



# Test Results | THERMORY® White Ash Hardness

Hardness

## TESTED

▶ Brinell testing, which is a European standard to determine the surface impact resistance of THERMORY® White Ash.

## RESULTS

▶ No significant change in impact resistance from standard kiln-dried White Ash to THERMORY® White Ash.



▶ DECKING ▶ CLADDING ▶ PORCH FLOORING

[ThermoryUSA.com](http://ThermoryUSA.com) [support@thermoryusa.com](mailto:support@thermoryusa.com)

### BUFFALO

P: 585.250.4074 • F: 847.256.0509  
56 Harvester Avenue, Suite 1-201  
Batavia, NY 14020

### DENVER

P: 720.759.7268 • F: 847.256.0509  
537 W. Highlands Ranch Pkwy, Unit #114  
Highlands Ranch, CO 80129





## TEST REPORT

Tallinn

2011-06-20

**Test samples:** Ash-thermowood (190 °C), cross section 90 x 20 mm; ash-thermowood (215 °C), cross section 115 x 20 mm; birch-thermowood (190 °C), cross section 80 x 15 mm and pecan-thermowood (190 °C), cross section 140 x 21 mm

**Committer:** Brenstol OÜ.

**Ground for testing:** Order for testing 2011-06-09.

**Testing objective:** Determination of Brinell hardness.

### Test method.

Moisture content was determined by drying 100 x 70 x 15 mm samples in drying oven at temperature of 103-105 °C until the constant mass was reached. The same samples were used for determination of oven-dry density.

The resistance to indentation was determined according to EN 1534 by applying a loaded indenter of 10 mm diameter to the face of the test specimen. The diameter of the residual indentation was used to calculate the resistance to indentation of the test specimen.

### Test results.

| Sample             | Moisture content<br>% | Density (oven-dry)<br>kg/m <sup>3</sup> | Brinell hardness<br>N/mm <sup>2</sup> |
|--------------------|-----------------------|---|---------------------------------------|
| Thermoash 190 °C   | 4,8                   | 588                                     | 30,6                                  |
| Thermoash 215 °C   | 2,7                   | 560                                     | 31,4                                  |
| Thermobirch 190 °C | 5,4                   | 647                                     | 28,6                                  |
| Thermopecan 190 °C | 4,4                   | 740                                     | 45,6                                  |

Appendix: Hardness testing data.

Rein Reiska  
Associate Professor

Appendix (test report 2011-06-20)

**Hardness testing data**

Thermoash 190°C

| Sample No.             | Test No.       | D <sub>1</sub> | D <sub>2</sub> | D           | HB(N/mm <sup>2</sup> ) |
|------------------------|----------------|----------------|----------------|-------------|------------------------|
| 1                      | 1              | 6,5            | 6,6            | 6,55        | 26,1                   |
|                        | 2              | 6,4            | 6,2            | 6,30        | 28,5                   |
|                        | 3              | 6,2            | 6,5            | 6,35        | 28,0                   |
|                        | 4              | 6,1            | 6,2            | 6,15        | 30,1                   |
|                        | 5              | 5,6            | 5,6            | 5,60        | 37,1                   |
|                        | <b>Average</b> |                |                |             | <b>6,19</b>            |
| 2                      | 1              | 6,8            | 6,7            | 6,75        | 24,3                   |
|                        | 2              | 6,5            | 6,4            | 6,45        | 27,0                   |
|                        | 3              | 6,6            | 6,7            | 6,65        | 25,2                   |
|                        | 4              | 6,6            | 6,5            | 6,55        | 26,1                   |
|                        | 5              | 6,3            | 6,5            | 6,40        | 27,5                   |
|                        | <b>Average</b> |                |                |             | <b>6,56</b>            |
| 3                      | 1              | 6,2            | 6,3            | 6,25        | 29,0                   |
|                        | 2              | 5,5            | 5,6            | 5,55        | 37,9                   |
|                        | 3              | 5,7            | 5,7            | 5,70        | 35,7                   |
|                        | 4              | 5,4            | 5,5            | 5,45        | 39,4                   |
|                        | 5              | 5,7            | 5,6            | 5,65        | 36,4                   |
|                        | <b>Average</b> |                |                |             | <b>5,72</b>            |
| 4                      | 1              | 5,7            | 5,8            | 5,75        | 35,0                   |
|                        | 2              | 6,4            | 6,5            | 6,45        | 27,0                   |
|                        | 3              | 5,0            | 5,0            | 5,00        | 47,5                   |
|                        | 4              | 5,2            | 5,2            | 5,20        | 43,7                   |
|                        | 5              | 6,4            | 6,5            | 6,45        | 27,0                   |
|                        | <b>Average</b> |                |                |             | <b>5,77</b>            |
| 5                      | 1              | 6,5            | 6,5            | 6,50        | 26,5                   |
|                        | 2              | 6,8            | 6,6            | 6,70        | 24,7                   |
|                        | 3              | 6,6            | 6,6            | 6,60        | 25,6                   |
|                        | 4              | 6,7            | 6,7            | 6,70        | 24,7                   |
|                        | 5              | 6,6            | 6,8            | 6,70        | 24,7                   |
|                        | <b>Average</b> |                |                |             | <b>6,64</b>            |
| <b>General average</b> |                |                |                | <b>6,18</b> | <b>30,6</b>            |

**Thermoash 215°C**

| Sample No.             | Test No.       | D <sub>1</sub> | D <sub>2</sub> | D           | HB(N/mm <sup>2</sup> ) |
|------------------------|----------------|----------------|----------------|-------------|------------------------|
| 1                      | 1              | 5,9            | 5,7            | 5,80        | 34,4                   |
|                        | 2              | 5,8            | 6,0            | 5,90        | 33,1                   |
|                        | 3              | 5,8            | 5,9            | 5,85        | 33,7                   |
|                        | 4              | 5,6            | 5,6            | 5,60        | 37,1                   |
|                        | 5              | 5,6            | 5,7            | 5,65        | 36,4                   |
|                        | <b>Average</b> |                |                |             | <b>5,76</b>            |
| 2                      | 1              | 5,9            | 6,2            | 6,05        | 31,3                   |
|                        | 2              | 6,5            | 6,3            | 6,40        | 27,5                   |
|                        | 3              | 6,3            | 6,0            | 6,15        | 30,1                   |
|                        | 4              | 5,9            | 5,8            | 5,85        | 33,7                   |
|                        | 5              | 6,0            | 5,8            | 5,90        | 33,1                   |
|                        | <b>Average</b> |                |                |             | <b>6,07</b>            |
| 3                      | 1              | 6,9            | 6,6            | 6,75        | 24,3                   |
|                        | 2              | 6,7            | 6,8            | 6,75        | 24,3                   |
|                        | 3              | 6,8            | 6,8            | 6,80        | 23,9                   |
|                        | 4              | 7,2            | 7,0            | 7,10        | 21,5                   |
|                        | 5              | 6,9            | 6,8            | 6,85        | 23,5                   |
|                        | <b>Average</b> |                |                |             | <b>6,85</b>            |
| 4                      | 1              | 6,9            | 6,9            | 6,90        | 23,1                   |
|                        | 2              | 6,1            | 6,0            | 6,05        | 31,3                   |
|                        | 3              | 6,1            | 6,2            | 6,15        | 30,1                   |
|                        | 4              | 6,7            | 6,7            | 6,70        | 24,7                   |
|                        | 5              | 6,8            | 6,7            | 6,75        | 24,3                   |
|                        | <b>Average</b> |                |                |             | <b>6,51</b>            |
| 5                      | 1              | 5,2            | 5,4            | 5,30        | 41,9                   |
|                        | 2              | 5,5            | 5,2            | 5,35        | 41,1                   |
|                        | 3              | 5,3            | 5,5            | 5,40        | 40,2                   |
|                        | 4              | 5,3            | 5,5            | 5,40        | 40,2                   |
|                        | 5              | 5,4            | 5,5            | 5,45        | 39,4                   |
|                        | <b>Average</b> |                |                |             | <b>5,38</b>            |
| <b>General average</b> |                |                |                | <b>6,11</b> | <b>31,4</b>            |

**Thermobirch 190°C**

| Sample No.             | Test No.       | D <sub>1</sub> | D <sub>2</sub> | D           | HB(N/mm <sup>2</sup> ) |
|------------------------|----------------|----------------|----------------|-------------|------------------------|
| 1                      | 1              | 6,3            | 6,0            | 6,15        | 30,1                   |
|                        | 2              | 6,5            | 6,6            | 6,55        | 26,1                   |
|                        | 3              | 6,5            | 6,3            | 6,40        | 27,5                   |
|                        | 4              | 6,5            | 6,4            | 6,45        | 27,0                   |
|                        | 5              | 6,5            | 6,5            | 6,50        | 26,5                   |
|                        | <b>Average</b> |                |                |             | <b>6,41</b>            |
| 2                      | 1              | 6,2            | 6,2            | 6,20        | 29,6                   |
|                        | 2              | 6,0            | 6,0            | 6,00        | 31,8                   |
|                        | 3              | 6,0            | 5,9            | 5,95        | 32,5                   |
|                        | 4              | 5,9            | 5,8            | 5,85        | 33,7                   |
|                        | 5              | 6,0            | 6,0            | 6,00        | 31,8                   |
|                        | <b>Average</b> |                |                |             | <b>6,00</b>            |
| 3                      | 1              | 6,3            | 6,4            | 6,35        | 28,0                   |
|                        | 2              | 6,4            | 6,4            | 6,40        | 27,5                   |
|                        | 3              | 6,5            | 6,5            | 6,50        | 26,5                   |
|                        | 4              | 6,2            | 6,1            | 6,15        | 30,1                   |
|                        | 5              | 6,3            | 6,1            | 6,20        | 29,6                   |
|                        | <b>Average</b> |                |                |             | <b>6,32</b>            |
| 4                      | 1              | 7,3            | 7,3            | 7,30        | 20,1                   |
|                        | 2              | 6,2            | 6,1            | 6,15        | 30,1                   |
|                        | 3              | 6,7            | 6,6            | 6,65        | 25,2                   |
|                        | 4              | 6,3            | 6,4            | 6,35        | 28,0                   |
|                        | 5              | 6,5            | 6,6            | 6,55        | 26,1                   |
|                        | <b>Average</b> |                |                |             | <b>6,60</b>            |
| 5                      | 1              | 6,4            | 6,4            | 6,40        | 27,5                   |
|                        | 2              | 6,5            | 6,3            | 6,40        | 27,5                   |
|                        | 3              | 6,4            | 6,3            | 6,35        | 28,0                   |
|                        | 4              | 6,0            | 5,9            | 5,95        | 32,5                   |
|                        | 5              | 6,0            | 6,0            | 6,00        | 31,8                   |
|                        | <b>Average</b> |                |                |             | <b>6,22</b>            |
| <b>General average</b> |                |                |                | <b>6,31</b> | <b>28,6</b>            |

## Thermopecan 190°C

| Sample No.             | Test No.       | D <sub>1</sub> | D <sub>2</sub> | D           | HB(N/mm <sup>2</sup> ) |
|------------------------|----------------|----------------|----------------|-------------|------------------------|
| 1                      | 1              | 5,4            | 5,4            | 5,40        | 40,2                   |
|                        | 2              | 5,2            | 5,1            | 5,15        | 44,6                   |
|                        | 3              | 4,7            | 4,7            | 4,70        | 54,3                   |
|                        | 4              | 4,7            | 4,9            | 4,80        | 51,9                   |
|                        | 5              | 4,6            | 4,7            | 4,65        | 55,5                   |
|                        | <b>Average</b> |                |                |             | <b>4,94</b>            |
| 2                      | 1              | 5,8            | 5,9            | 5,85        | 33,7                   |
|                        | 2              | 5,9            | 5,6            | 5,75        | 35,0                   |
|                        | 3              | 5,8            | 5,8            | 5,80        | 34,4                   |
|                        | 4              | 5,5            | 5,3            | 5,40        | 40,2                   |
|                        | 5              | 5,5            | 5,6            | 5,55        | 37,9                   |
|                        | <b>Average</b> |                |                |             | <b>5,67</b>            |
| 3                      | 1              | 4,9            | 4,8            | 4,85        | 50,8                   |
|                        | 2              | 4,7            | 4,8            | 4,75        | 53,1                   |
|                        | 3              | 4,3            | 4,4            | 4,35        | 64,0                   |
|                        | 4              | 4,7            | 4,7            | 4,70        | 54,3                   |
|                        | 5              | 4,7            | 4,6            | 4,65        | 55,5                   |
|                        | <b>Average</b> |                |                |             | <b>4,66</b>            |
| 4                      | 1              | 5,1            | 5,1            | 5,10        | 45,6                   |
|                        | 2              | 4,9            | 5,1            | 5,00        | 47,5                   |
|                        | 3              | 5,0            | 5,2            | 5,10        | 45,6                   |
|                        | 4              | 4,9            | 4,9            | 4,90        | 49,7                   |
|                        | 5              | 4,9            | 5,2            | 5,05        | 46,5                   |
|                        | <b>Average</b> |                |                |             | <b>5,03</b>            |
| 5                      | 1              | 5,3            | 5,6            | 5,45        | 39,4                   |
|                        | 2              | 5,5            | 5,5            | 5,50        | 38,6                   |
|                        | 3              | 5,2            | 5,7            | 5,45        | 39,4                   |
|                        | 4              | 5,2            | 5,3            | 5,25        | 42,8                   |
|                        | 5              | 5,6            | 5,4            | 5,50        | 38,6                   |
|                        | <b>Average</b> |                |                |             | <b>5,43</b>            |
| <b>General average</b> |                |                |                | <b>5,15</b> | <b>45,6</b>            |