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# PLANEWOOD

## Utilization of Pine Wood in the Manufacture of Wooden Components for Aircraft Production

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# High quality pine has tremendous potential in demanding applications



The light weight wood composite has highly advantageous material properties:

- Corrosion free
  - Durable and strong
  - Easy to repair and sustainable
1. Can a epoxy-wood bonding system be used in type certified airplanes?
  2. Is pine heartwood suitable for composite aircraft structures?

# Consortium based in Lapland and South Savo regions

## Atol Avion Ltd

- Manufacturer of amphibious light sport aircraft
- Based at Rovaniemi – production and test facilities
- Material testing, provides materials

## South Eastern Finland University of Applied Sciences

- The lead partner in the project – Mikpolis Research Unit, based in Mikkeli
- Material testing (strength, environmental stress), reporting etc.

## The Natural Resources institute Finland (Luke)

- Savonlinna unit – expertise and equipment for pine heart wood identification
- UV-fluorescence is used to separate the pine heartwood from the sapwood



# Outcomes and implementation to practice

Aircraft manufacturing is very strictly regulated by the aviation authorities

- The research results will be used in the EASA (European Union Aviation Safety Agency) type approval process of the Atol aircraft
- The project directly contributes to the technical capability of the Atol aircraft: TRL 5 → TRL 8 (complete and qualified system)
- It is expected that the tested epoxy adhesive performs well

If the pine heartwood performs well – it is possible to considerably increase the material efficiency and reduce the costs in the manufacturing process

The big picture: a thought provoking example of the use of wood in high performance application

- The regulatory approval opens other markets and applications for both the raw material and products manufactured out of it

# Competitive advantages & market opportunities

Atol Aurora to be the first type approved amphibious light aircraft in Europe

- European certification opens the global markets – bilateral approval process

Atol Avion is the only aircraft manufacturer in Finland

- Competitors in South America and the United States
- Only Atol's planes are built primarily of wood

Atol is about 10 % lighter than its competitors due to its optimized wood structure

- Low fuel consumption – lower climate impact
- Carbon dioxide stored in the wood structure
- Weight is a major competitive advantage – direct impact on the performance

