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

GB/T 34215-2023

**Cold-rolled non-oriented electrical steel strip (sheet) for electric
vehicle driving motor**

电动汽车驱动电机用冷轧无取向电工钢带（片）

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Foreword

This document was issued on 6 August 2023 by the State Administration for Market Regulation; Standardization Administration of the PRC and takes effect on 1 March 2024.

It is a GB/T standard: recommended rather than compulsory, but it is the text a Chinese reviewer applies when assessing a submission.

1 Scope

GB/T 34215-2023 covers the cold-rolled non-oriented electrical steel strip and sheet from which the stator and rotor laminations of an electric vehicle traction motor are stamped. Symbols and codes come first, then the designation system that sorts the product into four types, then the ordering contents a buyer has to state, the general requirements, the technical requirements, the inspection and testing, the re-inspection and judgement rules, and the packaging, marking and quality certificate. The technical requirements cover the magnetic properties at room temperature and after ageing alongside the mechanical

properties of the strip. The annexes map the designations onto those of IEC 60404-8-8:2017, give magnetic properties and yield strength at 150 °C, and set out an Epstein square coil method for measuring magnetic properties from 35 °C to 200 °C. That temperature work is why the document stands apart from general electrical steel: a traction motor runs hot and its rotor turns fast, so core loss measured on a cold sample understates what the drive cycle will really cost in range, and a lamination strong enough at room temperature may not hold a rotor together at working speed and heat. Steelmakers, motor designers and vehicle manufacturers are the users.

This document specifies symbols and codes, designations, ordering contents, general requirements, technical requirements, inspection and testing, re-inspection and judgment rules, packaging, marking and quality certificates for cold-rolled non-oriented electrical steel strip (sheet) for electric vehicle driving motor.

This document is applicable to grain-non-oriented electrical steel strip (sheet) with nominal thicknesses of 0.20 mm, 0.25mm, 0.27 mm, 0.30 mm, 0.35 mm, for the manufacture of electric vehicle drive motors [hereinafter referred to as "steel strip (sheet)"].

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

GB/T 228.1-2021, Metallic materials -- Tensile testing -- Part 1: Method of test at room temperature

GB/T 228.2-2015, Metallic materials -- Tensile testing -- Part 2: Method of test at elevated temperature

GB/T 247, General rule of package, mark and certification for steel plates (sheets) and strips

GB/T 2521.1-2016, Cold-rolled electrical steel delivered in the fully-processed state -- Part 1: Grain non-oriented steel strip (sheet)

GB/T 2522, Methods of test for the determination of coating insulation resistance and coating adhesion of electrical strip and sheet

GB/T 2900.60, Electrotechnical terminology -- Electromagnetism

GB/T 3655, Methods of measurement of the magnetic properties of electrical steel strip and sheet by means of an Epstein frame

GB/T 9637, Electrotechnical terminology -- Magnetic materials and components

GB/T 17505, Steel and steel products -- General technical delivery requirements

GB/T 19289, Methods of measurement of resistivity, density and stacking factor of electrical steel strip and sheet

YB/T 4292, Methods of determination of the geometrical characteristics of electric steel sheet and strip

YB/T 4731-2019, Reverse bend test method for electrical steel strip and sheet

3 Terms and definitions

For the purposes of this document, the terms and definitions defined in GB/T 2900.60, GB/T 9637, GB/T 2521.1-2016 apply.

4 Symbols and codes

4.1 Symbols

The following symbols apply to this document.

A50mm: Elongation after break with original gauge length of 50 mm.

J5000: Magnetic polarization intensity at which the peak magnetic field intensity is 5000A/m.

P1.0/400: Specific total loss measured with the peak magnetic polarization intensity at 1.0 T and the frequency at 400 Hz.

ReL: Lower yield strength.

Rm: Tensile strength.

Rp0.2: Stress that specifies the plastic elongation of 0.2%.

4.2 Codes

The following codes apply to this document.

NV: Non grain-oriented steel for electrical vehicle

NVP: Non grain-oriented high-permeability steel for electrical vehicle

NVPS: Non grain-oriented high-permeability and high-strength steel for electrical vehicle

NVS: Non grain-oriented high strength steel for electrical vehicle

5 Designations

5.1 Product type

In this document, the products are classified into four types: non-grain-oriented type, non-grain-oriented high-permeability type, non-grain-oriented high-permeability and high-strength type and non-grain-oriented high strength type.

5.2 Methods for expressing designations

5.2.1 The levels for designations of non-grain-oriented type, non-grain-oriented high-permeability type, non-grain-oriented high-permeability and high-strength type are defined based on the maximum specific total loss value P1.0/400 of material nominal thicknesses 0.20 mm, 0.25 mm, 0.27 mm, 0.30 mm and 0.35 mm, measured with magnetic polarization peak at 1.0 T, frequency at 400 Hz. The levels for designations of non-grain-oriented high strength type are defined according to the minimum yield strength for material nominal thickness 0.35 mm.

5.2.2 The product designation consists of the following three parts in order.

- 100 times the nominal thickness of the material, in millimeters (mm).
- Product type code.
- When the product type is non-grain-oriented type, non-grain-oriented high-permeability type, or non-grain-oriented high-permeability and high-strength type, Part 3 is 100 times the maximum specific total loss P1.0/400 (unit: W/kg) measured with the peak magnetic polarization intensity at 1.0 T and the frequency at 400 Hz. When the product type is non-grain-oriented high strength type, Part 3 is the minimum yield strength.

Example 1:

30NV1500 represents non-grain-oriented type non-oriented electrical steel strip (sheet) for electric vehicle driving motor with a nominal thickness of 0.30 mm and a maximum