ABSTRACT

Measurement of Physical properties of fibrous materials

SilviScan is a suite of instruments including an x-ray diffractometer, an x-ray densitometer and an image analyser, developed at CSIRO for the rapid non-destructive evaluation of wood properties for the forestry and forest products industries, has also been a valuable tool for the characterisation of other materials, such as cotton, bamboo, arabidopsis, and flax-polypropylene composites.

The x-ray diffractometry system uses a fibre optically coupled intensified 75mm CCD area detector and single tapered capillary focussing system to obtain information on the orientation of cellulose in the cell walls. The x-ray densitometer uses a non-intensified fibre-optically coupled CCD area detector, and the autofocussing image analyser uses computer controlled LED lighting system to acquire images of the cross-sections of wood cells. The various analytical components of the system are linked through servers that hold the raw data and database, and provide communication and control across a network.

SilviScan has also been installed in Stockholm, Sweden and Vancouver, Canada, where a very wide range of European and North American projects are supported. The Australian system has been the basis of more than 300 projects. This poster highlights the functions and applications of SilviScan, and its application to diverse scientific and industrial problems.