

# Timber Talk

## Tunncliffe's

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## What a Year!

It's 10 months since our last newsletter December 07, time flies, certainly when there is a lot happening.

We have seen a good start to the year, only for demand starting to drop off in the second quarter, especially from customers with business depending on building of new dwellings. The statistics on building consents confirm that there are difficult times ahead.

We have not seen the price increases for domestic timber as we experienced last year but the pressure on costs in the other areas is certainly there.

Despite the slow down in the market there are plenty of things happening at Tunncliffe's. We made life a little easier for our staff by building a new smoko room, we had to deal with a fire in May, got going on a new product ThermoWood® and we made good progress with CTS Ltd. designing and testing a further few double glazed timber joinery units.

## Fire

Doing business is all about taking risks. You know they are there, you take all reasonable steps to minimize the risks, but still, when reality hits, it hurts. It is not funny to get "the call", half past twelve in the morning where a friendly character from the monitoring company informs you that a fire alarm went off at your business premises, that



the Fire Service has been advised and asking for management to be present on-site...

I've never covered the distance between house and work in such a short time frame. Passing the fire station on the way, seeing that all lights are on, with both of the Edgcumbe appliances out, it makes your stomach turn. Seeing the clouds of smoke hanging above the buildings while turning into the yard and being confronted by helmets, hoses and flashing red lights, is a daunting experience.

But we were lucky, only the shavings bin. By working through the weekend and being able to blow our shavings straight into a truck we did not have any significant down time. Thanks to the fire alarm and fire service being quick off the mark we were safe. In an event like this it is also good to see that there are people and businesses willing to help out.

## Successful Further Tests



As announced in our Timbertalk of October 2007 "Double Glazing Special Edition" Tunncliffe's started working close together with four of its Auckland based customers (Bowdendoors, Seaboard Joinery, Total Timba Joinery, Westpine Joinery) to design a new system to accommodate the larger double glazed units in timber joinery. The introduction of double glazing will change

the New Zealand exterior timber window and door products significantly.

The group entered into the third stage of development by testing a further two units including an open-in door and a pair of open-out doors (French doors). This configuration was fully tested to meet New Zealand Standard 4211 for structural strength and weather-tightness.

These latest tests are a real break-through in the project as with these units it is particularly difficult to meet the weather-tightness requirements. It took more time and a few more tests than anticipated to get the design right yet we ended up with good results. With the bi-folds, sliding doors and double hung window still to go, we are not

far off a complete product range and expect to be able to enter the market within the next 6 months.

We have received numerous enquiries from interested parties from all areas of the industry as to our developments. We have spoken to joiners, architects and regulatory bodies. The amount of interest confirms that there is a real need for updated standards in timber joinery.

Our group believes that it is in the best interest of our industry to get these standards developed and the intention is to make the system available to other joiners by way of licensing and to engage with the Master Joinery Federation to establish a minimum standard.



# Our New Product ThermoWood®



ThermoWood® cladding application in Europe

Tunnickliffe's recently invested in the latest technology to "thermally modify" New Zealand Radiata pine using the ThermoWood® process. The process has been trialled at Scion (formally FRI Rotorua) since 2003, and creates a new timber species with its own specific properties.

The technology can be seen as revolutionary for our New Zealand Radiata pine resource as the timber will be able to enter areas of application which were previously the domain of imported timbers. Tunnickliffe's ThermoWood® is a truly sustainable and environmentally friendly, long lasting product of the future for New Zealand and beyond.

Tunnickliffe's ThermoWood® is a durable product, free of any chemical. The thermally modified pine is comparable with naturally durable timbers such as Cypress macrocarpa, Western Red Cedar and Redwood and is less expensive. The other main feature is added stability due to the reduction of equilibrium moisture content (EMC). ThermoWood® will display approximate half the amount of dimensional change when compared with non modified Radiata Pine.



Our first ThermoWood® product is in our beehive box range. The product was launched during the annual beekeeper conference in June with the first deliveries taking place in August. In this particular 'food-supply' market there is a real need for chemically free and durable product. Currently we are working on making ThermoWood® available for joinery and furniture applications in both Clears and Fingerjointed product.

With regards to durability, thermally modified timber will not replace all chemically treated timber.

We are unable to claim that the timber has a durability up to the level of H3.2 CCA or TanE treated Radiata pine. From 4 year old NZ based durability trials at Scion in Rotorua (now owned by Tunnickliffe's) and data from Europe on thermally modified Radiata pine at the higher temperature levels, we can conclude that it is comparable with NZS3620:2003 "Timber and Wood-based Products for Use in Buildings" section 111 "Requirements for Wood-Based building components with a 15-year durability" within References 2A.1 to 2A.6 more particularly, weatherboards, exterior joinery and

timber reveals for aluminium windows.

Radiata pine is a great timber to work with, yet its instability can let it down, restricting its use in certain applications such as doors and sashes. For timber joinery we recommend using our H3.2 TanE product for the frames, rebated jambs, mullion and sills where the risk of water entrapment occurs and to consider using ThermoWood® in sashes and doors.

## Background

It has been known for centuries that burning the surface of wood in open fire will make it more durable in exterior use. The Vikings (700 - 1050) used this method in outdoor structures such as fences.

The heat treatment of wood was scientifically studied in Germany and the USA from 1930 to 1970. In the 1990's research work was carried out in Finland, France and the Netherlands when the process was successfully developed for commercial use. The technology Tunnickliffe's is using originates from Finland, the ThermoWood® process has been developed by VTT Technical Research Centre of Finland in Helsinki [www.vtt.fi](http://www.vtt.fi). Tunnickliffe's established an association with the Finnish company Jartek Termo Oy [www.jartek.fi](http://www.jartek.fi) who are treatment chamber manufacturers and a member of the Finnish Thermowood® Association [www.thermowood.fi](http://www.thermowood.fi) (for translation click on your flag at the bottom of the page).

## The Process

New Zealand grown radiata pine is very suitable for the heat treatment process. The timber is modified in a special chamber where it is exposed to temperatures up to 230 degrees Celsius in a computer controlled process. Steam is added to prevent the timber from combusting but also has an effect on the chemical changes taking place in the timber.



The ThermoWood® treatment plant at our Edgecumbe factory

The process permanently changes the chemical and physical properties of the timber. In other words the wood structure is re-formed or "modified". These changes are mainly caused by thermal degrading of hemicelluloses (a sugar compounds in the timber). It increases the biological durability, stability and also the thermal insulation properties are improved. On

the other hand there is some loss of strength.

## High Durability

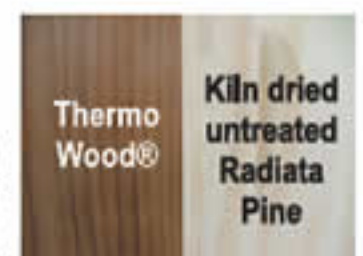
In principle the durability is increased due to the fact that the edibles (sugar compounds), on which fungi live on, have been taken out by burning-off. But there are a number of other changes occurring during the modification process that also contribute to the increased durability such as a lower level of moisture.

## Dimensional Stability

The equilibrium moisture content (EMC) is reduced, which increases the dimensional stability of the timber as there is less swelling and shrinkage caused by moisture uptake / release.

## Appearance

The timber darkens, right through, towards an attractive chocolate brown colour. The higher the maximum temperature treated to, the darker the timber looks.



## Modification Level

The level of modification depends on the end-use application. The three factors to be considered are durability, stability and strength. The modification process is not suitable for structural timber such as framing, beams and trusses. A compromise is needed between maximum durability and strength. With a higher durability level, there is some loss of strength. For example, Tunnickliffe's ThermoWood® Beehive boxes are treated with the maximum durability in mind because the loss of strength is less significant. The varying level of modification are achieved using different schedules with different maximum temperatures ranging from 185 to 230 degrees Celsius.

## Working With ThermoWood®

Working with ThermoWood® is easy. It machines and finishes well. In general the timber can be nailed and screwed as with the untreated version, keeping in mind that it is a little more brittle. For nailing it is recommended to use a small pneumatic nail gun with adjustable drive depth. Self tapping screws can be used without pre-drilling. Normal PVA, PU, MUF glues and RF resins can be used as well.

ThermoWood® can be used unpainted for exterior use. However it will weather, turning grey as any other timber. It is recommended to seal the timber with at least one coat of paint to keep it in long lasting good condition.

## Information

For more information visit our website or give us a free call (within NZ) on 0800 657 934. All enquiries are welcome.