

# INTERNATIONAL STANDARD

## NORME INTERNATIONALE



**Superconductivity –  
Part 4: Residual resistance ratio measurement – Residual resistance ratio of  
Nb-Ti and Nb<sub>3</sub>Sn composite superconductors**

**Supraconductivité –  
Partie 4: Mesurage du rapport de résistance résiduelle – Rapport de résistance  
résiduelle des composites supraconducteurs de Nb-Ti et de Nb<sub>3</sub>Sn**



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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

## SUPERCONDUCTIVITY –

**Part 4: Residual resistance ratio measurement –  
Residual resistance ratio of Nb-Ti and Nb<sub>3</sub>Sn  
composite superconductors**

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

This fifth edition cancels and replaces the fourth edition published in 2016. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) change in the suitable distance of voltage taps on the specimen for reliable measurement,
- b) new report on the result of the round robin test of the residual resistance ratio of Nb<sub>3</sub>Sn superconductors that proves the validity of the measurement method in this standard,
- c) revision of the confusing definitions of the copper ratio and copper fraction.

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

FDIS	Report on voting
90/448/FDIS	90/451/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.

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## INTRODUCTION

Copper, Cu/Cu-Ni or aluminium is used as matrix material in Ni-Ti and Nb<sub>3</sub>Sn composite 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 and AC losses 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.

This document specifies the test method for residual resistance ratio of Nb-Ti and Nb<sub>3</sub>Sn composite superconductors. The curve method is employed for the measurement of the resistance just above the superconducting transition. Other methods are described in Clause A.3.