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

GB/T 31840.2-2025

Replacing GB/T 31840.2-2015

**Aluminium alloy power cables with extruded insulation for rated
voltages from 1 kV up to 35 kV - Part 2: Cables for rated
voltages from 6 kV up to 30 kV**

额定电压1kV ($U_m=1.2\text{kV}$) 到35kV ($U_m=40.5\text{kV}$) 铝合金芯挤包绝缘电力电缆
第2部分: 额定电压6kV ($U_m=7.2\text{kV}$) 到30kV ($U_m=36\text{kV}$) 电缆

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents". Drafting.

This document is GB/T 31840 "Aluminum Alloy Core Extruded Insulation with Rated Voltage of 1kV ($U_m=1.2\text{kV}$) to 35kV ($U_m=40.5\text{kV}$)".

Part 2 of GB/T 31840, "Power Cables," has been published, including the following parts.

- Part 1: Cables with rated voltages of 1kV ($U_m=1.2\text{kV}$) and 3kV ($U_m=3.6\text{kV}$);
- Part 2: Cables with rated voltages from 6kV ($U_m=7.2\text{kV}$) to 30kV ($U_m=36\text{kV}$);
- Part 3: Cables with a rated voltage of 35kV ($U_m=40.5\text{kV}$).

This document replaces GB/T 31840.2-2015 "Aluminum Alloys with Rated Voltages from 1kV ($U_m=1.2\text{kV}$) to 35kV ($U_m=40.5\text{kV}$)".

Core-extruded insulated power cables, Part 2: Cables with rated voltages from 6kV ($U_m=7.2\text{kV}$) to 30kV ($U_m=36\text{kV}$).

Compared with GB/T 31840.2-2015, apart from structural adjustments and editorial changes, the main technical changes are as follows.

- Thermoplastic polypropylene insulation material has been added (see 4.2);
- Added halogen-free flame-retardant sheath material ST8 (see 4.3);
- Product naming has been added (see Chapter 5);
- The requirement for conductor structure type has been removed (see 5.2 in the 2015 version);
- The overlap requirement for metal shielding has been changed (see 10.2.2.3, 2015 version of 10.2.3);
- Added stainless steel wire (non-magnetic) and stainless steel strip (non-magnetic) materials to metal armor (see 10.4.2);
- Painted steel strip material has been removed (see 12.2 in the 2015 edition);
- The thickness requirements for non-metallic sheaths have been changed (see 11.3, 13.3 in the 2015 edition);
- Added DC withstand voltage test requirements for the outer sheath during factory testing (when the outer sheath has a semi-conductive structure) (see 12.2.5);
- Added measurement requirements for the wrapping overlap rate, wrapping gap rate, and total thickness of the wrapping inner lining and/or wrapping padding layer (see 12.3.12, 12.3.13);
- The requirements for bundled flame retardant testing have been revised (see 12.5.15.2, 18.14 in the 2015 edition);
- A creep test method for aluminum alloy conductors has been added (see 12.5.27);
- The requirement for compressive creep testing of single aluminum alloy wires has been removed (see 18.25 in the 2015 edition);
- The connection performance test for aluminum alloy conductors and fittings has been modified (see 12.5.29, 18.28 in the 2015 version);
- Inspection rules for products have been added (see Chapter 13);
- Added product labeling and accompanying documentation (see Chapter 14);

- Added product packaging, transportation, and storage (see Chapter 15);
- The requirement for supplementary clauses for aluminum alloy core cable products has been removed (see Chapter 20 and Appendix G of the 2015 edition).

This document was proposed and is under the jurisdiction of the China Electricity Council.

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The release history of this document and the document it replaces is as follows.

- First published in 2015 as GB/T 31840.2-2015;
- This is the first revision.

Introduction

In recent years, the contradiction between the rapid development of the power grid and the relative scarcity of copper resources has become increasingly prominent. Relying solely on copper core cables will significantly increase the distribution costs.

Power grid construction costs. To implement the national strategic goal of "saving copper with aluminum" and optimize the life-cycle cost of the distribution network, aluminum alloy core power supplies...

Cables are gradually being used. This type of cable uses aluminum alloy as the conductor, and its conductivity is comparable to that of aluminum core conductors, but its mechanical properties and resistance are different.

The creep performance is significantly improved, avoiding the problems of poor ductility and unstable connection that exist in aluminum core cables; at the same time, compared with copper core cables, aluminum alloy...

Gold-core cables offer significant economic advantages. China is a country rich in aluminum but poor in copper; therefore, in certain applications and while ensuring cable product quality, [this advantage is crucial].

The development and application of aluminum alloy core cables can solve resource problems, reduce power grid construction costs, and promote the sustainable development of the power grid.

GB/T 31840 "Aluminum Alloy Core Extruded Insulated Power Cables with Rated Voltages from 1kV ($U_m=1.2\text{kV}$) to 35kV ($U_m=40.5\text{kV}$)" refers to...

The standards for the design, production, and testing of aluminum alloy cables in China are proposed to consist of three parts.

- Part 1: Cables with rated voltages of 1kV ($U_m=1.2\text{kV}$) and 3kV ($U_m=3.6\text{kV}$). The purpose is to specify the rated voltage.

Structure, dimensions, and testing of 1kV ($U_m=1.2\text{kV}$) and 3kV ($U_m=3.6\text{kV}$) aluminum alloy core extruded insulated power cables Require.

- Part 2: Cables with rated voltages from 6kV ($U_m=7.2\text{kV}$) to 30kV ($U_m=36$). The purpose is to specify the rated voltage.

Structure, dimensions and test requirements for 6kV ($U_m=7.2\text{kV}$) to 30kV ($U_m=36$) aluminum alloy core extruded insulated power cables.

- Part 3: Cables with a rated voltage of 35kV ($U_m=40.5\text{kV}$). The purpose is to specify the rated voltage of cables with a rated voltage of 35kV ($U_m=$ Structure, dimensions and test requirements for 40.5kV aluminum alloy core extruded insulated power cables.

Aluminum alloy core power cable technology was introduced to China in 2007. After more than ten years of research, its manufacturing technology and application level have made significant progress.

Improvements have been made since the first edition of GB/T 31840 was released in 2015, providing a basis for the manufacturing, inspection, and application of aluminum alloy core power cables in China.

It has provided crucial support. After nearly ten years of application, the industry has gained a deeper understanding of the performance and testing requirements for aluminum alloy core power cables.

With the change in understanding, technical parameters and the use of raw materials, revisions are necessary.