

Translated English of Chinese Standard: GB/T3511-2018

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**GB**

NATIONAL STANDARD OF THE  
PEOPLE'S REPUBLIC OF CHINA

ICS 83.060

G 40

**GB/T 3511-2018 / ISO 4665:2016**

Replacing GB/T 3511-2008

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**Rubber, Vulcanized or Thermoplastic**

**– Resistance to Weathering**

(ISO 4665:2016, IDT)

硫化橡胶或热塑性橡胶 耐候性

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**Issued by: General Administration of Quality Supervision, Inspection and  
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**Standardization Administration of PRC.**

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## Foreword

This Standard was drafted as per the rules specified in GB/T 1.1-2009.

This Standard replaced GB/T 3511-2008 *Rubber, Vulcanized or Thermoplastic - Resistance to Weathering*. Compared with GB/T 3511-2008, this Standard has the major technical changes as follows:

- Modify the term and definition of “control” (see 3.1 of this Edition; 3.1 of 2008 Edition);
- Add the clause “it is recommended to use one or more weathering aging reference materials mentioned in Annex A as the control in the exposure test” (see Clauses 5, 6);
- Add normative reference “ISO 18314-1 Analytical Colorimetry – Part 1: Practical Color Measurement” (see Clause 2 of this Edition).
- Add Annex A; adjust the Annex A in 2008 Edition into Annex B of this Edition;
- Add “compression deformation” test item in Annex B;
- Add “Bibliography”;
- Delete Normative References “GB/T 11186.1, GB/T 11186.2 and GB/T 11186.3” (see Clause 2 of this Edition; Clause 2 of 2008 Edition).

This Standard uses the translation method to equivalently adopt ISO 4665:2016 *Rubber, Vulcanized or Thermoplastic - Resistance to Weathering*.

The Chinese documents that have a consistent correspondence with the international documents quoted in the Normative Reference of this Standard are as follows:

- GB/T 250-2008 Textiles - Tests for Color Fastness - Part A02: Grey Scale for Assessing Change in Color (ISO 105-A02:1993, IDT);
- GB/T 2941-2006 Rubber - General Procedures for Preparing and Conditioning Test Pieces for Physical Test Methods (ISO 23529:2004, IDT);
- GB/T 7762-2014 Rubber, Vulcanized or Thermoplastic - Resistance to Ozone Cracking - Part 1: Static Strain Testing (ISO 1431-1:2004, NEQ);
- GB/T 13642-2015 Rubber, Vulcanized or Thermoplastic - Resistance to Ozone Cracking - Part 1: Dynamic Strain Testing (ISO 1431-1:2004, NEQ);
- GB/T 16422.1-2006 Plastics - Methods of Exposure to Laboratory Light Sources

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- Part 1: General Guidance (ISO 4892-1:1999, IDT);
- GB/T 16422.2-2014 Plastics - Methods of Exposure to Laboratory Light Sources  
- Part 2: Xenon-Arc Lamps (ISO 4892-2:2006, IDT);
- GB/T 16422.3-2014 Plastics - Methods of Exposure to Laboratory Light Sources  
- Part 3: Fluorescent UV Lamps (ISO 4892-3:2006, IDT);
- GB/T 16422.4-2014 Plastics - Methods of Exposure to Laboratory Light Sources  
- Part 4: Open-Flame Carbon-Arc Lamps (ISO 4892-4:2004, IDT).

This Standard was proposed by China Petroleum and Chemical Industry Federation.

This Standard shall be under the jurisdiction of National Technical Committee for Standardization of Rubber and Rubber Products (SAC/TC 35).

Drafting organizations of this Standard: Northwest Rubber & Plastics Research and Design Institute; Aeolus Tyre Co., Ltd.; Guangzhou Research Institute of Synthetic Materials; Fushun Yikesi New Material Co., Ltd.; and Jiangsu Mingzhu Testing Machine Co., Ltd.

Chief drafting staffs of this Standard: Zhu Wei, Hang Lei, Ren Shaowen, Ma Tiancheng, Liu Xiaodan, Xie Yufang, Lin Qingju, Wang Longqing, and Bao Dafei.

The historical editions replaced by this Standard are as follows:

- GB/T 12831-1991;
- GB/T 14835-1993;
- GB/T 16996-1997;
- GB/T 3511-2001, GB/T 3511-2008.

## Rubber, Vulcanized or Thermoplastic

### - Resistance to Weathering

**WARNING:** Personnel using this Standard shall be familiar with the procedures of the formal laboratory. This Standard does not address all possible security issues. The user shall assume the responsibility to take appropriate safety and health measures, and ensure compliance with the conditions set by relevant national regulations.

**NOTE:** The substances or wastes used or generated in some procedures of this Standard may cause harm to the local environment; shall be safety treated and disposed of according to the relevant documents after the test.

## 1 Scope

This Standard specifies test methods for the exposure of vulcanized or thermoplastic rubbers to natural or artificial weathering and test methods for the determination of changes in color, appearance, and physical properties resulting from exposure.

This Standard is applicable to the determination of weathering performance of the vulcanized or thermoplastic rubbers.

## 2 Normative References

The following documents are essential to the application of this document. For the dated documents, only the versions with the dates indicated are applicable to this document; for the undated documents, only the latest version (including all the amendments) are applicable to this document.

ISO 105-A02 Textiles - Tests for Color Fastness - Part A02: Grey Scale for Assessing Change in Color

ISO 877-1:2009 Plastics – Methods of Exposure to Solar Radiation – Part 1: General Guidance

ISO 877-2:2009 Plastics – Methods of Exposure to Solar Radiation – Part 2: Direct Weathering and Exposure behind Window Glass

ISO 877-3: 2009 Plastics – Methods of Exposure to Solar Radiation – Part 3:

Intensified Weathering using Concentrated Solar Radiation

ISO 1431-1 Rubber, Vulcanized or Thermoplastic - Resistance to Ozone Cracking  
- Part 1: Static and Dynamic Strain Testing

ISO 4892-1 Plastics - Methods of Exposure to Laboratory Light Sources - Part 1:  
General Guidance

ISO 4892-2 Plastics - Methods of Exposure to Laboratory Light Sources - Part 2:  
Xenon-Arc Lamps

ISO 4892-3 Plastics - Methods of Exposure to Laboratory Light Sources - Part 3:  
Fluorescent UV Lamps

ISO 4892-4 Plastics - Methods of Exposure to Laboratory Light Sources - Part 4:  
Open-Flame Carbon-Arc Lamps

ISO 18314-1 Analytical Colorimetry – Part 1: Practical Color Measurement

ISO 23529 Rubber – General Procedures for Preparing and Conditioning Test  
Pieces for Physical Test Methods

### 3 Terms and Definitions

For the purposes of this document, the terms and definitions given in ISO 877 and ISO 4892 and the following apply.

#### 3.1 Control

Material exposed alongside the test material for comparison.

NOTE: The control, for example, may be a material of similar or related composition to the test material or a material having a known response to the exposure conditions.

#### 3.2 File test piece

Portion of the material to be tested which is stored under conditions in which it is stable and is used for comparison between the exposed and the original state.

#### 3.3 Masked area

Portion of the exposed test piece which is protected from light exposure by masking.

#### 3.4 Weathering reference material

Reference material whose weathering degradation properties are well documented

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