ICS 29.050 SLOVENSKÁ TECHNICKÁ NORMA August 2025

STN	**Supravodivosť Časť 27: Meranie kroku skrútenia praktických supravodivých drôtov Metóda merania kroku skrútenia kompozitných supravodičov Nb-Ti/Cu a Nb-Sn/Cu**	**STN EN IEC 61788-27** 34 5685

Superconductivity - Part 27: Twist pitch measurement of practical superconducting wires - Twist pitch measurement of Nb-Ti/Cu and Nb-Sn/Cu composite superconductors

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

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN IEC 61788-27

April 2025

ICS 29.050

English Version

Superconductivity - Part 27: Twist pitch measurement of practical superconducting wires - Twist pitch measurement of Nb-Ti/Cu and Nb-Sn/Cu composite superconductors (IEC 61788-27:2025)

Supraconductivité - Partie 27: Mesurage du pas de torsade de fils supraconducteurs pratiques - Mesurage du pas de torsade des composites supraconducteurs Nb-Ti/Cu et Nb-Sn/Cu
(IEC 61788-27:2025)

Supraleitfähigkeit - Teil 27: Messung der Schlaglänge von technischen supraleitenden Drähten - Messung der Schlaglänge von Nb-Ti/Cu- und Nb-Sn/Cu-Verbund-Supraleitern
(IEC 61788-27:2025)

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Comité Européen de Normalisation Electrotechnique
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European foreword

The text of document 90/532/FDIS, future edition 1 of IEC 61788-27, prepared by TC 90 "Superconductivity" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 61788-27:2025.

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) 2026-04-30
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INTERNATIONAL STANDARD

NORME INTERNATIONALE

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

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IEC 61788-27 has been prepared by IEC technical committee 90: Superconductivity. It is an International Standard.

The text of this International Standard is based on the following documents:

Draft	Report on voting
90/532/FDIS	90/540/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

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 document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

INTRODUCTION

Twisting of multi-filamentary superconductors is an important step in the development of wires with AC losses at an acceptable level for AC applications. The necessary twist pitch depends on wire architecture, critical current density, matrix material, and external factors such as temperature, frequency and applied magnetic field.

Therefore, twist pitch is a very important parameter in the design and application of composite superconducting wires, which is often inspected in the last stage of fabrication. Due to the different architectures of different composite superconductors, appropriate test methods should be adopted for specific architectures.

This document specifies the untwisting method for measuring the twist pitch of Nb-Ti/Cu and Nb-Sn/Cu composite superconductors [1][1]. As supplementary methods, the direct measurement method and the image processing method [1] are specified in Annex A and Annex B, respectively.

[1] Numbers in square brackets refer to the Bibliography.

SUPERCONDUCTIVITY –

Part 27: Twist pitch measurement of practical superconducting wires – Twist pitch measurement of Nb-Ti/Cu and Nb-Sn/Cu composite superconductors

1 Scope

This part of IEC 61788 specifies a test method for the twist pitch measurement of Nb-Ti/Cu and Nb-Sn/Cu composite superconductors by an untwisting method.

The test method is applicable to Nb-Ti/Cu and Nb-Sn/Cu composite superconducting wires with monolithic structures, which have either a round cross section with a diameter ranging from 0,2 mm to 2 mm or a rectangular cross section that is equivalent in area to the round cross-sectional wires. These wires possess a filament diameter ranging from 6 µm to 200 µm, a twist pitch between 5 mm and 50 mm, and a matrix of copper or copper alloy. This document uses nitric acid to remove the matrix (copper or copper alloy), so the surface of the composite superconducting wire can be plated with a material that is dissolvable by nitric acid.

Though uncertainty can increase, the method can apply to Nb-Ti/Cu or Nb-Sn/Cu composite superconducting wires when the parameters of cross-sectional area, filament diameter and twist pitch are out of the limit.

The test method specified in this document is expected to apply to other types of composite superconducting wires after some appropriate modifications.

2 Normative references

There are no normative references in this document.