Technical Report

ISO/TR 24813

Fibre reinforced plastics — Analysis of differences between circular-section tubes and cambered triangular thin-walled tubes in three-point bending tests

Plastiques renforcés de fibres — Analyse des différences entre les tubes à section circulaire et les tubes triangulaires cambrés à paroi mince dans les essais de flexion en trois points

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Contents

Page

Foreword

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This document was prepared by Technical Committee ISO/TC 61, *Plastics*, Subcommittee SC 11, *Products*.

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Introduction

This document focuses on the following issues and presents discussion and comparative analysis based on existing three-point bending test methods.

a) It gives an overview of the three-point bending test methods applicable to circular-section tubes made of fibre-reinforced plastic specified in current standards.

b) In view of the cross-sectional characteristics of cambered triangular thin-walled tubes, an analysis is conducted on the limitations of the three-point bending test methods in current standards when applied to cambered triangular thin-walled tubes.

c) Further explore the differences in test setup, apparatus, and evaluation criteria between circular-section tubes and cambered triangular thin-walled tubes through calculation, analysis, and comparison.

Fibre reinforced plastics — Analysis of differences between circular-section tubes and cambered triangular thin-walled tubes in three-point bending tests

1 Scope

This document explores and analyses the differences in the three-point bending test between circular-section tubes and cambered triangular thin-walled tubes, both fabricated from fibre-reinforced plastic, in view of the asymmetric characteristic of the cross-section of cambered triangular thin-walled tubes.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

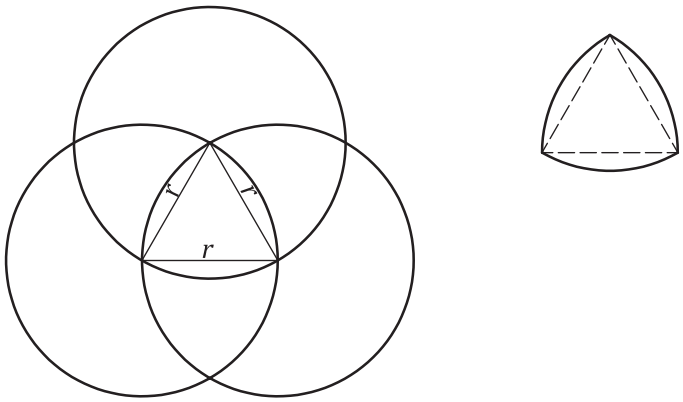
— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
cambered triangular
special type of triangle formed by three circular arcs

Note 1 to entry: It is also known as "reuleaux triangle".

Note 2 to entry: Construct circular arcs with the vertices of an equilateral triangle as centres and the length of its sides as radii, as shown in Figure 1.



Key

r radii of three curved arcs/the side length of an equilateral triangle (mm)

Figure 1 — Schematic diagram of cambered triangular