

EFFECT OF FIBRE MORPHOLOGY ON FLOCCULATION OF FIBRE-CEMENT SUSPENSIONS

G.H.D. TONOLI¹; E. FUENTE²; A. BLANCO²; H. SAVASTANO JR.³; F.A. ROCCO LAHR¹; C. NEGRO²

(1) *Dept. of Structures Engineering, Engineering School of São Carlos, University of São Paulo - Avenida Trabalhador São-Carlense, 400, 13566-590 - São Carlos, SP, Brazil.*

(2) *Dept of Chemical Engineering, F. CC. Químicas, Universidad Complutense de Madrid - Avda. Complutense s/n, 28040 Madrid, Spain.*

(3) *Dept. of Food Engineering, Faculty of Animal Science and Food Engineering, University of São Paulo - Avenida Duque de Caxias Norte, 225, 13635-900 – Pirassununga, SP, Brazil.*

ABSTRACT

The objective of the present research was to evaluate the effect of different fibre morphologies (length, width, fibrillation, broken ends, number of fibres per gram, for example) on the flocculation and drainage properties of fibre-cement suspensions. Unbleached and bleached eucalyptus and pine pulps in different refining levels (in the CSF range from 700 mL to CSF 70 mL) were morphologically characterized. Flocculation, floc properties and the drainage process were evaluated using the focused beam reflectance measurement (FBRM) and the vacuum drainage tester (VDT), respectively. The mechanical refining increased the size of formed flocs and decreased the concentration of free small particles (e.g. with dimensions between 1 μm and 20 μm) as a consequence of the increased fibrillation and broken ends, which increased the capacity of the fibres to capture the mineral particles. Pulp refining improved the packing of the particles and it, although decreased drainage rate, contributed to the less porous structure, which could improve mechanical properties of the composite.

KEYWORDS

Drainage; flocculation; kraft pulp; physical properties; refining.