

1. **Research Title:** Environmental Assisted Cracking in Third Generation AA7XXX

2. **Individual Sponsor:**

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3. **Academic Area/Field and Education Level:**

Materials Science and Engineering, Chemical Engineering, or Chemistry (MS or PhD level)

4. **Objectives:** Study the environmental assisted cracking (EAC) that is occurring in third generation AA7XXX alloys, e.g., 7085. Two goals should be kept in mind; 1) the life management of aerospace structural components manufactured with susceptible alloys, and 2) develop a test method to rapidly screen current and new AA7XXX alloys for EAC susceptibility.

5. **Description:** Environmental assisted cracking has been observed in new AA7XXX alloys that were not predicted based on current stress corrosion cracking screening methods like ASTM G44 and G47. Because of this, aerospace structures have found their way into aircraft that are now experiencing cracking. Methodologies to manage these fracture critical structures are needed that will ensure aircraft safety. The new alloys appear to be especially susceptible to cracking in warm moist environments. New screening test methodologies are required to prevent susceptible materials from being used. The research should assess the roles, for example, of environment (Temperature, Humidity, Corrosive Species, and Saturation), alloy composition, and the impact of specific heat treatment schedules on EAC.

6. **Research Classification/Restrictions:** This research is unclassified and has no ITAR restrictions.

7. **Eligible Research Institutions:** Wright State University, AFIT, Ohio State University, University of Dayton, Miami University, Ohio University, University of Cincinnati.

8. **PA Approval #:** AFRL-2026-3420