

Accepted Manuscript

Depth determination of defects in CFRP-structures using lock-in thermography

Sarah Ekanayake, Sumit Gurram, Robert H. Schmitt

PII: S1359-8368(18)30793-5

DOI: [10.1016/j.compositesb.2018.04.032](https://doi.org/10.1016/j.compositesb.2018.04.032)

Reference: JCOMB 5640

To appear in: *Composites Part B*

Received Date: 15 March 2018

Accepted Date: 9 April 2018

Please cite this article as: Ekanayake S, Gurram S, Schmitt RH, Depth determination of defects in CFRP-structures using lock-in thermography, *Composites Part B* (2018), doi: 10.1016/j.compositesb.2018.04.032.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



Title: Depth determination of defects in CFRP-structures using lock-in thermography

Authors: Sarah Ekanayake^{a*}, Sumit Gurram^a, Robert H. Schmitt^a

Affiliations: ^a Laboratory for Machine Tools and Production Engineering (WZL), RWTH Aachen University, 52056 Aachen, Germany

* Corresponding author. Tel.: +49-241-80-28396; Fax: +49-241-80-22193. E-mail address: s.ekanayake@wzl.rwth-aachen.de

Abstract (100 words):

Due to the increasing application of CFRP in mass application, an economic repair process gains importance. As the typical repair process starts with the defect detection, the accuracy of the measurement system is a limiting factor of the repair process. Lock-in thermography is a promising approach for non-destructive defect detection. Since the phase images contain a superposition of depth information, the determination of the defects' depth is a challenge. Based on the complex wave field, this paper introduces a method to determine the thermal properties and the defects' depth in CFRP structures using lock-in thermography.

Keywords (max 4): A. Thermal properties, A. Polymer-matrix composites (PMCs), B. Impact behavior, D. Non-destructive testing

Keywords (max 4, plus 1 additional): D. Thermal analysis, A. Polymer-matrix composites (PMCs), B. Defect, D. Non-destructive testing, Thermography

Main text

1. Introduction

To guarantee an economical feasible application of carbon fiber reinforced plastics (CFRP) long-term operational reliability and economic repair processes have to be assured. As the application of CFRP increases especially in mass markets (e.g. automotive industry), generously replacing damaged parts, which is an established in aircraft industry, is not justifiable anymore. Alternatively, economic repair processes are required. The typical repair process starts with the defect detection and is limited by the

Download English Version:

<https://daneshyari.com/en/article/7211943>

Download Persian Version:

<https://daneshyari.com/article/7211943>

[Daneshyari.com](https://daneshyari.com)