



## TEST REPORT

### ETH HEIMU timber coated with Intergrain Industrial Uni Timber Oil Clear

Prepared by : Keith Chu  
Intergrain R&D Australia

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#### **BACKGROUND**

ETH have a timber called HEIMU, and have asked what the performance benefits are of applying Intergrain Industrial Uni Timber Oil Clear on it.

#### **SUMMARY OF RESULTS**

The water uptake test was done in conjunction with an accelerated weathering test. Please refer to the accelerated weathering test report for details of that test.

- Application of Intergrain Industrial Uni Timber Oil Clear onto HEIMU reduced the amount of water absorbed into the timber compared to uncoated HEIMU, up to 1000 hours accelerated weathering (or roughly about 12 months natural weathering).
- Application of Intergrain Industrial Uni Timber Oil Clear onto HEIMU reduced the amount of end-grain swelling compared to uncoated HEIMU, up to 500 hours accelerated weathering (or roughly about 6 months natural weathering).



## TEST REPORT

### **TEST DETAILS AND RESULTS**

The following panels were prepared for testing; each system was prepared in triplicate.

- Uncoated HEIMU
- HEIMU coated with 1 coat of Intergrain Industrial Uni Timber Oil Clear
- HEIMU coated with 2 coats of Intergrain Industrial Uni Timber Oil Clear

The Intergrain Industrial Uni Timber Oil Clear coating was allowed to dry for 3 weeks before testing began.

The panels were placed into a QSun xenon arc accelerated weathering chamber, manufactured by Q-Lab.

The panels were removed from the accelerated testing chamber after set time frames. The appropriate tests were conducted after which the panels were then placed back into the accelerated testing chamber to continue testing.

The time frames for the water uptake testing were after:

- 500 hours accelerated exposure (roughly equivalent to 6 months natural weather exposure)
- 1000 hours accelerated exposure (roughly equivalent to 12 months natural weather exposure)

The water uptake test involved

- Weighing each panel
- Measuring the edge and end-grain thickness of each panel
- Submerging the panels into a water bath for 24 hours; the water was held at a constant 25°C
- After 24 hours, each panel was removed from the water bath one at a time and
  - excess water removed from the surface using a rubber squeegee
  - the weight measured
  - the edge and end-grain thickness measured

The difference in weight of the panel before and after the test indicated how much water was absorbed by the timber.

The difference in thickness of the panel before and after the test indicated how much the timber had swelled due to any water uptake or absorption.

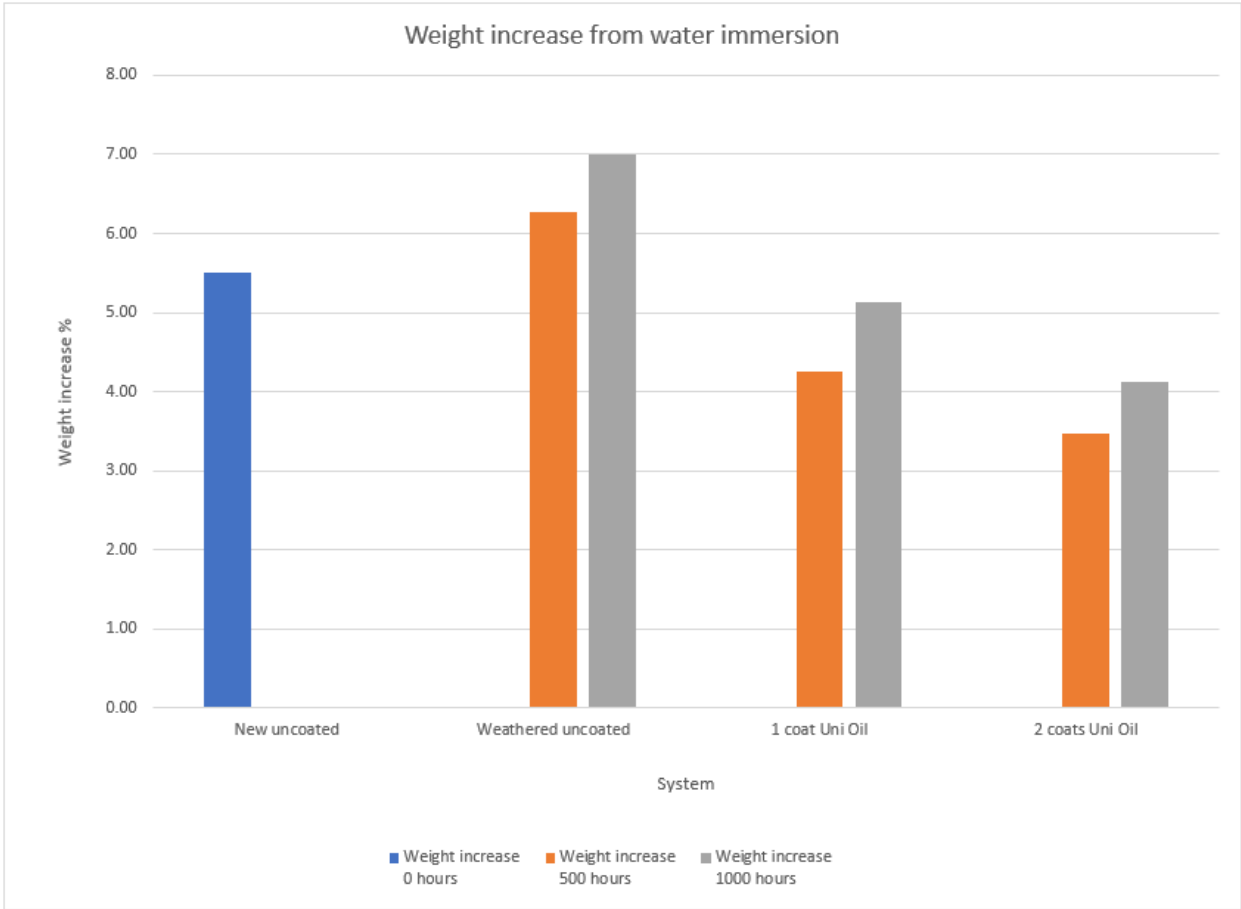


## TEST REPORT

### Water uptake or absorption after accelerated exposure

Graph 1 shows the averaged weight increase after water immersion of the panels. For this test, unweathered HEIMU panels were included as controls; this is labelled “New uncoated” in the graph. A larger weight increase meant more water was absorbed into the timber. “0 hours” meant the panel was not subjected to the accelerated exposure testing – ie. unweathered.

Graph 1



The results showed that application of Intergrain Industrial Uni Timber Oil Clear provided good water protection to HEIMU, even after 1000 hours of accelerated exposure. 2 coats of Intergrain Industrial Uni Timber Oil Clear gave better performance than 1 coat.

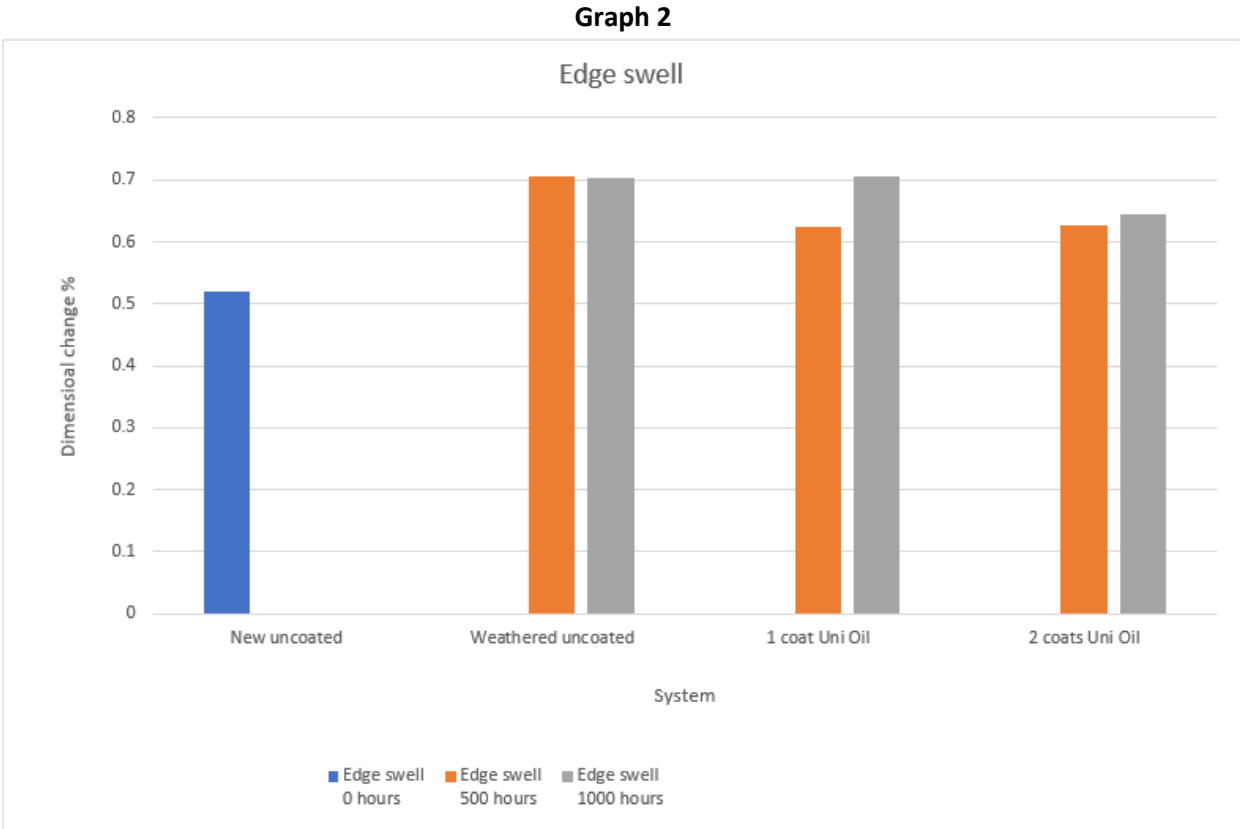


## TEST REPORT

### Dimensional changes due to water absorption into the timber after accelerated exposure

The graphs below show the averaged dimensional changes after water immersion of the panels – for both the edge and end-grain. For this test, unweathered HEIMU panels were included as controls; this is labelled “New uncoated” in the graphs. A larger dimensional change meant the timber had swelled more. “0 hours” meant the panel was not subjected to the accelerated exposure testing – ie. unweathered.

The results detailed in Graph 2 showed that there was very little dimensional change on the edge of the panels, and there were virtually no differences between the systems.



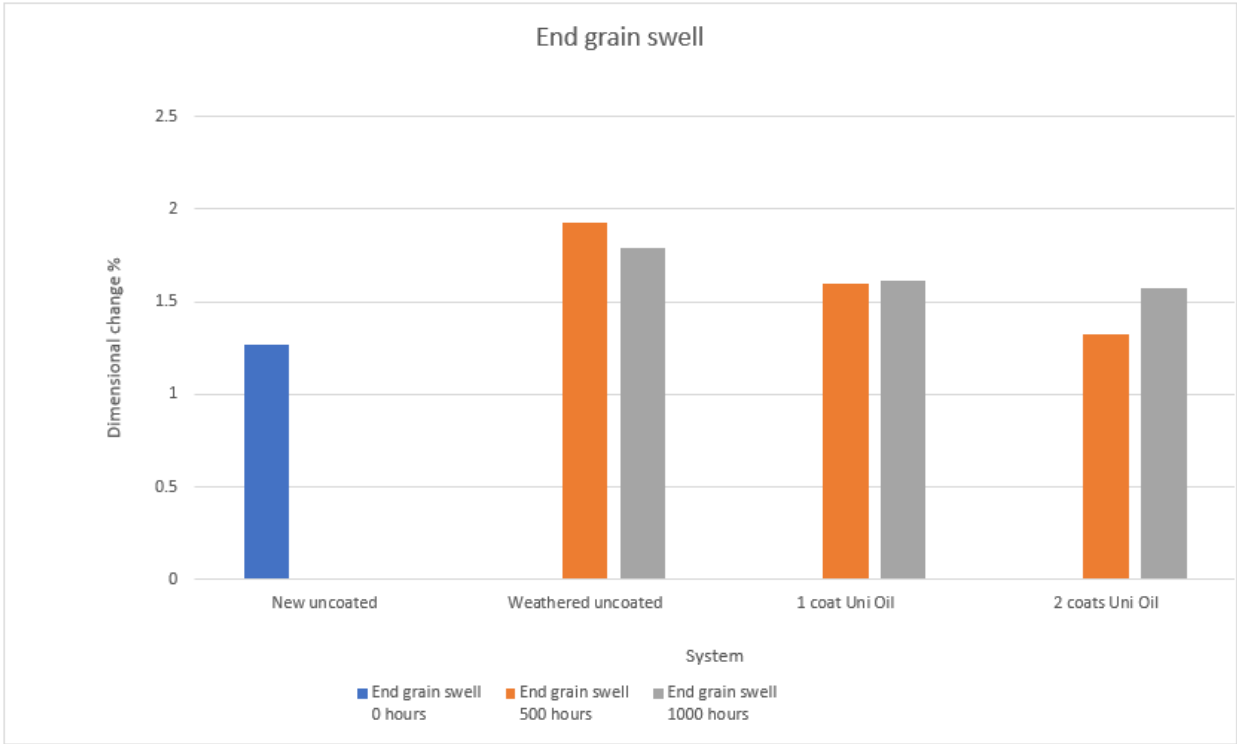


## TEST REPORT

The results detailed in Graph 3 showed that for the end-grain

- The new unweathered panel showed only slight swelling.
- However, once this uncoated panel was weathered in the accelerated exposure chamber, water absorption caused swelling.
- After 500 hours of accelerated exposure, the results showed that Intergrain Industrial Uni Timber Oil Clear reduced the end-grain swelling of the timber, compared to uncoated timber. 2 coats of Intergrain Industrial Uni Timber Oil Clear reduced the swelling to almost the same level as the new unweathered panel.
- After 1000 hours of accelerated exposure, both the 1 coat and 2 coats Intergrain Industrial Uni Timber Oil Clear panels had similar amount of swelling as the uncoated panel.

Graph 3





## TEST REPORT

### **CONCLUSION**

Based on the results detailed above, applying Intergrain Industrial Uni Timber Oil Clear onto HEIMU from ETH gave good performance benefits over uncoated HEIMU in the areas of

- Water protection (reducing water absorption)
- Reduction in end-grain timber swelling

The results showed that

- Application of Intergrain Industrial Uni Timber Oil Clear onto HEIMU reduced the amount of water absorbed into the timber compared to uncoated HEIMU, with 2 coats providing good protection for up to 1000 hours accelerated weathering (or roughly about 12 months natural weathering).
- Application of Intergrain Industrial Uni Timber Oil Clear onto HEIMU reduced the amount of end-grain swelling compared to uncoated HEIMU, up to 500 hours accelerated weathering (or roughly about 6 months natural weathering).