

Request for Proposal

Hypersonic Thermal Management II

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August 5, 2022

Program Abstract

LIFT through a Public Private Partnership seeks increased development of hypersonic materials and processes for manufacturing to support the OSD's requirement for Cross Platform System's Development. ALMMII, the Great Lakes Region's premier advanced manufacturing and economic development asset, is rapidly becoming the nation's leader in strengthening the industrial base and accelerating manufacturing process technology. LIFT has invested in and developed a significant ICME hypersonic capability and infrastructure via team projects. LIFT proposes a rapid design of advanced future generation hypersonic materials and manufacturing processes for application in the time frame beyond 2025. Materials focused on those that offer functionally graded optimization which are manufactured through a graded additive process. ICME capabilities will be developed to model and simulate the manufacture of these functionally graded materials systems allowing for agile and fast deployment in various component geometries and uses.

Hypersonic Thermal Management II – Graded Additive

Period of Performance: 24 months

- Task 1 Team Kick-Off
- Task 2 Collaborate with LIFT and LIFT's DoD partners to down-select 1 functionally graded material test article of interest to target for this effort
- Task 3 Develop ICME model(s) for this functionally graded material encompassing chemistry-process-structure-property relationships.
- Work with LIFT to identify mutually agreeable software package(s), programming languages, and data structures for hypersonic modeling and simulation efforts
 - Demonstrate reasonable parity of models with physical test articles
 - Delivery of models to LIFT by project completion
- Task 4 Collaborate with and support LIFT & LIFT member partner(s) responsible for hypersonic modeling of the functionally graded material
- Chemistry-process-structure-property ICME relationships developed from this effort will feed, in part, into these hypersonic models
- Task 5 Produce functionally graded test specimens relevant to support hypersonics material model validation using a graded additive manufacturing process. Test specimens must support coupon-level tests as well as hypersonic test specimen geometries.
- Task 6 Perform benchtop material characterization including microstructure and mechanical properties that would be relevant to a hypersonic environment. These materials must be sufficiently characterized to support modeling for the intended hypersonic environment.



- Task 7 Collaborate with and support LIFT partner(s) responsible for hypersonic modeling and testing
- Task 8 Final report outlining model development, road map effort required to extend toolset developed in this effort to other functionally graded materials, and material properties identified via this effort



Expectation of a LIFT Project Partner

- Open to all LIFT members
 - All project consortium members must be a LIFT member in good standing for award
 - Non-members may submit proposals but must join membership as appropriate
- Regular communications/summaries to be provided by the partner, including:
 - Weekly review updates
 - Quarterly reports
 - Final Report
- Demonstration of International Traffic in Arms Regulations (ITAR) Compliance. As such, only US persons may work on this program.
- Development research is expected to be accomplished internally, without the use of subcontractors

Deliverables

- Financial Proposal
- Timing Plan
- Resource plan

Note: Responding to this Request for Proposal for services does not require the provider to be able to support the entire request. Should there be aspects that cannot be supported, simply note those on the proposal.

Submission Due Date: August 19, 2022

Submission forum: LIFT submission portal <https://lift.technology/project-calls/>

Contact Information

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