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**INDUSTRY STANDARD OF THE
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Replacing JJG 66-1990

**Calibration Specification for High Frequency Capacity
Dissipation Standards
(English Translation)**

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Introduction

This specification is prepared in accordance with JJF 1071-2010 "Rules for the Preparation of National Metrology Calibration Specifications", JJF 1001 Measurement Terms and Definitions, JJF 1059.1-2012 "Measurement Uncertainty Evaluation and Representation" together constitute the support of this regulation the basic series of specifications for the revision work.

This specification is a revision of JJG66-1990.

Compared with JJG66-1990, in addition to editorial changes, the main revisions of this specification are.

--- Added introduction.

--- Added related terminology (see 2).

--- Revised the environmental conditions in the calibration conditions, including adjusting the range of ambient temperature and ambient relative humidity conditions, the atmospheric pressure condition was removed (see 5.1).

--- Revised measurement standards and other equipment (see 5.2).

--- Re-programmed the calibration process, supplemented with the calibration block diagram and other content (see 6.3~6.5).

--- Revised the calibration original record and the reference format of the certificate page (see Appendix A and Appendix B).

--- Added an example of measurement uncertainty assessment (see Appendix C).

--- Added the relevant principles and formula derivation process (see Appendix D).

The previous versions of this specification were released as follows.

---JJG66-1990.

High Frequency Capacitance Loss Standard Calibration Specification

1 Scope

This specification applies to the calibration of high frequency capacitance loss standard connected at both ends, not applicable to four-terminal high frequency capacitance loss.

Consumable calibration of the standard.

2 terms

2.1 Capacitance loss capacitydissipation Also known as the capacitance loss factor, loss value, is the loss tangent of the capacitor, using $\tan \delta$ or symbol D Show, dimensionless.

2.2 Quality factor Characterize an energy storage device (such as inductors, capacitors, etc.), energy stored in the resonant circuit, and energy loss per cycle A quality indicator of the ratio of quantities. The quality factor of the reactive component is equal to the ratio of its reactance to its equivalent series resistance.

The quality factor of the resonant tank is the ratio of the characteristic impedance of the resonant tank to the loop resistance, which is represented by the symbol Q, dimension.

3 Overview

The high frequency capacitance loss standard is a working standard for verifying or calibrating a capacitive dielectric loss meter.

The high frequency capacitance loss standard connected at both ends is made up of low loss fixed air medium (or mica medium) capacitors the high-frequency resistors are connected in series with a shield cover, and the equivalent circuit and basic parameters are shown in Figure 1.

Figure 1 Capacitor loss standard equivalent circuit connected at both ends

The capacitor inherent loss value $\tan \delta_1$ when the high-frequency resistor is not connected in series is the initial loss value of the high-frequency capacitance loss etalon.

After the series high-frequency resistor R, the loss value $\tan \delta_2$ of the high-frequency capacitor loss standard is called a large loss value.

(1) Calculate.

$\tan \delta_2 = \tan \delta_1 \omega C R$ (1) in the formula.

ω ---working angle frequency, rad/s;

C---capacitance value of high frequency capacitance loss standard, F;

R---The resistance value of the high frequency capacitance loss standard, ohm.

4 Measurement characteristics

4.1 Initial loss value $\tan \delta_1$