

ICS 29.035.20

CCS K 15



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

GB/T 26168.4-2018

**Electrical insulating materials -- Determination of the effects of
ionizing radiation -- Part 4: Procedures for assessment of
ageing in service**

Issued on: June 7, 2018

Implemented on: January 1, 2019

**Issued by: State Administration for Market Regulation, China National
Standardization Administration**

Table of Contents

Foreword

Introduction

1 Scope

2 Normative references

3 Abbreviations

Foreword

GB/T 26168 "Electrical insulation materials to determine the impact of ionizing radiation" is divided into the following parts.

- Part 1. Radiation interactions and dosimetry;
- Part 2. Irradiation and test procedures;
- Part 3. Application grading system in a radiation environment;
- Part 4. Assessment procedures for aging during operation.

This part is the fourth part of GB/T 26168.

This part is drafted in accordance with the rules given in GB/T 1.1-2009.

This part replaces GB/T 26168.4-2010 "Electrical insulating materials to determine the effects of ionizing radiation - Part 4. aging during operation"

Compared with GB/T 26168.4-2010, the main technical contents are as follows.

- Revised the normative reference document (see Chapter 2, Chapter 2 of the.2010 edition);
- Deleted 7 abbreviations of "BR, EPDM, ETFE, NBR, PEEK, PPO and XLPO" (see Chapter 3,.2010 edition)
- Chapter 3);
- Added four acronyms "CBQ, DBE, EQ and NPP" (see Chapter 3, Chapter 3 of the.2010 edition);
- Modified the "Aging Assessment Method" (see Chapter 5, 4.4 of the.2010 edition);
- Added "accelerated heat aging" (see 4.5);
- Added "identification of components of concern" (see Chapter 6);

- Modified "Status Monitoring Technology" (see Chapter 7, Chapter 5 of the.2010 edition);
- Added "predictive model" (see Chapter 8);
- Modified "device storage method" (see Chapter 9, Chapter 6 of the.2010 edition);
- Added "Example of CM correlation curve" (see Appendix A);
- Added "Use of the stocker" (see Appendix B).

This section uses the translation method equivalent to the use of IEC 60544-5.2011 "Electrical insulation materials to determine the effects of ionizing radiation Part 5.

Evaluation procedure for aging during operation.

The documents of our country that have a consistent correspondence with the international documents referenced in this part are as follows.

--- GB/T 26168.1-2018 Electrical insulating materials to determine the effects of ionizing radiation - Part 1. Radiation interactions and agents

Measurement (IEC 60544-1.2013, IDT);

GB/T 26168.2-2018 Electrical insulating materials - Determination of effects of ionizing radiation - Part 2. Irradiation and test procedures

(IEC 60544-2.2012, IDT);

--- GB /Z 28820.1-2012 Long-term radiation aging of polymers - Part 1. Techniques for monitoring diffusion-limited oxidation (IEC /TS

61244-1.1993, IDT);

--- GB /Z 28820.2-2012 Long-term radiation aging of polymers - Part 2. Procedures for predicting aging at low dose rates (IEC /

TS61244-2..1996, IDT).

This section has made the following editorial changes.

--- In line with the existing national standards, this part is the fourth part of the standard, the name is changed to "electrical insulation materials to determine ionizing radiation

Impact of Part 4. Assessment Procedures for Aging in Operation.

This part was proposed by China Electrical Equipment Industry Association.

This part is under the jurisdiction of the National Technical Committee for Standardization of Electrical Insulation Materials and Insulation Systems (SAC/TC301).

This section drafted by. Jiangsu Shangshang Cable Group Co., Ltd., State Grid Henan Electric Power Company Electric Power Research Institute, Machinery Industry North

Jingdian Institute of Technology and Economy, Guilin International Wire and Cable Group Co., Ltd., Shenzhen Woer Nuclear Materials Co., Ltd., Shenzhen

Xusheng Sanyi Technology Co., Ltd., China Nuclear Power Engineering Co., Ltd., Shanghai Cable Research Institute Co., Ltd., Wuxi Jiangnan Cable Co., Ltd.,

Haizhi Zhengdao Chemical Polymer Co., Ltd., Shanghai Keming Transmission Technology Co., Ltd., China Guangdong Nuclear High-tech Nuclear Materials Group Co., Ltd., Jiang

Su Dasheng High Polymer Co., Ltd., Shanghai Yuxun Microwave Technology Co., Ltd., Henan Enhao Gaoke Group Co., Ltd., Shanghai Nuclear Engineering Research

Research Institute, Harbin Power Equipment Co., Ltd.

Introduction

In the field of electrical insulation materials, organic and polymeric materials account for a large proportion. These materials are sensitive to the effects of radiation and materials

Different types, the degree of response is also very different. It is therefore important to assess the extent to which the insulating material ages during use. Recommended in this section

The aging evaluation procedure for insulation materials during operation.

There are several ways to assess the lifetime of a base polymer exposed to an irradiated environment, and development in this area is based on aging over the past few decades.

Understanding of factors affecting degradation. In nuclear power plants, identification procedures are often used to select materials, including polymer-based materials. Previous identification procedures

It was developed in the absence of sufficient knowledge of the aging mechanism, so most of the methods discussed in this section cite the previous identification procedures.

limitation.

This part is the fourth part of GB/T 26168, which is the evaluation procedure for aging during operation.

Electrical insulation determines the effects of ionizing radiation

Part 4. Assessment procedures for aging during operation

1 Scope

This part of GB/T 26168 specifies the operational life assessment method for components consisting of polymeric materials used in radiation environments, such as

Cable insulation and sheathing, elastomeric sealing sleeves, polymer coatings and rubber

sleeves.

This section applies to methods for assessing aging during operation, including ageing assessment procedures based on condition monitoring, and sample retention in harsh environments.

The use of the sample and the preparation of the actual aged sample.

2 Normative references

The following documents are indispensable for the application of this document. For dated references, only dated versions apply to this article.

Pieces. For undated references, the latest edition (including all amendments) applies to this document.

IEC 60544-1 Electrical insulating materials - Determination of effects of ionizing radiation - Part 1. Radiation interactions and dosimetry (Electrical

insulatingmaterials-Determinationoftheeffectsofionizingradiation-Part 1.Radiationinteraction Anddosimetry)

Electrical insulating materials - Determination of effects of ionizing radiation - Part 2. Irradiation and test procedures (Electricalinsu-

latingmaterials-Determinationoftheeffectsofionizingradiation-Part 2.Proceduresforirradiation Andtest)

IEC 60780 nuclear power plant safety system electrical equipment quality identification (Nuclearpowerplants-Electrical equip-

mentofthesafetysystem-Qualification)

IEC /T S61244-1 Long-term radiation aging of polymers - Part 1. Monitoring techniques for diffusion-limited oxidation (Determination of

long-termradiationageinginpolymers-Part 1.Techniquesformonitoringdiffusion-limitedoxida-Tion)

IEC /T S61244-2 Long-term radiation aging of polymers - Part 2. Procedures for predicting aging at low dose rates (Determination

oflong-termradiationageinginpolymers-Part 2.Proceduresforpredictingageingatlowdoserates)

3 Abbreviations

The following abbreviations apply to this document (from IEC 60780).