Supplier Scouting Opportunity 2023-023

Item Information

Item to be scouted: Analytical FIB/SEM Detectors

Days: 30

Item description: Energy dispersive x-ray (EDS) detectors and electron backscatter diffraction (EBSD) detectors for focused ion beam and scanning electron microscope (FIB/SEM) systems

NAICS code: 334516

Technical Information

Supplier Information

Type of supplier being sought: Manufacturer

Reason for scouting submission: Price

Summary of technical specifications and performance requirements
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Describe the manufacturing processes (elaborate to provide as much detail as possible): For the x-ray detector, a silicon lithium x-ray detector chip is attached to a system that allows for it to be inserted into a scanning electron microscope chamber. For the electron backscatter detector, a phosphor screen is attached to a system that allows for it to be inserted into a scanning electron microscope chamber. The images on the phosphor screen are collected by a camera.

Provide dimensions / size / tolerances / performance specifications for the item: The detectors must fit on any commercially available FIB/SEM systems and interface with the instrument control software

List required materials needed to make the product, including materials of product components: Aluminum, fiber optics, CMOS camera, semiconductor chips (for cameras/detectors/processor)

Are there applicable certification requirements?: No
Are there applicable regulations?: No
Are there any other standards, requirements, etc.?: The x-ray detector must be able to produce at least 400,00 counts. The EBSD diffraction camera shall have a maximum collection rate of no less than 4000 patterns per second.

Additional Comments:
A copy of the sources sought notice is included below and should be considered when responding to this scouting opportunity

Business Information

Volume and pricing

Estimated potential business volume:
30 units per year

Estimated target price / unit cost information (if unavailable explain): Less than $350,000 for a suite of two detectors

Delivery requirements

When is it needed by?: 6+ months, to be installed on microscopes that are still being procured

Describe packaging requirements: Each detector packaged individually

Where will this item be shipped?: Boulder, CO USA

Additional comments

Is there other information you would like to include?:
A copy of the sources sough notice related to this MEP scouting opportunity has been provided to MEP and should be considered when responding to this scouting opportunity.

Title: Suite of Analytical Detectors for Focused Ion Beam and Scanning Electron Microscopes

BACKGROUND

NIST is seeking information from sources that may be capable of providing a commercial item solution that meets or exceeds the following draft minimum specifications:

NIST is seeking information from vendors capable of providing analytical detectors for focused ion beam/scanning electron microscope (FIB-SEM) systems and/or scanning electron microscope (SEM) systems. The analytical detector systems will be installed on one or more FIB-SEM or SEM systems and will be operated in a multi-user precision imaging facility. The imaging facility supports multiple internal users by providing microscopy and microanalysis capabilities. Samples of interest include (but are not limited to) microfabricated, on-wafer devices and other solid-state electronics systems, as well as metal alloys.

The analytical detector systems will be installed on the Boulder, Colorado campus. The contractor shall furnish the necessary personnel, material, equipment, and services to fabricate, install, and test at least two (and up to four) complete analytical detector systems. The contractor shall provide training at the time of installation and the complete systems must be fully integrated, serviced, and warrantied by the single offeror.

NIST is specifically seeking to buy between two and four analytical detector systems from the same vendor to simplify instrument management, instrument service, and user training. Additionally, NIST seeks two to four systems with identical (or significantly similar) software user interfaces to minimize the time required to train users between the three instruments.

Common Requirements Between Systems:

1) Compatible software, user interface, and data types
    a. The systems provided by the Contractor shall operate with identical software with an identical user interface
    b. The systems provided by the Contractor shall output identical data file types.

Analytical Detector Suite:

A suite of analytical detectors to be installed on a focused ion beam/scanning electron microscope (FIB/SEM) system or scanning electron microscope (SEM) system. Each detector suite shall include an energy dispersive x-ray detector (EDS) and an electron backscatter detector (EBSD).

The detectors will be installed on the following microscope systems:
1) A dual beam FIB/SEM system, though the vendor/model of the FIB/SEM system is not yet known
2) A scanning electron microscope system, though the vendor/model of the SEM is not yet known
3) A dual beam FIB/SEM system (different from the FIB/SEM system in A), though the vendor/model of the FIB/SEM is not yet known
4) A Thermo Fisher Scios 2 dual beam FIB/SEM system

Specifications:
1) A software control system to allow for control of the microscope, including:
    a. Controlling the electron beam and ion beam (if required/appropriate)
    b. Reading detector signals from the instrument

    c. Controlling the instrument stage
    d. Reading imaging metadata from the instrument
2) The energy dispersive x-ray (EDS) detector shall:
    a. Not require liquid nitrogen or any external cooling water
    b. Be fully retractable (via motorized stage) such that the detector does not interfere with normal microscope operations when retracted
    c. Be of the silicon drift detector (SDD) type
3) The electron backscatter diffraction (EBSD) detector shall:
    a. Not require liquid nitrogen or any external cooling water
    b. Be fully retractable (via motorized stage) such that the detector does not interfere with normal microscope operations when retracted
    c. Be equipped with a CMOS type camera with a resolution of 640 x 480 pixels (or larger) that can collect data at a rate of 5000 indexed points per second or faster
4) The data collection computer system and software shall:
    a. Enable large area EDS and EBSD mapping to produce images of chemistry and crystallographic structure over large areas using the instrument stage
    b. Include one or more methods to process and quantify the collected ESD and EBSD data
    c. Be capable of controlling the specimen and stage, electron beam, and ion beam such that three-dimensional material data can be collected (commonly referred to as serial sectioning) if installed on a focused ion beam/scanning electron microscope (FIB/SEM) instrument
        i. Please specify which FIB/SEM vendors are supported

<u>IMPORTANT NOTES</u>

The information received in response to this notice will be reviewed and considered so that NIST may appropriately solicit for its requirements in the near future.

This notice should not be construed as a commitment by NIST to issue a solicitation or ultimately award a contract.

Responses will not be considered as proposals or quotations.

No award will be made as a result of this notice.

NIST is not responsible for any costs incurred by the respondents to this notice.

NIST reserves the right to use information provided by respondents for any purpose deemed necessary and appropriate.

Thank you for taking the time to submit a response to this request!