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TITLE: COMPUTED TOMOGRAPHY IN NDT AND METROLOGY FOR ADDITIVELY MANUFACTURED AEROSPACE COMPONENTS

ABSTRACTS

Additive Manufacturing (AM) is becoming an increasingly important production technique also for safety critical aerospace parts. Often these parts are very complex and require new methods of testing to assure their structural health and integrity. Furthermore it is often important to verify certain wall thicknesses or for example the inner diameter of a turbine blade's cooling channel.

The Computed Tomography (CT) allows both detecting the mentioned anomalies and carrying out dimensional measurements. Since the CT data represent the full 3D volume of the parts, the analysis covers not only the outer surface, but the complete part including the inner structures. However, due to the many different scan parameters it is often difficult to define the right inspection parameters.

At first a sophisticated method will be presented that helps the operator to determine the optimum parameter set, which suits the part material(s) and geometry, the required test specification as well as the side conditions of the available X-ray system.

Secondly, we will describe how to adjust the inspection strategies in order to adapt to the very specific requirements of the aircraft industry. Since DR standards as the ASTM E 2737 are still missing their equivalent for CT inspection, we will present a method that helps to determine both qualitatively and quantitatively the inspection quality of the CT scans.

KEYWORDS

Computed Tomography (CT) | Metrology | NDT | Additive Manufacturing (AM) |