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

GB/T 17389-2026

Replacing GB/T 18050-2000

**Manufacture, inspection and application of electric submersible
pump cable**

潜油电泵电缆生产制造检验及应用

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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 supersedes GB/T 17389-2013 "Application of Submersible Electric Pump Cable Systems" and GB/T 18050-2000 "Submersible Electric Pump Cables". The test methods document is based on GB/T 17389-2013, and incorporates content from GB/T 18050-2000. It is consistent with GB/T 17389- Compared to 2013, aside from structural adjustments and editorial changes, the main technical changes are as follows:

---The scope has been changed (see Chapter 1, Chapter 1 of the 2013 edition);

---Terms and definitions such as "US wire diameter, current carrying capacity, and antioxidants" have been removed (see Chapter 3 of the 2013 edition);

- Added terms and definitions such as "submersible pump cable, lead cable, and cable head" (see Chapter 3);
- Added the requirement of "categorization" (see 4.1);
- The conductor configuration and typical cable unit structure have been changed (see Figures 1 and 2, Figure 1 in the.2013 version);
- The metric standard for cable conductor dimensions has been revised (see Tables 1 and 3, Table 1 in the.2013 edition);
- The imperial standard for cable conductor dimensions has been removed (see Table 2 in the.2013 edition);
- Added requirements for the manufacture of submersible electric pump cables (see Chapter 5);
- Added conditions for the application of submersible electric pump cables (see Chapter 6);
- The requirement for cable bending radius has been increased (see 6.1.3);
- Added methods for on-site testing of submersible pump cables (see Chapter 7);
- The section on "woven layers and protective layers" has been removed (see Chapter 8 in the.2013 edition);

1 Scope

GB/T 17389-2026 is the Chinese national standard covering the cable that powers a pump at the bottom of an oil well - flat or round, armoured, and required to survive hot crude, gas that permeates the insulation and decompresses through it, and being strapped to tubing as it goes down the hole. It replaces GB/T 18050-2000 and has been in force since 1 September 2026. It was issued on 27 February 2026 and has been in force since 1 September 2026, replacing GB/T 18050-2000. The document is under the responsibility of the Standardization Administration of China. This page is published from the official record of the 2026 edition; the clause text of a standard this recent is not yet in circulation, and the figures, limits and tables it contains are those of the document itself, delivered in full with the English translation.

This document specifies the classification and structure, manufacturing, application, and field testing requirements for submersible pump cables. This document applies to the testing, acceptance, and application of cables used in submersible electric pumps, submersible screw pumps, submersible plunger pumps, and submersible diaphragm pump units.

4.1 Classification

4.1.1 According to their function, they are divided into. power cables and lead cables.

4.1.2 According to the shape of the cable cross-section, cables are classified as. round cables and flat cables.

4.1.3 According to the rated voltage level, they are divided into. 3kV and 6kV.

4.1.4 According to the temperature resistance rating, they are divided into. 90°C, 120°C, 150°C, 180°C, and 204°C.

4.2 Structure Typical cable structures are shown in Figures 1 and 2.

5.1 General Requirements

5.1.1 The three-phase DC resistance imbalance rate should not exceed 2%.

5.1.2 The measured insulation resistance value of the cable, when converted to 15.6°C, shall not be less than the minimum insulation resistance value of the cable specified in Appendix A.

5.1.3 The DC withstand voltage of the cable shall be tested according to method 7.3.5, and the withstand voltage shall be maintained for 5 minutes without breakdown.

5.1.4 The DC withstand voltage of the cable with cable head shall be tested according to method 7.3.5, and the withstand voltage shall be maintained for 5 minutes without breakdown.

5.1.5 The DC leakage current of the cable shall be tested according to method 7.3.6. When the test value is converted to 15.6°C, it shall not exceed the specification in Appendix A.

5.2 Materials

5.2.1 The conductor is generally made of copper, and the conductor surface should be smooth, without obvious oxidation marks or rust spots. When polypropylene insulation is used... When this is done, the copper conductor should be tin-plated.

5.2.2 The measured DC resistance of the conductor at 20°C should not exceed the standard value specified in Table 1.

5.2.3 Polyimide film should be used in environments not exceeding 232°C. When used as insulation for submersible electric pump cables, it should be used in conjunction with ternary dielectric film. Ethylene propylene rubber or fluoroplastics are used together.

5.2.4 Polyimide film is generally preferred when the dielectric strength (V/mm) is high and the insulation layer thickness is small.

5.2.5 The lead sheath shall be free from defects such as pinholes, cracks and impurities.

5.2.6 A layer of polytetrafluoroethylene film or polyester film shall be wrapped around the

outer sheath of flat cables, and the outer layer shall be wrapped with nylon cloth or polyester yarn. Braiding. When the inner sheath is a lead sheath, wrapping tape or braided layers may be used directly on the outside of the sheath. The insulation layer of the round cable core and the sheath layer... An oil-resistant padding layer is permitted between layers. The overlap ratio of the wrapping layer should be no less than 50%, and the density of the braided layer should be no less than 90%.

5.2.7 The weld joints of the armored tape should be flat and firm, free from defects such as cracks, loosening, and dents.

5.2.8 The mechanical connection between the cable head armor and the cable head housing shall be secure.

5.2.9 Before connecting the lead cable with a cable head to the power cable, measure its insulation resistance value. The insulation resistance value of thermoplastic cables should be greater than [value missing]. The insulation resistance of thermosetting resin should be greater than 800 MΩ·km, with a resistance of 1000 MΩ·km.

5.2.10 Other manufacturing technical parameters of submersible pump cables shall comply with the provisions of GB/T 16750.

5.2.11 Commonly used materials for submersible electric pump cables are shown in Table 2.

5.3 Dimensions

5.3.1 The external dimensions of the cable shall conform to the provisions of Table 3.

5.3.2 Conductor nominal diameter tolerance. conductor nominal diameter $\pm 1\%$.

5.4 Factory Inspection The factory testing items and test methods for submersible electric pump cables shall comply with the provisions of GB/T 16750.

6.1 General Rules

6.1.1 Generally, round cables should be selected. When the annular space of the oil jacket does not meet the installation conditions of round cables, flat cables should be selected.

6.1.2 Flat groove pulleys should be used when installing flat cables, and angle-wrapped pulleys should be used when installing round cables. The pulley diameter should not be less than [missing value]. 1220mm.

6.1.3 The bending radius of the cable shall comply with the provisions of JB/T 5332.1.

6.1.4 The cable specifications and dimensions should be selected based on conductivity and well annular gap. The minimum conductor size should be determined based on the required current of the motor and... Permissible voltage drop selection (see Appendix B).