## Analysis and Experimental Study of DFR Values for Aircraft Wing-fuselage Joint Structure

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June 2, 2022

## Abstract

Previous studies obtained the static and fatigue strength characteristics of the wing-fuselage joint structure by finite element analysis. In this paper, for the wing-fuselage tie rod and its connecting joint, the stress distribution at the detail design points and the calculated Detail Fatigue Rating (DFR) values were obtained by finite element analysis, and the test part design was simplified; the test life data were obtained by fatigue tests of the wing-fuselage tie rod and its connecting joint, and the test DFR values were obtained. The results show that the stress level of the simplified structure differs little from that of the real structure, so the simplified structure can be used for the test instead of the real structure; in the test, the contact area of the wing lug structure is the initial area for fatigue cracks generation. The DFR values obtained from the test are larger than those calculated, which indicates that the calculated results are on the conservative and safe side.

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