
Superprevodnost - 24. del: Meritve kritičnega toka - Obdržani kritični tok po dvojnem upogibu posrebrjenih Bi-2223 superprevodnih žic pri sobni temperaturi (IEC 61788-24:2018)

Superconductivity - Part 24: Critical current measurement - Retained critical current after double bending at room temperature of Ag-sheathed Bi-2223 superconducting wires (IEC 61788-24:2018)

Supraleitfähigkeit - Teil 24: Messung des kritischen Stroms - Verbleibender kritischer Strom nach Doppelbiegung bei Raumtemperatur in Ag-ummantelten Bi-2223 supraleitenden Drähten

Supraconductivité - Partie 24: Mesurage du courant critique - Courant critique retenu après double flexion à température ambiante des fils supraconducteurs Bi-2223 avec gaine Ag

Ta slovenski standard je istoveten z: EN IEC 61788-24:2018

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29.050	Superprevodnost in prevodni materiali	Superconductivity and conducting materials
29.060.10	Žice	Wires

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Superconductivity - Part 24: Critical current measurement -
Retained critical current after double bending at room
temperature of Ag-sheathed Bi-2223 superconducting wires
(IEC 61788-24:2018)

Supraconductivité - Partie 24: Mesurage du courant critique
- Courant critique retenu après double flexion à température
ambiante des fils supraconducteurs Bi-2223 avec gaine Ag
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Supraleitfähigkeit - Teil 24: Messung des kritischen Stroms
- Verbleibender kritischer Strom nach Doppelbiegung bei
Raumtemperatur in Ag-ummantelten Bi-2223
supraleitenden Drähten
(IEC 61788-24:2018)

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EN IEC 61788-24:2018 (E)**European foreword**

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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) 2019-04-23
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IEC 61788-3 NOTE Harmonized as EN 61788-3

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

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NOTE 1 Where 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	2015	International Electrotechnical Vocabulary - - Part 815: Superconductivity		-

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Superconductivity – Part 24: Critical current measurement – Retained critical current after double bending at room temperature of Ag-sheathed Bi-2223 superconducting wires

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

SUPERCONDUCTIVITY –

**Part 24: Critical current measurement –
Retained critical current after double bending at room
temperature of Ag-sheathed Bi-2223 superconducting wires**

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International Standard IEC 61788-24 has been prepared by IEC technical committee 90: Superconductivity:

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

FDIS	Report on voting
90/402/FDIS	90/406/RVD

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
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INTRODUCTION

In 1988, a new class of high critical temperature (T_c) copper oxide superconductors, Bi-Sr-Ca-Cu-O, was discovered. After nearly three decades, $(\text{Bi,Pb})_2\text{Sr}_2\text{Ca}_2\text{Cu}_3\text{O}_x$ (Bi-2223) is now being utilized as a commercial high- T_c superconducting wire.

Superconducting wires are often subjected to bending deformation during production and application, e.g. during wire processing, magnet construction, cable fabrication, etc. The wire is bent towards both the upper and lower directions as it passes through several pulleys. These production processes are carried out at room temperature. Critical current of the wire is likely influenced through such bending, and may be accompanied by irreversible degradation in case of large deformation. The easiest way to evaluate the influence of bending on critical current is to carry out comparative measurement with the wire in the straight form before and after bending to a specific diameter.

After a wire is made into a coil or a cable, critical current is often measured under bending conditions or a more complex deformation state. In these cases, change in critical current may include both reversible and irreversible contributions depending on the amount of deformation. Irreversible degradation usually originates from a fracture in the superconducting component. In order to evaluate only irreversible contributions, measuring the retained critical current after the wire is straightened back from its deformed shape is necessary.

The critical bending diameter below which wire performance degrades significantly is typically specified for use of commercial superconducting wire. Thus, it is important to standardize measurement methods for the retained critical current after double bending. This document can be applied to other similar bending tests such as single bending, cyclic bending, etc.

This document consists of two fundamental technologies of the critical current measurement and the double bending process.

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