

Aeronautical alloys between 1930 and 1945: Early materials in military aviation



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Aluminum alloys provide interesting evidence of industrial and technical developments before and during World War II. This work focuses on two versions of the aluminum alloy Duralumin collected from crashed WWII aircraft exhibited in the Museum Aeroscopia in Toulouse from four different nations: P51 Mustang (US), Dewoitine D520 (FR), Messerschmitt Bf109 (DE), and Lancaster (UK). This study compares the Duralumin used by each nation by their chemical composition, designations, microstructure, and mechanical properties. Duralumin is a light metal with good mechanical properties. One version has a magnesium content below or equal to 1wt% and the other has a higher magnesium content (1.5wt%), they are identified, respectively, as 17S, 24S in the US; Duralumin, Duralumin FR in France; AlCuMg1, AlCuMg2 in Germany, and Hiduminium DU Brand, Hiduminium 72 in the UK. The goal of the project is to document the alloys used in historic aircraft and their evolution over time to assess if WWII had an impact on the availability and use of material, or if there were any shortages necessitating significant changes in the alloys composition. This work is the first step towards evaluating the impact of the materials and their development on the performances of the aircraft.

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Topics in Museum Conservation

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