REQUEST FOR BIDS/PROPOSALS COVERSHEET

THE UNIVERSITY OF SOUTHERN MISSISSIPPI
Procurement and Contract Services
118 College Drive #5003, Hattiesburg, Mississippi 39406-0001

Date: September 28, 2018

Bid No. 19-09

THE UNIVERSITY OF SOUTHERN MISSISSIPPI is considering the purchase of the following item(s). We ask that you submit your bid and retain one copy for your files. Right is reserved to accept or reject any part of your bid. Your quotation will be given consideration if received in Bond Hall, Room 214 on or before:

2:00 p.m. CST

October 18, 2018

Buyer: Jessica Turner

NOTE: If you cannot quote on the exact material shown, please indicate any exception giving brand name and complete specifications of any alternate. If additional space is required, use a separate sheet or letter of transmittal.

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<tr>
<th>ITEM</th>
<th>QUANTITY</th>
<th>UNIT PRICE</th>
<th>TOTAL NET PRICE</th>
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<td>RFx #3160002544</td>
<td>DESCRIPTION</td>
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<td>Bid 19-09 Photovoltaic and Photodetector Testing System</td>
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PROPOSAL MUST BE RETURNED TO THE UNIVERSITY IN ACCORDANCE WITH THE SPECIFICATIONS. RFP NUMBER AND DATE OF BID OPENING MUST BE SHOWN ON THE OUTSIDE OF THE ENVELOPE IF USING THAT METHOD.

We quote you as above-F.O.B. The University of Southern Mississippi. Shipment can be made in ________ days from receipt of order. DATE __________ TERMS ____________________________

Return quotation to Procurement Services at above address.

Signature Required

AA/EOE/ADA/1
GENERAL TERMS, CONDITIONS AND INSTRUCTIONS FOR BIDS/PROPOSALS

1.) Failure to examine any drawings, specifications, and instructions will be at bidder’s risk.

2.) Samples of items when called for must be furnished free of expense and if not destroyed in testing, will, upon request, be returned at the bidder’s expense. Request for the return of samples must be made within ten (10) days following opening bids. Each individual sample must be labeled with bidder’s name and manufacturer’s brand name and number.

3.) Bids must be signed and sealed with bidder’s name and address on the outside of the envelope, and the time and date of the bid opening and the bid file number shown in the lower-left corner of the packages; envelopes, express mailing labels, boxes, etc.

4.) In order for your bid to be considered, it must be received and time stamped in our office by 2:00 P.M. of the bid opening date. It is the responsibility of the vendor to ensure their bid is received within the appointed time. If your bid package is not received in Bond Hall, Room 214, by 2:00 P.M. of the bid opening date, it will not be considered.

If you are delivering your bid, you need to hand carry the bid package to:

The University of Southern Mississippi
Procurement Services
Bond Hall, Room 214
Hattiesburg, Mississippi

If you are mailing your bid package via U.S. Postal Service, mail to:

The University of Southern Mississippi
Procurement Services
118 College Drive #5003
Hattiesburg, MS 39406-0001

If you are express mailing your bid package via Federal Express or UPS, or any other delivery service which requires the use of a physical address, deliver to:

The University of Southern Mississippi
Receiving Department
2609 West 4th Street
Hattiesburg, MS 39401
5.) Bids or proposals shall not be modified, corrected, altered, or amended after the specified closing time and the opening of such bids, unless otherwise noted in the request for bids or proposals.

6.) The University of Southern Mississippi reserves the right to reject any and all bids, to waive any informality in bids, and unless otherwise specified by the bidders, to accept any items on the bid. If the bidder fails to state the time within which bids must be accepted, it is understood and agreed that The University of Southern Mississippi shall have 60 days to accept. The University of Southern Mississippi reserves the right to make an award to this bid on an all or none basis, or on a line by line basis, whichever serves the best interest of The University of Southern Mississippi.

7.) Contracts and purchases will be made or entered into with the lowest, responsible bidder meeting specifications.

8.) A written purchase order or contract award mailed or otherwise furnished to the successful bidder within the time of acceptance specified in the Invitation for Bid results in a binding contract without further action by either party. The contract shall not be assignable by the vendor in whole or in part without the written consent of The University of Southern Mississippi.

9.) Bid files may be examined during normal working hours by bid participants. Non-participants will be prohibited from obtaining any information relative to the bid until the official award has been made.

10.) If purchase orders or contracts are canceled because of the awarded vendor’s failure to perform or request for price increase, that vendor shall be removed from our bidders’ list for a period of 24 months.

11.) No addendum will be issued within a period of two (2) working days prior to the time and date set for the bid opening. Should it become necessary to issue an addendum within the two-day period prior to the bid opening, the bid date will be reset giving bidders ample time to answer the addendum.

12.) Alternate bids, unless specifically requested or allowed, will not be considered.

13.) Bid openings will be conducted open to the public. However, they will serve only to open the bids. No discussion will be entered into with any vendor as to the quality or provisions of the specifications, and no award will be made either stated or implied at the bid opening. After the close of the bid opening meeting, the bids will be considered to be in the evaluation process and will not be available for review by bidders. Proposal openings are not required to be open to the public; however, the resulting award is open for public inspection.

14.) Prices quoted shall be firm for the term of the contract or for the stated time of
acceptance.

15.) The bidder understands that The University of Southern Mississippi is an equal opportunity employer and, therefore, maintains a policy which prohibits unlawful discrimination based on race, color, creed, sex, age, national origin, physical handicap, disability, or any other such discrimination; and the bidder, by signing this bid, agrees during the term of agreement that the bidder will strictly adhere to this policy in its employment practices and provision of products or services.

16.) Bidders must upon request of The University of Southern Mississippi furnish satisfactory evidence of their ability to furnish products or services in accordance with the terms and conditions of these specifications. The University of Southern Mississippi reserves the right to make the final determination as to the bidder’s ability.

17.) Questions or problems arising from bid procedures should be directed to the Buyer listed on the solicitation at:

   The University of Southern Mississippi
   118 College Drive #5003
   Hattiesburg, MS 39406-0001
   Phone: (601) 266-4131

18.) All items must equal or exceed the specifications listed. The absence of detail specifications or the omission of detail description shall be recognized as meaning that only the best commercial practices are to prevail and that only first quality materials and workmanship are to be used.

19.) It is the intent of the specifications to obtain a product that will adequately meet the needs of the user while promoting the greatest extent of competition that is practicable. It is the responsibility of the prospective bidder to review the entire Invitation to Bid packet and to notify The University of Southern Mississippi if the Specifications, Instructions, General, or Special Conditions are formulated in a manner which would unnecessarily restrict competition.

20.) It shall be incumbent upon the bidders to understand the specifications. Any requests for clarifications shall be in writing and shall be submitted to our Procurement Services office at least five (5) days prior to the time and date set for the bid opening, unless otherwise noted in the bid or proposal specifications.

21.) The minimum specifications are used to set a standard and in no case are used with the intention to discriminate against any manufacturer. Bidders should note the name and the manufacturer and model number of the product they propose to furnish and submit descriptive literature.

22.) Trade names, brand names, and/or manufacturer’s information used in these specifications are for the purpose of establishing quality, unless otherwise noted. Bids on
products of other qualified manufacturers are acceptable, provided they are demonstrated
as equal to those specified in construction, design and suitability. Each bidder shall
submit with his bid a complete brochure with pictures on each item and shall point out
specifically any deviations from the specified items. Failure to do so may disqualify any
bid. Please bid as specified or an approved equal.

23.) A copy of the manufacturer’s standard guarantee/warranty shall accompany and become
a part of this bid.

24.) There are no federal or state laws that prohibit bidders from submitting a bid lower than a
price or bid given to the U.S. Government. Bidders may bid lower than U.S.
Government contract price without any liability as The University of Southern
Mississippi is exempt from the provisions of the Robinson-Patman Act and other related
laws. In addition, the U.S. Government has no provisions in any of its purchasing
arrangements with bidders whereby a lower price to The University of Southern
Mississippi must automatically be given to the U.S. Government.

25.) All invoices, unless noted otherwise, are to be billed to:

The University of Southern Mississippi  
Accounts Payable  
118 College Drive #5104  
Hattiesburg, MS 39406-0001

26.) All equipment bid shall be of current production and of the latest design and
construction.

27.) Where all, or part(s), of the bid is requested on a unit price basis, both the unit prices and
the extension of the unit prices constitute a basis of determining the lowest responsible
and responsive bidder. In cases of error in the extension of price, the unit price will
govern.

28.) Should the University of Southern Mississippi close due to inclement weather conditions,
or any other unforeseen events on the bid opening date, sealed bids will open the
following business day at the same time and location.

29.) As an alternative to traditional sealed bids in envelopes, the University of Southern
Mississippi is capable of receiving electronic bid responses. While this option is
available, it is not required and we ask that all potential respondents keep in mind that
with any electronic system there could be delays or glitches with the submission process;
therefore the University highly encourages traditional sealed bids which are either mailed
or submitted in person. Should a vendor choose to submit their response electronically,
please follow the instructions below using the following website:
https://www.ms.gov/dfa/contract_bid_search/Home/Sell. On this site you will find
helpful links to procurement opportunities, as well as a link to supplier registration. If
not already registered in this system, potential bidders will first need to click on ‘Supplier
Registration’ and follow the steps outlined (a one-time process). Once registered, they can return to the original website and click on ‘Procurement Opportunities’ where they can either search by keyword for the bid they desire to respond to or leave the search box blank and click ‘Search’ for a listing of all current bids and proposals for the various State of Mississippi offices.

With regard to construction bids, there is one additional step required during the bid submission process. Along with the bid response and other attachments, contractors will also need to attach their Certificate of Responsibility (COR), or a statement that the bid enclosed does not exceed Fifty Thousand Dollars ($50,000.00). If their COR or such statement is not attached, the bid will be invalid and not considered.

AA/EOE/ADA/
The University of Southern Mississippi
Request for Bid# 19-09
USM-Photovoltaic and Photodetector Testing System

1. General Specifications

The University is requesting a Photovoltaic EQE (IPCE) and IQE for the spectral testing (300-3000nm) of a wide range of photovoltaic devices, materials and architectures.

The University is requesting a Photovoltaic and Photodetector Testing System or equivalent that meets or exceeds the following specifications:

2. Required Functionality

- Measurement wide range of photovoltaic devices including c:Si, mc:Si, a:Si, μ:Si, CdTe, CIGS, CIS, Ge, dye-sensitized, organic/polymer, tandem, multi-junction (2-, 3-, 4-junction and more), quantum well, quantum dots and perovskites.
- Measure of devices having front/ front, front/rear and rear/rear electrode architectures
- Measurement of devices under DC or AC monochromatic probe illumination
- Direct determination of device spectral response (SR, A W-1)/ external quantum efficiency (EQE/IPCE, %) in short-circuit conditions, under voltage bias, in dark and under light bias.
- Direct determination of total reflectance, R and transmittance, T using an integrating sphere to convert EQE to internal quantum efficiency (IQE, %)
- Excellent stray light performance to enable sub- band gap work

3. Equipment Requirements

1.1 General

- Optimized tunable monochromatic probe for operation 300-3000nm
- Range of mount to ensure easy mechanical mounting and electrical probing of various samples
- Selection of photocurrent measurement routes adapted to technology under test
- Fully automated over USB 2.0, controlled by Windows control software

1.2 Tunable monochromatic probe

The tunable monochromatic probe should meet the following specifications:

- 75W Xenon and 100W Quartz tungsten halogen light source
- Constant current lamp power supplies
- Automated source selection
- Integrated arrestable optical chopper and stepping motor-based shutter
- Chopping frequency 575 Hz
- Double monochromator with additive dispersion, total focal length 600mm comprised of two triple grating, symmetric Czerny-Turner, 300mm focal length single monochromators
- Stray light rejection: 10^-8
- Bandwidth: Adjustable fixed slit, 1-10nm typical
- Resolution: 0.2nm (1200g/mm); 0.3nm (600g/mm); 0.6nm (600g/mm)
Dispersion: 1.35nm/mm (1200g/mm); 2.7nm/mm (600g/mm); 5.4nm/mm (600g/mm)
Wavelength range: 300-1100nm (1200g/mm); 1100-2000nm (600g/mm); 2000-3000nm (300g/mm)
Wavelength accuracy: ± 0.1nm (1200g/mm); ± 0.2nm (600g/mm); ± 0.4nm (300g/mm)
Wide range of operation (300-3000nm), achievable in a single scan with no user intervention
Reflective optics beam delivery to sample plane
Beam size: Adjustable up to 6x6mm

1.3 Sample Mounts

1.3.1 General

Three sample mounts should be included with a pair of needle probes:

1. Temperature controlled vacuum mount for samples up to 200x200mm for front/front and front/rear contact devices
2. Superstrate mount for rear/rear contact devices
3. XY stage mount for fitting of supplied gas purge multi-device mount

1.3.2 Temperature-Controlled Vacuum Mount

The temperature-controlled vacuum mount should meet the following specifications:

- Sample area: 200x200mm
- Rear side electrical connection: gold-coated mount with vacuum feature
- Temperature control: 4x70W Peltier-based heat pump, water-cooled hot side
- Temperature range: 15-65°C
- Temperature feedback: Centrally-positioned sensor situated 3mm below sample plane
- Temperature stability: ± 1°C
- Be easily removed from tool to use in another setup

1.3.3 Superstrate Mount

The superstrate mount should meet the following specifications:

- Sample area: 60x60mm
- Base for rear-side attachment of magnetic probes
- Be easily removed from tool to use in another setup

1.3.4 XY stage mount

The XY stage mount should meet the following specifications:

- Travel in X and Y: 25mm
- Graduation of scale: 10μm
- Max deviation: 7μm
- Adaption to free-issued University of Southern Mississippi sample mount
- Be easily removed from tool to use in another setup

1.3.5 Probes

The probes should meet the following specifications:
• Magnetic-based probe
• Travel in X, Y and Z: 12.7mm
• Needle type: Tungsten
• Needle radius: 12.7μm

1.4 Light Bias

The light bias should meet the following specifications:

• Source: Quartz halogen
• Computer controlled shutter
• Transport to sample: 6- branched glass fiber bundle
• Variable irradiance: 0-1.5 suns
• Bias source uniformity: ±1% over 1 cm²
• Filter option: Two 50mm square filter holders

1.5 Voltage biasing

The voltage bias should meet the following specifications:

Source voltage range: ± 200mV to ± 20V
Source/ sink limit: ±1.05A at ±21 V

1.6 Photocurrent Measurement

The EQE tool should include four routes to measure the photocurrent of the device under test to be adapted to the technology under study:

1. Transformer, fixed gain pre-amplifier and DSP lock-in amplifier (AC measurement)
2. Six-decade trans-impedance pre-amplifier and DSP lock-in amplifier (AC measurement)
3. Auto-ranging (six decade) nanoammeter trans-impedance pre-amplifier and DSP lock-in amplifier (DC measurement)
4. SMU voltage source/ current measurement (DC measurement)

1.7 Reference Photodiodes

The reference photodiodes should meet the following specifications:

• Silicon photodiode (300-1100nm), 10x10mm active area
• Germanium photodiode (800-1800nm), 5mm dia. active area
• Lead Sulphide photodiode (1500-3000nm), 3mm dia. active area, thermo-electrically cooled
• All detectors supplied with NMI traceable spectral responsivity calibration

1.8 Integrating Sphere

The integrating sphere should meet the following specifications:

• 6” diameter
• Coated with barium sulphate to ensure high reflectance 300-1800nm
• Entrance port, reducers and clips to mount sample
- Reflectance port, reducers and clips to mount sample
- Reference diffuser reflectance standard supplied with NMI traceable spectral reflectance calibration
- Sphere port viewer to position sample at reference port

4. Installation/Training

Vendor must complete installation which includes set-up, run-in, and training. Final machine location and electrical connections will be made by the vendor. Vendor must agree to minimum two-day training on basic machine setup and operation.

5. Warranty

Bidder shall submit copy of written warranty. The University is requesting a minimum 2-year warranty period, including parts and labor.

6. Freight

The university is requesting delivery to University of Southern Mississippi Polymer Science Building, Hattiesburg, MS, USA.

7. Copies

At least one (1) signed original and two (2) copies of the bid response MUST be provided. The University requires a portable electronic virus/malware free copy (CD, thumb drive) of the bid response from the responding Vendor to be included in the bid response package. If an electronic copy is not included, the University reserves the right to request an electronic copy of the exact bid response prior to review of the bid.


- Any provisions disclaiming implied warranties shall be null and void. See Mississippi Code Annotated Sections 11-7-18 and 75-2-719(4). The Vendor shall not disclaim the implied warranties of merchantability and fitness for a particular purpose.
- The Vendor shall have no limitation on liability for claims related to the following items:
  - Infringement issues;
  - Bodily injury;
  - Death;
  - Physical damage to tangible personal and/or real property; and/or
  - The intentional and willful misconduct or negligent acts of the Vendor and/or Vendor’s employees or subcontractors.
- All requirements that the University pay interest are deleted, except for those in conjunction with USM’s standard payment terms of Net 45 days. Payments made beyond 45 days are subject to late fees and interest.
- Should any of the terms and conditions in the purchase contract be in conflict with the laws of the State of Mississippi, the laws of the State of Mississippi shall supersede and govern. A revision of the terms and conditions will be required to ensure compliance with Mississippi state law.
- The University shall not pay any attorney's fees, prejudgment interest or costs associated with any legal action to or for the Vendor, except that which are ordered by a court of competent jurisdiction.

9. Payment
The currency used for payment of costs will be in United States dollars.

State law requires that the University receive an original invoice from the Vendor and that payment of the invoice is processed within 45 days of receipt (Miss Code 31-7-305). The invoice should be on the Vendor’s letterhead and/or include an original Vendor representative signature.

10. USM Terms and Conditions

Unless written exception is provided in the bid response, the winning Vendor agrees to be bound by the USM Terms and Conditions, which are incorporated herein, and may be found at https://www.usm.edu/procurement-contract-services/usm-terms-and-conditions.

11. Delivery

Quote the lead time required for delivery of the quoted equipment. Quoted prices should be F.O.B. Destination (Hattiesburg, MS) Freight Allowed.