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

GB/T 41762.1-2025

**Fibre-reinforced plastic composites - Determination of laminate
through-thickness properties - Part 1: Direct tension and
compression tests**

纤维增强塑料复合材料 层合板厚度方向性能的测定 第1部分：直接拉伸和压缩试
验

(English Translation)

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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 1 of GB/T 41762 "Fiber reinforced plastic composite laminates - Determination of thickness properties".

GB/T 41762 has published the following parts.

--- Part 1: Direct tension and compression test;

--- Part 2: Determination of elastic modulus, strength and Weibull size effect of carbon fiber unidirectional laminates by bending test This document is equivalent to ISO 20975-1:2023 "Fiber reinforced plastic composite laminates - Determination of thickness properties - Part 1. Direct tension and compression testing.

Introduction

With the continuous expansion of the application field of fiber reinforced plastic composite materials, material research and development and structural design personnel need to understand fiber reinforced plastics.

The thickness direction performance of composite materials is tested by designing test methods and accurately evaluating data to ensure their safety in use.

It was developed to meet the needs of evaluating the thickness direction performance of fiber reinforced plastic composite laminates and is intended to consist of three parts.

--- Part 1: Direct tension and compression test. The purpose is to use tension and compression test methods to determine the thickness direction of the laminate performance.

--- Part 2: Determination of elastic modulus, strength and Weibull size effect of carbon fiber unidirectional laminates by bending test.

The bending test method was used to determine the thickness direction properties of the laminate.

--- Part 3: Impact test. The purpose is to determine the thickness direction properties of laminates using the impact test method.

This document provides a tensile and compression test method for determining the through-thickness properties of fiber-reinforced plastic composite laminates.

1 Scope

This document describes the use of rectangular and/or waist-shaped block specimens to determine the through-thickness properties (i.e. strength, elasticity, test method for tensile modulus, Poisson's ratio, and failure strain).

This document is applicable to laminates with a thickness of 20mm~40mm, with fiber forms of directional and non-directional, continuous and non-continuous, and matrix types Classification is thermosetting and thermoplastic. This document describes the following three specimen types.

---Type I, rectangular cross-section, constant cross-section along the thickness of the specimen. Type I specimens are suitable for determining elastic properties.

---Type II, waist-shaped and rectangular cross-section, cross-section changes along the thickness direction of the specimen. Type II specimen is suitable for measuring highly anisotropic and thermoplastic The tensile strength of the material.

---Type III, waist-shaped and rectangular cross-section, the cross-section is constant along

the length of the specimen. Type III specimens are suitable for measuring elastic properties and strength performance, providing complete stress-strain response.

Type I and II specimens are also suitable for non-reinforced plastics, but not for rigid porous materials and sandwich structures containing porous materials. This document provides two test methods.

---Method A-Stretching.

---Method B - Compression.

2 Normative references

The contents of the following documents constitute the essential clauses of this document through normative references in this document.

For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies to This document. and testing)

Note: GB/T 2918-2018 Standard environment for conditioning and testing of plastic specimens (ISO 291:2008, MOD)

ISO 1268 (all parts) Fibre-reinforced plastics - Methods of preparation of test panels

Note: GB/T 27797 (all parts) Preparation of fiber reinforced plastic test panels [ISO 1268 (all parts)] testresults-Estimationofthemean-Confidenceinterval)

Note: GB/T 17200-2008 Rubber and plastics tensile, compression and bending testing machines (constant speed drive) Technical specification (ISO 5893:2002, IDT)

ISO 7500-1 Metallic materials - Verification and calibration of static uniaxial testing machines - Part 1: Testing of tension and/or compression testing machines