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

GB/T 20485.31-2011

Replacing GB/T 13823.8-1994

**Methods for the calibration of vibration and shock transducers
-- Part 31: Testing of transverse vibration sensitivity**

振动与冲击传感器的校准方法 第31部分：横向振动灵敏度测试

(English Translation)

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Foreword

GB/T 20485 "calibration of vibration and shock sensor" composed by the following categories.

- Category 1. Basic Concepts;
- Category 2. Absolute calibration methods (such as. vibration calibration by laser interferometry, laser interferometry impact absolute calibration);
- Class 3. calibration by comparison (eg. Vibration calibration by comparison, the impact of comparison calibration);
- Category 4. Environmental analog calibration (eg. magnetic sensitivity, sound sensitivity, the base strain sensitivity, transverse vibration sensitivity, etc.).

This part belongs to category 4, the GB/T 20485 of Part 31.

This section drafted in accordance with GB/T 1.1-2009 given rules.

This Part replaces GB/T 13823.8-1994. This portion of the GB/T 13823.8-1994 The main difference is.

--- GB/T 13823.8-1994 only a method is proposed, and this section presents three different test methods. single-axis vibration excitation Reed Act, two-axis vibration excitation method and triaxial vibration excitation.

This section uses the translation method identical with ISO 16063-31:2009 calibration method "of vibration and shock transducers - Part 31. Horizontal Vibration sensitivity test "(in English).

This part of the National mechanical vibration, shock and condition monitoring Standardization Technical Committee (SAC/TC53) and focal points.

This section drafted by. China Testing Technology Research Institute, China Aviation Industry Corporation Beijing Great Wall Measurement and Testing Technology Research Institute, Shaanxi Western Province Institute of Metrology, Jiangsu United Electronic

Technology Co., Aerospace Technology Group Corporation No. 704 Institute.

1 Scope

This section GB/T 20485 specifies the equipment and method of transverse vibration sensitivity testing. This method is suitable for straight-line speed, and Accelerometer.

This section gives a vibration sensor in the plane perpendicular to the direction of the sensitive axis geometry generated sensitivity (see Appendix A) test Methods and procedures. Due to lateral vibration sensitivity varies with the size and orientation changes, and therefore there are a variety of methods to determine its maximum value. horizontal the sensitivity of the sensor geometry axis maximum sensitivity of the ratio of the maximum transverse sensitivity, while at this time also is the largest angle sensor Transverse sensitivity azimuth.

Methods and techniques of this section gives the realization of a sensor installed in the test process, to avoid repetition due to the sensor installation the introduction of large measurement uncertainty. This section presents three different test methods. single-axis vibration excitation method, and tri-axis vibration excitation method Shaft vibration excitation. Simultaneous excitation triaxial vibration measurements and geometric sensitive direction transverse sensitivity, thus simulating the real environment sensor Case by multi-axial vibration.

NOTE: In the bending beam design which accelerometer transverse sensitivity measured in the direction of the sensitive axis geometry no vibration to the accelerometers and vibration as There are significant differences when used in sensitive geometry axis accelerometer (for example, when the measured vibration due to bending beam deflection).

This section applies to the frequency range of 1Hz ~ 5kHz, the dynamic range of $1\text{m/s}^2 \sim 1000\text{m/s}^2$ (depending on the frequency dependent) and $1\text{mm/s} \sim 1\text{m/s}$ (depending on the frequency dependent). Although the system of the above mentioned ranges can perform these measurements, but each specific system System usually has its limitations, the actual use of much smaller.

The method given in this section are reference sensors and laser interferometer transverse sensitivity of the comparator output is obtained.

Transverse sensitivity of the expanded uncertainty is given in this section was 0.1% (coverage factor $k = 2$), if the transverse sensitivity of the sensor the percentage sensitivity to express uncertainty will be smaller.

2 Normative references

The following documents for the application of this document is essential. For dated references, only the dated version suitable for use herein Member. For undated references,

the latest edition (including any amendments) applies to this document.

GB/T 20485.1-2008 calibration of vibration and shock transducers - Part 1. Basic Concepts
(ISO 16063-1:1998, IDT) ISO 266 Acoustics common frequency
(Acoustics-Preferred frequencies)

3 Measurement Uncertainty

Transverse sensitivity to 1%, for example, expanded uncertainty of 0.1% (see Chapter 1) refers to the measured value should be between 1.1% and 0.9%.

We hope that all use the GB/T 20485 users evaluate measurement uncertainty in accordance with GB/T 20485.1-2008 APPENDIX A Report, containing the expanded uncertainty factor of 2 or take confidence probability is 95%. Laboratory or the end user's responsibility to ensure the expanded uncertainty of report data is credible.