

Superconductivity —

Part 10: Critical temperature measurement — Critical temperature of composite superconductors by a resistance method

The European Standard EN 61788-10:2006 has the status of a British Standard

ICS 29.050

National foreword

This British Standard was published by BSI. It is the UK implementation of EN 61788-10:2006. It is identical with IEC 61788-10:2006. It supersedes BS EN 61788-10:2002 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee L/-/90, Superconductivity.

A list of organizations represented on L/-/90 can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

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English version

Superconductivity
Part 10: Critical temperature measurement -
Critical temperature of composite superconductors
by a resistance method
(IEC 61788-10:2006)

Supraconductivité
Partie 10: Mesure de la température
critique -
Température critique
des composites supraconducteurs
par une méthode par résistance
(CEI 61788-10:2006)

Supraleitfähigkeit
Teil 10: Messung der kritischen
Temperatur -
Kritische Temperatur
von Verbundsupraleitern bestimmt
durch ein Widerstandsmessverfahren
(IEC 61788-10:2006)

This European Standard was approved by CENELEC on 2006-09-01. 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 Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

CENELEC

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

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Foreword

The text of document 90/191/FDIS, future edition 2 of IEC 61788-10, prepared by IEC TC 90, Superconductivity, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61788-10 on 2006-09-01.

This European Standard supersedes EN 61788-10:2002.

Modifications made in this EN 61788-10:2006 mostly increase covered composite superconductors in this standard, i.e. Cu/Nb₃Al and metal-sheathed MgB₂ composite superconductors and Yttrium- or rare-earth-based coated conductors are added. Furthermore, examples of technical change made are the base plate dimension and definition of the bending strain.

The following dates were fixed:

- | | | |
|--|-------|------------|
| – latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement | (dop) | 2007-06-01 |
| – latest date by which the national standards conflicting with the EN have to be withdrawn | (dow) | 2009-09-01 |

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 61788-10:2006 was approved by CENELEC as a European Standard without any modification.

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INTRODUCTION

In addition to critical current and critical field, critical temperature is an important, basic property of materials that exhibit superconductivity. Also, critical temperature is practically important in applications of superconductors, since the higher the critical temperature is, the larger is temperature margin and the lower the cooling power consumption. Thus, standardization of the measurement method of critical temperature is quite beneficial to conductor users and is urgently required.

There are a lot of test methods to measure the critical temperature of superconductors, including the resistance method, d.c. susceptibility methods using a SQUID magnetometer and VSM (vibrating-sample magnetometer), a.c. susceptibility methods, specific heat methods etc.

Test methods, other than the resistance method, may generally be more sensitive and informative compared to the resistance method and may be more appropriate for non-homogeneous materials or for thick films, thin films, bulks and powders, for which the resistance method is difficult to apply.

In this International Standard, however, the resistance measurement method is employed. This is because the resistance method is simpler and more reliable and can be applied to most of the composite superconductors in industrial use.

The outline of this standard was basically prepared by the Japan Fine Ceramics Association, a member institution of VAMAS (Versailles Project on Advanced Materials and Standards), TWA16 (Superconducting materials). The extensive revisions of the outline were primarily made by the New Materials Center supervised by the Japan National Committee and VAMAS.