

**Mississippi State University**  
**Notice of Proposed Sole Source Purchase**

**267-060**

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):

|                                                                                                                      |                                                                                                                                                         |
|----------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| Alicat MX-ES-SA-BGA-Kit (Alicat MXM-ES-SA Benchtop gas mixing system kit for arc-DED weld cell integration)          | Parts kit for welding cell gas mixer, with top cover, housing, base plate, internal GMB board, power supply, cables and integrated binary gas analyzer. |
| Alicat MC-50SLPM-D-PCV50-MXM Mass flow controllers                                                                   | Mass Flow Controller, 0-50 SLPM, Display, Industrial Connector, 0.050" Small Valve, for MXM-SA                                                          |
| Alicat MC-2SLPM-D-PCV10-MXM-SA/5M, RIN, 5IN, GAS: CO2, VC[IP4], PUSP: 0, TOT (9999.999, R), P1: 50 PSIG, P2: ATM, DS | Mass Flow Controller, 0 - 2 SLPM, Display, .010" Valve, for MXM-SA for tri-mix                                                                          |
| Alicat P-30PSIG-O-ST-MIXMOD-MXM-411411/5P                                                                            | Pressure Gauge, 0 - 30 PSIG, No Display, with Selco Temperature Sensor, Mix Module, using 411411 manifolds, for MXM systems                             |
| Alicat 210075 MXM Module                                                                                             | Module - USB Digital I/O interface box for turnkey systems                                                                                              |
| Alicat IC302 Cables                                                                                                  | Cable - Industrial 30' Double Ended Male required for integration of the MXM gas flow controllers into the existing MSU CAVS weld cell.                 |

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:

The Additive Manufacturing Laboratory at CAVS requires a benchtop, remotely controlled gas mixing system to supply shielding gas of controlled composition to our wire arc directed energy deposition (arc-DED) system. Shielding gas composition affects arc stability, heat input, bead geometry, and microstructure. Research on process-structure-property relationships and in situ monitoring therefore requires that composition be set accurately, changed programmatically between and within builds, and recorded as process data in flexible integration paths. Alternative gas mixing solutions lack remote control and logging, which is critical for on-going research. The Alicat MXM meets these needs in the following ways:

- Scalable blending in a single benchtop unit: Ability to add additional/reconfigure mass flow controller layout for different research configuration.
- Mass-flow based control: Alicat mass flow controllers use laminar differential pressure technology to measure mass flow, volumetric flow, absolute pressure, and temperature in real-time, with ultra-fast response time.
- Integrated binary gas analyzer: factory integrated, monitors and verifies the composition/quality of binary welding gas compositions
- Remote, digital control: Ability to communicate with external in situ data collection via IoT and communicate with industrial process equipment through direct digital signals.

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

The equipment outlined above is available solely from Alicat Scientific, Inc. and the company sells its equipment directly to customers. There is no separate distribution channel, or value-added resellers, which can provide this equipment. Founded in 1991, Alicat Scientific, Inc. is a leading manufacturer of precision mass flow and pressure instrumentation used in scientific discovery, research laboratories, and industrial automation. They are headquartered in Tucson, Arizona, and have been a subsidiary of Halma plc since November 2010.

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

The quote provided by Alicat Scientific, Inc if for \$26,585.75. This quote includes a 5.0% educational discount. The addition of a gas mixing system on the existing weld cell allows for additional research capabilities in weld shielding gas, ability to create novel gas mixes on the fly, and reduce operational costs over time by using bulk gases and mixing at the point of need. Sourcing pre-mixed gas shielding and retaining them on hand more than 40% of this system yearly.

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:

MSU personnel are experts in metal-based additive manufacturing, specifically instrumentation and hardware for wire arc additive manufacturing. Therefore, they are well aware of all hardware manufacturers in the industry. As stated in the justification above, there are no other vendors for Alicat Scientific, Inc. equipment. Other gas mixing solutions exist, but do not allow software integration/sensing/custom mixing or the precision/validation required for fundamental research. This type of equipment and integration for research requires custom integration, with small profit margins, but Alicat Scientific, Inc. has provided a 5% discount.

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 Services, Chief Procurement Officer

[jmayfield@procurement.msstate.edu](mailto:jmayfield@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.