Research and Development: Commercialisation, Adoption and Adaptation
Wood Innovations 2008

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The Problem

Internal Check:
- Occur in many species of hardwood.
- More prevalent in collapse prone species, regrowth and plantation resource
- Incidence and severity influenced by a wide range of factors particularly sawlog origin, storage of sawlogs, cutting pattern and all stages of drying
- Often no external sign of the occurrence of internal checking
The Problem

Internal Check:

• Check often not detected until last stage of manufacture showing as lifting grain or fine cracks leading to waste or costly rectification

• Inhibits confidence in the species
The Research

A research project funded by FWPA and conducted by Ensis aimed to:

• Research methods of measuring a sawlog's propensity to internal check using a range of technologies, particularly acoustic wave velocity

• Research methods of detecting internal check within kiln dried hardwood boards
Kiln Dried Hardwood Research-Ensisi:

• Literature review indicted a number potential detection methods

• Non contact ultrasound being used in US by Weyerhaeuser for detection of blows within OSB.

• This technology was adapted from de-lamination detection within the aerospace and nuclear power industry

• Samples sent to US for initial experiment, results confirmed possibilities
Kiln Dried Hardwood Research-Ensis:

- Larger sample sent to evaluate by Ensis scientist.
- Research project confirmed possible to detect internal check using non contact ultrasound
Ultrasound Project Development-ITC:

- Objective: to detect and measure internal check and other internal defects within kiln dried slabs of timber using non contact ultrasound in a production environment

- Visit to Heyfield by principle of small US company, Airstar, to gain better understanding of the problem and discuss potential solutions. Funded by ITC

- Development Plan drawn up

- ITC provided 600 slabs of timber for evaluation in Airstar Laboratory. Evaluation by Airstar and ITC personnel

- Design developed and agreed including measurement software

- Airstar installed, commissioned and trained ITC personnel
Screen of board moving through ultra sound scanner. Note one channel inactive.
Operation

Benefits of System:

• Enables internal checks and defects to become external defects using a spray marking system

• Enables the defect to be isolated through ripping and docking. Timber containing internal check not in appearance grades

• Measurement and data analysis allows evaluation of different treatments and sawlog resource
Adaption to other applications

Further developments:

• First detector 16 transducers and 16 receivers in transverse scanner

• Second scanner longitudinal for second line

• Development and installation of non contact ultrasound de-lamination detector on high production laminating line

• Current Modulus of Elasticity project