STATEMENT OF WORK
FOR
COMPOSITES & SHELF-LIFE LAB AUTOCLAVE & CONTROL SYSTEM

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Composites/Shelf-Life Lab Autoclave and Control System FY27
CSN: H7TM03
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1.0 SCOPE OF WORK

1.1. SCOPE

This statement of work establishes the requirements for the purchase, delivery, and installation of a commercially off-the-shelf (COTS) replacement Autoclave and Control System for the Tinker Air Force Base Composites & Shelf-Life Lab. The vendor shall provide all hardware, software, peripherals, documentation, training, calibration, shipping, and installation. The vendor shall ensure, upon installation, that all hardware and software functions and applications are fully functional prior to purchaser acceptance. Any required maintenance and calibration will be provided solely by the vendor through a maintenance contract. Tinker Air Force Base will prepare the site location for the Autoclave prior to installation.

1.2. BACKGROUND

The Autoclave and Control System described in this document is intended for use in the Tinker Composites & Shelf-Life Lab for the purpose of curing materials including, but not limited to composite prepregs, primers, film adhesives, graphite, and shelf-life materials in accordance with technical specifications to prepare them for testing in support of Oklahoma City Air Logistics Complex and Department of War Shelf-Life Program customers. The Autoclave and Control System will also be used to support backup curing of Tinker Commodities Maintenance Group production parts. The lab's current autoclave, which exceeded its expected service life in FY2012, [redacted]. Original equipment manufacturer support [redacted], [redacted], which [redacted], necessitating acquisition of a replacement unit. This equipment shall be installed at the Composites & Shelf-Life Lab, Bldg. 9001, [redacted] Tinker AFB, Oklahoma.

2.0 TECHNICAL REQUIREMENTS

2.1. HARDWARE

2.1.1. General Design

2.1.1.1. The autoclave shall consist of a front-loading main chamber capable of curing composite and adhesive materials utilizing pressure, vacuum, and temperature cure profiles.

2.1.1.2. The control system shall allow the user to program, control, automatically execute, and monitor pressure, vacuum, and temperature setpoints, hold/dwell times, and ramp rates.

2.1.2. Footprint

2.1.2.1. The autoclave chamber shall have a minimum overall footprint of 116“ W X 258“ L X 89“ H and maximum overall footprint of 126“ W X 268“ L X 99“ H.

2.1.2.2. The control system shall have a maximum footprint of 46” W X 35” L X 82” H.

2.1.2.3. The maximum floor load of the autoclave and control system shall not exceed 500 lbs./square foot.

2.1.3. Working Space

2.1.3.1. The autoclave chamber interior working space shall be a minimum of 60” W X 120” L X 48” H.

2.1.4. Pressure System

2.1.4.1. The autoclave pressurization system shall utilize Nitrogen gas as the source.

2.1.4.2. The autoclave pressure operating range shall be from 0 psi to 200 psi or greater.

2.1.4.3. The autoclave shall have a pressure accuracy of ± 0.5 psi or better over the operating pressure range.

2.1.4.4. The autoclave shall be capable of pressurization at rates of 0 to 10 psi/minute over the operating pressure range.

2.1.4.5. The autoclave shall be capable of depressurization at rates of -0 to -10 psi/minute over the operating pressure range.

2.1.5. Vacuum System

2.1.5.1. The autoclave vacuum operating range at Tinker AFB atmospheric conditions shall be from 0” Hg to 25” Hg or higher.

2.1.5.2. The autoclave shall have a vacuum accuracy of ± 1” Hg or better over the operating vacuum range.

2.1.5.3. The autoclave shall have a minimum of 5 vacuum source ports for pulling vacuum on the material/part being cured.

2.1.5.4. The autoclave shall have a minimum of 3 vacuum transducer ports separate from the vacuum source ports.

2.1.6. Heating and Cooling Systems

2.1.6.1. The maximum autoclave operating temperature shall be at least 450 °F.

2.1.6.2. The autoclave shall have a temperature accuracy of ± 5 °F or better over the operating temperature range.

2.1.6.3. The autoclave shall be capable of heating and cooling at rates of 0 to 10 °F/minute and -0 to -10 °F/minute respectively over the operating temperature range.

2.1.6.4. The autoclave shall have a minimum of 10 type J thermocouple hookups for temperature monitoring of the material/part being cured.

2.1.7. Electrical

2.1.7.1. The autoclave electrical power requirements shall be 480V, 3-phase power with 200 AMP disconnect.

2.1.8. Safety

2.1.8.1. The autoclave operating chamber shall have a mechanical door interlock with visual active indicator.

2.1.8.2. The autoclave shall include a pressure relief valve and rupture disk.

2.2. SOFTWARE

2.2.1. Computer

2.2.1.1. The control system shall function via an on-site professional computer (PC) and software.

2.2.1.2. The PC shall be approved by the Government Technical POC.

2.2.1.3. The PC shall operate using air force imaged Windows 11 operating system in accordance with Air Force requirements.

2.2.1.4. The vendor shall install software for the autoclave and control system onto the existing government PC on-site.

2.2.1.5. If the vendor cannot install software via 2.2.1.4, the government technical POC shall provide imaged operating system to the vendor for installation on a vendor PC as needed OR shall provide a government PC for the vendor to install software on.

2.2.2. Process Control System

2.2.2.1. The control system shall allow programming of cure profiles with the following parameters including set points, ramp rates, and hold/dwell times for each:

2.2.2.1.1. Pressure

2.2.2.1.2. Vacuum

2.2.2.1.3. Temperature

2.2.2.2. The control system shall provide live monitoring and data recording capabilities for all process variables described in 2.2.2.1

2.2.2.3. The creation, modification, and programming of any and all cure profiles and shall not require any external network connection or connection to the internet, a Bluetooth connected device or cloud-based service.

2.2.2.4. The control system shall be able to execute all process variables described in 2.2.2.1 without any external network connection or connection to the internet, a Bluetooth connected device or cloud-based service.

2.2.2.5. The control system screen shall be a minimum of 12” W x 12” H.

3.0 INSTALLATION

3.1. PRE-INSTALLATION

3.1.1. The allocated working space for the autoclave and control system shall be prepared by Tinker AFB by removing the lab's current autoclave to disposal (DRMO) or donating it to another organization**.**

3.1.2. Tinker personnel shall verify that hookups for all required utilities are within 10' of the autoclave and control system installation site.

3.1.3. Receiving

3.1.3.1. The vendor shall provide a minimum 30-day notice of expected delivery date.

3.1.3.2. Tinker personnel shall ensure doors and aisleways are clear for the autoclave and equipment to be moved by the vendor to the installation site.

3.1.3.3. Upon receipt, Composites/Shelf-Life lab personnel shall verify all parts, boxes, and containers are accounted for, take note of any damage, and store them in a climate-controlled environment.

3.2. VENDOR INSTALLATION

3.2.1. The vendor shall be responsible for:

3.2.1.1. Transporting the unit and purchased equipment to the installation site.

3.2.1.2. Unloading the unit and all purchased equipment at the installation site.

3.2.1.3. Setting chamber and auxiliary equipment in the allocated working space.

3.2.1.4. Connecting the unit and any equipment disassembled for shipping.

3.2.2. The autoclave system shall be fully integrated into the existing facility:

3.2.2.1. Nitrogen supply line

3.2.2.2. Vacuum system

3.2.2.3. Air supply line

3.2.2.4. Electrical power

3.2.2.5. Water line

3.2.2.6. Exhaust lines

3.2.2.7. Roof and wall penetrations

3.2.3. The vendor shall provide a trained service engineer and/or representative to oversee installation and integration of the autoclave and control system to the lab.

3.2.4. The vendor service engineer and/or representative shall ensure all physical, mechanical, and electrical components are connected, functional, and operational following installation.

3.2.5. The vendor service engineer and/or representative shall verify all cable connections and that all software and communication between the control system PC and autoclave is operational following installation.

3.2.6. Any hazardous waste material associated with the delivery and installation will be disposed of in the appropriate waste stream provided by Tinker AFB.

4.0 TRAINING

4.1. OPERATION AND PROGRAMMING

4.1.1. The vendor shall provide complete on-site and in-person training for operation of the autoclave and control system hardware and software within 5 working days of installation completion. Complete training shall include at a minimum:

4.1.1.1. Creation, programming, and execution of cure profiles.

4.1.1.2. Opening, closing, and interlocking the autoclave.

4.1.1.3. Loading samples into the autoclave and connecting sensors/thermocouples.

4.1.2. The vendor shall provide training for a minimum of three (3) composites/shelf-life lab personnel.

4.1.3. The vendor shall validate a developed test cure profile with lab supplied specimen(s) to verify functionality of the autoclave and control system.

5.0 MAINTENANCE AND CALIBRATION

5.1. WARRANTY

5.1.1. A 1-year warranty for the autoclave and control system shall be provided to include the following:

5.1.1.1. Parts, labor, and travel for repair and replacement of components for the autoclave and control system.

5.1.1.2. Software updates.

5.1.1.3. System diagnostics and support.

5.2. SERVICE CONTRACT

5.2.1. All periodic maintenance services shall be established in a service contract with the vendor.

5.2.2. Composites/Shelf-Life Lab personnel shall be responsible for day-to-day routine maintenance of the autoclave and control system.

5.3. CALIBRATION

5.3.1. The vendor shall perform initial calibration of the autoclave and control system upon completion of installation.

5.3.2. The vendor shall perform calibration services on a maximum 12-month interval for the autoclave and control system.

5.3.3. Calibration certificates shall be provided to the Composites/Shelf-Life Lab upon completion of installation and operational verification.

6.0 DOCUMENTATION

6.1. MANUALS

6.1.1. Prior to delivery of the system to the installation site, the vendor shall provide a pre-installation manual for receiving items and preparing the working site for installation.

6.1.2. The vendor shall provide an operator's manual for general use and care of the autoclave and control system.

6.2. MAINTENANCE DOCUMENTATION

6.2.1. Prior to delivery of the system to the installation site, the vendor shall provide complete electrical and mechanical drawings for the autoclave and control system to the Composites/Shelf-Life Lab.

6.2.2. The vendor shall provide a basic maintenance manual (if not covered by operator's manual) for routine maintenance tasks to be performed at the end user level.

6.3. CALIBRATION DOCUMENTATION

6.3.1. The vendor shall provide an initial calibration certificate for the autoclave and control system including temperature, pressure, and vacuum calibration.