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

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

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April 2016

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English Version

**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 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
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Annex ZA (normative)

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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		-



INTERNATIONAL STANDARD

NORME INTERNATIONALE



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

**Supraconductivité –
Partie 4: Mesurage du rapport de résistance résiduelle – Rapport de résistance
résiduelle des composites supraconducteurs de Nb-Ti et de Nb₃Sn**



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IEC Central Office
 3, rue de Varembe
 CH-1211 Geneva 20
 Switzerland

Tel.: +41 22 919 02 11
 Fax: +41 22 919 03 00
info@iec.ch
www.iec.ch

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INTERNATIONAL STANDARD

NORME INTERNATIONALE



Superconductivity –

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

Supraconductivité –

Partie 4: Mesurage du rapport de résistance résiduelle – Rapport de résistance résiduelle des composites supraconducteurs de Nb-Ti et de Nb₃Sn

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CONTENTS

FOREWORD	4
INTRODUCTION	6
1 Scope	7
2 Normative references	7
3 Terms and definitions	7
4 Principle	8
5 Apparatus	8
5.1 Material of measurement mandrel or of measurement base plate	8
5.2 Diameter of the measurement mandrel and length of the measurement base plate	8
5.3 Cryostat for the resistance (R_2) measurement	9
6 Specimen preparation	9
7 Data acquisition and analysis	9
7.1 Resistance (R_1) at room temperature	9
7.2 Resistance (R_2 or R_2^*) just above the superconducting transition	9
7.2.1 Correction of strain effect	9
7.2.2 Data acquisition of cryogenic resistance	10
7.2.3 Optional acquisition methods	12
7.3 Correction on measured R_2^* of Nb-Ti composite superconductor for bending strain	12
7.4 Residual resistance ratio (RRR)	12
8 Uncertainty and stability of the test method	12
8.1 Temperature	12
8.2 Voltage measurement	12
8.3 Current	13
8.4 Dimension	13
9 Test report	13
9.1 RRR value	13
9.2 Specimen	13
9.3 Test conditions	14
9.3.1 Measurements of R_1 and R_2	14
9.3.2 Measurement of R_1	14
9.3.3 Measurement of R_2	14
Annex A (informative) Additional information relating to the measurement of RRR	15
A.1 Recommendation on specimen mounting orientation	15
A.2 Alternative methods for increasing temperature of specimen above superconducting transition temperature	15
A.3 Alternative measurement methods of R_2 or R_2^*	15
A.4 Bending strain dependency of RRR for Nb-Ti composite superconductor	18
A.5 Procedure of correction of bending strain effect	21
Annex B (informative) Uncertainty considerations	23
B.1 Overview	23
B.2 Definitions	23
B.3 Consideration of the uncertainty concept	23

B.4	Uncertainty evaluation example for TC 90 standards.....	25
Annex C (informative) Uncertainty evaluation in test method of RRR for Nb-Ti and Nb ₃ Sn composite superconductors		27
C.1	Evaluation of uncertainty.....	27
C.2	Summary of round robin test of RRR of a Nb-Ti composite superconductor.....	30
C.3	Reason for large COV value in the intercomparison test on Nb ₃ Sn composite superconductor	31
Bibliography.....		32
Figure 1 – Relationship between temperature and resistance.....		8
Figure 2 – Voltage versus temperature curves and definitions of each voltage		10
Figure A.1 – Definition of voltages		17
Figure A.2 – Bending strain dependency of RRR value for pure Cu matrix of Nb-Ti composite superconductors (comparison between measured values and calculated values).....		19
Figure A.3 – Bending strain dependency of RRR value for round Cu wires.....		19
Figure A.4 – Bending strain dependency of normalized RRR value for round Cu wires.....		20
Figure A.5 – Bending strain dependency of RRR value for rectangular Cu wires		20
Figure A.6 – Bending strain dependency of normalized RRR value for rectangular Cu wires.....		21
Figure C.1 – Distribution of observed r_{RRR} of Cu/Nb-Ti composite superconductor		31
Table A.1 – Minimum diameter of the measurement mandrel for round wires		21
Table A.2 – Minimum diameter of the measurement mandrel for rectangular wires.....		21
Table B.1 – Output signals from two nominally identical extensometers		24
Table B.2 – Mean values of two output signals		24
Table B.3 – Experimental standard deviations of two output signals.....		24
Table B.4 – Standard uncertainties of two output signals		25
Table B.5 – COV values of two output signals.....		25
Table C.1 – Uncertainty of each measurement.....		30
Table C.2 – Obtained values of R_1 , R_2 and r_{RRR} for three Nb ₃ Sn samples		31

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.

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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.

SUPERCONDUCTIVITY –

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

1 Scope

This part of IEC 61788 specifies a test method for the determination of the residual resistance ratio (RRR) of Nb-Ti and Nb₃Sn composite superconductors with Cu, Cu-Ni, Cu/Cu-Ni and Al matrix. This method is intended for use with superconductor specimens that have a monolithic structure with rectangular or round cross-section, RRR value less than 350, and cross-sectional area less than 3 mm². In the case of Nb₃Sn, the specimens have received a reaction heat-treatment.

2 Normative references

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IEC 60050-815, *International Electrotechnical Vocabulary – Part 815: Superconductivity* (available at: www.electropedia.org)

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