SLOVENSKI STANDARD
SIST EN 61788-5:2014

01-maj-2014

Nadomešča:
SIST EN 61788-5:2002

Superprevodnost - 5. del: Matrika za merjenje superprevodniškega volumenskega razmerja - Razmerje med bakrom in superprevodniškim volumenskim razmerjem superprevodnih žic iz kompozita Cu/Nb-Ti (IEC 61788-5:2013)

Superconductivity - Part 5: Matrix to superconductor volume ratio measurement - Copper to superconductor volume ratio of Cu/Nb-Ti composite superconducting wires

Supraleitfähigkeit - Teil 5: Messung des Verhältnisses von Matrixvolumen zu Supraleitervolumen - Verhältnis von Kupfervolumen zu Supraleitervolumen von Cu/NbTi-Verbundsupraleitern

Supraconductivté - Partie 5 : Mesure du rapport volumique matrice/supraconducteur - Rapport volumique cuivre/supraconducteur des fils en composite supraconducteur Cu/Nb-Ti

Ta slovenski standard je istoveten z: **EN 61788-5:2013**

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

SIST EN 61788-5:2014 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 61788-5

September 2013

ICS 17.220.20; 29.050

Supersedes EN 61788-5:2001

English version

Superconductivity - Part 5: Matrix to superconductor volume ratio measurement - Copper to superconductor volume ratio of Cu/Nb-Ti composite superconducting wires (IEC 61788-5:2013)

Supraconductivité -
Partie 5 : Mesure du rapport volumique matrice/supraconducteur -
Rapport volumique cuivre/supraconducteur des fils en composite supraconducteur Cu/Nb-Ti
(CEI 61788-5:2013)

Supraleitfähigkeit -
Teil 5: Messung des Verhältnisses von Matrixvolumen zu Supraleitervolumen -
Verhältnis von Kupfervolumen zu Supraleitervolumen von Cu/Nb-Ti Verbundsupraleiterdrähten
(IEC 61788-5:2013)

This European Standard was approved by CENELEC on 2013-07-02. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

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CENELEC
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

Ref. No. EN 61788-5:2013 E

Foreword

The text of document 90/321/FDIS, future edition 2 of IEC 61788-5, prepared by IEC/TC 90 "Superconductivity" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61788-5:2013.

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)	2014-04-02
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2016-07-02

This document supersedes EN 61788-5:2001.

EN 61788-5:2013 includes the following significant technical changes with respect to EN 61788-5:2001:

The main revisions are the addition of two new annexes, "Uncertainty considerations" (Annex E) and "Uncertainty evaluation in test method of copper to superconductor volume ratio of Cu/Nb-Ti composite superconductors" (Annex F).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

Endorsement notice

The text of the International Standard IEC 61788-5:2013 was approved by CENELEC as a European Standard without any modification.

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 When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

Publication	Year	Title	EN/HD	Year
IEC 60050-815	Series	International Electrotechnical Vocabulary (IEV)	-	-

IEC 61788-5

Edition 2.0 2013-05

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Superconductivity –
Part 5: Matrix to superconductor volume ratio measurement – Copper to superconductor volume ratio of Cu/Nb-Ti composite superconducting wires

Supraconductivité –
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SUPERCONDUCTIVITY –

Part 5: Matrix to superconductor volume ratio measurement – Copper to superconductor volume ratio of Cu/Nb-Ti composite superconducting wires

FOREWORD

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International Standard IEC 61788-5 has been prepared by IEC technical committee 90: Superconductivity.

This second edition cancels and replaces the first edition published in 2000. It constitutes a technical revision. The main revisions are the addition of two new annexes, "Uncertainty considerations" (Annex E) and "Uncertainty evaluation in test method of copper to superconductor volume ratio of Cu/Nb-Ti composite superconductors" (Annex F).

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

FDIS	Report on voting
90/321/FDIS	90/324/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 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.

INTRODUCTION

The copper to superconductor volume ratio of composite superconductors is used mainly to calculate the critical current density of superconducting wires. The test with the method given in this International Standard may be used to provide part of the information needed to determine the suitability of a specific superconductor. Moreover, this method is useful for quality control, acceptance or research testing if the precautions given in this standard are observed.

The test method given in this International Standard is based on the condition that the specific mass of Nb-Ti is known or the Nb-Ti alloy fraction is known and Annex B can be used to estimate the specific mass. If the specific mass of Nb-Ti is unknown and the Nb-Ti alloy fraction is unknown and/or the fraction of Nb barrier is unknown, another method to determine the copper to superconductor volume ratio of composite superconductors is described in Annex A.

SUPERCONDUCTIVITY –

Part 5: Matrix to superconductor volume ratio measurement – Copper to superconductor volume ratio of Cu/Nb-Ti composite superconducting wires

1 Scope

This part of IEC 61788 covers a test method for the determination of copper to superconductor volume ratio of Cu/Nb-Ti composite superconducting wires.

This test method and the alternate method in Annex A are intended for use with Cu/Nb-Ti composite superconducting wires with a cross-sectional area of 0,1 mm^2 to 3 mm^2, a diameter of the Nb-Ti filament(s) of 2 μm to 200 μm, and a copper to superconductor volume ratio of 0,5 or more.

The Cu/Nb-Ti composite test conductor discussed in this method has a monolithic structure with a round or rectangular cross-section. This test method is carried out by dissolving the copper with nitric acid. Deviations from this test method that are allowed for routine tests and other specific restrictions are given in this standard.

Cu/Nb-Ti composite superconducting wires beyond the limits in the cross-sectional area, the filament diameter and the copper to superconductor volume ratio could be measured with this present method with an anticipated reduction of uncertainty. Other, more specialized, specimen test geometries may be more appropriate for conductors beyond the limits and have been omitted from this present standard for simplicity and to retain low uncertainty.

The test method given in this standard is expected to apply to other superconducting composite wires after some appropriate modifications.

2 Normative references

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.

IEC 60050-815 (all parts), *International Electrotechnical Vocabulary* (available at <http://www.electropedia.org>)

3 Terms and definitions

For the purposes of this document, the definitions given in IEC 60050-815 as well as the following definition apply.

3.1
copper to superconductor volume ratio
ratio of the volume of the copper stabilizing material to the volume without copper consisting of Nb-Ti filaments and their Nb barriers