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Superconductivity - Part 4: Residual resistance ratio measurement - Residual resistance ratio of Nb-Ti and Nb₃Sn composite superconductors (IEC 61788-4:2016)

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ICS:

17.220.20	Merjenje električnih in magnetnih veličin	Measurement of electrical and magnetic quantities
29.050	Superprevodnost in prevodni materiali	Superconductivity and conducting materials

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EUROPEAN STANDARD

EN 61788-4

NORME EUROPÉENNE

EUROPÄISCHE NORM

April 2016

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Superconductivity - Part 4: Residual resistance ratio
measurement - Residual resistance ratio of Nb-Ti and Nb₃Sn
composite superconductors
(IEC 61788-4:2016)

Supraconductivité - Partie 4: Mesurage du rapport de
résistance résiduelle - Rapport de résistance résiduelle des
composites supraconducteurs de Nb-Ti et de Nb₃Sn
(IEC 61788-4:2016)

Supraleitfähigkeit - Teil 4: Messung des
Restwiderstandsverhältnisses - Restwiderstandsverhältnis
von Nb-Ti und Nb₃Sn Verbundsupraleitern
(IEC 61788-4:2016)

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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

EN 61788-4:2016**European foreword**

The text of document 90/359/FDIS, future edition 4 of IEC 61788-4, prepared by IEC/TC 90 "Superconductivity" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61788-4:2016.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2016-11-23
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2019-02-23

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Annex ZA (normative)

Normative references to international publications with their corresponding European publications

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE 1 When an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60050-815	-	International Electrotechnical Vocabulary- (IEV) -- Part 815: Superconductivity		-

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IEC 61788-4

Edition 4.0 2016-01

INTERNATIONAL STANDARD

NORME INTERNATIONALE



Superconductivity – Residual resistance ratio measurement – Residual resistance ratio of Nb-Ti and Nb₃Sn composite superconductors

SIST EN 61788-4:2016

Supraconductivité – Mesurage du rapport de résistance résiduelle – Rapport de résistance résiduelle des composites supraconducteurs de Nb-Ti et de Nb₃Sn

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

SUPERCONDUCTIVITY –

**Part 4: Residual resistance ratio measurement –
Residual resistance ratio of Nb-Ti and Nb₃Sn
composite superconductors**

FOREWORD

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

This fourth edition cancels and replaces the third edition published in 2011. This edition constitutes a technical revision.

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

- a) the unification of similar test methods for residual resistance ratio (RRR) of Nb-Ti and Nb₃Sn composite superconductors, the latter of which is described in IEC 61788-11.

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

FDIS	Report on voting
90/359/FDIS	90/360/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 stability date indicated on the IEC website 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.

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INTRODUCTION

Copper, Cu/Cu-Ni or aluminium is used as matrix material in Nb-Ti and Nb₃Sn 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 part of IEC 61788 specifies the test method for residual resistance ratio of Nb-Ti and Nb₃Sn composite superconductors. The curve method is employed for the measurement of the resistance just above the superconducting transition. Other methods are described in A.3.

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