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**NATIONAL STANDARD OF THE
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**Test method for mode III interlaminar fracture toughness of
carbon fiber reinforced composite materials - Edge crack
torsion method**

碳纤维增强复合材料III型层间断裂韧性的测定 边缘裂纹扭转法

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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.

Please note that some of the contents of this document may involve patents. The issuing organization of this document does not assume the responsibility for identifying patents.

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Mode III interlaminar fracture toughness of carbon fiber reinforced composites
Determination of edge crack torsion method

1 Scope

This document describes the principle, test equipment, test specimens, test methods and test methods of carbon fiber reinforced composite material type III interlaminar fracture toughness test method.

The test conditions and test steps are given, as well as the calculation formula and the writing content of the test report.

This document is applicable to the determination of mode III interlaminar fracture toughness of carbon fiber reinforced composite laminates.

2 Normative references

GB/T 1446

GB/T 3961

GB/T 40724

3 Terms and definitions

The terms and definitions defined in GB/T 3961 and GB/T 40724 and the following apply to this document.

3.1 Compliance

The degree to which a structure deforms under external forces.

3.2 [Source. GB/T 40724-2021, 6.77]

The rate of change of strain energy of a cracked object as the crack propagates.

3.3 GIIC

The critical value of strain energy release rate when delamination crack starts to propagate under mode III tearing load.

Note. Mode III interlaminar fracture toughness is measured in joules per square meter (J/m²).

[Source. GB/T 40724-2021, 6.86]

4 Principle

The load is applied to the edge-cut specimen in the form of torsion loading (see Figure 1), so that the specimen is subjected to the τ_{ZX} shear stress (X direction on the ZX plane).

The delamination expansion occurs under the action of shear stress, thereby obtaining the mode III interlaminar fracture toughness (GIIC) of carbon fiber reinforced composite materials.