MEP National Network™

COMPLETE THIS FORM TO INITIATE SUPPLIER SCOUTING

MEPNN Supplier Scouting Opportunity Synopsis

☒ *The submitting entity agrees to notify NIST MEP of the status of actions taken as a result of this scouting instance within 30 days after receiving a results report. For instances where the submitting entity is an MEP Center submitting on behalf of a client, the MEP Center agrees to notify NIST MEP on behalf of their client. For instances where the submission is direct from federal/state agencies or is a private company, the submitting federal/state agency or private company entity agrees to notify NIST MEP. Notification should be via email to scouting@nist.gov, indicating the following:

- Contact with matches identified in report complete and supply contract awarded, process complete
- Contact with matches identified in report complete and no supply contract awarded, process complete
- Contact with matches identified in report complete and supply negotiations underway, process in progress
- Contact with matches identified in report underway; supply negotiations not yet begun; process in progress
- Contact with matches identified in report not yet begun, process in progress
- Contact with matches identified in report will not occur within the next 6-months, process complete

Focused Ion Beam Scanning Electron Microscope (FIB/SEM) System

Item to be Scouted

___________days

Opportunities will be postedfor 30 days unless specified

Please describe the item application/ the end use of item.* Provide the item number if applicable: (N95 Mask vs Protective Mask).

NIST is seeking information from vendors capable of providing a focused ion beam scanning electron microscope (FIB/SEM) system.

2022-130

Supplier Scouting Number (NIST MEP use)

Scouting customer/product NAICS Code, if known

TECHNICAL INFORMATION:

1. Supplier Information

a. Type of supplier being sought*

☒ Manufacturer ☐ Contract Manufacturer ☐ Distributor

☐ Other ____________________

b. Reason for scouting submission*

☐ 2nd Supplier ☐ Price ☐ Re-shore ☐ Past supplier no longer available

☐ New Product Startup

☒ Other ____________________

2. Summary of Technical Specifications and Performance Requirements:

a. Describe the manufacturing processes (elaborate to provide as much detail as possible).*

Item to be purchased as a standalone unit

b. Provide dimensions / size / tolerances / performance specifications for the item.*

NIST is seeking information from vendors capable of providing a focused ion beam scanning electron microscope (FIB/SEM) system. Provide information regarding the following requirements: 1. Ion Beam Related Characteristics 1.1. Focused ion beam column with Ga liquid metal ion source, liquid metal alloy ion source, or Plasma source. 1.2. If a Ga LMIS, 1.2.1. Maximum ion accelerating voltage of 30 kilovolts (kV) or higher. 1.2.2. Minimum ion accelerating voltage of 500 volts (V) or lower. 1.2.3. Minimum ion probe current of 10 picoamp (pA) or lower. 1.2.4. Maximum ion probe current of 50 nanoamp (nA) or higher. 1.2.5. Minimum ion source life of at least 1000 microamp hours. 1.2.6. Minimum ion beam resolution(s) (selective edge method): 1.2.6.1. at 30 kV: 5 nanometers (nm) or better 1.2.6.2. at 500 V: 750 nm or better 1.3. If a plasma FIB, 1.3.1. Maximum ion accelerating voltage of 30 kilovolts (kV) or higher. 1.3.2. Minimum ion accelerating voltage of 500 volts (V) or lower. 1.3.3. Minimum ion probe current of 10 picoamp (pA) or lower. 1.3.4. Maximum ion probe current of 2 microamp (uA) or higher. 1.3.5. Minimum ion source life of at least 1000 microamp hours. 1.3.6. Minimum ion beam resolution(s) (selective edge method): 1.3.6.1. at 30kV: 25 nanometers (nm) or better 1.3.7. Provide information about available ion species and their beam characteristics. 1.4. If a non-Gallium focused ion source, for each ion source, 1.4.1. Provide ion accelerating voltage ranges. 1.4.2. Provide ion probe current range. 1.4.3. Provide ion beam resolutions and specify the method used to determine the resolution. 1.5. Gas injection system (GIS) for deposition of Tungsten (W), Platinum (Pt), Carbon (C), Silica (SiOx), and others; or external

gas flow of, for example, Water (H_2O), Carbon Tetrafluoride (CF_4), or Xenon Difluoride (XeF_2). GIS shall accommodate at least three different precursor materials. 1.6. Micromanipulator system for specimen prep. Provide information on different micromanipulator options. 1.7. Patterning capabilities with a suite of pre-defined patterns. 1.8. Ability to use a stream file, or similar, to control the ion beam. 1.9. Beam blanker 2. Electron Beam Related Characteristics 2.1. High-stability field-emission electron emitter. 2.2. Maximum electron accelerating voltage of 30 kV. 2.3. Minimum electron accelerating voltage of 350 V or lower. 2.4. Minimum electron probe current of 10 pA or lower. 2.5. Maximum electron probe current of 100 nA or higher. 2.6. Minimum resolution(s): 2.6.1. at 30kV: at least one (1) nm or better (in Scanning/Transmission Electron Microscopy (STEM) mode) 2.6.2. at 15kV: at least one (1) nm or better 2.6.3. at 1kV: at least two (2) nm or better 2.7. Beam deceleration or similar capability allowing landing energies of 100 electron-volts (eV) or lower. 2.8. Maximum field-of-view of two (2) millimeters (mm) or higher. 2.9. Beam blanker 2.10. Integrated current measurement 2.11. Scan features include at a minimum: line averaging, scan interlacing, drift-compensated frame integration, standard frame integration, and frame averaging capabilities. 2.12. Simultaneous acquisition from two or more detectors. Provide details on maximum number of simultaneous signal acquisition and whether these signals can be mixed on-the fly. 2.13. Minimum image bit depth of 8 bit. Higher is preferred. 3. Specimen Chamber and Stage Related Characteristics 3.1. Large chamber with 3.1.1. minimum width x depth dimensions of 300 mm x 300 mm. 3.1.2. Sample chamber with the ability to accommodate several different sample heating, cooling stages in addition to a standard multi-sample holder stage. 3.1.3. Minimum of 15 ports. 3.1.4. Integrated cleaner. 3.2. Specimen stage with minimum: (1) X-Y-Z range of 100 mm – 100 mm -10 mm; (2) continuous rotation of 360 degree, and tilt range of -4 degree to +59 degree. 3.3. Provide stage load capacity. 3.4. Provide XY stage movement repeatability at 0 degree tilt. 3.5. Integrated column and chamber isolation for vibration damping. 3.6. Compatible with 3rd party analytical instruments such as EDS, EBSD, SIMS 4. Detector Related Characteristics 4.1. At a minimum, the following types of detectors or equivalent: 4.1.1. Everhart-Thornley secondary electron (SE) 4.1.2. In-lens secondary electron/backscattered electron (SE/BSE) 4.1.3. In-column SE/BSE 4.1.4. In-column backscattered electron (BSE) 4.1.5. Dedicated segmented back-scattered electron (BSE) 4.1.6. Dedicated segmented STEM with bright-field (BF), dark-field (DF), and high-angle annular dark-field (HAADF) modes. 4.2. In-chamber navigation camera or low magnification capability equivalent. 5. Vacuum and Power Related Characteristics 5.1. Completely oil free vacuum system. 5.2. Uninterruptible power supply (UPS). 6. User Interface and Software Related Characteristics 6.1. Provide information on electron and ion column alignment process. 6.1.1. What needs to be done by a service engineer and what can be done by a user as needed. 6.1.2. Which alignments are automated, semi-automated, or fully manual. 6.1.3. How often each type of alignments is typically needed. 6.1.4. Can specific alignments be saved and recalled. 6.2. Automated or macro-based routines for specimen preparation 6.3. Automated mosaic capturing and image stitching capable. 6.4. Programming API and/or support for custom scripting (e.g. python) for automated specimen characterization and/or fabrication. 6.5. Software or script for FIB sample preparation (e.g. transmission electron microscope specimen or atom-probe tips). 6.6. Automated serial sectioning, imaging, analytical characterization, and three dimensional (3D) tomography (e.g. imaging, EDS, and EBSD) capable. 6.7. Control PC with Windows 10 operating system or later with Trusted Platform Module 2.0 or greater. 6.8. Remote operation of the instrument. 7. The Contractor shall provide information on following Optional or 3rd party Equipment Characteristics separately: 7.1. GIS unit capable of premixing a minimum of two (2) chemicals listed above prior to injection for complex chemistry deposition or enhanced reactive etching. 7.2. Silicon drift detector (SDD) based energy dispersive spectrometer (EDS) system with ultra-thin window for low-Z element detection. Provide detailed information for the proposed SDD system such as the manufacturer, model, detector size, window type, resolution, software package, etc. 7.3. Electron backscatter diffraction (EBSD) system. Provide detailed information for the proposed EBSD system such as the manufacturer, model, camera, software package, etc. 7.4. Multi-purpose specimen holders. Provide detailed descriptions and/or drawings of the holder and note their compatibility with FIB/SEM components (e.g., used for EBSD analysis, used with STEM detector, used with dedicated BSD, etc.) 7.5. Additional ion species for the ion column and their imaging resolution and milling rate for Si. 7.6. SIMS add-on for the FIB/SEM. Provide detailed characteristics of the SIMS instrument and performance spec in the proposed FIB/SEM configuration. 7.7. Cold stage add-on for the FIB-SEM. Provide detailed characteristics of the cold stage performance spec in the proposed FIB/SEM configuration. 7.8. Laser milling capability. Provide detailed description of the instrument, system configuration, and material removal rates.

c. List required materials needed to make the product, including materials of product components.*

Item to be purchased as a standalone unit

2. Summary of Technical Specifications and Performance Requirements cont.

d. Are there applicable certification requirements?* ☐ Yes ■ No
Please explain

e. Are there applicable regulations?* ☐ Yes ■ No
Please explain

f. Are there any other standards, requirements, etc.?* ☐ Yes ■ No
Please explain

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		g. Additional Comments: Is there other information that would impact the item's performance or usefulness? Please explain.
BUSINESS INFORMATION:	3. Volume and Pricing	**3a. Estimated potential business volume (i.e., # Units Per Day, Month, Year) *:**
		One unit
		b. Estimated target price / unit cost information (flexible and negotiable not accepted) *:
		$3,000,000.00
	4. Delivery Requirements:	**a. When is it needed by? (Immediate, 30 Days, 6 months, etc.)***
		ASAP
		b. Describe packaging requirements (i.e., individually/group packaging)*
		Flexible
		c. Where will this item be shipped? *
		NIST, 100 Bureau Drive, Gaithersburg, MD 20899
	5. Additional Comments:	**Is there other information you would like to include?**

Photos or diagrams of the item (helpful but not required).