

**FA8650-23-S-5004**  
**REQUEST FOR INFORMATION**

**Advanced Nuclear and DE Materials for Integrated Composites  
(ANDEMIC)**

**CONTRACTING OFFICE ADDRESS**

Department of the Air Force, Air Force Research Laboratory (AFRL) – Wright Research Site,  
Manufacturing Technology Contracting Section, AFRL/RXKMC, Area B, Bldg 45, 2130 8th  
Street, Wright-Patterson AFB, OH, 45433-7541

**GENERAL INFORMATION**

The intent of this Request for Information (RFI) is to gather information on the domestic capabilities in research and development, production, and manufacturing for integration of electromagnetic (EM) shielding into composites with performance across a broad range of frequencies. The United States (US) Department of Defense (DoD) and other domestic consumers have an interest in being able to protect systems against interference and/or attack from a broad range of frequencies from the low kilohertz (KHz) through approximately 40 gigahertz (GHz) range. Existing composites with integrated EM shielding focus either on the electric wave reflection/absorption or magnetic wave reflection but rarely can a single material accomplish both. The commercial applications for such technologies include Wireless Fidelity (Wi-Fi) router and cellular telephone (cellphone) data protection as well as protection from spurious signal emission jamming. The US Government has similar protection needs while also requiring continuity of operations for electronic and communication systems. Using lightweight composite options to provide built-in and retrofittable options for shielding to DoD systems, both ground and air operated, increases the viability of mission survival in an ever growing technologically reliant world. A composite system with reduction or elimination of parasitic layers will increase applicability across the DoD and having a domestic source for such materials is paramount to EM protection across multiple platforms.

**ESTIMATED PROGRAM FUNDING**

The Federal Government (DoD) anticipates a total program value of up to \$2.2M.

**STATEMENT OF REQUIREMENTS**

AFRL seeks to obtain information from interested participants on their current capabilities to manufacture and produce integrated EM shielded composites across a broad frequency range with emphasis on both low frequency magnetic wave and high frequency electric wave protection.

This program encompasses the technical challenges to integration of multiple shielding materials into a structural composite without degrading the performance with respect to environmental and mechanical survivability. Research efforts will focus on the techniques needed for multifunctionality of shielding composites for utilization in DoD systems.

Requirements include: Working closely with Air Force researchers to determine Air Force needs in advanced characterization of materials, advanced integration of protection materials, composite

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manufacturing, and materials evaluations. Defining the scope of effort needed and manufacturing techniques and integration are also anticipated. Responses should include consideration of the following:

**EM Shielded Materials Production:** Familiarization with domestic commercial off the shelf (COTS) or government off the shelf (GOTS) EM shielding materials is desired. These materials may include highly electrically conductive materials or those with a large permeability useful in the mitigation of EM wave propagation. How materials with a response in the electric portion of a propagating wave integrate with magnetically responsive materials must be considered. The objective is a symbiotic integration as opposed to parasitic layering of materials onto a structural panel or composite. Production or identification of these materials at scale is necessary to creating a final integrated composite product that meets DoD needs and requirements. Materials considered must protect against low power commercially available communication systems such as Wi-Fi or cellular 5G and higher power systems military communications. The resultant material will shield against geomagnetic disturbances (GMD) or possible electronic warfare (EW) type threats while not degrading the structural or environmental survivability of the composite system.

**Composite Manufacturing:** An understanding of composite manufacturing with multifunctional optimization is necessary. The resultant solutions must provide comparable mechanical properties at lower aerial density than state of the art parasitic solutions. Responses should consider the following questions: What order should variable shielding materials be placed into the matrix to optimize EM performance without sacrificing the structural characteristics? What form factors should materials be in for optimal integration into a multifunctional composite and is there adequate manufacturing basis for such a material (i.e., using an additional ply in a composite stackup or a particulate solution mixed into the composite resin)? What prepregging systems could be formulated for this application? What autoclave or out of autoclave parameters should be considered to maximize the utility of the product?

**System Modeling and Design:** There is opportunity to use or develop custom code and software to better understand and guide development of composite systems for EM shielding. The addition of conductive particulates, magnetic layers and resultant impacts to structural performance are complex, multivariate problems that need to be addressed. Existing tools need to be assessed for adequacy.

**Composite Shielding Effectiveness Testing:** Responses should consider the following questions; What test set-ups and procedures should be applied to measure the shielding effectiveness of the designed materials to EM waves? How do you measure the proper magnetic and electric responses of small-scale materials for optimization? What sample production sizes are achievable and how does that dictate the testing data collection?

**Composite Performance Testing:** Responses should consider the following questions: What tests need to be performed to ensure that the composite will meet structural performance metrics for utilization in DoD systems? What equipment is needed for mechanical standards testing and verification and how are those samples produced in representative ways? What testing should be performed to assess environmental stressors that will be seen by DoD systems in service and ensuring that they can operate in mission essential areas. What other outside considerations should be evaluated for fully successful, multifunctional composites?

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### **RESPONSE GUIDELINES** (It is expected that there could be multiple awards for contract)

Limit RFI responses to 10 single sided, double-spaced pages. In addition, please respond to the questionnaire that follows in Attachment 1. The font for text should be Times New Roman 12-point or larger. The Responder may use oversize pages (including “foldouts”) where appropriate to contain graphic presentations. Oversize pages do not count as extra pages within the page limitations. Submitted responses should be in Microsoft Word or Adobe Acrobat format. Existing commercial documentation and product literature can also be submitted and is not subject to a page limitation. **Responses must be unclassified and any Proprietary information provided must be marked accordingly.**

To protect such data, each line or paragraph on the pages containing such data must be specifically identified and marked with a legend similar to the following: “The following contains proprietary information that (name of Responder) requests not be released to persons outside the Government, except for the purposes of review and evaluation.”

**Responses shall include:** 1) Interested participant’s current capabilities that pertain to the requirements listed in this RFI, and 2) Completed questionnaire provided in Attachment 1

### **RESPONSE DUE**

Documentation shall be delivered to the Contracting Office via e-mil to the following:

AFRL/RXKMC  
Mark A. Smith  
Contracting Officer  
E-mail: [mark.smilth.142@us.af.mil](mailto:mark.smilth.142@us.af.mil)

E-mail responses are preferred but if you have large files or information that is proprietary in nature to send, you may provide your submission using the DoD SAFE site (<https://safe.apps.mil/>). You must request a submission email for the DoD SAFE site via the listed Contracting POCs. You will then receive an email from DoD SAFE with a secure link and password to upload and submit your documents via the DoD SAFE site

**Date Due: On or before 3:00 pm EST, 7 Jul 2023.** Direct all inquiries to the Contracting Point of Contact listed in the Requests for Clarification / Points of Contact paragraph.

Please Note: The Government is not required to provide feedback to RFI responders.

### **REQUESTS FOR CLARIFICATION / POINTS OF CONTACT**

A responder may request clarification in writing from the Contracting Office for any requirement that is unclear by sending an e-mail to the Contracting Point of Contact below:

Mark A. Smith  
[mark.smith.142@us.af.mil](mailto:mark.smith.142@us.af.mil)

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Any requests for clarification must be received no later than seven (7) business days prior to the close of this RFI in order to receive a timely response. Clarifications may be posted on the RFI announcement website to benefit all interested responders. Interested responders are encouraged to periodically check the website during the response period for clarifications.

#### **OPERATIONS SECURITY (OPSEC) REQUIREMENTS**

The contractor shall participate in all activities associated with the disciplines of the organization's Industrial Security, Information Security, Personnel Security, Operations Security (OPSEC), and Antiterrorism programs, following appropriate measures in each program as required for this particular request. Security measures are required to reduce program vulnerability from successful adversary collection, exploitation of critical information, and violations of export control requirements. The prime contractor shall ensure all subcontractors, if applicable, conform to these requirements as required by the prime contractor.

#### **PROGRAM PROTECTION PLAN (PPP) REQUIREMENTS**

Any potential critical program information (CPI) generated as part of this response will be reviewed to determine the need for a PPP or to be included as part of an existing PPP.

#### **DISCLAIMER**

This RFI is not a request for competitive proposals, but rather a request to better understand the current state-of-the-art. Therefore, responses to this notice are not considered offers and cannot be accepted by the Government to form a binding contract. Companies that respond will not be paid for the information submitted except as an allowable cost under other contracts as provided in FAR 31.205-18, "Bid and Proposal Costs."

No telephone calls will be accepted requesting a bid package or solicitation. There is no bid package or solicitation at this time.

All information received for this RFI shall be safeguarded from unauthorized disclosure. Responses must be unclassified. Responses to this RFI may constitute proprietary information, Controlled Unclassified Information (CUI) or export-controlled information. Respondents are directed to contact the Contracting Office for supplemental instructions related to the submission of proprietary information, CUI, or export-controlled data.

Note: There is no guarantee that ANDEMIC will become an AFRL program and responders to this RFI will have no competitive advantage in receiving awards related to this area of research. The information submitted in all responses may be utilized to help the Government further define its requirements, performance measures, inspection and acceptance procedures.

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**Attachment 1**  
**ACOM RFI Questionnaire**

Company Name: Company Address:  
POC for RFI:

1. Please provide your company's cage code and web page URL.
2. Describe your business size based on NAICS code 541712 (Small Business Size Standard of 1,000 employees) and identify small business subcategories that are applicable to your business.
  - a. Small Business
  - b. Small Disadvantaged Business
  - c. 8(a)
  - d. Woman Owned Small Business
  - e. Veteran Owned Small Business
  - f. Service Disabled Veteran Owned Small Business
  - g. HUB Zone Small Business
  - h. Large Business
  - i. Non-Profit
3. Define your firm's procedures and timelines to ensure that personnel hired for this effort possess or can obtain the appropriate clearance levels to work in a Government facility and/or with sensitive documents.
4. Any contract resulting from this inquiry may be awarded as cost-reimbursement type. Does your firm have an adequate accounting system for cost type contracts? If so, please provide the most recent approval date of your accounting system.
5. Would your firm be interested in submitting a proposal for this effort as a prime contractor? If your firm is a small business, demonstrate your firm's capability to perform at least 50% of the labor required for this effort. Describe in detail how your company intends to obtain the capability to meet any remaining requirements with subcontractors or teaming arrangements. Limit your responses to one single-spaced page.
6. Finally, **does your firm** have any other comments or suggestions that you would like to share with us?