

Advances
in
Aircraft Structures

Editor

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Chapter 7

Corrosion Detection in Aircraft Structures by Ultrasonic Method

Meftah Hrairi, Nurul Farahana Zuhudi

Abstract

This chapter describes the use of ultrasonic nondestructive evaluation in corrosion detection of aircrafts structures. Initiating on the inside or in the interface of an aircraft's skin, the corrosion must be tested from the outside surface. Corroded aluminum as well as corrosion simulation samples were inspected using pulse-echo technique of ultrasonic nondestructive evaluation and the values of the remaining thickness obtained was compared with the noncorroded plate of the same type of aluminum alloy. Surface roughness of those plates was also investigated to establish its relation with the determined remaining thicknesses. The estimated depth of the real corrosion by this method shows good agreement with that measured with a micrometer.

Keywords: Ultrasonic, A-scan, Hidden corrosion, Nondestructive evaluation, Aluminum

1. Introduction

Most metals used in aircraft structures are subjected to degradation due to exposure to adverse environments including humidity-induced stresses and wide temperature excursions. These conditions may cause localized corrosion attacks in