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Fixing a hole (with cold spray)

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Abstract

Continuous development of cold spray technology, resulting in higher mechanical properties, enable extension of cold spray application to components carrying loads. As a new subject, no standard procedures to assess fatigue life of repaired parts are available. Here, we propose new specimen for axial fatigue test to simulate behaviour of parts with localized damage and repaired with cold spray, which are subjected to cyclic loading. Geometry of the specimen, including cavity representing spray bed machined around the damage to permit cold spraying, was based on coating quality and stress analysis, which are discussed in this study. Specimen, produced from A357 aluminum alloy, was successfully tested and can be used as a part of standard procedure for mechanical testing of structural repairs. Moreover, fatigue limit obtained on repaired specimens corresponds to the limit obtained on bulk material, which proves potential of cold spray for restoration of structural parts.

1. Introduction

Global aeronautical segments have been growing since 2009 recession and even more rapid growth is expected in upcoming years, especially in Asia and Middle East developing market [1]. Increasing

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