

## ▼ ACCOYA<sup>®</sup> Wood Properties

### ► Introduction

ACCOYA<sup>®</sup> wood is a remarkable “new wood species” and represents a major development in wood technology that has made the consistent supply of durable, dimensionally stable, reliable wood a reality.

ACCOYA<sup>®</sup> wood’s performance credentials have been extensively researched and repeatedly demonstrated. With properties that exceed those of the best tropical woods, ACCOYA<sup>®</sup> wood is manufactured by modifying wood sourced from well-managed forests without the introduction of toxins.

### ► Properties



Outstanding dimensional stability and improved hardness.



Highly improved thermal insulation in comparison with commonly used wood species.



Class 1 durability – the best available.



Non-toxic. The ACCOYA<sup>®</sup> wood manufacturing process adds nothing to the wood that does not already naturally occur in it.



Improved mould and insect resistance



Consistent supply from sustainably managed certified sources.



ACCOYA<sup>®</sup> wood is easy to machine and manually process and creates no extra challenges for product manufacturers and end users.



Consistent and measurable modification quality - from the surface to the core of every sample.



Retained natural strength and beauty.



Environmentally compatible. 100 % recyclable and naturally renewable.



Superior resistance to UV degradation when translucent coated.



Lasting for at least 50 years above ground and 25 years in-ground and/or in contact with fresh water.

▶▶ continued

▶ **Technical Data**

This table shows the average properties of ACCOYA® wood and has been compiled using data extracted from official test reports, copies of which are available upon request.

<b>Durability class</b>	1	
<b>Density</b>	510 kg/m <sup>3</sup>	
<b>Equilibrium moisture content</b>	3-5 % (65% RV, 20°C)	
<b>Shrinkage (wet - dry)</b>	Radial	0.7 %
	Tangential	1.5 %
<b>Bending strength</b>	39 N/mm <sup>2</sup>	
<b>Bending stiffness</b>	8790 N/mm <sup>2</sup>	
<b>Hardness (Janka)</b>	Side	4100 N
	End	6600 N

▶ **Appearance**

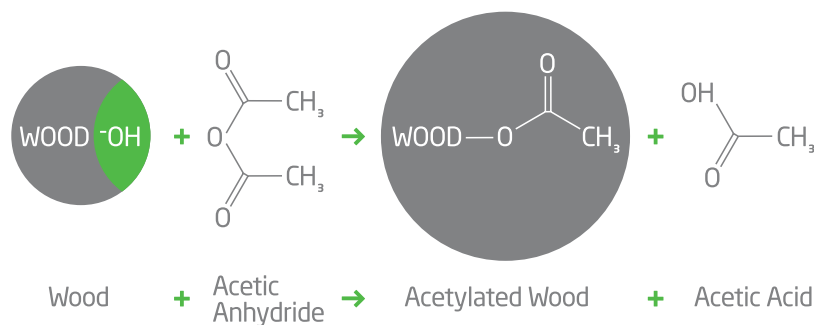
ACCOYA® is supplied as sawn wood in various sizes with a maximum thickness of 100 mm. The species used is sourced from *Pinus radiata* and has the appearance of pine wood. The visual qualities that Titan Wood can offer are:

- ▶ Optimised / finger jointed
- ▶ 4 sides clear
- ▶ 3 sides clear
- ▶ 1 side clear
- ▶ Mixed quality
- ▶ Dressing
- ▶ Quality class 6

▶ **Acetylation**

ACCOYA® wood is the result of more than 75 years of research and development that have brought together a long-established and extensively researched wood modification technique – acetylation – and leading-edge technology to create and make this extraordinary “new wood species” commercially available.

ACCOYA® wood is modified throughout the cross section, not just at the surface. The quality of the modification of each batch produced is validated by a range of sophisticated and proven tests that take place in Titan Wood’s laboratories. Thus consistent quality and performance in accordance with set standards is assured. ACCOYA® wood always meets the requirements of Durability Class 1 in accordance with EN 350-2.



▶ **Detailed Information**

The ACCOYA® wood brochure and website, [www.accoya.info](http://www.accoya.info), provide a detailed description of the acetylation process and the properties of ACCOYA® wood. In addition, official test reports may be obtained from Titan Wood in Arnhem.

▶ **Contact Information**

Titan Wood BV	6802 CC Arnhem	T: +31 (0)26 366 4122	E: <a href="mailto:info@titanwood.com">info@titanwood.com</a>
P.O. Box 2147	The Netherlands	F: +31 (0)26 366 5936	W: <a href="http://www.accoya.info">www.accoya.info</a>

## ▼ Certifications

### ► General

Titan Wood's production plant is located in Arnhem, the Netherlands. The plant, including all installations and process technology, is subject to regular inspections, certifications and quality assurance. Further all ACCOYA<sup>®</sup> wood produced is also subject to quality assurance. These inspections are undertaken by Titan Wood's staff and by accredited certification bodies.

### ► Wood from Well Managed Forests

The responsible procurement of wood to be processed at the plant plays a fundamental role in enhancing the proposition of ACCOYA<sup>®</sup> wood as an environmentally compatible product.

Titan Wood is committed to the consistent use of wood from sustainably managed certified sources. ACCOYA<sup>®</sup> wood can be obtained with FSC or PEFC certification ([www.fsc.org](http://www.fsc.org) / [www.pefc.org](http://www.pefc.org)) and Titan Wood's procedures are assessed annually by an independent certification body to ensure that they meet FSC and PEFC Chain of Custody guidelines.



### ► KOMO

Titan Wood's modification process and the end product, ACCOYA<sup>®</sup> wood are inspected several times each year by the notified certification body SKH (Netherlands) within the KOMO<sup>®</sup> guidelines for modified wood, in accordance with assessment directive BRL 0605. Titan Wood's production is evaluated as follows:

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

ACCOYA<sup>®</sup> wood is also tested in accordance with SKH publication 97-04 and assessed for:

- Durability.
- Dimensional stability.
- Mechanical properties.
- Workability.
- Gluability.
- Finishing.

ACCOYA<sup>®</sup> wood has been shown to satisfy the requirements demanded of a wood species for use in KOMO<sup>®</sup> certified joinery and façade cladding.



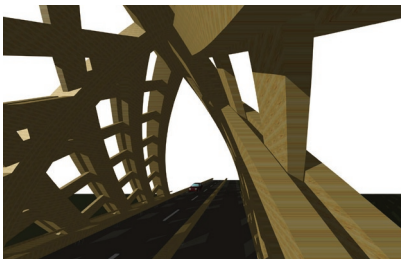
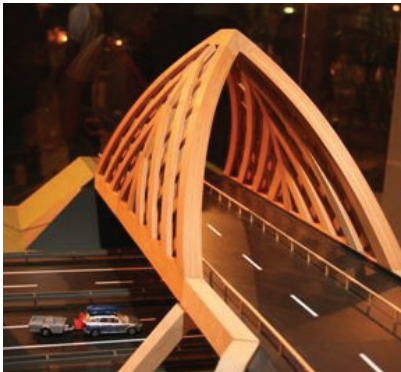
**TITAN**  
**WOOD**

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## ▼ Road Bridges Project - Sneek

- ▶ **Project Name** A7 Road Bridges Project – Sneek, the Netherlands
- ▶ **Architect**
  - ▶ Achterbosch Architectuur – Hans Achterbosch
  - ▶ Onix – Alex van de Beld, Haiko Meijer
- ▶ **Principal** Province of Friesland
- ▶ **Detailed Design**
  - ▶ H.E. Luning Adviesbureau voor technische houtconstructies
  - ▶ Oranjewoud Mobiliteit & Infrastructuur
  - ▶ GLC Houtconstructies
- ▶ **Project Location** Across A7 near Akkerwinde and Molenkrite
- ▶ **Project** The construction of two wooden bridges to carry heavy road traffic (up to 65 tonnes) over the A7
- ▶ **Construction Date** First bridge - summer 2008; second bridge - 2009
- ▶ **Material** Approximately 1,200 m<sup>3</sup> strength graded ACCOYA® wood.
- ▶ **Laminating** Finger-jointing and laminating to the required construction dimensions
- ▶ **Finishing** Semi-film forming coating
- ▶ **Notes** Further information and images are available from Titan Wood in Arnhem upon request.



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## ▼ Standards and Regulations

### ► Natural Durability

The term “Natural Durability” refers to the resistance of wood in its natural state to wood-destroying organisms, such as fungi and insects. The following table shows the natural durability of wood according to classification EN 350-2:

Classification of the Natural Durability to Wood-destroying Fungi

Class	Durability for in-ground situations	Average life span
1	Very durable	25 years and more
2	Durable	15 - 25 years
3	Moderately durable	10 - 15 years
4	Slightly durable	5 - 10 years
5	Not durable	Less than 5 years

This classification refers to fungal attack and is most commonly used when referring to natural durability. The table below indicates the natural durability to four wood-destroying insects, termites and/or marine borers. Marine borers are found in salt and brackish water and include molluscs and crustaceans.

Natural Durability Classification to Insects and Marine Borers

Class	Description
D	Sapwood and heartwood are very durable.
M	Moderately durable (only for termites and marine borers).
S	Sapwood is susceptible to attacks.
SH	Sapwood and heartwood are susceptible to the four selected insects for testing.
V	This indicates that the species exhibits an unusually high level of variability.

### ► Use Classes

The risk of fungal attack is determined by the conditions in which the wood is used and the degree of exposure to moisture. The EN 335-1 defines five use classes. The table below gives the classification whereby wetting and the related wood moisture content are determining factors.

Class	Conditions of use	Wetting	Wood moisture content
1	No contact with the ground, sheltered and dry	Permanently dry	Permanent exposure < 20%
2	No contact with the ground, sheltered with little chance of becoming wet	Occasionally exposed to moisture	Incidental short-term exposure* >20%
3	No contact with the ground, not sheltered in all weather conditions	Regularly exposed to moisture	Regular short-term exposure* >20%
4	In contact with ground or fresh water	Permanently exposed to water	Permanent exposure >20%
5	In contact with salt or brackish water	Permanently exposed to salt water	Permanent exposure >20%

\* Short-term exposure: a period of a couple of days to one week.

▶▶ continued

▶ **Relevant Standard Sheets & Guidelines**

Below is an overview of the standards and guidelines referred to in this Information Guide.

EN stands for 'European Standard'. This standard is usually registered as a Dutch standard shortly after the European Standard is published, and is shown as NEN-EN. ENV denotes a European pre-standard. ENV 807 is, however, already being used and is generally accepted. Further information about standards may be obtained from NEN-Klantenservice on T. +31(0)15 2690391 or visit [www.nen.nl](http://www.nen.nl).

For information about BRL and SKH publications contact Stichting Keuringsbureau Hout, SKH on T. +31(0)317 453425 or visit [www.skh.org](http://www.skh.org). For information about WVS (work instructions) contact SHR Hout Research, on T. +31(0)317 467366 or visit [www.shr.nl](http://www.shr.nl).

<b>BRL 1704-1</b>	Finger-joined timber for load bearing applications.
<b>BRL 1704-2</b>	Finger-joined timber for non-load bearing applications.
<b>BRL 2339</b>	Adhesives for non-load bearing applications.
<b>BRL 2338</b>	Adhesives for load bearing wooden building constructions.
<b>BRL 2902</b>	Laminated wood for non-load bearing applications.
<b>EN 113</b>	Wood preservatives - Test method for determining the protective effectiveness against wood destroying basidiomycetes - Determination of the toxic values.
<b>EN 335-1</b>	Durability of wood and wood-based products - Definition of use classes - Part 1: General.
<b>EN 350-2</b>	Durability of wood and wood-based products - Natural durability of solid wood - Part 2: Guide to natural durability and treatability of selected wood species of importance in Europe.
<b>EN 460</b>	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.
<b>EN 10088</b>	Stainless steels - Part 2: Technical delivery conditions for sheet/plate and strip of corrosion resisting steels for general purposes.
<b>ENV 807</b>	Wood preservatives - Determination of the effectiveness against soft rotting micro-fungi and other soil inhabiting micro-organisms.
<b>NEN 5461</b>	Requirements for timber (KVH 2000) - Sawn timber and round wood - General part.
<b>BRL 0605</b>	National Assessment Directive for the KOMO® product certificate modified timber.
<b>SKH pub. 97-04</b>	Beoordelingsgrondslag 'Houtsoorten voor toepassing in geveltimmerwerk; eisen en bepalingmethoden'. (Basis of assesment for wood species for use in KOMO certified joinery; requirements and testing methods)
<b>SKH pub. 99-02</b>	Basis of assessment for opaque primer systems for timber
<b>SKH pub. 00-01</b>	Basis of assessment for transparent film forming coatings on timber.
<b>SKH pub. 04-02</b>	Samenvatting van toegelaten grondverfsystemen voor toepassing op geveltimmerwerk. (Overview of tested and approved (primer) coating systems for application to joinery under KOMO certification)
<b>SKH pub. 07-01</b>	Overzicht van toegelaten afdichtmiddelen voor de timmerindustrie. (Overview of tested and approved sealants for the joinery industry under KOMO certification)
<b>WVS_SHR_049</b>	Determination of shrinkage and swelling of solid timber.

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## ▼ Building Specifications & STABU

### ► General

Building Specifications form the basis of the contractual commitment between the manufacturer of the end product and the client. It is important that the parties clearly specify the use required for the ACCOYA® wood and use it accordingly. Below is an example of a Dutch building specification for illustrative purposes only. Please note that each EU country operates its own system.

Please contact Titan Wood if you require soft copy versions of available specifications. Any additional performance requirements must be agreed upon by the client and the manufacturer of the relevant end product.

### ► STABU

Titan Wood includes an FPS sheet (Manufacturer-related Product Specification) in the STABU specifications (Dutch building specification system). As only ACCOYA® wood is included, the system is limited to production requirements under the code B243120 ACETYLATED SAWN TIMBER (see the STABU description below).

<b>B243120.111.f01 ACETYLATED TIMBER, SAWN</b>	
1	Manufactured by: Titan Wood B.V.
2	Type: ACCOYA®.
3	# \The wood must be durably harvested. NOTE: DUBO requirement 063.
4	# \Shrinkage, maximum (%): tangential 2.7 radial 1.5.
5	# \Durability Class (NEN-EN 350-2-94): 1.
6	# \Thickness (mm): .....
7	# \Width (mm): .....
8	# \Length (mm): .....
9	# \Equilibrium moisture content of timber at 65% RV (%): approx. 5.
10	# \Machining: planed. \Machining.....
11	# \Preservation: wood modification by acetylation.
12	# \Surface treatment: .....
13	# \.....
14	# \Accessory:
15	# \- fastenings, corrosion-proof steel, and quality in accordance with NEN-EN 10088-1: .....



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