

# "Six months in a leaky house" or framing timber – what is the standard?

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**L**eaky buildings. Rotting timber. Shonky builders. What are the standards? Private building certifiers. Distraught homeowners. Commissions of Inquiry. BIA. Huge claims. These phrases are now commonplace in the nation's daily newspapers as we learn of more and more relatively new homes literally rotting away after being exposed to water ingress. The question is, who is to blame?

Why did we not hear of these issues 10 years ago or even 6 years ago? The papers tell us it is because of poor modern building practices, use of untreated framing timber and the trend towards Mediterranean-style houses with monolithic cladding systems.

## But let's step back a bit....

At the time our building codes changed to allow untreated framing timber I presented a paper on boron treatment at the 1996 South African Wood Preservers Association International Conference (Eddy 1996). I noted that preservative treatment of building timbers in New Zealand began in the late 1930s when the then State Advances Corporation became concerned at the increasing quantities of insect borer-susceptible sapwood of native species being used in SAC-financed dwellings. The SAC were particularly concerned about the proposed use of untreated timber from plantation grown pines being used for construction purposes. The Timber Protection Research Committee at the DSIR developed a relatively simple borax/boric acid diffusion treatment for protection of timber against insect attack, based to some extent on Australian experience where boron treatment was becoming popular for protecting sapwood of hardwoods against *Lyctus* powder post beetle (Cross & Hedley 1991).

New Zealand introduced full-scale boron diffusion of timber in the mid 1950s to protect non-durable pine framing timber from insect attack and fungal decay. This continued until the building codes changed in 1996, with over 20 million m<sup>3</sup> of radiata pine being treated this way. Boron treatment was then the preferred method of preserving timber destined for H1 (low hazard) applications.



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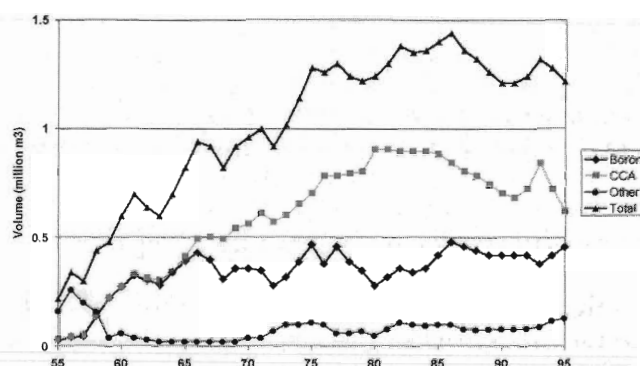


Fig. 1: Volume of Treated Timber by Preservative type 1955 to 1995.

Fig. 1 shows the volume of treated timber by preservative type from 1955 to 1996 when the requirement for treated framing timber was removed.

Boron salt usage tended to mirror the housing permits issued each year. CCA usage peaked in 1985/86 at the height of the kiwifruit horticultural boom where thousands of cubic metres of CCA treated posts and poles were installed for trellising and wind breaks. This growth was short lived. Also, for many years Australia had been a major export market for New Zealand softwood timber. A large proportion of this timber was CCA treated. The "other" category includes LOSP and creosote.

In 1996, fungal decay of any type was uncommon in New Zealand houses and buildings, except in older ones constructed using untreated timber. Similarly, New Zealand had virtually no timber remedial industry except for borer eradication services confined almost exclusively to older houses built from untreated timber (Cross & Hedley 1991). By comparison, the United States spends over US\$2 billion per annum replacing decayed and insect-infested construction timbers. In the United Kingdom the remedial treatments/building repair industry is worth some £200 million per annum.

The 1996 NZ Building Code removed the regulatory requirement for all framing timber to be preservative treated. It however defined various performance life criteria - 5, 15, 50 years. Assignments of Building Systems or elements in each category were based on the functional importance of each, e.g. structural use and difficulty/expense to replace defined a 50-year minimum performance. The Building Code then laid the responsibility squarely with the supplier to define the product, purpose, use (and limitations) and expected performance under given conditions (Drysedale 1992)



### Why the change?

Why did the industry move away from treated framing timber if it had performed so well over more than 40 years? The answer is actually quite simple; untreated kiln dried framing timber was being used in Australia. If it could be used there, why not here? Somehow the research mentioned above seemed to have been conveniently forgotten. Companies lobbied for the change because they wanted to reduce the environmental exposure on their sites and at the same time optimise their production flow. It is a costly nuisance to dry and machine gauge after treatment; to deal with contaminated kiln condensate and to get rid of boron shavings.

At the time several organisations were making submissions. Koppers Hickson submitted the view that it was extremely short sighted and dangerous to move away from treated framing timber. They and other preservative suppliers were accused of acting in self-interest and told to stop interfering in the issue.

Our houses have always leaked to varying degrees, which is one of the reasons why New Zealand has such a high per capita usage of dehumidifiers. The difference is in the past one could normally detect the leak and have it repaired long before the framing timber was destroyed by fungal decay (see Fig. 2).



Fig. 2: Leaky building - Decay hidden by a built-in window seat.

It is true that *Anobium punctatum* does not appear to enjoy kiln dried framing timber, which is why dry framing timber is usually well-wrapped and marked "Keep Dry". On the next rainy day, take a walk around your neighbourhood and have a look at a building site. You will see the timber frame fully exposed, dripping wet.


### What to do next?

We in the timber preservation industry could now easily sit back and say, "I told you so", but that would not help anybody.

Timber treaters are presently under a great deal of pressure to meet the renewed demand for treated framing timber. However, the worrying issue now is whether or not hazard class H1 is good enough if buildings are going to leak. The H1 LOSP kiln dried treated timber frame in Fig. 3 was showing signs of decay after six months in a leaky room.



Fig. 3: H1 LOSP Treated Framing Timber after 6 months' service in a leaky home.




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After repairing the leak, the frame was left open to dry out for six weeks. If this timber had been untreated it is almost certain that the frame would have had to be



replaced at significant cost and inconvenience to the homeowner. H1 LOSP treatment is designed to protect against insects, not fungal attack, so in the example above it was probably the water repellents, which provided some protection rather than the active ingredient – Permethrin.

To combat this, the industry has been supplying an “H1+” LOSP treatment containing 3-Iodo-2-Propynyl Butyl Carbonate (IPBC), Permethrin and a high level of water repellent. TimTech Chemicals Limited supplies an improved “H1+” Permethrin product containing the patented formulation, NP1 plus and H3 levels of a highly effective proprietary water repellent.

If the current H1 standard is not suitable for the hazard, should the industry be creating an ‘unofficial’ new standard.....H1+ or should the H1 requirements be increased and the standard revised?

The timber industry, chemical companies and the BIA (Building Industry Authority) are in discussions right now to resolve this issue. If the framing timber is going to be wet all the time, then even H3 CCA treated timber will not offer 50 years’ protection. So it is clear that building practices and inspections will have to improve and H1+ or H3 treated framing should be used so that there will be ample time to discover and repair leaks before structural damage occurs.



Fig. 4: Ceiling with mould that provides early evidence of a leak.

Journalists are always taught to ask, “Who is to blame?” Many of us in the timber industry remember the Alkyl Ammonium Chloride (AAC) debacle some 20 years ago. The Forest Research Institute developed AAC as an ‘environmentally friendly’ wood preservative and it was approved for use by the government’s Timber Preservation Authority. It was widely promoted as an alternative preservative for decking, fencing, pergolas and generally for most above ground applications. The problem was that AAC was so environmentally friendly that timber failures occurred within 5 years and suddenly

the industry was exposed to huge claims. The government was blamed for approving the product and timber treaters were blamed for the failures. These claims cost timber suppliers and the government millions of dollars. It cost New Zealand dearly.

When untreated framing was introduced, the Building Codes placed the onus for performance on the suppliers of the construction materials. Does this mean that as with AAC the suppliers of the kiln dried untreated timber framing are going to be held liable? Is the Government liable for approving a change in the Standards allowing untreated timber? Are the builders liable for building leaky houses? Are architects and homeowners liable because they did not insist on treated framing? Are the certifiers liable for approving buildings that allow water penetration?

Back to the Standards. It is now well documented that Dr John Kininmonth, the chairman of the Standards Committee which approved untreated timber framing, was concerned enough about evidence of decaying buildings after only three years to write to the BIA recommending that the decision be reversed and timber again be treated. It appears that this recommendation was ignored.

Research by Dr Mick Hedley at Forest Research has shown that untreated framing timber within a leaky monolithic cladding system will decay significantly, destroying the structural integrity of the building. He also found that boron treated timber remained unaffected - something we told the Standards Review Committee at the time they were considering untreated framing timber.

The BIA approved the standard allowing untreated framing timber to be used. It is their responsibility to now amend the Standard in order to provide the required level of protection for future houses.

#### References

- Cross, D., Hedley, M. 1991: Is there still a need for boron treatment? *NZ Forest Industries*, November 1991: 21-22
- Drysdale, J. A. 1992: The Need for Boron Treatment in New Zealand. Koppers-Hickson Internal Report.
- Eddy, R.C. 1996: To B or Not to B: That is the Question. Paper presented at South African Wood Preservers Association Conference.