ICS 29.050 SLOVENSKÁ TECHNICKÁ NORMA Júl 2014

STN	**Supravodivosť. Časť 18: Meranie mechanických vlastností. Skúška ťahom kompozitných supravodičov Bi-2223 a Bi-2212 s plášťom zo striebra a/alebo striebornej zliatiny pri teplote prostredia.**	**STN EN 61788-18** 34 5685

Superconductivity Part 18: Mechanical properties measurement - Room temperature tensile test of Ag- and/or Ag alloy-sheathed Bi-2223 and Bi-2212 composite superconductors

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

Obsahuje: EN 61788-18:2013, IEC 61788-18:2013

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 61788-18

December 2013

ICS 29.050

English version

Superconductivity - Part 18: Mechanical properties measurement - Room temperature tensile test of Ag- and/or Ag alloy-sheathed Bi-2223 and Bi-2212 composite superconductors

(IEC 61788-18:2013)

Supraconductivité -
Partie 18: Mesure des propriétés mécaniques -
Essai de traction à température ambiante des supraconducteurs composites Bi-2223 et Bi-2212 avec gaine Ag et/ou en alliage d'Ag
(CEI 61788-18:2013)

Supraleitfähigkeit -
Teil 18: Messung der mechanischen Eigenschaften -
Zugversuch von Ag und/oder Ag-Legierung ummantelten Bi-2223 und Bi-2212 Verbundsupraleitern bei Raumtemperatur
(IEC 61788-18:2013)

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 61788-18:2013 E

Foreword

The text of document 90/326/FDIS, future edition 1 of IEC 61788-18, prepared by IEC/TC 90 "Superconductivity" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61788-18:2013.

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)	2014-07-17
– latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2016-10-17

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Endorsement notice

The text of the International Standard IEC 61788-18:2013 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 61788-6	NOTE	Harmonized as EN 61788-6.
ISO 3611:2010	NOTE	Harmonized as EN ISO 3611:2010 (not modified).

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

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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	series	International Electrotechnical Vocabulary	-	-
ISO 376	-	Metallic materials - Calibration of force-proving instruments used for the verification of uniaxial testing machines	EN ISO 376	-
ISO 6892-1	-	Metallic materials - Tensile testing Part 1: Method of test at room temperature	EN ISO 6892-1	-
ISO 7500-1	-	Metallic materials - Verification of static uniaxial testing machines Part 1: Tension/compression testing machines - Verification and calibration of the force-measuring system	EN ISO 7500-1	-
ISO 9513	-	Metallic materials - Calibration of extensometer systems used in uniaxial testing	EN ISO 9513	-

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INTERNATIONAL STANDARD

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IEC 61788-18:2013

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FOREWORD

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International Standard IEC 61788-18 has been prepared by IEC technical committee 90: Superconductivity.

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

FDIS	Report on voting
90/326/FDIS	90/327/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

Several types of composite superconductors have now been commercialised. Especially, high temperature superconductors such as Ag- and/or Ag alloy-sheathed Bi-2223 (Ag/Bi-2223) and Ag- and/or Ag alloy-sheathed Bi-2212 (Ag/Bi-2212) wires are now manufactured in industrial scale. Commercial composite superconductors have a high current density and a small cross-sectional area. The major applications of composite superconductors are to build electrical power devices and superconducting magnets. While the magnet is being manufactured, complicated stresses/strains are applied to its windings and, while it is being energized, a large electromagnetic force is applied to the superconducting wires because of its high current density. It is therefore indispensable to determine the mechanical properties of the superconductive wires from which the windings are made.

The Ag/Bi-2223 and Ag/Bi-2212 superconductive composite wires fabricated by the powder-in -tube method are composed of a number of oxide filaments with silver and silver alloy as a stabilizer and supporter. In the case that the external reinforcement of Ag/Bi-2223 and Ag/Bi-2212 wires by using thin stainless or Cu alloy foils has been adopted in order to resist the large electromagnet force, this standard shall be also applied.

SUPERCONDUCTIVITY –

Part 18: Mechanical properties measurement – Room temperature tensile test of Ag- and/or Ag alloy-sheathed Bi-2223 and Bi-2212 composite superconductors

1 Scope

This International Standard specifies a test method detailing the tensile test procedures to be carried out on Ag/Bi-2223 and Ag/Bi-2212 superconductive composite wires at room temperature.

This test is used to measure the modulus of elasticity and to determine the 0,2 % proof strength.

When the 0,2 % proof strength could not be determined due to earlier failure, the stress level at apparent strains of 0,05 %, 0,1 %, 0,15 %, 0,2 %, 0,25 % with increment of 0,05 % is measured.

The values for elastic limit, fracture strength, percentage elongation after fracture and the fitted type of 0,2 % proof strength serve only as a reference (see Clauses A.4, A.5, A.6 and A.10).

The sample covered by this test procedure should have a round or rectangular cross-section with an area of 0,3 mm^2 to 2,0 mm^2 (corresponding to the tape-shaped wires with width of 2,0 mm to 5,0 mm and thickness of 0,16 mm to 0,4 mm).

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

ISO 376, *Metallic materials – Calibration of force-proving instruments used for the verification of uniaxial testing machines*

ISO 6892-1, *Metallic materials – Tensile testing – Part 1: Method of test at room temperature*

ISO 7500-1, *Metallic materials – Verification of static uniaxial testing machines – Part 1: Tension/compression testing machines – Verification and calibration of the force-measuring system*

ISO 9513, *Metallic materials – Calibration of extensometer systems used in uniaxial testing*