International Standard

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Fibre-reinforced polymer (FRP) reinforcement of concrete — Test methods —

Part 1:
FRP bars

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Foreword

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This document was prepared by Technical Committee ISO/TC 71, *Concrete, reinforced concrete and pre-stressed concrete*, Subcommittee SC 6, *Non-traditional reinforcing materials for concrete structures*.

This third edition cancels and replaces the second edition (ISO 10406-1:2015), which has been technically revised.

The main changes are as follows:

— inclusion of thermoplastic resin for FRP bars;

— addition of the test method for fibre volume fraction of FRP bars;

— revision of test methods for alkaline resistance, long-term relaxation, tensile fatigue strength, and creep failure strength to enhance rigor and comprehensiveness;

— increase in the minimum number of test specimens from 3 to 5 for all test methods to ensure data reliability.

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Introduction

Fibre reinforced polymer (FRP) bars, renowned for their high strength, lightweight nature, excellent bond behaviour, and superior durability, serve a pivotal role in reinforcing new constructions and rehabilitating existing reinforced concrete structures. As the global use of FRP bars continues to expand, the need for standardized test methods has become paramount. Unlike steel, FRP bars exhibit anisotropic behaviour and their performance is influenced by the type of fibres, resin matrix, and manufacturing processes. As such, rigorous and consistent test methods are essential to accurately evaluate the physical properties, mechanical properties, long-term durability, and reliability of FRP bars in various environmental and loading conditions.

This document provides a comprehensive framework for evaluating the physical properties, mechanical properties, durability, and long-term performance of FRP bars. It aims to promote uniformity in test methods globally, thereby ensuring consistency in product quality and facilitating international trade. By establishing these test methods, this document supports engineers, manufacturers, and regulators in the design, production, and certification of FRP reinforcement systems for safe and sustainable infrastructure.