



**THIS IS NOT  
AN ORDER**

**REQUEST FOR BIDS/PROPOSALS COVERSHEET**  
**THE UNIVERSITY OF SOUTHERN MISSISSIPPI**  
**Procurement and Contract Services**  
**118 College Drive #5003, Hattiesburg, Mississippi 39406-0001**

**Date:** June 23, 2020

**Bid No. 21-03**

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. CT

July 15, 2020

**Buyer:** Jessica Whitten

Name: \_\_\_\_\_

Company: \_\_\_\_\_

Address: \_\_\_\_\_

City/State/Zip: \_\_\_\_\_

TERMS - Bidder should state terms of sale. Our terms are 2% ten days, net 45 days.

These terms will apply per Mississippi law.

AWARDING CONTRACT - Cash terms will not be used as a basis for awarding contracts; however, the University will accept cash discounts when earned.

**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.**

ITEM	QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL NET PRICE
		<p><b>RFx #3160003720</b></p> <p><b>DESCRIPTION</b></p> <p><b>Bid 21-03 Twin Screw Extruder System</b></p> <p>PROPOSAL MUST BE RETURNED TO THE UNIVERSITY IN ACCORDANCE WITH THE SPECIFICATIONS. BID NUMBER AND DATE OF BID OPENING MUST BE SHOWN ON THE OUTSIDE OF THE ENVELOPE IF USING THAT METHOD.</p>		

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** \_\_\_\_\_

**THE UNIVERSITY OF SOUTHERN MISSISSIPPI  
PROCUREMENT SERVICES  
118 COLLEGE DRIVE #5003  
HATTIESBURG, MS 39406-0001**

**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 4<sup>th</sup> 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](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**

**USM Bid #21-03**

**Specifications for Twin Screw Extruder System**

1. BACKGROUND

The University of Southern Mississippi requires a high temperature co-rotating twin screw extruder for the purpose of processing high melt temperature thermoplastic resins. The unit will be used in the development of high performance thermoplastic composite parts for a US Army Engineer Research and Development Center (ERDC) project.

2. PURPOSE

The purpose of the extrusion system is to process high glass transition temperature (T<sub>g</sub>) thermoplastic polymers for use in structural composite components. This system will be used as an integral part of the thermoplastic composite development process. Additionally, the extruder will be used to develop novel thermoplastic formulations that meet the needs of our funding agency and to provide students an opportunity to gain thermoplastic processing experience.

3. GENERAL PERFORMANCE SPECIFICATIONS

The extrusion system must be capable of processing high T<sub>g</sub> thermoplastic polymers with T<sub>g</sub>'s > ~145°C and melt temps exceeding 350°C. These materials will be formulated with a variety of additives that modify the parent material properties. The system must have integrated feeder systems that are data traceable. Additional capabilities include liquid and solid feeder options, pressure and temperature monitoring, and strand processing capabilities.

4. REQUIREMENTS

The following specifications are to ensure that the twin-screw extruder (TSE) system will perform the tasks necessary to satisfy the project's objectives. Any deviation from the following specifications must be explained and justified. Table 1 provides a summary of basic extruder characteristics and required specifications. The following sections provide detailed requirements.

**Table 1**

<b>Twin Screw Extrusion (TSE) System Characteristics</b>	<b>Specifications</b>
Throughput	Up to 40 kg/h to support scale-up process and

	commercialization
Processing temperature	Up to 450°C to support high temperature high performance thermal plastic matrix compounding, such as poly ether sulfone, poly ether ketone, poly ether ether ketone and so on.
Processing torque	>10 Nm/cm <sup>3</sup> High processing torque capability is preferred for the high viscose characteristic of the thermal plastic matrix and to avoid pushing higher processing temperatures, which can easily incur molecule degradation.
Maximum RPM	1200 RPM Provide high shear, pumping, and a broad residence time processing window.
Processing zone	40L/D (10 zones) 40 l/d ratio is required to achieve enough processing residence time and to adopt feasible compounding practices such as additive incorporation, de-gassing, liquid component injection, and molecular synthesis.
Process cooling	Must have efficient and robust cooling system to achieve excellent temperature control. This is critical for high temperature and temperature sensitive compounding and synthesis.
Process central control module	The system must have a central computer control system to streamline operation. The system shall provide data acquisition and storage. The system shall have a safety interlock between the feeder and main extruder, barrel temperature, and motor.
Safety feature: motor gear protection	Must have protection to prevent potential personnel and motor damage.
Safety feature: high temperature	Must include safety features to provide high temperature warning and internal safety interlocks to prevent instrument damage.
Platform	Modular platform for easy accessibility, operation, and assembly/disassembly of attachment.
Mobility	Caster wheels or equivalent to allow positioning control
Twin-screw extruder	Up to 18 mm diameter Co-rotation Modular screw design with optimal processing configuration, provide good customer supports for screw element purchases, and screw configuration design.
Feeders	2 Feeders one solid and one liquid gravimetric control Solid Feeder Max 20lb/hr. Liquid Feeder 2-20lb/hr. feeding rate up to 120C



	Powered from extruder main cabinet and integrated into extruder control screen
Strand die option	2-4 holes with diameter 1-5 mm
Water bath	Included to cool strands
Pelletizer	Support up to 50 kg/h production
Side Stuffer	Prepared in control cabinet to accept for future addition
Shipping and Installation	Should be included in bid pricing.

## 5. SCREW SHAFT AND ELEMENTS

The vendor shall provide robust screw shaft design with well-selected materials to sustain challenged high temperature and high torque requirements. The shaft shall be designed to afford repeated assembly, disassembly, and cleaning.

The vendor shall provide a broad range of screw elements for the purposes of conveying, high shear, dispersion, distribution, micronized particle or nano-particle dispersion, liquid component adding, de-gassing, and high-pressure pumping.

The vendor shall provide expertise regarding screw configuration designs for a broad range of process applications.

The vendor shall provide reasonable delivery leading time for any future screw shaft and screw element orders and be willing to support The University of Southern Mississippi to expedite any related orders in critical and time sensitive project path.

## 6. TEMPERATURE CONTROL

The temperature control is critical to our process. The vendor shall provide sufficient thermocouple parts to replace any failed thermocouples. The vendor should provide short turnaround time for any failed thermocouple replacement orders or suggest alternative solutions to avoid unnecessary project delays.

It is preferred for the extruder to have alarms to detect thermocouple failures or a similar system to warn of any improper thermocouple installation, or thermocouple “drop off” to avoid the heating element discharging unregulated heat, which could result in damage to the equipment or personnel.

The extruder should have excellent insulation to maximize heating efficiency and provide energy savings for the processing temperature above 350°C.

## 7. EXTRUDER BARREL

The barrel should have good temperature insulation between adjacent zones to deliver accurate temperature profile control.

The barrel materials should be robust to sustain the high processing temperature stated above

in Table 1 without any deformation or weakening.

The vendor should provide comprehensive knowledge and good communication with The University of Southern Mississippi regarding the selection of the barrel construction materials for high heat resistance, friction resistance, and chemical resistance.

The vendor should provide good documentation to state the barrel construction materials and application limitation clearly.

## 8. COMPUTER SYSTEM

The extruder should include an integrated computer system to communicate with all affiliated devices such as main motor, feeders, side extruder, and vacuum pumps.

The computer should be robustly designed to avoid any false signals, unnecessary idle, or any other type of malfunctions.

The vendor should provide The University of Southern Mississippi an extra copy of the operation software in case of any computer crashes/malfunctions.

The computer system is preferred to have data acquisition and storage functions and provide a convenient way to export processing data.

## 9. DOCUMENTATION

The vendor should provide comprehensive documentation manual of the extruder system including:

- A clear specification sheet should be included.

- A list of the actual delivery parts, spare parts, any tools should be included in the documentation and include schematics, diagrams, or images of the parts.

- A list of all main section bolt sizes and numbers should be included and their positions should be well stated. For example, strand die bolts, 4, standard, Black-Oxide Alloy Steel Socket Head Screw 2-56 thread size, 2'' long.

- A list of most commonly ordered spare parts/consumables.

- A standard operation procedure for start-up and shutdown.

- A standard operation procedure for screw installation and removal.

- A standard operation procedure for screw assembly/disassembly.

- A standard operation procedure for barrel assembly/disassembly.

A standard maintenance schedule of the extruder.

## 10. CUSTOMER SUPPORT

The vendor should be willing to help The University of Southern Mississippi resolve any technical issues associated with the extruder system not only in the warranty period but also out of the warranty with reasonable service fee and leading time. It is preferred that the vendor is able to provide technical service through remote access and/or on-site technical support. Sound customer support will be considered in awarding bid.

## 11. SAFETY

Safety should be well weighted in the extruder system design, engineering delivery and user interface communication.

Safety measures and appropriate designs for any moving parts.

Emergency stop system available.

Motor and gearbox disengagement systems at unexpected high torque is required.

All electrical outlets should be well labeled and designed with proper protection.

Engineering design to avoid potential high temperature hazards to operators through the use of proper insulation and/or heat shielding.

High temperature hazard labels should be present at proper positions on the extruder system.

## 12. WARRANTY

Bidder shall submit a copy of the written warranty. The University is requesting a minimum one (1) year warranty period, including parts, travel, and labor. Longer warranty periods are preferred.

## 13. TRAINING

The vendor should include in the bid response (as a separate line item) training on the operation, software, maintenance, and troubleshooting of the extrusion system. (In person or virtual).

## 14. COPIES

At least one (1) signed original copy of the bid response **MUST** be provided, as well as a portable electronic virus/malware free copy (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.

## 15. 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.

## 16. USM TERMS AND CONDITIONS

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-contractservices/Uusm-terms-and-conditions>.

The University of Southern Mississippi reserves the right to reject any and all bids.

The University of Southern Mississippi reserves the right to accept or reject optional line items included in the bid response.

## 17. DELIVERY

Vendor should quote the lead-time required for delivery of the quoted equipment. Quoted prices should be F.O.B. Destination Freight Allowed.