

# Research Report

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## Machine ability of Accoya™

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## 1. Background

For production of joinery the processing (machine ability) is a critical aspect. In this respect the machine ability of Accoya™ is studied by investigating all commonly used processing steps needed for production of a window frame (i.e. cross cutting, planing, profiling).

## 2. Material and methods

In co-operation with 2 joinery producers, Titan Wood has investigated the machine ability (processing) of Accoya™. In total 4 windows have been produced; 2 window frames with a dowel type connection (NL: deuvolverbinding) and 2 window frames with a post & I-beam connection (NL: slisverbinding). During the production the following processing aspects have been studied:

- Cross cutting
- Calibration
- Ripping
- Surface planing
- Thicknessing
- Profiling
- End profiling
- Drilling of holes
- Drilling of holes for dowels
- Evaluation of deviation in dimensions, dimensional stability, distortion and surface smoothness, carbonizing of the surface, decrease of router speed, jamming and wobbling of the saw
- Effect of wood components on machine and mankind
- General impression of machine ability compared to other (traditional) wood species
- General impression of the wood quality (lot inspection)

### 3. Results and discussion

The results of the investigation of the machine ability of Accoya™ are described in appendix 1 and 2.

### 4. Conclusions

Accoya™ is highly suitable for preparation of window frames in respect to the machine ability (processing). Cross cutting, ripping, planing and profiling results in a (very) smooth surface. During the tests no problems were noticed regarding distortion, carbonizing of the surface, decrease of router speed, jamming and wobbling of the saw. During the processing of Accoya™ a slight not-predominating acid odour is noticed, not leading to irritation for eyes, skin and respiration.

## Appendix 1 Investigation of the machine ability of Accoya™ - Timmerselect Doornenbal

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**Date:** 23/25 September 2006

**Contact person:** C. Doornenbal / H. van de Beek

**Representative of Titan Wood:** F. Bongers

### General impression of the wood quality

The original wood species is Radiata pine (*Pinus radiata*), a softwood species that grows in plantation in New Zealand, Chili, South Africa. The wood contains large annual rings and consists totally of sapwood. The wood has small resin ducts and (small) knots.

1 (terrible)     2     3     4     5 (excellent)

### Cross cutting

During the cross cutting a slight dust mist is observed. The wood is easy to cross cut, has a clean cross cut and there is no decrease of the saw rotation during sawing. A slight, not dominating acid odour is observed during cross cutting.

1 (terrible)     2     3     4     5 (excellent)

### Calibration

Calibration and planing leads to a very nice structure and smooth surface.

1 (terrible)     2     3     4     5 (excellent)

### Ripping

Ripping is easy and does not have any problems with slope or grain or decrease of the saw rotation speed during ripping.

1 (terrible)     2     3     4     5 (excellent)

**Surface planing**

No problems were observed. Mechanical induced defects (NL: Machineslag) less than during calibration.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
1	2	3	4	5
(terrible)				(excellent)

**Thickening**

Good, without any problems. Very slight mechanical induced defect (rollers).



*Planing leads to a (very) smooth surface.*

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
1	2	3	4	5
(terrible)				(excellent)

**Profiling**

Smooth structure. Profiling (nearby) knots is possible without occurring breaking out.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
1	2	3	4	5
(terrible)				(excellent)

**End profiling**

End profiling gives a very smooth structure.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	2	3	4	5
(terrible)				(excellent)

**Drilling of holes**

Sound holes are made, no splinters on the outside.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	2	3	4	5
(terrible)				(excellent)

**Drilling of holes for dowels**

Dowel holes are sound, there are no splinters on the outside of the hole.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	2	3	4	5
(terrible)				(excellent)

**Evaluation of deviation in dimensions, dimensional stability, distortion and surface smoothness, carbonizing of the surface, decrease of router speed, jamming and wobbling of the saw**

The deviation in dimensions is not too large. Processing leads to smooth surfaces. During the processing of the wood no carbonizing of the surface, decrease of router speed, jamming and wobbling of the saw is observed.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	2	3	4	5
(terrible)				(excellent)

**Effect of wood components on machine and mankind**

During the processing of the wood a slight not-predominating acid odour is noticed, not leading to irritation for eyes, skin and respiration.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
1	2	3	4	5
(terrible)				(excellent)

**General impression of the machine ability compared to other (traditional) wood species**

Accoya™ is easy to process and relative light in weight which result in easy handling. The machine ability (processing) of Accoya™ is comparable to that of Meranti and Larch, and many times better than Robinia or Merbau.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
1	2	3	4	5
(terrible)				(excellent)

**General remarks**

The feeling of the wood during processing gives a positive impression. Accoya™ is relative light in weight which increases the handling compared to other common used (tropical) wood species.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
1	2	3	4	5
(terrible)				(excellent)



The results of the investigation of the machine ability (processing) of Accoya™ are described in this document and recorded without any prejudice and independent from commercial interests.

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## Appendix 2 Investigation of the machine ability of Accoya™ - Nijhuis Toelevering

**Company:** Nijhuis Toelevering B.V.  
Molendijk-Noord 86d  
7461 JE RIJSSEN  
T. 0548-535300

**Date:** 21 oktober 2006

**Contact person:** W. Olthof / H. Otten /  
M. Delaney

**Representative of Titan Wood:** F. Bongers / S. van Roijen

### General impression of the wood quality

The wood has a beautiful structure. Remarkably are the (small) resin ducts which result in a special pattern on the wood surface. During the investigation Accoya™ is used that contained large knots to determine the effect of these knots on the machine ability.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
1	2	3	4	5
(terrible)				(excellent)

### Cross cutting

The wood is easy to cross cut, and no splintering is observed.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
1	2	3	4	5
(terrible)				(excellent)

### Calibration / surface planing and thickening

The wood surface is very smooth and has a nice structure after planing. Also knots can be planed smoothly and do not result in problems during machining.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	2	3	4	5
(terrible)				(excellent)

### Profiling

The profiling is tested with a low throughput speed. The profiling results in a very smooth wood surface, even on knots. Problems like the in-pressing of wood scrapings during routing (like can be observed at spruce) are not observed.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
1	2	3	4	5
(terrible)				(excellent)



**End profiling**

After end profiling the surface is smooth. The end profiling has to be performed with care since splintering could occur.



<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1	2	3	4	5
(terrible)				(excellent)

**Evaluation of deviation in dimensions, dimensional stability, distortion and surface smoothness, carbonizing of the surface, decrease of router speed, jamming and wobbling of the saw**

Processing of the wood results in a very smooth surface. During the processing no carbonizing of the surface, decrease of router speed, jamming and wobbling of the saw is observed.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
1	2	3	4	5
(terrible)				(excellent)

**Effect of wood components on machine and mankind**

During processing a slight (acid) scent is observed.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
1	2	3	4	5
(terrible)				(excellent)

**General impression of the machine ability compared to other (traditional) wood species**

The wood is easy to process and results in a very smooth surface compared to other commonly used wood species in the joinery industry.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
1	2	3	4	5
(terrible)				(excellent)

**General remarks**

The processing of Accoya™ and the production of a window frame leads to a good and nice result.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
1	2	3	4	5
(terrible)				(excellent)



The results of the investigation of the machine ability (processing) of Accoya™ are described in this document and recorded without any prejudice and independent from commercial interests.

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