



Durability of Adhesively Bonded Joints for Aircraft Structures

Daniel O. Adams, *Ph.D.* – Dept. of Mechanical Engineering, University of Utah
K. L. "Larry" DeVries, *Ph.D.* - Dept. of Mechanical Engineering, University of Utah
Clint Child - Dept. of Mechanical Engineering, University of Utah

ABSTRACT

The objective of this recently-initiated research investigation is to revisit and revise the ASTM D 3762 metal wedge crack durability test. While considered to be a reliable method for investigating adhesive bond durability, the existing standard provides little guidance regarding the conditions and requirements that constitute an acceptable metal bonded joint. Of particular concern is the reduction in strength of the bonded metal joint over time due to hydration. Thus a need exists to revise the existing test standard such that it provides specific guidance on how to successfully develop criteria for the wedge crack durability test. Possible revisions to the standard include proposed exposure environments, and pass/fail criteria with regards to both crack growth extension and failure modes. This research project will initially focus on reviewing the literature and identifying stakeholders associated with the test method. Test results and proposed additions and revisions to the ASTM D 3762 standard will be communicated regularly to ASTM Committee D14 on adhesives. In addition to proposing revisions to this standardized test method, research results from this investigation will be disseminated through an FAA technical report and journal publications. Expected benefits to aviation include an improved adhesive bond durability test method for use in assessing the reliability of adhesively bonded aircraft structures.