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Academic Institution: University of Missouri-Rolla

Address: 1870 Miner Circle Rolla, MO 65409

Departments Involved: Mechanical & Aerospace Engineering & Engineering Mechanics

Team's Designated Contact

First Name: David

Last Name: Harris

Phone Number: 573-341-5507

E-Mail: dharris@umr.edu

Team's Supervising Faculty

First Name: Henry

Last Name: Pernicka

Phone Number: 573-341-6749

E-Mail: pernicka@umr.edu

Second Supervising Faculty

First Name: Hai Lung

Last Name: Tsai

Phone Number: 573-341-4945

E-Mail: tsai@umr.edu

Proposed Experiment Topic: Mechanical Properties of Welds Performed in Reduced Gravity

In one paragraph, briefly describe the test activity that will be addressed in the team proposal

In light of NASA's current goal of permanent human habitation in space, a need for viable construction techniques in this environment arises. A major component of most large-scale, modern construction involves various welding processes. However, gravitational forces

influence the formation of a weld; therefore, the near weightless environment will have a significant effect on the mechanical properties of a weld. Our intent is to compare metallic welds performed in microgravity with similar welds performed on Earth. We intend to use a gas metal arc welder to weld thin plates of steel and aluminum under varying gravitational conditions. The welded plates will then be tested by ground-based equipment for strength, depth to width ratio, and other applicable weld properties. The use of an automated setup will ensure consistency in the welding technique. The results obtained can be used to suggest improvements to the welding process when in a near-weightless environment. The goal is to show that welding techniques will prove practical in future space construction applications.

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Curator:
[Wesley Tarkington](#)

Responsible NASA Official:
[Donn Sickorez](#)



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