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Chip Orientation Measurement Using a Profile Measuring Sensor for Recycled Chips from Waste Timber

Jun KONTA[1] and Naoto ANDO[1]

1) Graduate School of Agricultural and Life Sciences, The University of Tokyo

Abstract: Surface data of three differently oriented forming mats were obtained by profile measuring sensor and by digital camera. Surface profile data were obtained by a profile measuring sensor whereas digital image data obtained by a digital camera. Each data was analyzed in two ways, namely two-dimensional fast Fourier transform analyses and image processing. Orientation functions were compared with chip orientation data obtained by visual inspections. Orientation degrees were calculated from orientation functions. Averaging filter, Laplacian filters and threshold filter were adopted to surface profile data and digital image data to enhance chip edge points. In order to evaluate accuracy of edge enhancing, the number of edge point numbers were counted and were judged whether they are on edge or not by visual inspections. Percentiles of correct edge points were calculated from filtered images. The results can be summarized as follows :
1) FFT analyses can be used to estimate chip orientation on surface profile data and digital image data.
2) Orientation degree obtained from surface profiles and digital images, and chip orientation from visual inspections agreed approximately.

Keywords: recycled chip, chip orientation, image analysis, surface profile, fast Fourier transform

[Image PDF (1069K)] [References]