

Mississippi State University
Notice of Proposed Sole Source Purchase
156-08

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):
 - Make: Armfield
 - Model:
 - C6-MKII-B w/ C6-MKII-DTA-ALITE [Fluid Friction Measurements (Incorporates Basic Hydraulics Bench F1-10) w/ Data Logging Accessory with Software for C6-MkII]
 - C7-MKII-B [Pressure Surge in a Pipe & Water Hammer Apparatus (Incorporates Basic Hydraulics Bench F1-10)]
 - RA1-MKII-G w/ TRANS-1500VA [Vapour Compression Refrigeration Unit (requires 220 voltage) w/ Transformer to accommodate 120V/1Ph/60Hz supply]
 - TH3-B w/ TH-DTA-ALITE [Saturation Pressure & Throttling Calorimeter w/ Educational Software for TH1 to TH5 on a single CD-ROM, c/w Data Logger]

2. Explanation of the need to be fulfilled by this item(s) and why it is the only one that can meet the specific needs of the department:
 - The C6-MKII-B w/ C6-MKII-DTA-ALITE, C7-MKII-B, RA1-MKII-G w/ TRANS-1500VA, & TH3-B w/ TH-DTA-ALITE are necessary instructional tools to meet the requirements for the renovation of the mechanical engineering department's thermal fluids undergraduate laboratory course.
 - While a fluid friction apparatuses may be available through other vendors, Armfield's C6-MKII-B w/ C6-MKII-DTA-ALITE apparatus offers distinct advantages, notably in the data acquisition software that is compatible with the Labview software currently licensed by the mechanical engineering department and existing Armfield equipment utilized in undergraduate laboratories. Additionally, Armfield software is provided with source code to allow the user to adapt the code as desired to best fit their independent needs. Also specific to Armfield's C6-MKII-B w/ C6-MKII-DTA-ALITE and C7-MKII-B apparatuses, the hardware is supplied with copyright laboratory instruction manuals and software where applicable that provide a common shell of coursework and laboratory investigation developed by Armfield with specific assignments that apply to this equipment only. This allows students to progressively investigate hydraulic systems using a common shell. The C6-MKII-B & C7-MKII-B are

exclusive to Armfield and are direct accessories for the F1-10 hydraulic bench. In addition, this modular system from Armfield offers a total of 28 different experiments for future expansion. There are no other vendors that can offer accessories compatible with the Armfield complete Fluid Mechanics Laboratory. Armfield also supplies comprehensive teaching manuals with recommended laboratory exercises to allow turn-key experiments that help to maintain curriculum consistency regardless of laboratory instructor.

- The RA1-MKII-G w/ TRANS-1500VA demonstrates a thermodynamic cycle and introduces the concept of refrigeration, an industry most relevant to mechanical engineering graduates. Armfield's RA1-MKII-G w/ TRANS-1500VA is a computer-controlled vapor compression refrigeration system with automatic recording of appropriate process variables using an integral USB interface device. This allows the student to gain a thorough understanding of the refrigeration process by changing the operation of different parts of the process and recording the response of the complete system. Features of this system unique to Armfield include complete vapor-compression refrigeration system with remote control, on-line monitoring and logging of results using a PC; compressor speed can be varied and torque measured via an inverter allowing changes in performance to be evaluated – speed and torque can be logged continuously; condenser and evaporator use plate heat exchangers with water as the heat transfer medium allowing complete energy balance to be carried out and conditions in the condenser and evaporator to be varied accurately and independently using variable speed pumps; instrumented with electronic sensors measuring temperature throughout the process, pressure on both sides of the compressor and water flow rate through the condenser and evaporator, allowing all of these parameters to be logged continuously; among many others. Additionally, the software and equipment advantages outlined for the C6-MKII-B w/ C6-MKII-DTA-ALITE and C7-MKII-apparatuses are relevant for this product, as well.
- Finally, the TH3-B w/ TH-DTA-ALITE illustrates a fundamental concept of Thermodynamics, saturation temperature and pressure, which is often difficult for students to initially grasp in lecture. This apparatus has been designed to introduce students to how the temperature of water behaves at its boiling point with variation in the absolute pressure. Saturation curves can be obtained by the student and compared with published steam tables. The quality of steam exiting the apparatus can be determined using a throttling calorimeter connected at the point of discharge. This unique classroom/engineering laboratory experiment is the only known bench top scale unit known to exist for instructional purposes.

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

4. Estimated cost of item(s) and an explanation why the amount to be expended is considered reasonable:
 - Estimated Cost: \$149,451.00
 - Amount is within the expected price range of this caliber of laboratory equipment
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:
 - Armfield is the sole manufacturer and exclusive distributor for these products.
 - All applicable discounts were explored and applied

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
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.