INTERNATIONAL STANDARD

ISO 16616

First edition
2015-08-01

Test methods for natural fibre-reinforced plastic composite (NFC) deck boards

Méthodes d'essai pour les planches en composite bois-plastique (WPC)

Reference number
ISO 16616:2015(E)

ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

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Foreword

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 61, *Plastics*, Subcommittee SC 11, *Products*.

Introduction

Natural fibre-reinforced composite (NFC) or wood-plastics composite (WPC) is made from one or more natural fibres or flours and a polymer or mixture of polymers. Natural fibres and flours come from different vegetable sources. Any kinds of polymers, virgin or recycled, can be used but currently the most common ones are poly(vinyl chloride), polypropylene, and polyethylene. For editorial reasons, in this International Standard, the term and abbreviation "natural fibre-reinforced composite" (NFC) is used instead of "wood-plastics composite" (WPC).

NFC materials can be considered neither as filled plastics nor as a special kind of wood material. They are to be considered as different materials having their own characteristics.

At present, the main application of NFC products is deck boards. NFC deck boards can be processed by different techniques, as extruding for profiles and pipes, compression moulding or injection moulding.

Recently, industrial interests have focused on NFC as a composite material partially derived from biomass.

However, as NFC's main constituents are hydrophilic natural fibres and hydrophobic polymer(s), problems such as cracking, bending, and strength reduction may occur in case of long-term use due to their different characteristics in the use environment related to e.g. moisture, UV resistance and thermal changes. However, due to the lack of standardized testing methods to evaluate the performance and durability of NFC, it is difficult to give the orientation for the product development and to protect the consumers' interest. Consequently International Standards are being established in order to encourage technology development in the NFC production field and to protect consumers from NFC products of low quality.

Test methods for natural fibre-reinforced plastic composite (NFC) deck boards

1 Scope

This International Standard provides test methods of natural fibre-reinforced composite (NFC) deck boards used in exterior applications. This International Standard will cover the preparation of specimen, test equipments, procedures of measurements and evaluation methods.

2 Normative references

The following referenced documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 178, *Plastics — Determination of flexural properties*

ISO 179-1, *Plastics — Determination of Charpy impact properties — Part 1: Non-instrumented impact test*

ISO 291, *Plastics — Standard atmospheres for conditioning and testing*

ISO 868, *Plastics and ebonite — Determination of indentation hardness by means of a durometer (Shore hardness)*

ISO 899-2, *Plastics — Determination of creep behaviour — Part 2: Flexural creep by three-point loading*

ISO 1183-1, *Plastics — Methods for determining the density of non-cellular plastics — Part 1: Immersion method, liquid pyknometer method and titration method*

ISO 1478, *Tapping screws thread*

ISO 4892-2, *Plastics — Methods of exposure to laboratory light sources — Part 2: Xenon-arc lamps*

ISO 8124-3, *Safety of toys — Part 3: Migration of certain elements*

ISO 9239-1, *Reaction to fire tests for floorings — Part 1: Determination of the burning behaviour using a radiant heat source*

ISO 11359-2, *Plastics — Thermomechanical analysis (TMA) — Part 2: Determination of coefficient of linear thermal expansion and glass transition temperature*

ISO 11664-1, *Colorimetry — Part 1: CIE standard colorimetric observers*

ISO 11664-2, *Colorimetry — Part 2: CIE standard illuminants*

ISO 11664-4, *Colorimetry — Part 4: CIE 1976 L*a*b* Colour space*

ISO 12460-4, *Wood-based panels-Determination of formaldehyde release*

ISO 18314-1, *Analytical colorimetry — Part 1: Practical colour measurement (in preparation)*

EN 15534-1, *Composites made from cellulose-based materials and thermoplastics (usually called wood polymer composites (WPC) or natural fibre composites (NFC)) — Part 1: Test methods for characterization of compounds and products*