and the conversion method of mass flow and molar flow.

The release status of previous versions of this specification.

---JJG793-1992.

Calibration specification for vacuum helium leak

1 Scope

This specification applies to vacuum helium leaks with a leak rate value in the range of (1x10-10~1x10-4) Pa·m3/s calibration.

2 Reference documents this specification refers to the following documents.

JJF 1001-2011 General measurement terms and definitions JJF 1008-2008 Pressure measurement terms and definitions GB/T 3163-2007 Vacuum technical terms GB/T 3164-2007 Graphical symbols for vacuum technology BSEN20486:2018 Non-destructive testing leak detection gas reference leak calibration (NonDestructive Testing-LeakTesting-CalibrationofReferenceLeaksforGases) ASTME908:1998 (2012)

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Standard Practice for Calibration Gas Reference Leaks (Standard Practice forCalibratingGaseousReferenceLeaks) for dated reference documents, only the dated version applies to this specification; for undated references the latest version (including all amendments) is applicable to this specification.

3 Terms and units of measurement

3.1 Term

3.1.1 Leak

When the pressure or concentration of the gas inside and outside the closed container is different, the gas can be leaked from one side of the wall Small holes, defects or gaps and penetration elements or leaks to the other side.

[JJF 1008-2008, definition 11.31]

3.1.2 Vacuumheliumleak Leaks calibrated and used under the condition that the outlet pressure is lower than 1kPa using helium as the tracer gas.

3.1.3 Conductanceleak it can be ideally regarded as a leak in a long capillary with one or more discrete channels.

[GB/T 3163-2007, definition 6.1.2]

3.1.4 Permeationleak the gas penetrates through a type of leak in the membrane (thin wall).

3.1.5 Leakrate

Under specified conditions, the flow rate of a specific gas through the leak.

[GB/T 3163-2007, definition 6.1.9]

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