Mississippi State University  
Notice of Proposed Sole Source Purchase

190-17

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):

BeAM Modulo 250 with process monitoring capability

The Modulo 250 is a blown powder direct energy deposition additive manufacturing system designed for research and low quantity manufacturing. It uses a laser to form a melt pool and powder is then blown into the melt pool by the deposition head. The system offers 5-axes of freedom to build new parts or repair existing components.

1. 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:

As part of our additive manufacturing (AM) process monitoring research at MSU, we require a direct energy deposition (DED) AM system that can collect information about the temperature and shape of the melt pool during the AM process. Our process monitoring research is well established in the community and offers capabilities that are in high demand to manufacturers interested in making use of AM. Our current limitation is the quantity and quality of the data we can collect and how to integrate that information into a feedback control system that can adjust build parameters on the fly to improve final build quality. BeAM offers the most advanced process monitoring suite of sensors and software available on the market today. All other manufacturers of DED systems are missing some component of the monitoring system that is necessary for our work.

There are two features that are unique to the BeAM system that other manufacturers do not offer. The first feature is the design of the deposition head which deposits the powder into the melt pool during a build. The design of the deposition head is critical to having quality builds. The quality of the deposition determines the resolution of the build and whether significant porosity occurs during the build. Additive manufacturing research primarily focuses on build quality and reduction of porosity in the built component. The BeAM deposition head has extra gas flow paths that create better resolution during the build process. Other systems do not have that capability.

The most important feature to MSU researchers is the advanced process monitoring system. The BeAM system has an IR camera, pyrometer, and z-height sensor that will provide information about the melt pool but also gives a global temperature measurement of the tool which is valuable when determining temperature gradients during the build process. In addition to the sensors, BeAM includes software that will help us in the future to adjust the build parameters during the build based on information from the sensors. This potential for a feedback control system is unique to BeAM as they are willing to enable our research efforts by providing us with access to modify the system controls and develop our own IP for DED system control.

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

BeAM USA Cincinnati

5101 Creek Rd, Cincinnati,

OH 45242

BeAM is the sole manufacturer and does not use distributors.

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

The estimated cost of the system with process monitoring capabilities is $659,400. Laser-based metal additive manufacturing systems of all types have pricing that begins at about $500,000. DED systems are typically more expensive than powder bed AM systems due to the complexity of the DED system’s robotic movements and higher-powered lasers. At this price point, it very difficult to include the 5-axis capabilities.

1. 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:

The quoted price includes a significant educational discount on the base system. We have negotiated heavily with this company to reduce the price as much as possible, and the current price is just above their cost to manufacture the system.

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:

Don Buffum, 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.

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