INTERNATIONAL STANDARD

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Superconductivity –

Part 4: Residual resistance ratio measurement – Residual resistance ratio of Nb-Ti composite superconductors

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International Standard IEC 61788-4 has been prepared by IEC technical committee 90: Superconductivity.

This second edition cancels and replaces the first edition published in 2001. It constitutes a technical revision. The main revisions are the replacement of "accuracy" by "uncertainty" and a change in Figure 1, where the relationship between temperature and voltage is changed to the relationship between temperature and resistance.

The text of this standard is based on the following documents:

FDIS	Report on voting
90/203/FDIS	90/205/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts of the IEC 61788 series, published under the general title *Superconductivity,* can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

INTRODUCTION

Copper is used as a matrix material in multifilamentary superconductors and works as an electrical shunt when the superconductivity is interrupted. It also contributes to recovery of the superconductivity by conducting heat generated in the superconductor to the surrounding coolant. The cryogenic-temperature resistivity of copper is an important quantity, which influences the stability of the superconductor. The residual resistance ratio is defined as a ratio of the resistance of the superconductor at room temperature to that just above the superconducting transition.

In this International Standard, the test method of residual resistance ratio of Nb-Ti composite superconductors is described. The curve method is employed for the measurement of the resistance just above the superconducting transition. Other methods are described in Clause A.4.

SUPERCONDUCTIVITY –

Part 4: Residual resistance ratio measurement – Residual resistance ratio of Nb-Ti composite superconductors

1 Scope

This part of IEC 61788 covers a test method for the determination of the residual resistance ratio (*RRR*) of a composite superconductor comprised of Nb-Ti filaments and Cu, Cu-Ni or Cu/Cu-Ni matrix. This method is intended for use with superconductors that have a monolithic structure with rectangular or round cross-section, *RRR* less than 350, and cross sectional area less than 3 mm^2. All measurements are done without an applied magnetic field.

The method described in the body of this standard is the “reference” method and optional acquisition methods are outlined in Clause A.4.

2 Normative references

The following referenced document is indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60050-815, *International Electrotechnical Vocabulary (IEV) – Part 815: Superconductivity*