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JIS R 1637 : 1998

**Test method for resistivity of conduc-
tive fine ceramic thin films with a
four-point probe array**

ICS 81.060.01

Descriptors : ceramics, special ceramics, hardness, strength of materials, chemical elements and inorganic compounds, non-metals, electrical resistance, resistance measurement

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Foreword

This translation has been made based on the original Japanese Industrial Standard established by the Minister of International Trade and Industry through deliberations at Japanese Industrial Standards Committee in accordance with the Industrial Standardization Law.

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Test method for resistivity of conductive fine ceramic thin films with a four-point probe array

1 Scope This Japanese Industrial Standard specifies the test method for resistivity of the conductive fine ceramic thin films with a four-point array. The applicable range of the resistivity shall be $1 \times 10^{-5} \Omega \cdot \text{cm}$ to $2 \times 10^2 \Omega \cdot \text{cm}$, and the film thickness shall be maximum 500 μm .

Remarks : This Standard can be applied to a case where the fine ceramic thin film is covered on the insulation material, and a case where the thickness of the fine ceramic film can be measured or the nominal value of the film is known, but can not be applied to the case where the thickness of the fine ceramic film is not known.

2 Normative references The following standards contain provisions which, through reference in this Standard, constitute provisions of this Standard. The most recent editions of the standards indicated below shall be applied.

- JIS B 0651 *Surface texture—Instruments for the assessment of surface texture—Profile method*
- JIS R 1600 *Glossary of terms relating to fine ceramics*
- JIS R 1636 *Test method for thickness of fine ceramic thin films—Film thickness by contact probe profilometer*
- JIS Z 8401 *Rules for rounding off of numerical values*

3 Definitions For the main terms used in this Standard the definitions in JIS R 1600 apply, and the rest of the terms are as follows.

- a) **correction factor** The factor to correct the resistance measured by the four-point probe array, which is the dimensionless numeral to be determined by the shape and dimensions of the sample, and the position of the probe.

4 Test environment The test shall, in principle, be carried out under the environment which is sufficiently and electromagnetically shielded and free from any mechanical vibration at the temperature of $(23 \pm 2) ^\circ\text{C}$ and the relative humidity of $(50 \pm 5) \%$. The sample shall be left under the test environment for minimum 30 minutes, and tested after the temperature reaches the constant value.

5 Apparatus and appliance

5.1 Test apparatus The test apparatus comprises the constant current source, the potentiometer, the probe, and the change-over switch as indicated in Fig. 1.