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

GB/T 3855-2026

Replacing GB/T 3855-2005

**Test method for the resin content of carbon fibre reinforced
plastics**

碳纤维增强塑料树脂含量试验方法

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Table of Contents

1	Scope
4	Principles
5	Samples
5.1	Sample Preparation
5.2	Sample Conditioning
6	Trial Implementation
6.1	Method A. Digestion
6.1.3	Test Procedure
6.1.3.1	Weigh the sample using an analytical balance, accurate to
6.1.4	Calculation
6.2	Method B. Calcination method
6.2.3	Test Procedure
6.2.3.3	Weigh the crucible using an analytical balance, accurate to
6.2.4	Calculation
8	Test Report

Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part

1. Structure and Drafting Rules of Standardization Documents". Drafting. This document supersedes GB/T 3855-2005 "Test Method for Resin Content in Carbon Fiber Reinforced Plastics" and is consistent with GB/T 3855-2005. Aside from structural adjustments and editorial changes, the main technical changes are as follows:

- The scope has been changed (see Chapter 1, Chapter 1 of the 2005 edition);
- Method A. The principle of digestion (see 4.1, Chapter 3 of the 2005 edition);
- Added Method B. The principle and experiment of calcination (see
- Sample preparation and conditioning have been added (see 5.1.4);
- Added requirements for acetone reagent in Method A. Digestion Method (see 6.1.2);
- Added Method A. Formula for calculating the fiber volume content of carbon fiber reinforced plastics by digestion method (see 6.1.4.2);

---Added content regarding the methods used in the experiment in the test report (see Chapter 8). Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents. This document was prepared by the National Technical Committee on Standardization of Carbon Fiber (SAC/TC572) and the National Technical Committee on Standardization of Fiber Reinforced Plastics. (SAC/TC39) jointly proposed and are under the jurisdiction of the relevant authorities. This document was drafted by: Harbin Fiberglass Research Institute Co., Ltd., Harbin Institute of Technology, and Sinoma Science & Technology Wind Turbine Blade Co., Ltd. Company, Feirongda Technology (Jiangsu) Co., Ltd., Sinoma Science & Technology (Funing) Wind Power Blade Co., Ltd., Beijing Fiberglass Research Institute Testing Center Co., Ltd. Nanjing Fiberglass Research and Design Institute Co., Ltd., Guangdong Baihuida New Materials Co., Ltd., Nantong Fuyuan New Materials Technology Co., Ltd., Harbin Binlepu Industrial Co., Ltd., Harbin Habo Top Composite Materials Co., Ltd., Heilongjiang Academy of Sciences Petrochemical Research Institute, Beijing Glass Steel Research and Design Institute Co., Ltd., and China Petroleum & Chemical Corporation Shanghai Petrochemical Co., Ltd. The main drafters of this document are. Zhang Mingrui, Wu Xiaohong, Sun Yuanjun, Wang Baorui, Yi Liangwen, Wu Weiwei, Xu Youmu, Ma Dan, Yuan Huixia, and Shi Jianjun. Yu Tongbai, Li Xin, Qin Wei, Zhou Guotai, Song Nan, Li Jun, Li Yang, Tang Huali, Yu Fubin, Liu Xiaowei, Wang Jing, Kuang Naihang, Zhang Binbo, Yin Yue Zhu Nan, Liu Jiaming, Liu Jia, Ji Danyang, Peng Degong, Chen Guofu, Du Shu, Yang Yongsheng, Ren Kun, Ji Yuan, Yu Jinghui, Fan Huijuan, Yang Bin. This document was first published in 1981, revised for the first time in 1989, revised for the second time in 2005, and this is the third revision. Test method for resin content of carbon fiber reinforced plastics

1 Scope

GB/T 3855-2026 is the Chinese national standard covering the resin fraction of a composite - determined by acid digestion or by burning off the matrix, and the figure from which fibre volume fraction and void content follow, which is to say the figure that says whether the laminate was made properly. It replaces GB/T 3855-2005 and has been in force since 1 October 2026, with the carbon composite standards of this batch. It was issued on 31 March 2026 and takes effect on 1 October 2026, replacing GB/T 3855-2005. The document is under the responsibility of the Standardization Administration of China. This page is published from the official record of the 2026 edition; the clause text of a standard this recent is not yet in circulation, and the figures, limits and tables it contains are those of the document itself, delivered in full with the English translation.

This document describes the principle, specimens, test procedures, test results, and test report for the carbon fiber reinforced plastic resin content test. Method A in this document. The digestion method is suitable for carbon fibers where sulfuric acid, under certain conditions, completely decomposes the resin without excessively corroding the fiber. Resin

content testing for reinforced plastics; Method B. Calcination method is suitable for achieving resin carbonization under a high-temperature nitrogen atmosphere without affecting the quality of carbon fibers. Resin content test of carbon fiber reinforced plastics. This document does not apply to the resin content testing of carbon fiber reinforced plastics with fillers.

4 Principles

4.1 Method A. Digestion A sample of known mass was subjected to partial digestion of the resin in a hot sulfuric acid medium. The residue containing carbon fibers was then filtered, washed, dried, and cooled. Weigh the sample and calculate the resin content of the carbon fiber reinforced plastic based on the mass change before and after digestion.

4.2 Method B. Calcination method A sample of known mass was calcined at high temperature under a nitrogen atmosphere. The mass of the carbon fiber remained unchanged, but the resin portion underwent carbonization. The corresponding resin casting samples under the same conditions were calcined, the mass of the residue was weighed, and the carbon fiber reinforced plasticity was calculated based on the mass change. The resin content of the material.

5.1 Sample Preparation

5.1.1 The test specimen should be selected from a representative part of the sample or as agreed.

5.1.2 The sample thickness shall not exceed 3 mm, the mass shall be approximately 0.5 g, and the shape shall be unrestricted, as long as it fits comfortably in a container. Each group shall contain no fewer than 3 samples. The shapes of the group of test samples should be consistent.

5.1.3 Remove oil stains from the sample surface.

5.1.4 Method B. In addition to the above requirements, the thickness of the resin-cast specimens should also be the same as that of the carbon fiber reinforced plastic specimens. The sample had a uniform thickness and a mass of approximately 0.5g.

5.2 Sample Conditioning

5.2.1 Before the test, the sample shall be placed in a desiccator for at least 24 hours.

5.2.2 Other state adjustment conditions shall be agreed upon separately.

6.1 Method A. Digestion

6.1.1 Test Instruments The testing instruments shall meet the following requirements.

a) Analytical balance. graduation value

0.1 mg;

b) Heater. Operating temperature not lower than 420°C, with an accuracy of $\pm 10^\circ\text{C}$;

c) Beaker or flask. 250 mL in volume;

d) Acid-resistant filter. pore size $4.5\mu\text{m}\sim 9.0\mu\text{m}$;

e) Suction flask. 500mL;

f) Vacuum pump and pressure gauge. measuring range greater than 20 kPa, accuracy not less than

0.4 grade;

g) Oven. Ambient temperature $\sim 300^\circ\text{C}$, accuracy $\pm 10^\circ\text{C}$;

h) Dryer. Volume not less than 1L.

6.1.2 Test Reagents The test reagents should meet the following requirements.

a) Sulfuric acid. concentration 95%~98%, analytical grade;

b) Hydrogen peroxide. 30% concentration, analytical grade;

6.1.3.1 Weigh the sample using an analytical balance, accurate to

0.1 mg.

6.1.3.2 Place the sample in a beaker or flask, add at least 30 mL of sulfuric acid, and place it above a heater to raise the temperature to the digestion temperature. Epoxy, Poly The digestion temperature for ester-based carbon fiber reinforced plastics is $220^\circ\text{C}\pm 10^\circ\text{C}$. The digestion temperature for phenolic carbon fiber reinforced plastics is $285^\circ\text{C}\pm 5^\circ\text{C}$. Sulfuric acid... The time required to rise from room temperature to the set temperature should not be less than 15 minutes. After reaching the set temperature, digestion should continue for 60 minutes $\pm$ 10 minutes. Other resin digestion... The method for determining the temperature can be based on the selected temperature conditions, such as adding hydrogen peroxide after sulfuric acid digestion to clarify the digestate and ensure complete fiber recovery. The part floats to the surface of the liquid to be determined.

6.1.3.3 Slowly add hydrogen peroxide along the bottle wall until the digestion solution becomes clear and the fibers float to the surface of the solution.

6.1.3.4 Heat the clarified digest solution to the digestion temperature and keep it warm for 10 minutes. If it becomes cloudy again, continue to add hydrogen peroxide dropwise while stirring until it becomes clear. until.

6.1.3.5 Wash and dry the acid-resistant filter until it reaches constant weight. Weigh the