



**File Code:** 1570

**Date:** November 7, 2017

Mr. Edward Malinowski  
Air Safety Investigator  
National Transportation Safety Board  
[Redacted]  
West Chicago IL 60185

**Subject: Inspection of Wooden Propeller Blade Sections**

Mr. Malinowski:

The USDA Forest Products Laboratory (FPL) received pieces from two wooden propellers from a helicopter crash that is being investigated by the National Transportation Safety Board (NTSB) on 28 September, 2017. According to the National Transportation Safety Board Aviation Accident Preliminary Report, on July 6, 2017, about 1200 central daylight time, a Bell 47D1 helicopter, N153B, had main rotor blade separation and contact with a ground vehicle during the initiation of an aerial application flight near Big Lake, Minnesota. The airline transport pilot was uninjured. The helicopter sustained substantial main rotor blade damage. The helicopter was registered to the pilot and operated by Oleen Ag Air as a 14 Code of Federal Regulations Part 137 aerial application flight. Day visual meteorological conditions prevailed in the area about the time of the accident and the flight was not operated on a flight plan. The local flight was originating at the time of the accident.

According to initial information from the pilot, the main rotor shaft separated while the helicopter was standing with the engine running prior to departure on the flight.

FPL was contacted by NTSB to conduct an inspection of the wooden propeller sections. Specifically, FPL was asked to: 1. Identify the type of wood products used in its construction; 2. Identify the species of wood used, and; 3. Determine if there is any evidence of decay of the wood.

In response to your request, we submit the following:

1. The propeller was manufactured from plywood and defect-free lumber, in accordance with the design of the propellers, per the blue prints you provided.
2. The plywood was made from birch veneers, and laminated with an exterior grade adhesive. The wood used in the remainder of the laminations was determined to be Sitka spruce, which is in accordance with design specifications.
3. No evidence of fungal decay activity was observed in the plywood or wood laminations. Visual examination did not reveal any decay. Microscopic examination of sections from the propellers confirmed that no decay activity was present.



Respectfully;



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