

## A summary of usage data for CL-415 aircraft in service with USFS

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**Abstract:** United States Forest Service (USFS) uses a variety of aircraft for firefighting operations. In this study, flight data is analyzed for CL-415 aircraft, which were specifically designed for firefighting. A major operational and design difference between other airtankers and the CL-415 is that, being an amphibious aircraft, it does not need to land to fill with water; therefore, it performs multiple fills and drops per flight. Data is available for firefighting missions as well as maintenance and ferry flights for analysis. In total, 1,069 flights files, consisting of 380,903 nautical miles, are analyzed for four CL-415 airframes. The flight data, recorded at 32 Hz, contains channels of navigational, inertial, and air data. Usage data is extracted from each ground-air- ground (GAG) cycle using a FORTRAN code developed specifically for the aircraft. Some results of interest are flight duration and distance, altitudes at which the aircraft is flown, maximum airspeeds and load factors, number of fills and drops per flight, and flap usage. The usage results are then compared against published operational limits as given by the airframe manufacturer in the flight manual. The comparison of the results with operational limitations set by the manufacturer is used to determine if the aircraft are being operated as they were designed. This data could be used by the FAA to recommend possible design limits for future aircraft in a similar role. Finally, the operators can use results of this nature to fine-tune their maintenance and inspection periods.

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