

JANUARY 2026

Performance Testing Summary

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ACCOYA PERFORMANCE TESTING SUMMARY

Accoya represents a revolution in modified wood, bringing new design possibilities for architects, manufacturers and property owners.

The benefits of Accoya mean that timber projects can now be designed with absolute confidence. Accoya is a highly proven product with testing from many different perspectives, on a worldwide basis.

Many tests have been conducted in real world conditions over many years.

This summary shows some of these results.



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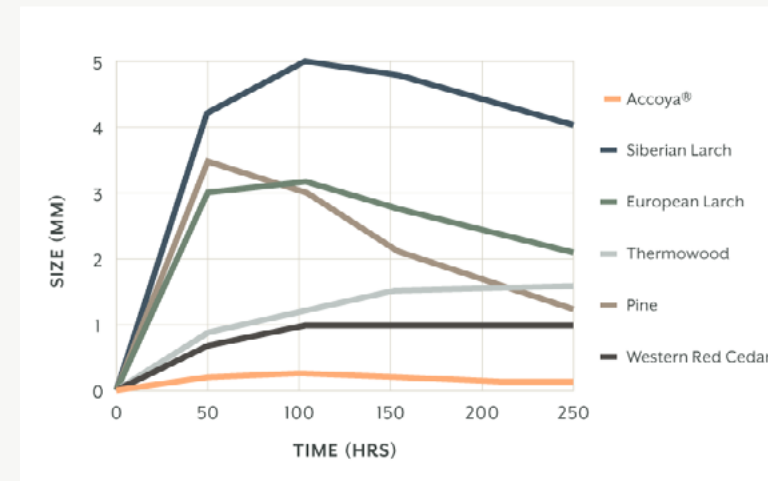
DIMENSIONAL STABILITY

Accoya wood exhibits superior dimensional stability compared to other naturally durable species, in both radial and tangential direction.

This provides short and long term benefit. In the short term, Accoya remains stable during processing. In the medium term, joinery remains stable and resists movement when environmental conditions fluctuate after installation.

Further on in service, deck boards remain flat, stable around fixings and with practically no splinters. Cladding boards and louvres retain their flush and smooth lines and coated products benefit from the board stability placing less stress on the coating and leading to requiring earlier maintenance.

Cupping distortion by species



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PRODUCT CERTIFICATION – FCBA

This test was
conducted by



FCBA are the national centre for Wood Expertise and testing in France.

The 2015 certificate of conformity, part of the FCBA CCMQ 39/14 control agreement, was issued following rigorous test procedures that characterizes the physical, mechanical and biological performance of Accoya wood.

Extensive evaluations were carried out by the FCBA for more than two years, particularly in terms of mechanical strength, dimensional stability, resistance to fungi and insects as well as its Brinell hardness.

To ensure ongoing compliance to the certification, FCBA require robust Quality Assurance plans and ongoing Quality Control programs are in place. Compliance to these is audited with factory visits by FCBA every 6 months. This is one of several third party certifications verifying the consistency of the Accoya process.

Subsequent application certifications have been conducted by FCBA for use of Accoya in Decking (terraces) and windows. These are available on request.

Accoya wood material properties

	PROPERTY	VALUE
Mechanical	Bending strength (EN 408) > 20°C / 65% RH > Upright test orientation	5-percentile characteristic values: > Modulus of elasticity: 5290 MPa > Bending strength: 22.4 MPa <small>(The acetylation process does not affect the mechanical properties)</small>
	Brinell hardness (EN 1534)	23.4 MPa (20°C / 65% RH) 15.1 MPa (20°C / 12% RH)
	Impact resistance (DIN 52189-1)	Average bending strength: 50 kJ/m ² <small>(No loss of impact bending strength by the acetylation process)</small>
	Screw holding capacity (EN 320)	Better than compared to unacetylated Radiata Pine
Physical	Density (BRL 0605)	Average: 500 kg/m ³ (20°C / 65% RH) Characteristic: 417 kg/m ³
	Dimensional stability (BRL 0605)	Average shrinkage: > Radial: 0.7% > Tangential: 1.5%
	Water uptake (EN 317)	82.5% after 91 days of immersion
	Equilibrium moisture content (BRL 0605)	Average EMC during drying at 20°C: > 7.5% at 95% RH > 4.5% at 65% > 2.5% at 35% RH
	Thermal conductivity (EN 12664)	0.12 W/m-K
Biological	Resistance against fungi (EN 113 / ENV 807) after leaching (EN 84) (Dry rot, soft rot and white rot)	Durability class 1 (NF EN 350) Material suitable for use classes 1 to 4 (EN 335)
	Termite resistance: > Choice test (EN 117 amended): > Forced feeding test (EN 118):	The material is not degraded by European subterranean termites. The material is not an appropriate source of food The material is susceptible to termite degradation.
	Resistance against wood boring insect larvae (EN 46-1)	Material not degraded by wood boring insect larvae

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15 YEAR DURABILITY COMPARISON

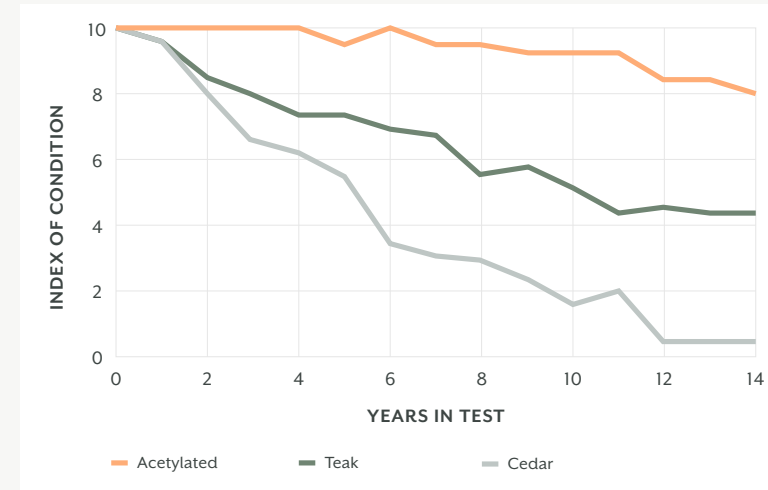
This test was
conducted by



Scion is the New Zealand Crown research institute that specialises in research, science and technology development for the forestry, wood product, wood-derived materials, and other biomaterial sectors. Scion tested the durability of Accoya wood against other naturally durable and preservative treated timbers.

The rigorous tests run exposed timbers in exterior ground contact tests at the Whakarewarewa, New Zealand site. The tests have run for 15 years and show Accoya outperforming Teak, Cedar and H3.2 (above ground, uncoated horizontal) and H4 (in ground contact) preservative (CCA) treated timbers, proving that Accoya has the highest possible durability classification.

Graph title



Decay/insect damage rating system*

TYPE	RATING
No decay or insect damage	10
Discoloration or trace of decay, not positively identified as decay	T
Minor decay, 0.3% of the cross section	9
Lightly established decay, 3 – 10% of the cross section	8
Well established decay, 10 – 30% of the cross section	7
Extensive and deep decay, 30 – 50% of the cross section	6
Deep and severe decay, more than 50% of the cross section	4
Failed	0

* Based on ASTM D 1758

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IN-GROUND STAKE TEST

In 2017 the FCBA started an in-ground stake test on Accoya wood in order to confirm the durability class in accordance to EN 252.

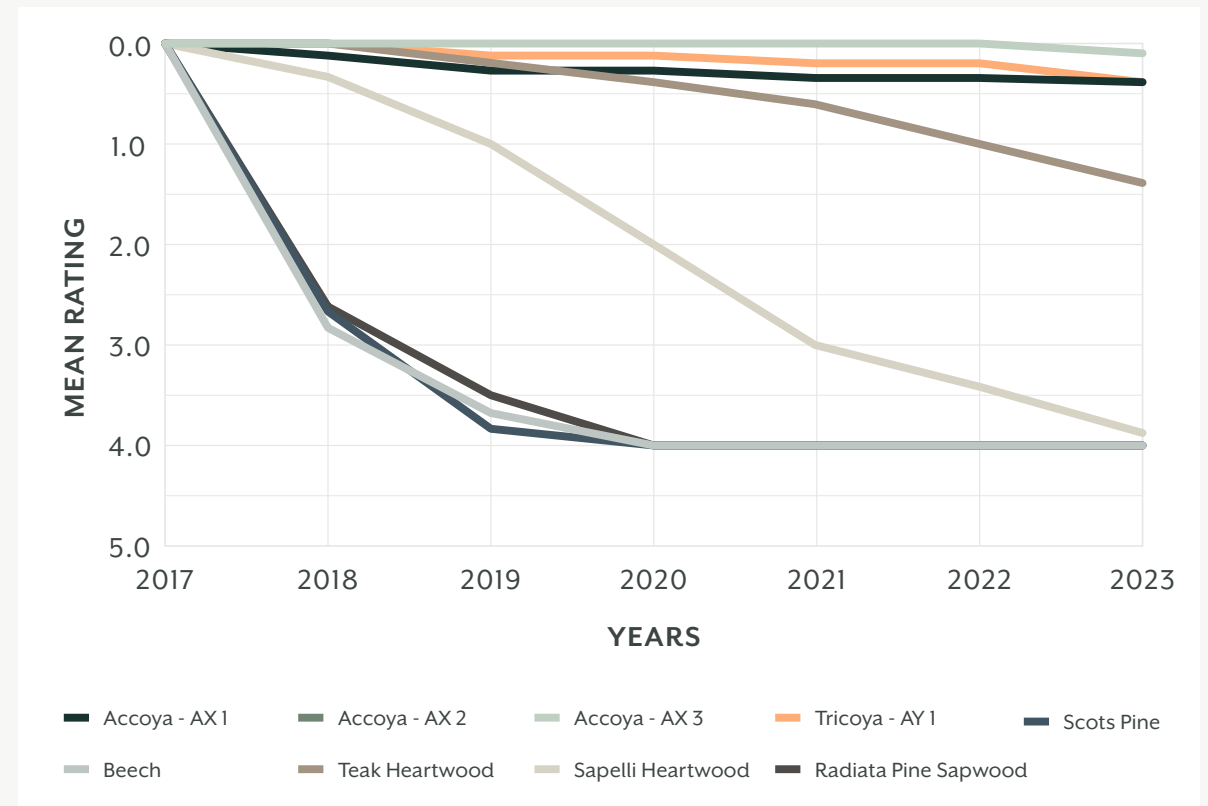
Accoya stakes were put in the ground in Oleron Island, France and inspected after 6 years in 2023. They were reference against untreated Radiata Pine, Scots Pine, Beech, Burmese Teak and Sapele.

After 6 years in the fields Accoya showed no deterioration and has outperformed all other species.

This test was
conducted by



Accoya – Tricoya vs Untreated Stake
Biological rating (Fungi & Termites) / Oleron Test Field



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ABOVE GROUND FIELD PERFORMANCE TEST

This test was conducted by



The above ground Hazard Class H3 flat panel field trial was installed in September 2014 on a test site in Sarawak, Borneo. The samples were inspected after nine years, in 2023. The test determines field performance of wood against attack by wood destroying fungi.

Accoya and Tricoya samples were tested against tropical hardwood plywood as well as durable reference species such as Merbau, Spotted Gum, Teak and Western Red Cedar heartwood.

The samples were analysed in accordance to AWPA 10 point visual rating scale.

After 9 years exposure in the test field Accoya has shown superior decay resistance, achieving a higher rating than all other tested wood species.

Trial field in Sarawaka, Malaysia



ASTM Decay Ratings

MATERIAL	ASTM DECAY RATINGS		
	11 months	43 months	107 months
Accoya Radiata	10 (0)	10 (0)	9.8 (0.1)
Tricoya	10 (0)	10 (0)	10 (0)
Alder Sapwood	6.6 (0.4)	0 (0)	0 (0)
Beech Sapwood	7.7 (0.3)	0 (0)	0 (0)
Radiata Pine Sapwood	8.1 (0.5)	0 (0)	0 (0)
Scots Pine Sapwood	9.2 (0.2)	0 (0)	0 (0)
Exterior Grade MDF	9.0 (0.4)	0 (0)	0 (0)
11-ply Gaboon Plywood	9.1 (0.1)	7.2 (0.2)	0 (0)
17-ply Gaboon Plywood	9.1 (0.1)	0.6 (0.6)	0 (0)
Merbau	9.8 (0.1)	7.6 (0.4)	4.5 (0.7)
Spotted Gum	9.5 (0.2)	7.6 (0.9)	6.8 (0.9)**
Teak	9.9 (0.1)	8.6 (0.2)	7.3 (0.6)
Western Red Cedar	10 (0)	8.9 (0.2)	7.9 (0.3)

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5-YEAR DECAY TEST

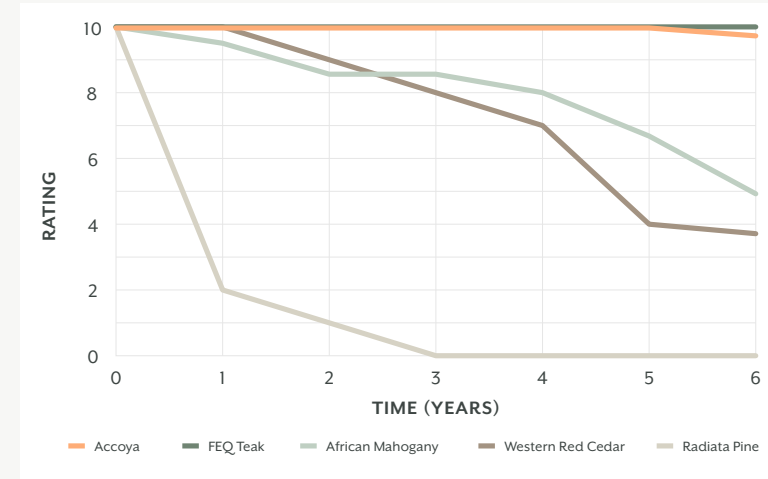
Timber Products Inspection (USA), the largest accredited agency under ALSC for wood related auditing programs, have performed decay tests of Accoya wood at their Gainesville (FL) exposure site.

Testing ran for a 5 year field trial period according to AWPA E7-09 in ground stake test and AWPA E18-06 ground proximity test. The results show Accoya wood to outperform high quality (FEQ) teak, western red cedar and African mahogany.

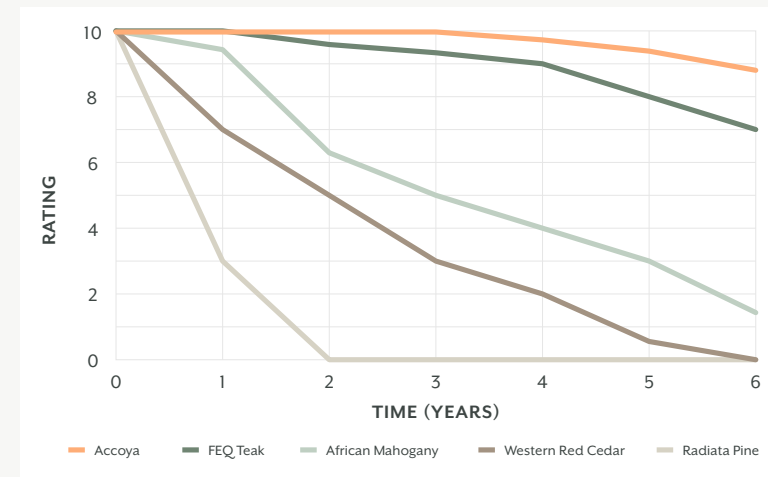
This test was
conducted by



5 year decay rating (E18 ground proximity)



5 year decay rating (E7 ground contact)



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21 & 26 YEAR CANAL LINING TEST

This test was
conducted by



Accoya wood's high performance was proven with two Dutch project tests in the Flevopolder near Almere, the Netherlands, one installed in 1995 and one in 2000. The SHR institute in the Netherlands originally set up the tests and made detailed inspections at respective 26 and 21 year exposure periods in 2021.

These tests include acetylated wood alongside control wood, preservative treated wood and hardwood species used as a canal lining (fresh water exposure).

These canal bank conditions are particularly punishing, especially at the waterline, since the wood is exposed to a combination of water, microbe rich soil and air (oxygen). Both trials show hardly any sign of rot, decay or fungal damage in acetylated wood – highlighting its class 1 durability status and reinforcing the 25-year ground and fresh water contact warranty.

No sign of rot and decay



Accoya wood



Non-Accoya wood



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PROTECTIVE EFFECTIVENESS AGAINST MARINE BORERS

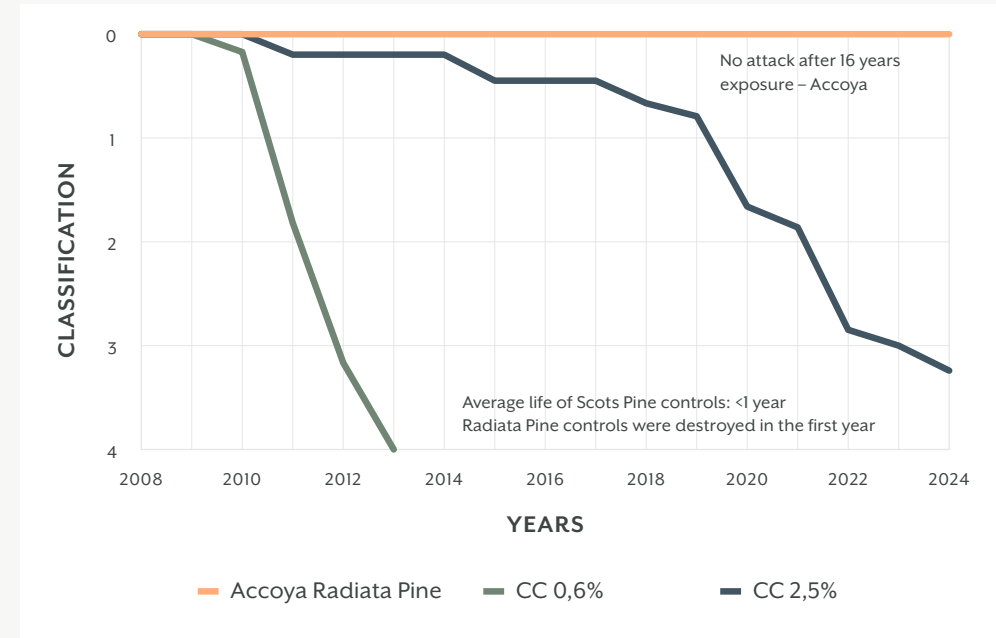
This test was conducted by



The University of Goettingen, Germany conducted test to determine Accoya's durability against marine borers (shipworm), according to EN 275 (1992). The tests started in 2008 on a test field in the Baltic Sea. In addition to Accoya, untreated Pinus Radiata was tested, as well as Pinus sylvestris, which served as a reference. The test specimens were examined in 2024 after 16 years in the test field.

After 16 years of exposure all Accoya specimens were sound and were classified as durable in UC5 conditions according to EN 350 (2016).

Rating system for attack by teredinids according to EN 275 (1992)



Title

RATING	CLASSIFICATION	CONDITION/APPEARANCE OF THE TEST SPECIMEN ON THE RADIOGRAPH
0	No attack	No sign of attack
1	Slight attack	Single or few scattered tunnels covering no more than 15% of the area of the specimen
2	Moderate attack	Tunnels covering no more than about 2% of the area of the test specimen
3	Severe attack	Tunnels covering no more than 50% of the area of the specimen
4	Failure	Tunnels covering more than 50% of the area of the specimen

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20 YEAR WINDOW L-JOINT TEST

BRE, with its main campus outside London UK is a world leading, multi-disciplinary, building science centre with a mission to improve buildings and infrastructure, through research and knowledge generation.

In durability field testing to European Norm (EN) 330:1993 – which parallels American Wood – Preserver’s association (AWPA) E9 – simple mortice and tenon joints (L-joints) are assembled, coated and placed outside, with the coating over the joint deliberately broken to allow water ingress that might be encountered if a joint is open, damaged or poorly maintained.

This test represents a worst case scenario for joinery products and requires the coated wood to be exposed to normal environmental factors.

In February 1998, L-joints were installed at the BRE Garston field exposure site (Watford, UK) facing the prevailing south westerly weather on an elevated test rig.

The acetylated L-joints used were acetylated at the University of Wales, Bangor, to a lower acetyl content than Accoya wood, and still performed significantly better than the treated wood, which were degraded completely in 2014.

BRE concludes that Accoya wood would exceed the biological reference value (brv) and would be deemed to provide sufficient protection for long life window joinery.

This test was
conducted by

bre

Title



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FORMOSAN TERMITE DURABILITY TEST

This test was
conducted by

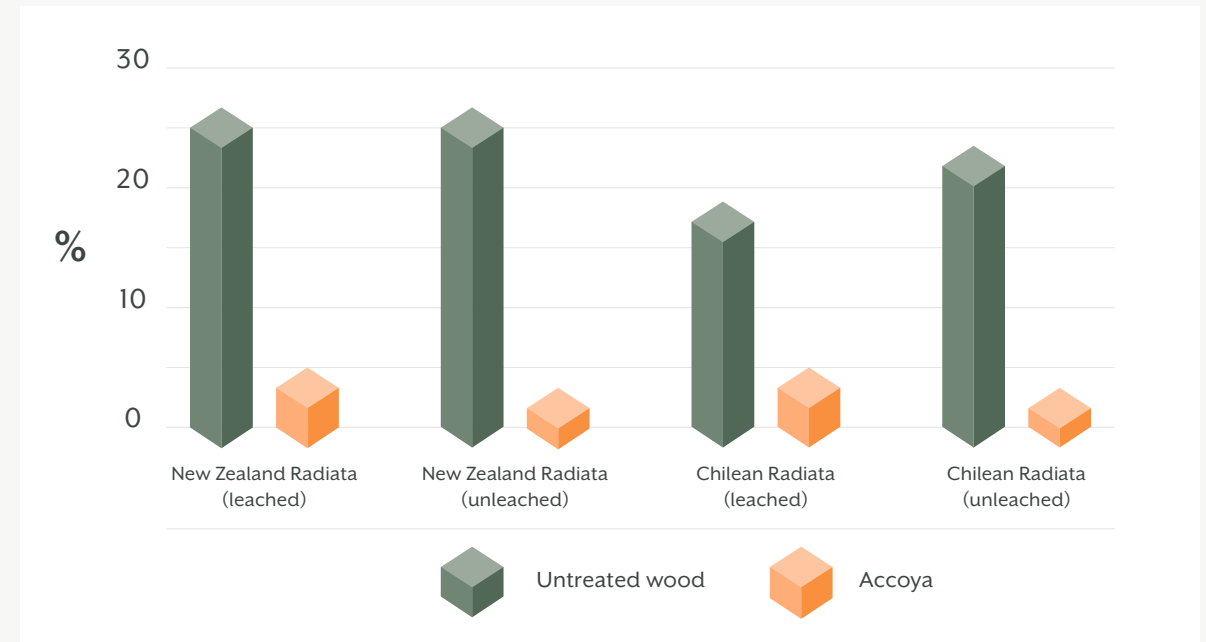


Louisianian State University (LSU), USA AgCenter's Wood Durability Lab are a specialist in termite testing of wood products. *Coptotermes formosanus*, known as Formosan termites, are considered one of the world's most aggressive termite species.

LSU conducted a Formosan termite 'choice' test according to AWPA E1-09 standard, using leached and un-leached Accoya and untreated samples together with choice samples.

After 28 days of exposure, the samples were assessed on weight loss. The Accoya wood treatment, regardless of the wood specie, resulted in a consistent significant reduction in weight loss. Accoya wood was even as much as 22 times better than the untreated radiata (when measured by sample weight loss).

Weight loss in LSU Formosan



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5 YEAR TERMITE FIELD TRIAL DATA FROM GAINESVILLE, FLORIDA

This test was
conducted by

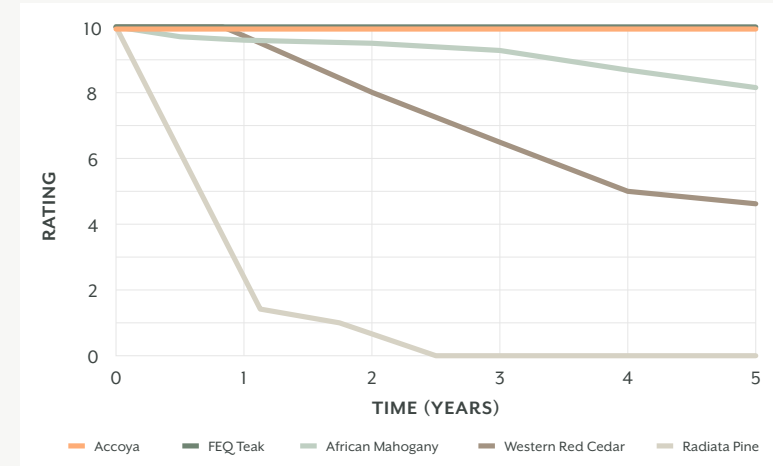


Additional testing by TPI at their exposure sites in Gainesville Florida and Costa Rica demonstrate that Accoya performance exceeds that of high quality (FEQ) teak.

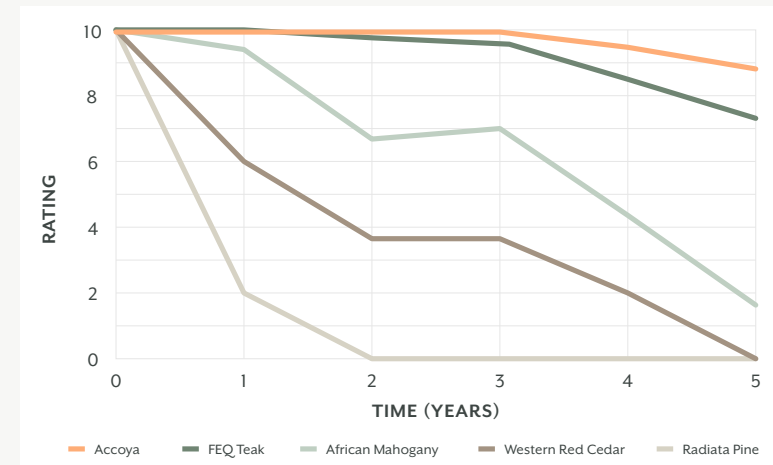
The results were developed over a 5 year field trial period in accordance with AWPA E7-09 in ground stake test and AWPA E18-06 ground proximity test.

This performance level was used to support the qualification of Accoya for use in termite zones and 'in ground' application in the ICC ESR-2825 which confirms Accoya decking compliance with US Building Code.

5 year termite data (Gainesville FL, E18. Ground Proximity)



5 year termite data (Gainesville FL, E7. Ground Contact)



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TERMITE DURABILITY TEST, AUSTRALIA – AFRC

Coptotermes acinaciformis is a widely encountered species of Australian termite distributed throughout mainland Australia and is responsible for greater economic loss than all the other Australian species of termites combined. Hazard Class 3 above ground testing was set up in Northern Territory, Australia according to the AWPA protocol by the Australian Forest Research Company.

At the conclusion of the field trial all test specimens had evidence of contact by *C. acinaciformis*, and all untreated *Eucalyptus nitens* bait-wood, used as a susceptible and attractive food source for maintaining the presence of termites in exposure containers, had been destroyed. The majority of the susceptible sapwood test specimens were destroyed or severely attacked by *C. acinaciformis*. The mean mass loss of the untreated Radiata Pine Sapwood was 82.6%.

Merbau and Spotted Gum Heartwood were highly resistant to attack by *C. acinaciformis*. In contrast, the mean mass loss for Western Red Cedar was 28.6%.

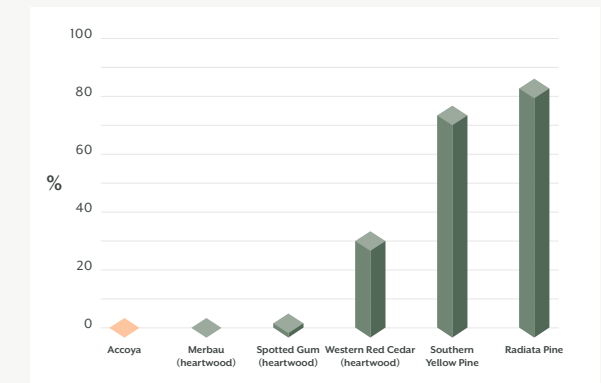
All of the Accoya materials performed similarly to Merbau and Spotted Gum Heartwood, having mean mass losses ranging from 0.2% to 0.7%. Any attack by *C. acinaciformis* largely consisted of minor localised grazing on the surfaces of test specimens. The Accoya materials investigated in this study would be expected to perform well against termites in Australia when used in locations south of the Tropic of Capricorn.

Additional testing run at AFRC, in accordance with AWPA protocol, include performance evaluation in fungal decay testing alongside Spotted Gum, a durability class 1 rated timber and density of 1,050kg/ m³. Accoya performance matched Spotted Gum.

This test was
conducted by



Mass loss in Hazard Class H3 field trial (%) after exposure to *Coptotermes acinaciformis*



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TERMITE ATTACK AND DECAY TRIAL – THAILAND

This test was
conducted by



A test conducted by the Environmental Research Centre; Naresuan University involved setting up ground stake tests at sites around Thailand.

Test stakes were Accoya, Teak and Makha. After 6 years Accoya demonstrated significantly higher performance than Makha hardwood and high-quality Burmese Teak.

This superior performance relative to Burmese Teak corroborates termite and decay evaluation tests reported in earlier pages of this brochure in Florida and New Zealand.

Failure conditions in termite rating of Makha wood for Ubonratchathani province 72 months inspection

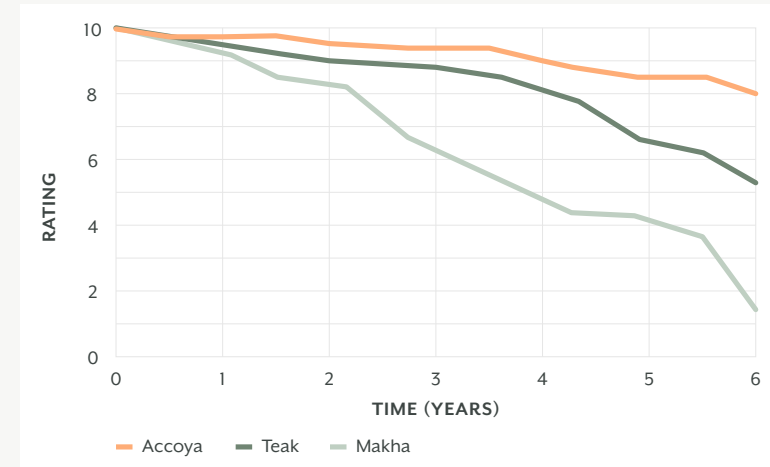


Makha

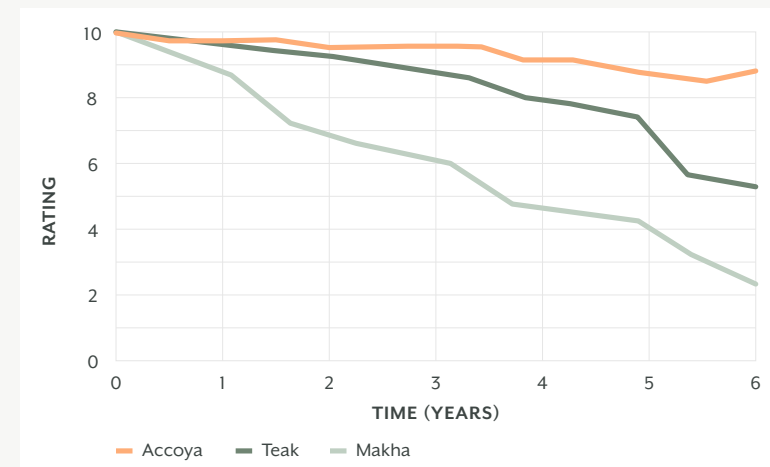
Accoya
wood

Teak

Decay rating (index of condition)



Termite rating (index of condition)



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10 YEAR COATING TEST AT TEKNOS

This evaluation was conducted by



A weathering test was set up by Teknos (UK) Ltd, a leading coatings company supplying products to the factory applied window, door and cladding industry across Europe. The test began in March 2009 to obtain natural weathering performance data, end grain sealing, face fix detail and profile design impact of three different timber substrates (coated) and on different cladding profiles. Apart from Accoya, vertical grain Western Red Cedar (WRC) and Siberian Larch were included in the test rig.

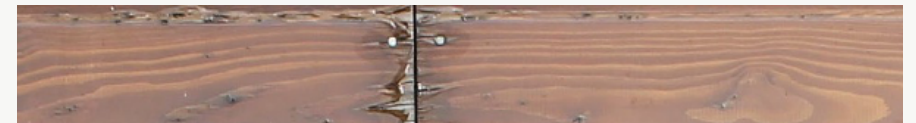
After 10 years of natural exposure, without any form of maintenance, the Accoya boards have confirmed the superior long-term performance in virtually all respects compared to the vertical grain Western Red Cedar and Siberian Larch timber substrates, even more so in the most unfavourable conditions. Accoya wood showed excellent stability, which has served to significantly reduce splitting and fissuring at board ends, prevented distortion and fissuring around fixings.

The coating on boards made from Western Red Cedar and Siberian Larch have now lost all of their protective functionality whereas on the Accoya boards the coating had yet to show any significant deterioration effects after ten years of unbroken weathering exposure and has retained its full protective function. The test shows that the expected lifetime of the coating can be extended by as much as three times compared to when unmodified softwoods are used as a substrate.

Accoya



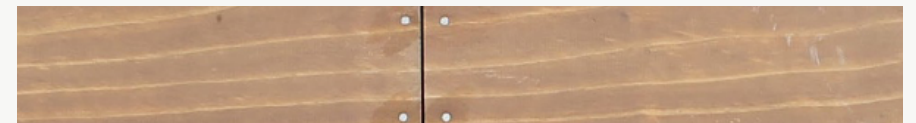
Siberian Larch



Western Red Cedar



Accoya



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14 YEAR SERVICE LIFE

To validate extended maintenance periods, renowned coating company Remmers set up window and door test rigs on their German premises in 2006.

Windows made from Accoya wood with approved coatings from Remmers have been exposed to natural weathering in the Netherlands for 14 years with no maintenance at all – and the results show no natural coating degradation or loss of performance. No tears, no swelling nor any other deformation has been found.

Based on these test results combined with case studies around the world, Remmers have issued a maintenance schedule for their fully factory-finished coatings on Accoya joinery up to 10 years for translucent and up to 12 years for opaque finishes.

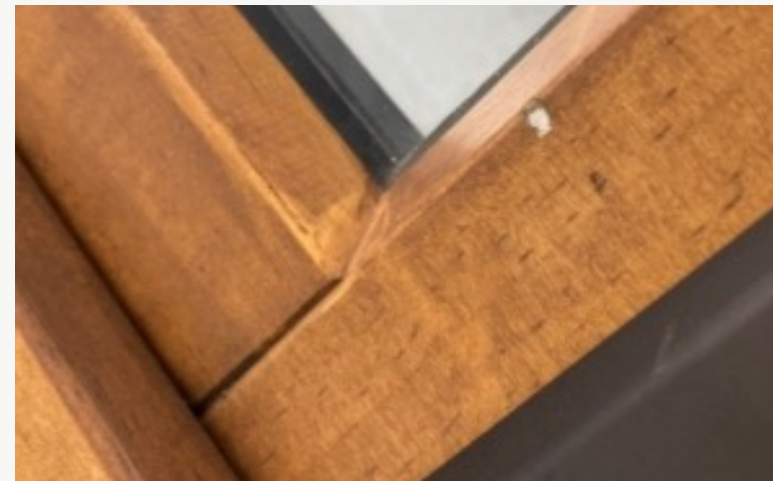
This test was
conducted by



Test rig after 10 years of exposure



No coating degradation visible after 14 years



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11 YEAR FACE LAMINATED ACCOYA WINDOW TEST

Two window frames made from face laminated Accoya/ Pine/Pine wood were installed in the BRE Window Joinery Test building in June 2012, facing South to maximise solar irradiance. One window frame was coated with a translucent finish, and one with an opaque white finish.

Additionally, tests have been completed at IFT Rosenheim, Germany according to standard methods for 2.0m length scantling stability and adhesive bond delamination resistance. The tests have been completed for Accoya-Pine-Pine and Accoya-Spruce – Spruce combination. IFT is the leading institute for window and door performance in Germany. The scantlings met both requirements. Reports are available upon request.

After 11 years of exposure, these windows on exposure at BRE were inspected on:

General condition
Appearance excellent

Joint condition
Excellent, joints tight, coating intact, no evidence of movement or opening

Bead condition:
Excellent

Coating condition:
No signs of deterioration. Milky appearance on horizontal surfaces, especially sill and lower bead

Operation:
Movement of opening light was easy
This resulted in Accoya being awarded an ‘excellent’ overall rating (9/10) for translucent coating.

The white coated window achieved a similar rating (9.5/10)

General condition:
Appearance excellent

Joint condition:
Excellent, joints tight, coating intact, no evidence of movement or opening

Bead condition:
Excellent

Coating condition:
Excellent, bright, no signs of deterioration. Some yellowing on interior surfaces

Operation:
Movement of opening light was easy

This test was conducted by



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9.5 YEARS EXTERNAL COATINGS TEST

This test was
conducted by



Independent testing institute, SHR Timber Research in the Netherlands, conducted a comprehensive coatings test on Accoya and untreated wood with opaque and film forming paints and stains.

Accoya wood constantly demonstrated better coating performance and superior coating adhesion in both wet and dry conditions. The white opaque performed extremely well, requiring no maintenance after 9.5 years – which is an important benefit in the long-term life cost of the product and ensures that Accoya has a superior whole life cost compared to competing materials.

Accoya wood



Joinery-quality Norpic Pine



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ACCOYA IN STRUCTURAL APPLICATIONS – DEUTSCHES INSTITUT FÜR BAUTECHNIK (DIBT)

Deutsches Institut für Bautechnik (DIBt) plays a pivotal role in the German construction industry. Its approvals and assessments ensures the safety of construction works. The German building approval ('Zulassung') relates to Accoya sawn wood, for use as structural timber.

This testing qualified Accoya structural performance against European standards and assigned C strength classifications to Accoya, applicable across Europe.

The allowable dimensions of Accoya wood are (may be used both flat and upright):

- Width: 100 – 250mm
- Thickness: 25 – 100mm

Accoya wood may be used for exterior load-bearing constructions in service classes 1 to 3. Outdoor use is allowed up to use class 3.2 providing that dirt deposits in, for example, wood cracks or on connecting parts, is prevented. When used in use class 3.2, a professional design (preventing water capillaries, end-grain sealing / protection) are of particular importance.

Accoya lumber may only be used in structures loaded statically or quasi-statically. Fatigue-relevant stresses are to be excluded.

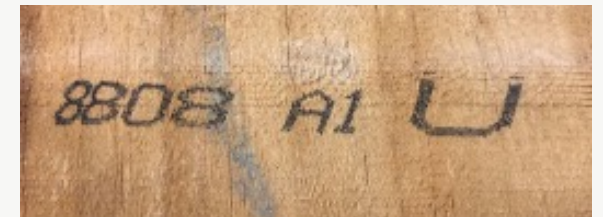
As with most timber species, Accoya wood meets the requirements of normal flammable building materials class B2 (DIN 4102-1).

In the design of Accoya components the characteristic strength, stiffness and density of strength class C22 apply for Accoya of A1 quality, and C16 values apply for Accoya of A2 quality (according to EN 338). The certificate also gives details of components and connections, maintenance and servicing, according to EN standards.

This test was
conducted by



Title



The U mark indicates that Accoya is certified under the German certification system for solid wood in structural applications

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ICC ESR DECKING CERTIFICATION

This test was
conducted by



ICC-ES is a USA based institute specialised in technical evaluations of building products, components, methods, and materials.

They have evaluated the compliance of Accoya wood with the International Building Code (IBC), the International Residential Code (IRC) and the ICC-700 National Green Building Standard™ for use in decking, porch flooring and stair threads, resulting in an Evaluation Report.

The ICC-ESR report states that typical applications for Accoya wood products are among the highest use categories defined by AWP. The service condition UC4A is general use in ground contact and fresh water contact and includes above ground applications with ground contact type hazards or that are critical or hard to replace.

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FLAME SPREAD AND SMOKE DEVELOPMENT TESTING

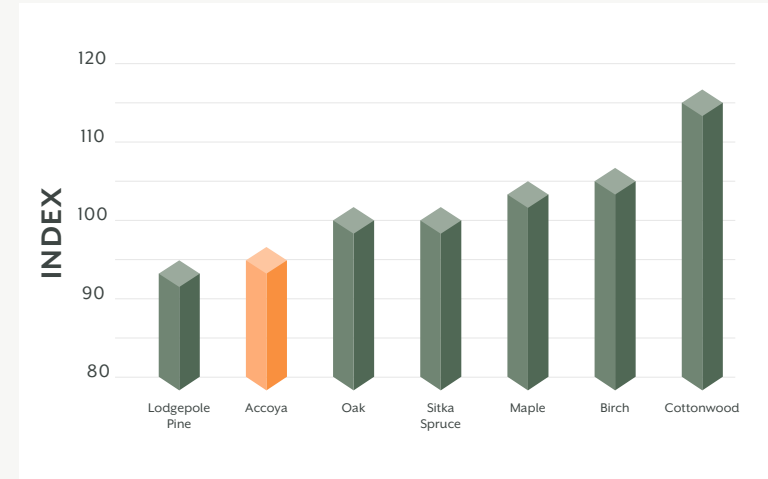
This test was
conducted by



Southwest Research Institute undertook Flame Spread Tests and Smoke Developed Tests in accordance with the standard test method for surface burning characteristics of building materials NFPA 255 (ASTM E84, UL 723 & UBC 8-1).

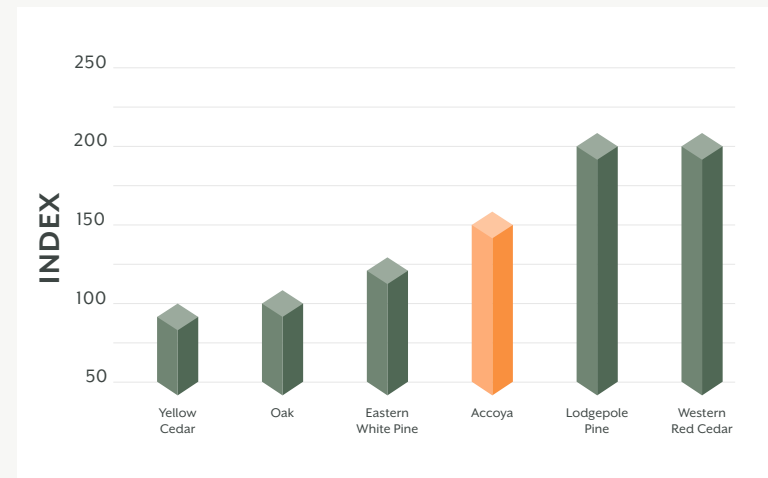
The conclusion of the Flame Spread Test results is that Accoya wood can be classified within the range of standard timber species and achieves Class C in this US rating system.

Fire spread index



FLAME SPREAD CLASSIFICATION	FLAME SPREAD INDEX
Class I (or A)	0 – 25
Class II (or B)	26 – 75
Class III (or C)	76 – 200

Smoke developed index



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THERMAL GAIN ON DECKS – JAPAN

This test was
conducted by



Thermal gain on decks and terraces is a particular issue in the summer season. A thermogram image analysis was arranged in Japan with the Hiroshima Prefectural Technology Research Institute to assess differences between Natural Accoya, thermally modified wood and three variants of commercial WPC decking.

The ambient temperature during the testing of all decks was 32°C. Deck board dimensions were comparable for all three types:

Natural Accoya:

26 x 140mm

Thermally modified wood:

26 x 140mm

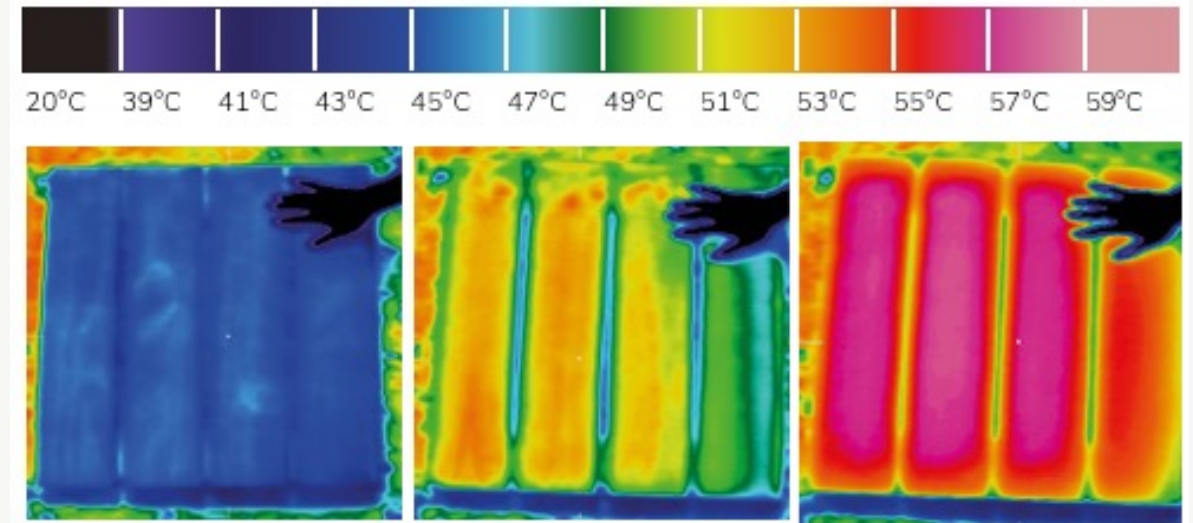
WPC:

26 x 145mm

The thermographs clearly indicate thermal gain in Accoya is substantially less than the alternatives tested.

This low level of thermal gain, combines with in-situ benefits derived from Accoya's dimensional stability and resisting cupping, remaining flat, the fixings not being stressed and remaining flush, and finally, the boards not suffering splintering with prolonged weathering.

Title



Natural Accoya Wood

Thermally Modified Wood

Wood Plastic Composite

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IMPROVED THERMAL PERFORMANCE

Thermal value is a critical aspect in window and door design. The thermal conductivity of the wood (lambda value) makes a significant contribution to the overall window frame calculated thermal value.

Accoya thermal conductivity has been assessed by IFT Rossenheim, Germany in accordance with EN 12664 and then developed into the required declared value format, under the most rigorous European assessment methods by the EN ISO 10456: 2008 procedure for determination of declared and design thermal values.

In comparison to other standard wood types for joinery, Accoya thermal conductivity is:

- Superior to softwood by 8%
- Superior to hardwood by 30%

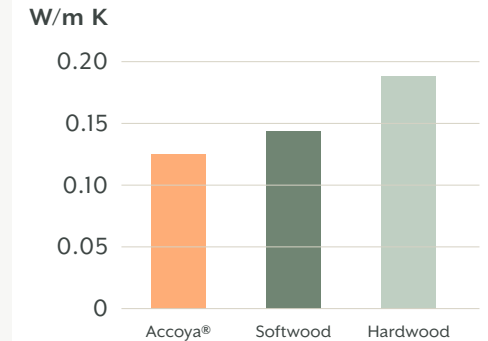
These improved levels provide options in design, in terms of achieving a higher U-Value for the same window design by switching timber type, or alternatively using a more preferred aesthetic or production friendly design without significantly compromising energy efficiency.

Accoya is regularly used to achieve A rated windows under the UK's BFRC Window Energy Rating Program where other woods in the same design would not meet this standard.

This test was
conducted by



DECLARED λ



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THERMAL CONDUCTIVITY – ASTM C177

Precision Measurements and Instruments Corporation (PMIC) measured the thermal conductivity (lambda value) of Accoya wood and sapele test specimens according to ASTM standard C177, with the so-called guarded hot-plate method in a dry nitrogen environment.

The results show the thermal conductivity of Sapele, a tropical hardwood species, to be 36% higher than that of Accoya wood. Choosing Accoya wood for the construction of windows and doors will have a significant positive effect on the total thermal performance and therefore the energy balance of your home.

This test was
conducted by



Title

WOOD SPECIES	THERMAL CONDUCTIVITY
Accoya	0.1022 W/m-K
Radiata Pine	0.1284 W/m-K
Sapele	0.1741 W/m-K

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HARDNESS AND WEAR TEST

Independent testing from leading timber research institute, BM Trada, UK, proved that Accoya wood can withstand harsh, abrasive environments.

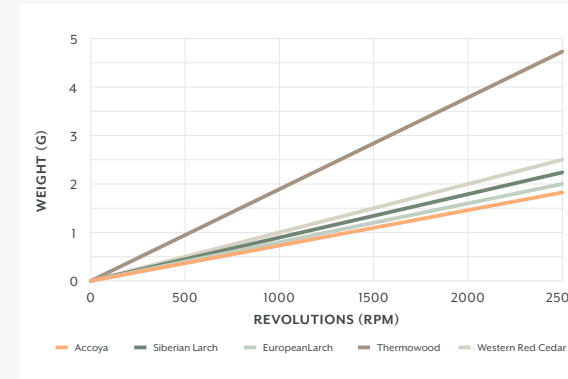
BM Trada's testing showed that hardening that occurs as a result of the Accoya process results in greater resistance to indentation than Western Red Cedar and two types of Larch. This is particularly useful when making specification choices for cladding and ground floor exterior products.

Separate scuffing and mechanical abrasion tests carried out by BM Trada show that Accoya wood is just as good, if not better than the two types of Larch, and significantly better than Western Red Cedar.

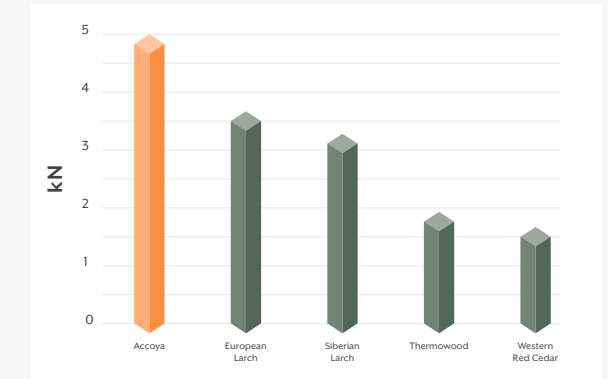
This test was
conducted by

bmtrada

Taber abrasion weight loss



Mean hardness load



Siberian Larch



Thermowood



Western Red Cedar



Accoya Wood



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