

STN	Supravodivosť Časť 25: Meranie mechanických vlastností Skúška v ťahu pri izbovej teplote na drôtoch REBCO	STN EN IEC 61788-25 34 5685
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Superconductivity - Part 25: Mechanical properties measurement - Room temperature tensile test on REBCO wires

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

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 02/19

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EUROPEAN STANDARD

EN IEC 61788-25

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English Version

**Superconductivity - Part 25: Mechanical properties measurement
- Room temperature tensile test on REBCO wires
(IEC 61788-25:2018)**

Supraconductivité - Partie 25: Mesure des propriétés
mécaniques - Essai de traction à température ambiante des
fils REBCO
(IEC 61788-25:2018)

Supraleitfähigkeit - Teil 25: Messung der mechanischen
Eigenschaften - Messung der Zugfestigkeit von REBCO
Supraleiterdrähten bei Raumtemperatur
(IEC 61788-25:2018)

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EN IEC 61788-25:2018 (E)**European foreword**

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ISO 6892-1	NOTE	Harmonized as EN ISO 6892-1

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

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<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
ISO 376	-	Metallic materials - Calibration of force-proving instruments used for the verification of uniaxial testing machines	-	-
ISO 7500-1	-	Metallic materials - Calibration and verification of static uniaxial testing machines Part 1: Tension/compression testing machines - Calibration and verification 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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Edition 1.0 2018-08

INTERNATIONAL STANDARD

NORME INTERNATIONALE



**Superconductivity –
Part 25: Mechanical properties measurement – Room temperature tensile test on
REBCO wires**

**Supraconductivité –
Partie 25: Mesure des propriétés mécaniques – Essai de traction à température
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INTERNATIONAL STANDARD

NORME INTERNATIONALE



Superconductivity –

Part 25: Mechanical properties measurement – Room temperature tensile test on REBCO wires

Supraconductivité –

Partie 25: Mesure des propriétés mécaniques – Essai de traction à température ambiante des fils REBCO

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SUPERCONDUCTIVITY –**Part 25: Mechanical properties measurement –
Room temperature tensile test on REBCO wires**

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International Standard IEC 61788-25 has been prepared by IEC technical committee 90: Superconductivity.

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

FDIS	Report on voting
90/404/FDIS	90/411/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.

A list of all parts in the IEC 61788 series, published under the general title *Superconductivity*, can be found on the IEC website.

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INTRODUCTION

Several types of composite superconductors have now been commercialized. The rare-earth-based oxide superconductor (SC) with chemical formula $REBa_2Cu_3O_7$ is used for practical SC wires, where the rare-earth element RE is typically Y, Dy, Gd, Nd, Ho or Sm, or a combination of two or more among them. This type of practical SC wire is usually called REBCO coated conductors. A typical architecture consists of a substrate of Ni-Cr-Mo based alloy, Ni-W alloy or stainless steel, a buffer layer consisting of a plurality of oxides, a SC layer and a protection layer of Ag. The substrate and buffer layer act as template to facilitate the well-oriented SC layer. In order to resist the large electromagnetic force, the wires are often externally reinforced by laminating thin stainless steel or Cu alloy foils. Commercial composite superconductors have a high current density and a small cross-sectional area. The major application of composite superconductors is to build electrical power devices and superconducting magnets. Complex stresses and strains are applied to the composite superconducting wires when devices are manufactured and energized. In the case of superconducting magnets, large electromagnetic forces are experienced by the windings due to the combination of high magnetic fields and high current density. It is therefore indispensable to determine the mechanical properties of the practical REBCO wires.

SUPERCONDUCTIVITY –

Part 25: Mechanical properties measurement – Room temperature tensile test on REBCO wires

1 Scope

This part of IEC 61788 specifies the test method and procedures for testing tensile mechanical properties of REBCO superconductive composite tapes at room temperature. This test is used to measure the modulus of elasticity and 0,2 % proof strength. The values for elastic limit, fracture strength and percentage elongation after fracture serve only as a reference. This document applies to samples having a rectangular cross-section with an area of 0,12 mm² to 6,0 mm² (corresponding to the tapes with width of 2,0 mm to 12,0 mm and thickness of 0,06 mm to 0,5 mm).

2 Normative references

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

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

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