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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 10067.37-2024

**Basic specifications for electroheating and electromagnetic
processing installations - Part 37: Superconducting direct
current induction through-heating installations**

电热和电磁处理装置基本技术条件 第37部分：超导直流感应透热装置

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part

1.Structure and drafting rules for standardization documents" Drafting. This document is part 37 of GB/T 10067 "Basic technical requirements for electrothermal and electromagnetic treatment equipment". GB/T 10067 has been published. The following sections.

--- Part 101: General requirements for vacuum electrothermal and electromagnetic treatment equipment;

2.Arc heating device;

21.Large AC electric arc furnaces;

3.Induction heating device;

31.Medium frequency coreless induction furnace;

32.Voltage type variable frequency multiple medium frequency coreless induction furnace complete set;

33.Power frequency coreless induction copper melting furnace;

34.Transistor high frequency induction heating device;

35.Medium frequency vacuum induction melting furnace;

36.Induction heating devices;

37.Superconducting DC induction diathermy device;

4.Indirect resistance furnace;

1 Scope

Part 37 of China's series on electroheating and electromagnetic processing installations, covering superconducting direct current induction through-heating - one of the most recent additions to the family and the most interesting. It specifies the product classification, the technical requirements, the inspection rules, the marking, packaging, transport and storage, and the ordering and supply of superconducting DC induction through-heating installations, and describes the corresponding test methods. Conventional induction heating passes alternating current through a copper coil to induce currents in the workpiece, and it is inefficient at this duty: much of the energy goes into resistive losses in the coil itself, and heating a large aluminium billet through its whole section this way wastes a great deal. The superconducting approach inverts the arrangement. A superconducting magnet produces a strong, steady direct-current field, consuming almost nothing to maintain it, and the billet is rotated inside that field - the relative motion, not an alternating current, induces the eddy currents that heat it. The result is a large improvement in efficiency for through-heating aluminium and other non-ferrous billets before extrusion or forging. What the standard has to cover therefore includes things no other part of the series does: the superconducting magnet and its cryogenic system with the cooling, the current leads and the quench protection that must act if the magnet loses superconductivity; the mechanical drive that rotates a heavy billet in a strong field; the stray field around the installation and the exclusion zone it requires, since a field of this strength is a hazard to people with implants and to anything ferromagnetic nearby; and then the heating performance itself - the temperature uniformity through the section, the throughput and the efficiency. Issued on 26 October 2024 and in force since 1 May 2025.

This document specifies the product classification, technical requirements, inspection rules, marking, packaging, transportation and storage of superconducting DC induction diathermy devices. and ordering and supply, and describes the corresponding test methods. This document is applicable to the working frequency of 3Hz~25Hz, for the blanks (or workpieces) mainly made of low resistivity, non-ferromagnetic metals and alloys. A superconducting direct current induction diathermy device for overall or local heating (hereinafter referred to as "superconducting diathermy device").

2 Normative references

The contents of the following documents constitute the essential clauses of this document through normative references in this document. For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies to This

document.

GB/T 150.4-2011 Pressure vessels Part

3 Terms and Definitions

GB/T 2900.23, GB/T 2900.100, GB/T 12604.6 and GB/T 10066.32-2021 and the following terms and Definitions apply to this document.

3.1 ferromagnetic The magnetic permeability is much greater than 1, and the material can be magnetized and conduct magnetism.

3.2 non-ferromagnetic Does not have ferromagnetic material properties.

4 Manufacturing, inspection and acceptance

GB/T 2900.23 Electrical terminology Industrial electric heating devices

GB/T 2900.100 Electrical terminology - Superconductivity

GB/T 5959.1-2019 Safety of electric heating and electromagnetic processing equipment
Part