

Translated English of Chinese Standard: GB/T3780.10-2017

www.ChineseStandard.net → Buy True-PDF → Auto-delivery.

Sales@ChineseStandard.net

GB

NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA

ICS 83.040.20

G 49

GB/T 3780.10-2017

Replacing GB/T 3780.10-2009

Carbon Black – Part 10: Determination of Ash

(ISO 1125:2015, Rubber Compounding

Ingredients – Carbon Black – Determination of Ash, MOD)

Issued on: November 01, 2017

Implemented on: May 01, 2018

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

Table of Contents

Foreword.....	3
1 Scope.....	6
2 Normative References	6
3 Principle	6
4 Instrument.....	7
5 Sample.....	7
6 Test Procedures	7
7 Test Data Processing	8
8 Precision	8
9 Test Report	9
Appendix A (Informative) Comparison of Clause No. between This Part and ISO 1125:2015	10

Foreword

GB/T 3780 *Carbon Black* can be divided into the following parts:

- Part 1: Test Method for Iodine Adsorption Number;
- Part 2: Determination of Dibutyl Phthalate Absorption Number;
- Part 4: Determination of Oil Absorption Number for Compressed Sample;
- Part 5: Determination of Specific Surface Area - CTAB Test Method;
- Part 6: Determination of Tinting Strength;
- Part 7: Determination of pH Value;
- Part 8: Determination of Heating Loss;
- Part 10: Determination of Ash;
- Part 12: Inspection of Impurity Material;
- Part 14: Determination of Sulfur Content;
- Part 15: Determination of Light Transmittance of Toluene Extract;
- Part 17: Indirect Determination of Particle Size - Reflectance Method;
- Part 18: Standard Test Methods for Evaluation in Natural Rubber (NR);
- Part 21: Determination of Sieve Residue - Water Flushing Method;
- Part 22: Calculation of Process Indexes from an Analysis of Process Control Data;
- Part 23: Sampling and Testing of Carbon Black Fugitive Emissions or Other Environmental Particulate;
- Part 24: Determination of Void Volume.

This Part belongs to Part 10 of GB/T 3780.

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

This Part replaced GB/T 3780.10-2009 *Carbon Black – Part 10: Determination of Ash*; compared with GB/T 3780.10-2009, this Part has the major technical changes as follows:

- Add “after taking out the crucible, cooling it on a dry and clean porcelain plate beside the high temperature furnace for 3 minutes”; add the operability (see 6.1);
- Add “cover the lid of crucible, transfer to a dry and clean porcelain plate beside the high temperature furnace; open the lid of the crucible”; prevent the sample loss due to the air flow during the transferring period (see 6.3);
- Add “6.4 and 6.5”, so that add the operability and accuracy (see 6.4 and 6.5).

This Part adopts the re-drafting method to modify and use ISO 1125:2015. For the sake of comparison, a checklist for the clauses of this Part and ISO 1125:2015 are listed in the informative Appendix A.

Compared with ISO 1125:2015, this Part has more adjustments in structure. The technical differences and causes between this Part and ISO 1125:2015 are as follows:

- Add the content that this Standard is applicable to the acetylene black and color black (see Clause 1);
- Delete the reference standard of ISO 1125:2015; meanwhile, quote GB/T 3778, GB/T 7044, GB/T 3782, GB/T 8170, which has no correspondence with ISO 1125:2015 (see Clause 2);
- Modify the test temperature of ash from $(550\pm 25)^\circ\text{C}$ to $(825\pm 25)^\circ\text{C}$, because increasing the test temperature shall significantly improve the test efficiency (see 4.1);
- Modify to express the specification of crucible by the volume; so that conform to the customary representation of China's porcelain crucible specifications (see 4.2, ISO 1125:2015);
- Modify “temperature can be controlled at $(125\pm 1)^\circ\text{C}$ ” into “temperature can be controlled at $(125\pm 2)^\circ\text{C}$ ” (see 4.5);
- Add Table 1 to confirm the sampling quantity of various carbon black (see Table 1);
- Modify “treat the new crucible as per the procedure of 6.1” into “burn the new crucible till the difference between two dosing not exceeding 0.3mg”; so that increase the operability (see 6.1; 6.1 of ISO 1125:2015);
- Modify “place the carbon black into 125°C oven” into “place the carbon black into $(125\pm 2)^\circ\text{C}$ ” (see 6.2);
- Delete “crucible cleaning process”, which is easy to cause the result error (see 6.4 of ISO 1125:2015);

Carbon Black – Part 10: Determination of Ash

WARNINGS: Personnel using this Part shall have practical working experience in the formal laboratory. This Part does not address all the possible security issues. The users are responsible to take appropriate safety and health measures; and ensure the compliance with conditions set by relevant national regulations.

1 Scope

This Part of GB/T 3780 specifies the determination of ash in carbon black.

This Part is applicable to the rubber carbon black, acetylene black, and color black.

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.

GB/T 3778 Carbon Black for Use in Rubber Products

GB/T 3782 Acetylene Black

GB/T 7044 Color Carbon Black

GB/T 8170 Rules of Rounding off for Numerical Values & Expression and Judgement of Limiting Values

3 Principle

Accurately take the dry specimen into the porcelain crucible; place the crucible into a high temperature furnace for burning till all carbonaceous materials are oxidized; then take out crucible, cool off into the desiccator, and weigh it; then calculate the ash content.

burning period, open the high temperature furnace door for about 0.5cm; so that the air enters into the high temperature furnace and facilitate the combustion of the sample. Other burning temperatures may be used with the agreement of both parties.

6.4 After the sample is completely ashed, close the furnace door to burn for 30min; take out the crucible; place onto the dry and clean porcelain plate beside the high temperature furnace and cool off for 3min; then cover the lid of the crucible; place into the desiccator to cool off to the room temperature. When opening the lid of the desiccator, the air shall be ensured to flow into slowly, so that avoid ash loss in the crucible due to strong airflow. Weigh the mass of the crucible, accurate to 0.1mg.

6.5 Place the crucible into a high temperature furnace for repeat burning until difference between two weightings does not exceed 0.3mg; record the smaller weighting value of m_2 . In order to avoid repeated operations, the ashing time of the sample shall be fully estimated during the burning period.

7 Test Data Processing

The ash content of the carbon black shall be recorded by mass fraction of residue after burning of the sample, w ; it shall be calculated as per Formula (1):

$$w = \frac{m_2 - m_0}{m_1 - m_0} \times 100\% \quad \dots\dots\dots (1)$$

Where:

m_0 – the mass value of empty crucible before sample-weighing, in g;

m_1 – the mass value of crucible and specimen before burning, in g;

m_2 – the mass value of crucible and residue after burning, in g.

The calculation results shall be expressed by two figures after the decimal points; if there are multiple measurement results, take the average value; then round-off the value as per the report requirements or provisions of GB/T 3778, GB/T 3782, GB/T 7044 or GB/T 8170.

8 Precision

8.1 Repeatability

In the same laboratory, the absolute difference between two independent test results obtained by the same operator using the same equipment, according to the same test method, and testing the same object independently in a short time shall be no more

This is an excerpt of the PDF (Some pages are marked off intentionally)

Full-copy PDF can be purchased from 1 of 2 websites:

1. <https://www.ChineseStandard.us>

- SEARCH the standard ID, such as GB 4943.1-2022.
- Select your country (currency), for example: USA (USD); Germany (Euro).
- Full-copy of PDF (text-editable, true-PDF) can be downloaded in 9 seconds.
- Tax invoice can be downloaded in 9 seconds.
- Receiving emails in 9 seconds (with download links).

2. <https://www.ChineseStandard.net>

- SEARCH the standard ID, such as GB 4943.1-2022.
- Add to cart. Only accept USD (other currencies - <https://www.ChineseStandard.us>).
- Full-copy of PDF (text-editable, true-PDF) can be downloaded in 9 seconds.
- Receiving emails in 9 seconds (with PDFs attached, invoice and download links).

Translated by: Field Test Asia Pte. Ltd. (Incorporated & taxed in Singapore. Tax ID: 201302277C)

About Us (Goodwill, Policies, Fair Trading...): <https://www.chinesestandard.net/AboutUs.aspx>

Contact: Wayne Zheng, Sales@ChineseStandard.net

Linkin: <https://www.linkedin.com/in/waynezhengwenrui/>

----- The End -----