

**Mississippi State University**  
**Notice of Proposed Sole Source Purchase**  
**234-87**

Mississippi State University anticipates purchasing the item(s) listed below as a sole source purchase. Anyone objecting to this purchase shall follow the procedures outlined below.

**1. Commodity or commodities to be purchased (make, model, description):**

Correlated Solutions, Inc., Irmo, SC 29063, VIC-3D Post Processing . This item will complement the current capability of 2D digital image correlation (DIC) at the Advanced Composites Institute (ACI). Having the 3D DIC capability with this item, extended research will be performed on damage characterization for stitched resin-infused composites.

**2. Explanation of the need to be fulfilled by this item(s), how is it unique from all other options, and why it is the only one that can meet the specific needs of the department:**

Specific needs of AIC: ACI has been investigating the enhanced structural performance and crack arrestment mechanism of stitched resin-infused (SRI) composites. The first phase (from 2021 to 2023) of this study was focused on characterizing crack initiation and propagation near the initial crack tip under the quasi-brittle regime using a 2D microscopic DIC testing system. The 2D testing system consists of a Psylotech  $\mu$ TS micro testing frame, an Olympus BXFM microscope set, a Basler Ace 12MP machine vision camera, and Correlated Solutions VIC-Snap and VIC-2D software packages. The damage initiation and propagation along the fracture process zones (FPZs) in SRI specimens were characterized in the form of separations between the upper and lower layers using the 2D DIC data. Furthermore, it was observed that stitching enhances fracture toughness not only by arresting crack propagation but also by interfering with the crack initiation process along FPZs. The next phase (from 2024) will be focused on characterizing crack arrestment around stitches and the impact of stitching types and materials on the effectiveness of enhancing fracture toughness. The crack arrestment regime involves large displacements compared to the quasi-brittle fracture regime. It was observed from the 2D DIC tests that the large in-plane displacements induced fictitious (or relative) out-of-plane displacements in 2D DIC data and led to DIC process failure at the crack arrestment regime. To address this issue, a 3D DIC capability is required. 3D DIC systems can capture both in-plane and out-of-plane displacements with triangulation and thus are suitable for capturing large displacements in the crack arrestment regime. The current 2D DIC testing system can be upgraded to have a 3D DIC capability by adding a machine vision camera set and a 3D DIC software package.

Unique features: Correlated Solutions VIC-3D post-processing software package will enable studies on damage characterization in specimens under large deformations. Additionally, the package will be compatible with the current resources: Correlated Solutions VIC-Snap and VIC-2D.

General requirements:

3D digital image correlation software package which can be compatible with Correlated Solutions VIC-Snap and VIC-2D.

**3. Name of company/individual selling the item and why that source is the only possible source that can provide the required item(s):**

Name of company: Correlated Solutions, Inc., Irmo, SC 29063

The company is the developer and distributor of the software package. The company is the sole provider of the software package.

**4. Estimated cost of item(s) and an explanation why the amount to be expended is considered reasonable:**

Estimated cost: \$21,715

The company provided a 30% academic discount on the software package. Also, a data acquisition package for the post-processing package was already purchased so additional cost is not required.

**5. Explanation of the efforts taken by the department to determine this is the only source and the efforts used to obtain the best possible price:**

ACI contacted individual vendors but it ended up being redirected to Correlated Solutions.

ACI has managed to receive a 30% academic discount through negotiations.

Any person or entity that objects and proposes that the commodity listed is not sole source and can be provided by another person or entity shall submit a written notice to:

Jennifer Mayfield, CPPo

Director of Procurement & Contracts

[dbuffum@procurement.msstate.edu](mailto:dbuffum@procurement.msstate.edu)

Subject Line must read "Sole Source Objection"

The notice shall contain a detailed explanation of why the commodity is not a sole source procurement. Appropriate documentation shall also be submitted if applicable.

If after a review of the submitted notice and documents, MSU determines that the commodity in the proposed sole source request can be provided by another person or entity, then MSU will

withdraw the sole source request publication from the procurement portal website and submit the procurement of the commodity to an advertised competitive bid or selection process.

If MSU determines after review that there is only one (1) source for the required commodity, then MSU will appeal to the Public Procurement Review Board. MSU will have the burden of proving that the commodity is only provided by one (1) source.