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

GB/T 13542.4-2024

Replacing GB/T 13542.4-2009

**Plastic films for electrical purposes - Part 4: Polyethylene
terephthalate films
(English Translation)**

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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 4 of GB/T 13542 "Films for electrical insulation". GB/T 13542 has been published in the following parts.

- Part 1: Definitions and general requirements;
- Part 2: Test methods;
- Part 3: Biaxially oriented polypropylene films for capacitors;
- Part 4: Polyester film;
- Part 5: Biaxially oriented polynaphthyl ester films;
- Part 6: Polyimide films for electrical insulation.

This document replaces GB/T 13542.4-2009 "Electrical insulating films Part 4: Polyester films" and GB/T 13542.4-Compared with 2009, in addition to structural adjustments and editorial changes, the main technical changes are as follows.

- Added product types (see Chapter 4);

- Changed the "thickness" measurement method, and recommended the preferred thickness for different types of dimensions (see 7.1, 5.1 of the 2009 edition);
- Added the "roll film diameter/length" item (see 7.3);
- Added the performance requirements of the supplementary type film and the test conditions for relative permittivity (1kHz) and dielectric loss factor (1kHz) (see Table 2);
- Changed the requirements for density, melting point, relative permittivity (1kHz) and dielectric loss factor (1kHz) of opaque colored films (See Table 2, Table 2 of the 2009 edition);
- Deleted the performance requirements for electrolytic corrosion and dimensional stability at high temperatures (see Table 2 of the 2009 edition);
- According to the nominal thickness specifications and corresponding requirements are subdivided (see Table 3 and Table 4, Table 3 of the 2009 edition);
- Added the flammability requirements for polyester films (see Table 5);
- Added the requirements for the electrode type and nominal thickness of 500 μ m for "Electrical Strength (AC Test)" (see Table 6);
- Deleted the requirements for nominal thickness < 6 μ m, 6 μ m, 8 μ m, 10 μ m, 150 μ m (see Table 4 of the 2009 edition);
- Added "Electrical Strength (DC Test)" ϕ 6mm electrode method and aluminum foil sandwich method and corresponding requirements, according to the nominal thickness specifications and the corresponding requirements are subdivided (see Table 7);
- Added "Electrical Weakness" Method C2, Method C3 and 0.9 μ m~< 2.5 μ m, 2.5 μ m nominal thickness specifications and corresponding requirements Request (see Table 8);
- Added TI requirements for "long-term heat resistance" type 3, type 4 and type 5, and unified the test endpoint standard as the tensile strength maintaining the initial value 50% (see Table 9);
- Modified the humidity content of the air in the aging oven (see 8.6, 6.3.1 of the 2009 edition);
- Added the performance requirements of "resistance to moisture and heat aging" (see Table 10);
- Changed the requirements for film joints and film roll width (see 9.2, 9.3, 7.3, 7.4 of the 2009 edition).

This document is modified to adopt IEC 60674-3-2:2019 "Plastic film for electrical use - Part 3: Specifications for individual materials - Part 2.

Requirements for balanced biaxially oriented polyethylene terephthalate (PET) films for electrical insulation.

This document has the following structural adjustments compared to IEC 60674-3-2:2019.

--- Added Table 1, Table 2 corresponds to Table 1 of IEC 60674-3-2:2019, Table 3 corresponds to Table 2 of IEC 60674-3-2:2019, Table 4 Corresponding to Table 3 of IEC 60674-3-2:2019;

--- Added Table 5, Table 6 corresponds to Table 4 of IEC 60674-3-2:2019, and the following table numbers are postponed accordingly.

The technical differences between this document and IEC 60674-3-2:2019 and their reasons are as follows.

--- The content of "Scope" has been reorganized (see Chapter 1) to meet the needs of technical content;

--- Replaced IEC 60068-2-67 (see 8.7) with the normative reference GB/T 2423.50 to adapt to my country's technical conditions, and added Operability;

--- Replaced IEC 60674-2:2016 with the normative reference GB/T 13542.2-2021 (see 7.1, 7.2, Tables 2 to 8, 8.3~8.6, 9.1, 9.3), the consistency between the two documents is modified to adapt to my country's technical conditions and increase operability Sexuality;

--- Added normative references to GB/T 5169.16 (see Table 5) to meet the needs of technical content;

--- Change the polyester film thickness measurement from mass density method to mechanical method, and change the preferred thickness of type 4 and type 5 from 50μm~500μm, 50μm~350μm are changed to 36μm~500μm, 36μm~350μm respectively (see 7.1).

Adapt to my country's technical conditions and increase operability;

--- Added the performance requirements of relative permittivity (23°C, 48Hz~62Hz) and changed the dielectric loss factor (23°C, 48Hz~ 62Hz) measurement method (see Table 2) to adapt to my country's technical conditions and increase operability;

--- Added the performance requirements of "combustibility" (see Table 5) to adapt to my country's technical conditions and increase operability;

--- The performance requirements for the electrical strength (AC test) of 25 μm thick films have been added (see Table 6) to adapt to my country's technical conditions.

Increase operability;

--- Change the IT value of "long-term heat resistance" of Type 3, Type 4 and Type 5 from 125 to 120 (see Table 9) to adapt to my country's technical conditions parts to increase

operability.

The following editorial changes were made to this document.

--- In order to coordinate with the existing standard, the name of the standard is changed to "Films for electrical insulating purposes Part 4: Polyester films".

Introduction

The electrical insulation film standard is widely used in the research and development, production, quality inspection, sales, acceptance and technical exchanges of this series of products.

The series of standards can guide the industry to carry out the testing and evaluation of electrical insulating films more effectively, and can improve the quality of electrical insulating film products.

Quality and application reliability.

GB/T 13542 specifies the definition and general requirements, test methods, and product standards for individual materials of insulating films for electrical use.

Column parts.

--- Part 1: Definitions and general requirements. The purpose is to determine the terms and definitions and general requirements for electrical insulating films.

--- Part 2: Test methods. The purpose is to determine the test methods for insulating films for electrical use.

--- Part 3: Biaxially oriented polypropylene film for capacitors. The purpose is to determine the classification of biaxially oriented polypropylene film for capacitors.

Classes and nomenclature, dimensions, performance requirements and roll characteristics.

--- Part 4: Polyester films. The purpose is to determine the classification, nomenclature and requirements of polyester films for electrical insulation.

--- Part 5: Biaxially oriented polynaphthyl ester films. The purpose is to determine the characteristics of biaxially oriented polynaphthyl ester (PEN) films for electrical insulation.

Classes, naming, and requirements.

--- Part 6: Polyimide films for electrical insulation. The purpose is to determine the classification and nomenclature of polyimide films for electrical insulation, Dimensions, performance requirements and film roll characteristics.

Films for electrical insulation. Part 4: Polyester films