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Formaldehyde Emission From Solid Wood

Formaldehyde, which can be released from a range of materials (wood and non wood) used in building products, has recently been classified by the WHO as a known carcinogen. The European Union and Japan now have legislation covering the level of formaldehyde emissions from wood-based products, and without doubt there will be increased focus and controls placed on products which are known to release formaldehyde.

Most of the focus for the wood industry to date has been on those products which use formaldehyde based glues (like MDF and Plywood), but even solid wood grown in normal forest conditions releases low levels of formaldehyde, particularly during processing. High levels from any wood based products could exclude sale in certain markets such as Japan. Additionally, it would prevent the use of green labeling in high value markets where environmental concerns affect purchasing decisions.

Hence, WQI Ltd, a consortium of NZ forestry companies and forest sector research agencies, commissioned a range of studies looking at the level of formaldehyde emission from solid *Pinus radiata*, with a view to documenting how radiata pine stacks up against other species and against the current Japanese emission standard.

The investigations into formaldehyde emission from radiata pine looked at a range of factors, including differences in emission within and between trees on one site, different growing sites, the effect of kiln drying temperature, and also benchmarked radiata pine against a range of other internationally traded species. The work was carried out by TimberTest Laboratory in New Zealand who for several years have been specialising in testing formaldehyde emission from wood based products and have ISO accreditation for such analyses.

The results showed:

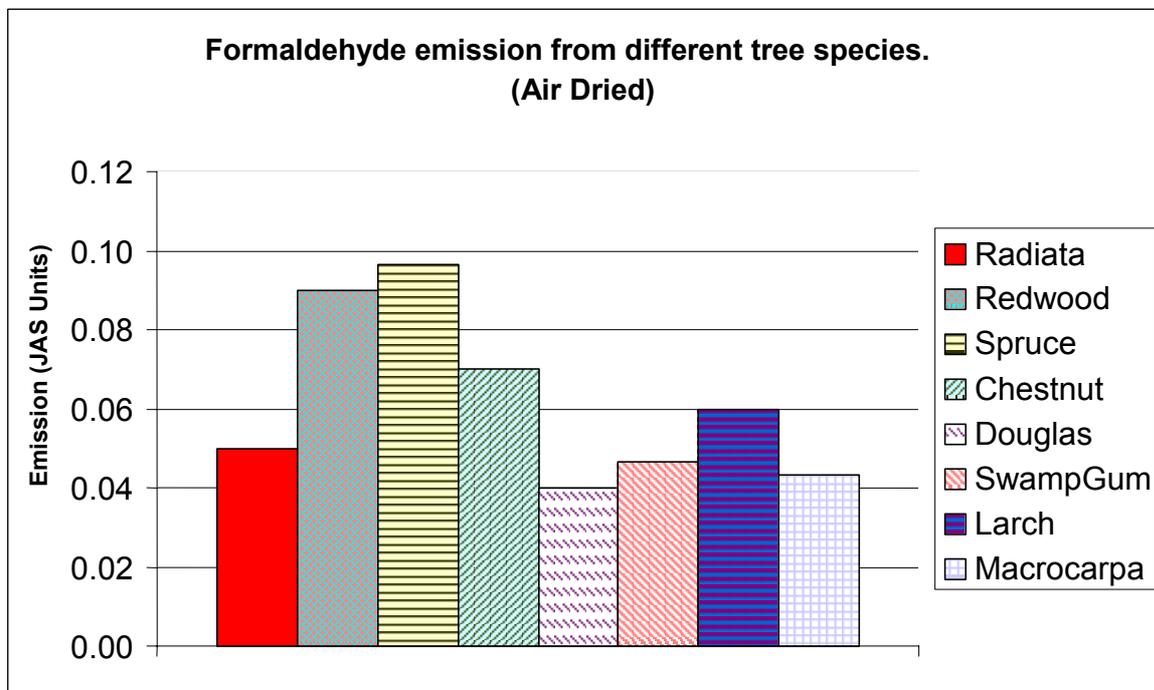
There was little or no difference between the radiata pine grown in different areas in NZ and only small differences were detected within trees.

Air-dried radiata pine releases similar levels of formaldehyde to other international species, and emissions after air-drying from all species tested were less than a third of the Japanese low emission limit for wood products.

After high temperature kiln drying at 140°C the formaldehyde emission from all wood species tested was again similar. However, immediately after HT drying the emissions were close to the Japanese low emission limit. Within 3 weeks of drying the levels had reduced to one third of the Japanese low formaldehyde limit.

The conclusions were:

- Air-dried wood of all the species tested produce low emissions of formaldehyde. Radiata has similar emission to the other species tested.
- Emission levels from solid radiata wood increase after kiln drying but will reduce to low levels quite quickly after drying and will stay low.
- Formaldehyde emission from solid radiata pine will not prevent application of green labelling or sale into the low emission markets like Japan.



The graph shows formaldehyde emission from wood of eight tree species. On this scale 0.30 JAS Units is the Japanese low emission limit.