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

GB/T 3780.29-2022

**Carbon black - Part 29: Determination of solvent extractable
material**

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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 29 of GB/T 3780. GB/T 3780 has released 22 parts.

- Part 1. Test method for iodine absorption value;
- Part 2. Determination of oil absorption value;
- Part 4. Determination of oil absorption value of compressed samples;
- Part 5. Determination of specific surface area CTAB method;
- Part 6. Determination of tinting strength;
- Part 7. Determination of pH value;
- Part 8. Determination of heating loss;
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- Part 18. Identification methods in natural rubber (NR);

- Part 21.Determination of sieve residue - Water washing method;
- Part 22.Calculation of process capability index using process control data;
- Part 23.Sampling and identification of fugitive carbon black or other environmental particles;
- Part 24.Determination of void volume;
- Part 25.Determination of carbon content;
- Part 26.Determination of carbon content in carbon black feedstock oil;
- Part 27.Determination of aggregate size distribution by disc centrifugal optical deposition measurement;
- Part 28.Determination of polycyclic aromatic hydrocarbon content;
- Part 29.Determination of solvent extractables.

This document is modified to adopt ISO 6209.2009 "Determination of solvent extractables of carbon black in rubber compounds".

Compared with ISO 6209.2009, this document has made the following structural adjustments.

- Added the chapter "Terms and Definitions" (see Chapter 3);
- Chapter 4~Chapter 10 correspond to Chapter 3~Chapter 9 of ISO 6209.2009 in turn;
- The note in Chapter 5 corresponds to the last half sentence of the second sentence in Chapter 4 of ISO 6209.2009.

The technical differences between this document and ISO 6209.2009 and their reasons are as follows.

- Replaced ISO 1126 (see 7.3) with the normatively quoted GB/T 3780.8 to adapt to the technical conditions of our country;
- Deleted ISO 1124 (see Chapter 6 of ISO 6209.2009) to adapt to the technical conditions of our country;
- Added GB/T 6003.1 (see 6.2.7) to adapt to the technical conditions of our country;
- Increased GB/T 3778, GB/T 7044 (see 7.1) to adapt to the technical conditions of our country;
- Added GB/T 8170 (see 9.2) to adapt to the technical conditions of our country.

The following editorial changes have been made to this document.

- In order to coordinate with existing standards, the name of the standard was changed to "Carbon Black Part 29.Determination of Solvent Extractables";

--- Delete the third paragraph of Chapter 3 in ISO 6209.2009, which is already specified in the test procedure (see 8.2), which is a duplication;

--- Deleted the informative Appendix A of ISO 6209.2009, and the precision value given is too large.

Please note that some contents of this document may refer to patents. The issuing agency of this document assumes no responsibility for identifying patents.

Introduction

Carbon black is a kind of carbon element, which exists in the form of nano-scale particle size and amorphous carbon, and is the organic matter (natural gas, heavy oil, fuel oil, etc.)

The product obtained by incomplete combustion or thermal decomposition under the condition of insufficient gas. Carbon black is the earliest nanomaterial developed, applied and currently produced by human beings.

Rice materials are listed as one of the 25 basic chemical products and fine chemical products by the international chemical industry. Carbon black is indispensable for the rubber industry

With less reinforcing raw materials, it can endow rubber products with a series of excellent properties.

In the standardization system of carbon black, the three characteristic indicators of carbon black, specific surface area, structure and surface activity, are the main indicators to determine the reinforcing ability of carbon black.

Indicators, GB/T 3780 is divided into multiple parts around the performance of carbon black, and it is proposed to be composed of 22 parts.

--- Part 1. Test method for iodine absorption value. Suitable for testing the surface area of carbon black, the size of the surface area of carbon black will affect the carbon black in rubber

dispersion, especially in relation to tire wear resistance.

--- Part 2. Determination of oil absorption value. It is suitable for testing the structure of carbon black. The structure is the unique performance of carbon black. Carbon black with high structure can be

In order to provide better reinforcement for tires, the structure tested in this part is the primary structure and secondary structure of carbon black, and the secondary structure of carbon black

The structure is the structure of the smallest unit aggregate of carbon black due to agglomeration.

--- Part 4.Determination of oil absorption value of compressed samples. The oil absorption value of the compressed sample of carbon black tests the primary structure of carbon black, which is the

According to the structural parameters of the smallest unit aggregate, only the primary structure of carbon black can reinforce the tire.

--- Part 5.Determination of specific surface area CTAB method. It is suitable for testing the outer surface area of carbon black, which is the difference between carbon black and rubber

The effective area where crosslinking can occur.

--- Part 6.Determination of tinting strength. It is suitable for testing the particle size distribution of carbon black, which can determine its effect on rubber.

Reinforcing effect. Carbon black with high tinting strength value has a relatively concentrated particle size distribution, which can greatly improve the reinforcing effect of carbon black.

Effect.

--- Part 7.Determination of pH value. Suitable for testing the pH value of carbon black, the pH value of carbon black will affect the vulcanization speed of rubber products degree and curing time.

--- Part 8.Determination of heating loss. It is suitable for the determination of low-temperature volatiles such as moisture in carbon black, and the heat loss in carbon black is partial

When it is high, its rubber products will produce air bubbles due to low-temperature volatiles such as moisture vulcanized at high temperature, which will affect the quality of rubber products such as tires.

quality.

--- Part 10.Determination of ash. High ash content in carbon black will affect the purity of carbon black and reduce the carbon content in carbon black.

--- Part 12.Inspection of impurities. Impurities in carbon black are foreign matter in the production process, which are relatively large in size and can be found in rubber products.

If it exists, local cracks will easily appear in the place where it exists, and it may cause a blowout in the tire.

--- Part 14.Determination of sulfur content. Rubber products need to be vulcanized with sulfur, and the sulfur content of carbon black is high, which will affect the quality of rubber products, etc.