

DATA SHEET ACCOYA® RADIATA

Accoya® wood is the result of more than 80 years' research and development that has brought together a long-established and extensively proven wood modification technique - acetylation - and leading-edge proprietary technology to create a high performance wood.

KEY FEATURES



DIMENSIONALLY STABLE



OUTSTANDING DURABILITY



PERFECT FOR COATING

Accoya® wood is produced from sustainably sourced, fast growing wood and manufactured using Accsys' proprietary patented modification process from surface to core.



BAREFOOT FRIENDLY



NATURALLY INSULATING*



EXCELLENT MACHINABILITY



INSECT BARRIER



CONSISTANT QUALITY THROUGHOUT



NATURALLY BEAUTIFUL WOOD



FROM SUSTAINABLE SOURCES



RETAINED STRENGTH & HARDNESS



NON-TOXIC & RECYCLABLE

* U-value advantage over hardwood

STANDARD LENGTHS

2.4 m, 3.0 m, 3.6 m, 4.2 m, 4.8 m.

Please contact your Accoya® sales manager for stock availability and delivery time.

- All dimensions are actual rough sawn.
- Accoya® wood is available in many other standard decking sizes and siding patterns from our partners.
 - A1 : 4 sides primarily clear
 - A2 : 3 sides primarily clear
 - FJ : Finger Jointed

Other grades and dimensions can be made. Please contact your Accoya® Sales Manager for more information. Please refer to Accoya® Structural Design Guide to Eurocode 5 for information on the Accoya® Structural C24 equivalent grade available at www.accoya.com.

STANDARD DIMENSIONS & GRADES

HEIGHTS	WIDTHS				GRADES
	100	125	150	200	
25	✓	✓	✓	✓	A1, A2
32	✓	✓	✓	✓	A1, A2
38	✓	✓	✓	✓	A1, A2
50	✓	✓	✓*	✓	A1, A2, FJ
63	✓*	✓*	✓*	✓	A1, A2, FJ
75	✓*	✓*	✓*	✓	A1, A2, FJ
100		✓**	✓**		FJ

* Also possible in Finger Jointed (46 x 95 / 121 / 145 mm) L = 6 m
** Only Finger Jointed and laminated (95 x 121 / 145 mm) L = 6 m

MATERIAL	
100% Solid Accoya® wood	
DURABILITY	
EN 113 Class 1 (the highest rating). It is an effective barrier against a broad spectrum of fungi including cellar, wet rot, dry rot, soft rot, white, brown and pore fungi.	
EQUILIBRIUM MOISTURE CONTENT	
3 - 5 % at 65% relative humidity, 20°C	
DENSITY AND SPREAD	
65% RH, 20°C, Average 512 kg/m³, Range 432 to 592 kg/m³	
SHRINKAGE	
WET - 65% RH, 20°C	WET - OVEN DRY
Radial 0.4%	Radial 0.7%
Tangential 0.8%	Tangential 1.5%
FIRE RATING	
Class C (ASTM E84) and D (EN14915). Accoya® wood can be fire-treated to meet higher requirements.	
THERMAL CONDUCTIVITY	
EN 12667, $\lambda = 0.12$ W/m·K	
BENDING STRENGTH	
EN 408, 40 N/mm²	
BENDING STIFFNESS	
EN 408, 8800 N/mm²	
JANKA HARDNESS	
ASTM D143, Side 4100 N, End grain 6600 N	

INSECT DECAY

Accoya® wood is indigestible to a wide range of pests and an effective barrier to attack. For example, testing for termites according to AWPA E1 test standards yielded appearance ratings always ≥ 9 (Light Attack) versus control sample averages of 3.5 (worse than Heavy Attack). Weight loss averaged only 1.43% for Accoya® wood versus control sample averages of 32.06%.

MACHINABILITY

Processing does not affect the unique properties of Accoya® wood, as it is modified throughout and not leachable. It is relatively easy to process and can be compared to profiling a soft wood species. No special tools are required for cross cutting, ripping, planing, routing and drilling. Sanding before finishing is rarely required.

GLUING

Both load bearing and non-load bearing applications have been tested using adhesive systems related to laminating, finger jointing and frame corner joints. While good results can be achieved with most common adhesives, PU, epoxy and PRF adhesives give the best results. The results of gluing with polyvinyl acetate (PVAc) and melamine urea formaldehyde (MUF) can vary greatly. Specific recommendations for your project are available upon request.

FINISHING

Most commonly used coating systems can be used on Accoya® wood. Testing has been performed with a full range of oil-based and water-based coating systems. Leading coating manufacturers have found that their products last three or more times longer when used on Accoya® wood. Specific recommendations for your project are available upon request.

FASTENING

In good joinery practice, the use of corrosion-proof steel fastenings that conform to EN 10088-1 is recommended such as A2, A4 quality stainless steel. Use of other metals and alloys is included in the Accoya® Wood Information Guide.

Please note that all values are averages unless otherwise stated and should not be used for calculations in structural applications. For assistance in planning for structural projects, please contact us directly.

Calvary Composite Decking System Specification:

1. Material Description

Accoya® wood is produced from sustainably sourced, fast growing wood and manufactured using Accsys' proprietary patented modification process from surface to core.

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2. Material Specification

Material	100% Solid Acetylated wood (Radiata pine)
Treatment	Acetylation - Subjecting a softwood to a vinegar, which turns it into a hardwood by preventing the cells in the wood from being able to absorb water.
Durability	EN 113 Class 1 (the highest rating). It is an effective barrier against a broad spectrum of fungi including cellar, wet rot, dry rot, soft rot, white, brown and pore fungi.
Equilibrium Moisture content	3 – 5 % at 65% relative humidity, 20°C
Density and Spread	65% RH, 20°C, Average 512 kg/m ³ , Range 432 to 592 kg/m ³
Dimensional stability (BRL 0605)	<p>WET – 65% RH, 20°C</p> <ul style="list-style-type: none"> - Radial 0.4% - Tangential 0.8% <p>WET – OVEN DRY</p> <ul style="list-style-type: none"> - Radial 0.7% - Tangential 1.5%

Fire Rating	Class C (ASTM E84) and D (EN14915). Accoya® wood can be firetreated to meet higher requirements.
Thermal Conductivity	EN 12667, = 0.12 W/m·K “barefoot friendly” refer to test report from Hiroshima Prefectural Technology research Institute Japan on Accoya vs solid wood vs WPC
Bending Strength	EN 408, 40 N/mm ²
Bending Stiffness	EN 408, 8800 N/mm ²
Janka Hardness	ASTM D143, Side 4100 N, End grain 6600 N
Standard Lengths	2.4 m, 3.0 m, 3.6 m, 4.2 m, 4.8 m.
Standard Thickness	9mm, 19mm , 28mm, 45mm
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 (No loss of impact bending strength by the acetylation process)
Screw holding capacity (EN 320)	Better than compared to unacetylated Radiata Pine
Density (BRL 0605)	Average: 500 kg/m ³ (20°C / 65% RH) Characteristic: 417 kg/m ³
Water uptake (EN 317)	82.5% after 91 days of immersion
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

3. Tests / Certifications

- a. 10 year durability comparison test by Scion is a Crown research institute SGBC
- b. 5-year grave yard test by Timber Products Inspection (USA),
- c. 15 & 20 year canal lining test by SHR institute
- d. Formosan termite durability test by Louisiana State University (LSU)
- e. 5 year termite field trial data from Gainesville, Florida al testing by (TPI)
- f. Termite durability test, Australia –testing by AFRC

- g. Termite attack and decay trial – Thailand by Environmental Research Centre; Naresuan University
- h. 10 year coating durability test at Teknos
- i. 9.5 year external coatings test by SHR Institute
- j. 24 months Accoya and OSMO test
- k. Singapore Green Building Council (SGBC) certificate (3 ticks) SGBP 3897
- l. R11 Anti slip test by Setsco (SS 485:11 results V)

4. Recommended installation

- a. Boards should not be in direct contact with soil or surfaces which are consistently moist.
- b. Removable clip systems are advised. i.e EZrail clips
- c. Aluminium battens/runners are highly recommended.
- d. Exposed end grains are to be sealed with OSMO end grain sealer after cutting of boards and prior to installation onto battens/runners.
- e. Punctured holes due to drills/screws are to be covered and not left exposed.
- f. Processing does not affect the unique properties of Accoya® wood, as it is modified throughout and not leachable. It is relatively easy to process and can be compared to profiling a soft wood species. No special tools are required for cross cutting, ripping, planing, routing and drilling. Sanding before finishing is rarely required.
- g. In good joinery practice, the use of corrosion-proof steel fastenings that conform to EN 10088-1 is recommended such as A2, A4 quality stainless steel. Use of other metals and alloys is included in the Accoya® Wood Information Guide.

5. Warranty

- a. 50 years when used above ground or 25 years below ground of product warranty commencing from the date of original purchase. This warranty is offered to the original purchaser and is not transferrable.
- b. Decay & Soft-Rot Fungi: Deck boards will not be damaged by decay caused by soft-rot fungi and the wood destroying fungi so that the decking Products do not perform according to their intended function
- c. Termite Resistance: Deck boards are termite resistant when used and maintained in an above ground application free from termite and insect attack on the condition that annual pest control is conducted during the length of service.
- d. Warranty is not valid in the event that installation method does not comply with recommended installation methods.

6. Maintenance

- a. Greying , Because Accoya wood has a very high resistance against wood destroying fungi, a popular choice is to use it in various applications uncoated. It will weather naturally to a silverygrey colour, due to physical and biological processes that take place within the board surfaces
- b. Reoiling , It is recommended that only Oil products to be used for coating E.g OSMO external oil

09 Certifications and Eco-Labels

Wood from Well Managed Forests

The responsible procurement of sustainable wood plays a fundamental role in enhancing the proposition of Accoya® wood as an environmentally responsible product. All Accoya® wood is produced from well managed, sustainable sources, including FSC, PEFC, other controlled wood sources.

Accoya® can be specified with FSC or PEFC (www.fsc.org / www.pefc.org) certification. Procedures are assessed annually by an independent certification body to ensure that they meet FSC and PEFC Chain of Custody guidelines.



Cradle to CradleSM Gold

The MBDC Cradle to Cradle certification evaluated our end product as well as the total production process of Accoya® wood, including the sourcing of the wood, energy, water and waste management. A prestigious Gold Certificate level was achieved. The report is available in the download section of our website: www.accoya.com/accoya_downloads.asp



Other Eco Certifications

Singapore Green Label

RAL (Germany)

Accoya® wood has been evaluated according to the VFF Merkblatt HO.06-4 for its suitability in RAL certified joinery. Final acceptance of Accoya® wood was given in April, 2010, after a provisional acceptance period, and it has been added to the "approved" wood species list of the VFF (Joinery and Facades Association).

KOMO (Netherlands)

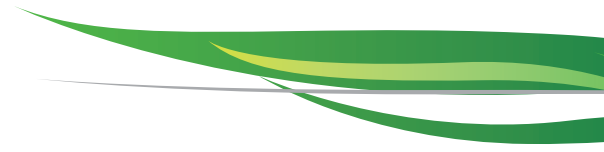
Accsys Technologies' modification process and the end product, Accoya® wood, are inspected several times each year by the notified certification body, SKH (Netherlands), within the KOMO® guidelines for modified wood, in accordance with the assessment directive BRL 0605. Accsys Technologies' production is evaluated as follows:

- ▶ Uniformity and replication of the production process.
- ▶ Quality system.

Accoya® wood has been tested in accordance with SKH publication 97-04 in respect to durability, dimensional stability, mechanical properties, workability, gluability and finishing, and has been shown to satisfy the requirements demanded of a wood species for use in KOMO® certified joinery and façade cladding.

Window and Door Manufacturers Assc. Hallmark® (North America)

Accsys Technologies was certified by the Window and Door Manufacturers' Association (WDMA) as an approved material for Hallmark Certified producers after meeting the requirements of the WDMA I.S.4 "Industry Specification for Preservative Treatment for Millwork" in October, 2009. This rating certifies the quality of exterior millwork and gives government and private agencies a method of identifying windows and doors that are manufactured in accordance with the WDMA's highest standards. The WDMA Hallmark® is a mark of excellence among architects, contractors and other specifiers. Products eligible for Hallmark certification are subjected to a rigorous verification process in order to ensure conformance with requirements.



10 Standards and Regulations Testing

Introduction

Below is a sample of various standards and guidelines that Accoya® has been tested against, with passes or better results against set criteria. For more detailed information on these results, please contact us.

Europe

- | | | | |
|---|---|---|---|
| <p>EN 113
Wood preservatives - Test method for determining the protective effectiveness against wood destroying basidiomycetes - Determination of the toxic values.</p> | <p>EN 717-1
Wood-based panels - Determination of formaldehyde release - Part 1: Formaldehyde emission by the chamber method.</p> | <p>EN 927-6
Paints and varnishes - Coating materials and coating systems for exterior wood - Part 6: Exposure of wood coatings to artificial weathering using fluorescent UV lamps and water.</p> | <p>ISO 16000-9
Indoor air - Part 9: Determination of the emission of volatile organic compounds from building products and furnishing - Emission test chamber method.</p> |
| <p>EN 320
Fibreboards - Determination of resistance to axial withdrawal of screws.</p> | <p>ENV 807
Wood preservatives - Determination of the effectiveness against soft rotting micro-fungi and other soil inhabiting micro-organisms.</p> | <p>EN 12667
Thermal performance of building materials and products - Determination of thermal resistance by means of guarded hot plate and heat flow meter methods - Products of high and medium thermal resistance.</p> | <p>ISO 16000-11
Indoor air - Part 11: Determination of the emission of volatile organic compounds from building products and furnishing - Sampling, storage of samples and preparation of test specimens</p> |
| <p>EN 350-1
Durability of wood and wood-based products - Natural durability of solid wood - Part 1: Guide to the principles of testing and classification of the natural durability of wood.</p> | <p>EN 927-3
Paints and varnishes - Coating materials and coating systems for exterior wood - Part 3: Natural weathering test.</p> | <p>ISO 16000-6
Indoor air - Part 6: Determination of volatile organic compounds in indoor and test chamber air by active sampling on Tenax TA sorbent, thermal desorption and gas chromatography using MS/ FID</p> | |
| <p>EN 408
Timber structures - Structural timber and glued laminated timber - Determination of some physical and mechanical properties.</p> | <p>EN 927-5
Paints and varnishes - Coating materials and coating systems for exterior wood - Part 5: Assessment of liquid water permeability.</p> | | |



10 Standards and Regulations Testing

Germany

DIN 52184

Prüfung von Holz;
Bestimmung der Quellung
und Schwindung. (Testing
of wood; determination of
swelling and shrinkage)

DIN 5218

5 Prüfung von Holz;
Bestimmung der
Druckfestigkeit parallel zur
Faser. (Testing of wood;
compression test parallel to
grain)

DIN 52186

Prüfung von Holz;
Biegeversuch. (Testing of
wood; bending test)

DIN 52192

Prüfung von Holz;
Druckversuch quer zur
Faserrichtung. (Testing of
wood; compression test
perpendicular to grain)

AgBB:2008

Health-related Evaluation
Procedure for Volatile
Organic Compounds
Emissions (VOC and SVOC)
from Building Products.

DIN 52617

Bestimmung des
Wasseraufnahmekoeffi-
zienten von Baustoffen.
(Determination of the water
absorption coefficient of
building materials)

IFT Richtlinie DI-01/1

Verwendbarkeit von
Dichtstoffen. Teil 1 -
Prüfung von Materialien in
Kontakt mit dem Isolierglas-
Randverbund. (Application
of sealants. Part 1 - Testing
of products in contact with
sealants used in double
glass)

IFT Richtlinie FE-08/1

Rahmeneckverbindungen
für Holzfenster.
Anforderungen, Prüfung
und Bewertung (Window
corner joints for wooden
windows. Requirements,
testing and evaluation)

IFT Richtlinie HO-10/1

Massive, keilgezinkte und
lamellierte Profile für
Holzfenster. Anforderung
und Prüfung. (Solid, finger-
jointed and laminated
elements for wooden
windows. Requirements
and testing)

IFT Richtlinie 7/86

Verträglichkeit von
Dichtprofilen mit Anstrichen
auf Holz.

RAL-GZ 695

Fenster, Haustüren,
Fassaden und Wintergärten
- Gütesicherung (Windows,
doors, façades and patios -
quality assurance)

VFF Merkblatt HO.06-4

Holzarten für den
Fensterbau Teil 4:
Modifizierte Hölzer (Wood
species suitable for joinery).

Netherlands

BRL 0605

National Assessment Directive
for the KOMO[®] product
certificate modified timber.

BRL 1704-1

Finger-joined timber for load
bearing applications.

BRL 1704-2

Finger-joined timber for non-
load bearing applications.

BRL 2338

Adhesives for load-bearing
wooden building constructions.

BRL 2339

Adhesives for non-load bearing
applications.

BRL 2902

Optimized timber for non-load
bearing applications

SKH pub. 97-04

Basis of assessment for wood
species for use in KOMO
certified joinery; requirements
and testing methods

WVS_SHR_049

Determination of shrinkage
and swelling of solid timber.

10 Standards and Regulations Testing

North America

ASTM B117-0 7A

Standard Practice for Operating Salt Spray (Fog) Apparatus

ASTM D143- 94

Standard Test Method for Small Clear Specimens of Timber

ASTM E84

Standard Test Method for Surface Burning Characteristics of Building Materials

ASTM G154-06

Standard Practice for Operating Fluorescent Light Apparatus for UV Exposure of Non-metallic Materials

WDMA T.M. 1-06

Soil Block Test, Test Method to Determine Preservative Effectiveness in Preventing Wood Decay

WDMA T.M. 2-06

Swellometer Test, Test Method to Determine the Short-Term Anti-Swell Effectiveness of Treating Systems

WDMA I.S. 4

Industry Specification for Preservative Treatment for Millwork

AWPA E1-06

Standard Method of Laboratory Evaluation to Determining Resistance to Subterranean Termites

AWPA E10-01

Standard Method of Testing Wood Preservatives by Laboratory Soil-Block Culture

AWPA E12-94

Standard Method of Determining Corrosion of Metal in Contact with Treated Wood

AWPA E18

Standard Field Test for Evaluation of Wood Preservatives Intended for Use Category BB Applications Exposed, Out of Ground Contact, Uncoated Ground Proximity Decay Method

AWPA E20

Standard Method for Determining the Leachability of Wood Preservatives in Ground Contact

AWPA E22-07

Standard Accelerated Laboratory Method for Testing the Efficacy of Preservatives Against Wood Decay Fungi Using Compression Strength

AWPA E23-07

Accelerated Method of Evaluating Wood Preservatives in Soil Contact

AWPA E24-06

Standard Method of Evaluating the Resistance of Wood Product Surfaces to Mold Growth

General Standards

EN 335-1

Durability of wood and wood-based products - Definition of use classes - Part 1: General.

EN 460

Durability of wood and wood based products - Natural durability of solid wood - Guide to the durability requirements for wood to be used in hazard classes.

EN 10088

Stainless steels - Part 2: Technical delivery conditions for sheet/plate and strip of corrosion resisting steels for general purposes.

10 Standards and Regulations Testing

Abbreviations

EN & ENV

EN stands for 'European Standard' and is the abbreviation used in the European classification system. ENV denotes a European pre-standard.

BRL & SKH

SKH is a Dutch notified certification body that is permitted to KOMO[®] certify timber, timber products, timber constructions and timber related products. The BRL represents the National Assessment Directive. For information about BRL and SKH publications contact Stichting Keuringsbureau Hout, SKH at T. +31(0)317 453425 or visit www.skh.org.

AWPA

The American Wood Protection Association standards are represented by the acronym AWPA. More information is available at www.awpa.com.

ASTM

ASTM stands for the American Society for Testing and Materials. More information is available at www.astm.org.

VFF & IFT

The VFF stands for "Verband der Fenster- und Fassadenhersteller" The "Gütegemeinschaft Fenster und Haustüren" is the beholder of the RAL certification (www.window.de). IFT Rosenheim is a test and certification body in Germany (www.ift-rosenheim.de).

ISO

ISO (International Organization for Standardization) is a network of the national standards institutes of some 162 countries, with a Central Secretariat in Geneva, Switzerland, that coordinates the system. Every full member of ISO has the right to take part in the development of any standard which it judges to be important to its country's economy. ISO standards are voluntary. As a non-governmental organization, ISO does not regulate or legislate. However, countries may decide to adopt ISO standards as regulations or refer to them in legislation. More information can be found on www.iso.org.



the world's leading high technology wood

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ACCSYS
TECHNOLOGIES

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