

ICS 59.100.20

CCS Q 53



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

GB/T 47405-2026

**Test methods for the permeability of carbon fibre
reinforcements used in liquid moulding**

液体成型用碳纤维增强材料渗透率测定方法

Issued on: March 31, 2026

Implemented on: October 1, 2026

**Issued by: State Administration for Market Regulation;
Standardization Administration of the PRC**

Table of Contents

- 1 Scope
- 2 Normative references
- 3 Terms and Definitions

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. 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 proposed and is under the jurisdiction of the National Technical Committee on Carbon Fiber Standardization (SAC/TC572). This document was drafted by: Beijing Civil Aircraft Technology Research Center of Commercial Aircraft Corporation of China, Ltd., and Huaneng Liaoning Clean Energy Co., Ltd. Limited Liability Company, Nanjing Glass Fiber Research and Design Institute Co., Ltd., Wuhan University of Technology, China Petroleum & Chemical Corporation Shanghai Petrochemical Co., Ltd. Taiyuan University of Technology, Donghua University, Jiangnan University, Huazhong University of Science and Technology, China Academy of Aeronautical Manufacturing Technology, and Zhongfu Shenying Carbon Fiber Co., Ltd. Limited Liability Company, AVIC Composite Materials Co., Ltd., CRRC Qingdao Sifang Locomotive & Rolling Stock Co., Ltd., Suzhou Offensive New Materials Technology Co., Ltd. Limited Liability Company, Modern Textile Technology Innovation Center (Jianhu Laboratory), Shenzhen Dingxinde New Materials Science and Technology Innovation Co., Ltd., Xianning Haiwei Composite Materials Products Co., Ltd., Zhejiang Youwei New Materials Co., Ltd., Jiangxi Jiuyou Aviation Equipment Co., Ltd., China Huaneng Group Clean Energy Source Technology Research Institute Co., Ltd., Yangtze River Delta Carbon Fiber and Composite Materials Technology Innovation Center, Sichuan Xinwanxing Carbon Fiber Composite Materials Co., Ltd. Company. Beijing Weisheng Composite Materials Co., Ltd. The main drafters of this document are. Xu Jifeng, Duan Mufeng, Wang Yan, Qian Zhongyan, Yin Wei, Su Yanan, Ma Dan, Yang Bin, Yue Guangquan, Wu Zhanjun, and Tian Tiebing. Xin Meiyin, Luo Yunfeng, Feng Yuwei, Zhou Huamin, He Bohan, Song Nan, Jin Liang, Zhang Lu, Zhang Xiaomin, Zhou Helezi, Sun Lin, Pan Lijian, Dong Fengyan Xu Lu, Li Qiang, Lei Zhongyuan, Li Tianhai, Cai Zhengjie, Wang Jingnan, Qin Zhiwen, Fan Airong, Zhang Hui, Xia Jisheng, Su Shunsheng, Wang Zhihua, Li Zhiqiang Chen Chaozhong, Fan Yunxing, and Wang Wei. Permeability of carbon fiber reinforced materials for liquid molding Determination methods

1 Scope

GB/T 47405-2026 is the Chinese national standard covering how easily resin flows through a dry carbon preform - the permeability that decides whether a resin transfer moulding fills completely or leaves a dry patch in the middle of a part nobody can see into. First edition, in force since 1 October 2026. It was issued on 31 March 2026 and takes effect on 1 October 2026, as a first edition. 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, equipment, sample, test liquid, and test procedure for determining the permeability of carbon fiber reinforced materials used in liquid molding. Environment, testing procedures, result calculation, and test report. This document applies to the determination of permeability of carbon fiber reinforced materials used in vacuum-assisted infusion liquid molding, including in-plane permeability and thickness permeability. Permeability. Refer to this method for determining the permeability of other fiber-reinforced materials.

2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are not included. For references to documents, only the version corresponding to that date applies to this document; for undated references, the latest version (including all amendments) applies. This document.

GB/T 1226-2017 General Pressure Gauges

GB/T 10247 Viscosity Measurement Method

GB/T 30019 Determination of carbon fiber density

GB/T 40724 Terminology for Carbon Fibers and Their Composites

3 Terms and Definitions

The terms and definitions defined in GB/T 40724, as well as the following terms and definitions, apply to this document.

3.1 permeability A quantitative characterization parameter for the resin conductivity of fiber reinforcement as a liquid flowing through a porous medium under a certain pressure difference. [Source: GB/T 40724-2021, 6.25]

3.2 The permeability, which characterizes the flow capacity of a material's pore structure

under given conditions at that moment, is used to describe its flow capacity at that time.

3.3 global permeability The equivalent permeability is obtained by comprehensively characterizing the seepage process within the specified test conditions and statistical time range.

4.Principles Based on Darcy's law, under a specified pressure, a liquid of known viscosity is injected into a carbon fiber reinforced material sample to determine the unsaturated flow of the liquid. The distance and time are considered, and the permeability is calculated based on the liquid viscosity, the porosity of the reinforcing material, and the vacuum level.

In-plane permeability corresponds to the X and Y directions. Let k_X and k_Y be the reference values; the thickness permeability corresponds to the Z direction and is denoted as k_Z .